Dam Safety State Performance Reports

2019 National Inventory of Dams & 2019 State Program Performance Data
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Dams are a critical part of the nation’s infrastructure, providing vital benefits such as flood protection, water supply, hydropower, irrigation and recreation. Yet thousands of US dams have the potential to fail with tragic consequences. Our nation’s dams are aging and deteriorating while downstream populations are increasing; this situation demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State Dam Safety Programs regulate 69% of the 91,457 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. Many state programs lack adequate budgets, staff and authority to ensure public safety.

**Improvement in State Dam Safety Program Performance**


<table>
<thead>
<tr>
<th>Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total NID Dams</td>
<td>91,457</td>
</tr>
<tr>
<td>Total NID High Hazard Dams</td>
<td>15,621</td>
</tr>
<tr>
<td>Total State Regulated Dams</td>
<td>85,134</td>
</tr>
<tr>
<td>Total State Regulated High Hazard Dams</td>
<td>12,887</td>
</tr>
</tbody>
</table>

Unlike Most Components of US infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam ownership percentages are based on the 2019 NID dataset for total NID-sized dams.)
Building State Programs to Address Deficient Dams

The National Dam Safety Program, in cooperation with the Association of State Dam Safety Officials (ASDSO), developed the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to minimize risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The following table presents the weighted average of state responses over time to a series of yes/no questions on the authorities for each chapter. The areas are listed and weighted by importance (weights indicated in parentheses). Higher percentages indicate greater alignment of the state programs with the model.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>64%</td>
<td>73%</td>
<td>85%</td>
<td>86%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>54%</td>
<td>68%</td>
<td>74%</td>
<td>79%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>66%</td>
<td>79%</td>
<td>90%</td>
<td>93%</td>
</tr>
<tr>
<td>EAP and Response (4)</td>
<td>51%</td>
<td>62%</td>
<td>72%</td>
<td>79%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>58%</td>
<td>67%</td>
<td>75%</td>
<td>77%</td>
</tr>
<tr>
<td>Education and Training (3)</td>
<td>59%</td>
<td>72%</td>
<td>76%</td>
<td>76%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>13%</td>
<td>30%</td>
<td>32%</td>
</tr>
<tr>
<td>Overall Weighted Percentage</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Identifying the Problem

*2010 - 2019 data from NID condition assessment with not all State Regulated HHP dams being reported (86% in 2019). Prior years’ data was anecdotal totals reported by each state to ASDSO. The condition assessment field, instituted by the NID in 2009, provides more accurate data on remediation needs than the anecdotal totals.
Advances in Resources for State Dam Safety Programs

**Dam Safety Total State Budget**

**National Average Dam Safety State Budget per Regulated High Hazard Potential Dam**

**Total Staff (FTE)**
Inspection of High Hazard Potential State Regulated Dams Remains a Strength

National Inspection Percentage of State-Regulated High Hazard Potential Dams

Improvement in Emergency Preparedness for High Hazard Potential Dams

State-Regulated High Hazard Potential Dams with an EAP
EAP Completion Percentage for State-Regulated High Hazard Potential Dams
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

- **Satisfactory** – No existing or potential dam safety deficiencies are recognized.
- **Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.
- **Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.
- **Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
- **Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

**Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.**

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

**2018 Condition Rating of State-Regulated High Hazard Potential Dams.**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfactory</td>
<td>0</td>
</tr>
<tr>
<td>Fair</td>
<td>1</td>
</tr>
<tr>
<td>Poor</td>
<td>2</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>81</td>
</tr>
<tr>
<td>Not Rated</td>
<td>17</td>
</tr>
</tbody>
</table>

**National Inventory of Dams Condition Ratings**

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

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- **Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

**High Hazard Potential Dams Remediated** – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>Alaska</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>86%</td>
<td>59%</td>
</tr>
<tr>
<td>1998</td>
<td>79%</td>
<td>66%</td>
</tr>
<tr>
<td>2010</td>
<td>71%</td>
<td>77%</td>
</tr>
<tr>
<td>2018</td>
<td>73%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>94%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>75%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>50%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>94%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>90%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>39%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>73%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

Alaska has one Congressional District accounting for 107 dams.

State Staffing for Dam Safety

State Budgeting for Dam Safety

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

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Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.
Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>Congressional District</th>
<th>Number of Dams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona-1</td>
<td>208</td>
</tr>
<tr>
<td>Arizona-2</td>
<td>20</td>
</tr>
<tr>
<td>Arizona-3</td>
<td>24</td>
</tr>
<tr>
<td>Arizona-4</td>
<td>78</td>
</tr>
<tr>
<td>Arizona-5</td>
<td>2</td>
</tr>
<tr>
<td>Arizona-6</td>
<td>20</td>
</tr>
<tr>
<td>Arizona-8</td>
<td>5</td>
</tr>
<tr>
<td>Arizona-9</td>
<td>2</td>
</tr>
</tbody>
</table>

State Staffing for Dam Safety

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

Note that a smaller bar represents a higher number of staff per dam.

State Budgeting for Dam Safety

Dam Safety State Budget

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, Arizona conducted 106 dam owner meetings during scheduled dam safety inspections to discuss various issues, such as operation and maintenance and emergency preparedness.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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State NID Statistics

| 1263 | NID Dams |
| 193  | NID High Hazard Potential Dams |
| 410  | State-Regulated Dams |
| 114  | State-Regulated High Hazard Potential Dams |

National Inventory of Dams Condition Ratings

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**Overall Weighted Percentage**

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>47%</td>
<td>90%</td>
<td>81%</td>
<td>82%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

**2018 State Weighted Percentage**

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation</td>
<td>5</td>
<td>97%</td>
</tr>
<tr>
<td>Inspection</td>
<td>4</td>
<td>75%</td>
</tr>
<tr>
<td>Enforcement</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response</td>
<td>4</td>
<td>83%</td>
</tr>
<tr>
<td>Permitting</td>
<td>3</td>
<td>71%</td>
</tr>
<tr>
<td>Education &amp; Training</td>
<td>3</td>
<td>72%</td>
</tr>
<tr>
<td>Public Relations</td>
<td>1</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td></td>
<td><strong>82%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

State Staffing for Dam Safety

**Total Staff (FTE)**

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

**Dam Safety State Budget**

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

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Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Arkansas conducted an annual dam owner workshop training, and 34 on-site meetings with dam owners for maintenance issues, and EAP exercises.

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www.damsafety.org

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

National Inventory of Dams Condition Ratings
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediates – In calendar year 2018, ten state-regulated high hazard potential dams were remediates (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

In 2018, California conducted more than 1500 maintenance and construction inspections in which they met with dam owners and consultants to discuss the safety of the owner’s dams and appurtenant structures. In addition, California conducted approximately 200 meetings and phone conferences with dam owners and their consultants. Public outreach meetings were also held for newly adopted annual fee and inundation map regulations. On a continuous basis, the state promotes and assists owners with the preparation of Inundation Maps and EAPs for dams.

Number of State-Regulated High Hazard Potential Dams with an EAP.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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High Hazard Potential Dams Remediated – In calendar year 2018, fifteen state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

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**Are States Comparing Well to the National Benchmark?**

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Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
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An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, Colorado had 183 outreach efforts including design review meetings, PFMA’s, Public meetings, EAP exercises, CDHSEM coordination meetings, meetings for our Regional Extreme Precipitation Study and meetings and presentations for our High Hazard dam release - downstream floodplain impacts study.

Number of State-Regulated High Hazard Potential Dams with an EAP.


<table>
<thead>
<tr>
<th>Year</th>
<th>% with an EAP</th>
<th>% Full EAP*</th>
<th>% Exercised**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, eight state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 2%
Local 24%
Private 44%
State 17%
Utility 13%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
<tr>
<td>Connecticut</td>
<td>61%</td>
<td>87%</td>
<td>79%</td>
<td>84%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>88%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>80%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>94%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>81%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>67%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>42%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>84%</td>
</tr>
</tbody>
</table>
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

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High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.

State NID Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>NID Dams</td>
<td>83</td>
</tr>
<tr>
<td>NID High Hazard Potential Dams</td>
<td>63</td>
</tr>
<tr>
<td>State-Regulated Dams</td>
<td>47</td>
</tr>
<tr>
<td>State-Regulated High Hazard Potential Dams</td>
<td>43</td>
</tr>
</tbody>
</table>

National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

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Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

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**Are States Comparing Well to the National Benchmark?**

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Estimated Breakdown of Dams per Congressional District

Delaware has one Congressional District accounting for 83 dams.

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

![Graph showing the number of state-regulated high hazard potential dams with an EAP from 2005 to 2018.]

Outreach to Dam Owners, Local Officials and the Public

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State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Delaware law exempts dams owned by private individuals and entities.

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“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

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Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, four state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 1%
Local 5%
Private 73%
State 21%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>7% data not available</td>
<td>86%</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>85%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>95%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>100%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>67%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>0%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>86%</td>
</tr>
</tbody>
</table>
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Number of State-Regulated High Hazard Potential Dams with an EAP.

![Bar chart showing the number of state-regulated high hazard potential dams with an EAP from 1999 to 2018.]

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

In 2018, Florida held 20 onsite visits with dam owners and a technical dam safety conference.

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![Bar chart showing the 2018 emergency action plan data for state-regulated high hazard potential dams.]

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

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Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

State NID Statistics

| 5306 | NID Dams |
| 630 | NID High Hazard Potential Dams |
| 4166 | State-Regulated Dams |
| 492 | State-Regulated High Hazard Potential Dams |

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

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High Hazard Potential Dams Remediated – In calendar year 2018, six state-regulated high hazard potential dams were remediaded (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>72%</td>
<td>70%</td>
<td>84%</td>
<td></td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

1989 data not available

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>88%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>95%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>61%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>84%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>94%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>17%</td>
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</table>

Weighted Percentage 84%
Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>Congressional District</th>
<th>Regulated Dams per FTE</th>
<th>High Hazard Potential Dams per FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia-1</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Georgia-2</td>
<td>610</td>
<td></td>
</tr>
<tr>
<td>Georgia-3</td>
<td>652</td>
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<td>Georgia-4</td>
<td>124</td>
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<td>Georgia-5</td>
<td>32</td>
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<td>Georgia-6</td>
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<td>Georgia-7</td>
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<td>Georgia-8</td>
<td>885</td>
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<td>Georgia-9</td>
<td>541</td>
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<td>Georgia-11</td>
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<td>Georgia-12</td>
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<tr>
<td>Georgia-13</td>
<td>208</td>
<td></td>
</tr>
<tr>
<td>Georgia-14</td>
<td>338</td>
<td></td>
</tr>
</tbody>
</table>

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.


Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Georgia conducted five workshops and 41 meetings with dam owners.

Association of State Dam Safety Officials

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www.damsafety.org

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

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Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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### State NID Statistics

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>NID Dams</td>
<td>472</td>
</tr>
<tr>
<td>NID High Hazard Potential Dams</td>
<td>101</td>
</tr>
<tr>
<td>State-Regulated Dams</td>
<td>399</td>
</tr>
<tr>
<td>State-Regulated High Hazard Potential Dams</td>
<td>88</td>
</tr>
</tbody>
</table>

### 2018 Condition Rating of State-Regulated High Hazard Potential Dams

#### National Inventory of Dams Condition Ratings

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#### High Hazard Potential Dams Remediated

In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

---

**Are States Comparing Well to the National Benchmark?**

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---

**Overall Weighted Percentage**

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>79%</td>
<td>81%</td>
<td>81%</td>
<td>78%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

**2018 State Weighted Percentage**

<table>
<thead>
<tr>
<th>Area</th>
<th>Weighting (in parentheses)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td></td>
<td>85%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td></td>
<td>90%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td></td>
<td>83%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td></td>
<td>78%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td></td>
<td>86%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td></td>
<td>56%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>17%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td></td>
<td>78%</td>
</tr>
</tbody>
</table>
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**State NID Statistics**

<table>
<thead>
<tr>
<th></th>
<th>NID Dams</th>
<th>NID High Hazard Potential Dams</th>
<th>State-Regulated Dams</th>
<th>State-Regulated High Hazard Potential Dams</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1662</strong></td>
<td><strong>253</strong></td>
<td><strong>1965</strong></td>
<td><strong>253</strong></td>
<td></td>
</tr>
</tbody>
</table>

High Hazard Potential Dams Remediates - In calendar year 2018, zero state-regulated high hazard potential dams were remediates (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.

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### Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>71%</td>
</tr>
<tr>
<td>Local</td>
<td>17%</td>
</tr>
<tr>
<td>State</td>
<td>4%</td>
</tr>
<tr>
<td>Federal</td>
<td>3%</td>
</tr>
<tr>
<td>Utility</td>
<td>4%</td>
</tr>
<tr>
<td>Undetermined</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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#### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>Illinois</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>81%</td>
<td>59%</td>
</tr>
<tr>
<td>1998</td>
<td>78%</td>
<td>66%</td>
</tr>
<tr>
<td>2010</td>
<td>87%</td>
<td>77%</td>
</tr>
<tr>
<td>2018</td>
<td>88%</td>
<td>79%</td>
</tr>
</tbody>
</table>

#### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td></td>
<td>97%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td></td>
<td>74%</td>
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<tr>
<td>Enforcement (4)</td>
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<td>100%</td>
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<tr>
<td>EAP &amp; Response (4)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td></td>
<td>88%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td></td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>0%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td></td>
<td><strong>88%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

State Staffing for Dam Safety

**Total Staff (FTE)**

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

**Dam Safety State Budget**

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Illinois conducted 15 public information sessions and meetings with dam owners.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

State NID Statistics

<table>
<thead>
<tr>
<th>NID Statistics</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>NID Dams</td>
<td>912</td>
</tr>
<tr>
<td>NID High Hazard Potential Dams</td>
<td>266</td>
</tr>
<tr>
<td>State-Regulated Dams</td>
<td>1116</td>
</tr>
<tr>
<td>State-Regulated High Hazard Potential Dams</td>
<td>243</td>
</tr>
</tbody>
</table>

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, two state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>3%</td>
</tr>
<tr>
<td>Local</td>
<td>19%</td>
</tr>
<tr>
<td>State</td>
<td>8%</td>
</tr>
<tr>
<td>Utility</td>
<td>0%</td>
</tr>
<tr>
<td>Private</td>
<td>70%</td>
</tr>
</tbody>
</table>
| State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana</td>
<td>55%</td>
<td>data not available</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>82%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>38%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>11%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>44%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>61%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>56%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.

State Staffing for Dam Safety

State Budgeting for Dam Safety

<table>
<thead>
<tr>
<th>Indiana-1</th>
<th>Indiana-4</th>
<th>Indiana-7</th>
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<tbody>
<tr>
<td>22</td>
<td>76</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indiana-2</th>
<th>Indiana-5</th>
<th>Indiana-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>32</td>
<td>240</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indiana-3</th>
<th>Indiana-6</th>
<th>Indiana-9</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>159</td>
<td>285</td>
</tr>
</tbody>
</table>

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

In 2018, Indiana conducted three EAP workshops, the annual DIRT conference, and several one-on-one training sessions with dam owners.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

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**Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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**High Hazard Potential Dams Remediated** – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

- Federal: 1%
- Local: 48%
- Private: 48%
- State: 3%
- Utility: 0%

**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>52%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>85%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>53%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>67%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>11%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>58%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>28%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>50%</strong></td>
</tr>
</tbody>
</table>
## Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>District</th>
<th>Staffing (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa-1</td>
<td>260</td>
</tr>
<tr>
<td>Iowa-2</td>
<td>1202</td>
</tr>
<tr>
<td>Iowa-3</td>
<td>1215</td>
</tr>
<tr>
<td>Iowa-4</td>
<td>1338</td>
</tr>
</tbody>
</table>

### State Staffing for Dam Safety

- **Total Staff (FTE)**
- **State-Regulated Dams per FTE (blue) and National Average (red)**
- **State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)**

### State Budgeting for Dam Safety

- **Dam Safety State Budget**
- **Dam Safety State Budget per Regulated Dam (blue) and National Average (red)**
- **Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)**

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**Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.**
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Iowa conducted 50 meetings with dam owners as part of inspections. The meetings were used to explain dam safety and the importance of monitoring and maintenance.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

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State NID Statistics

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>NID Dams</td>
<td>6403</td>
</tr>
<tr>
<td>NID High Hazard Potential Dams</td>
<td>289</td>
</tr>
<tr>
<td>State-Regulated Dams</td>
<td>6654</td>
</tr>
<tr>
<td>State-Regulated High Hazard Potential Dams</td>
<td>256</td>
</tr>
</tbody>
</table>


National Inventory of Dams Condition Ratings

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High Hazard Potential Dams Remediated – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

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Estimated Breakdown of Dams per Congressional District

Kansas-1 2441
Kansas-2 2737
Kansas-3 175
Kansas-4 1049

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
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Number of State-Regulated High Hazard Potential Dams with an EAP.

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State Outreach Highlights

In 2018, Kansas held a Dam Safety Conference (180 attendees) and a Watershed District Contracting Officer Training (50 attendees).

State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Kansas law exempts all dams less than 25 feet high or with a height of six feet or greater and a storage volume at the top of the emergency spillway elevation of less than 50 acre feet and all low hazard potential dams with a height of less than 30 feet and storage volume at the top of the emergency spillway elevation of less than 125 acre feet. In addition all low-hazard potential dams that are wastewater storage structures for a confined feeding facility are exempt.

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Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.
Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.
Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>8%</td>
</tr>
<tr>
<td>Local</td>
<td>29%</td>
</tr>
<tr>
<td>Private</td>
<td>57%</td>
</tr>
<tr>
<td>State</td>
<td>6%</td>
</tr>
</tbody>
</table>

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>State</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>52%</td>
<td>59%</td>
</tr>
<tr>
<td>1998</td>
<td>78%</td>
<td>66%</td>
</tr>
<tr>
<td>2010</td>
<td>60%</td>
<td>77%</td>
</tr>
<tr>
<td>2018</td>
<td>63%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>82%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>77%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>11%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>54%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>61%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>8%</td>
</tr>
</tbody>
</table>

Weighted Percentage 63%
Estimated Breakdown of Dams per Congressional District

Kentucky-1 320
Kentucky-2 188
Kentucky-3 27
Kentucky-4 193
Kentucky-5 200
Kentucky-6 162

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Kentucky conducted 20 meetings with dam owners.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

Dams are a critical part of our nation's infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation's dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>Louisiana</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>85%</td>
<td>59%</td>
</tr>
<tr>
<td>1998</td>
<td>97%</td>
<td>66%</td>
</tr>
<tr>
<td>2010</td>
<td>80%</td>
<td>77%</td>
</tr>
<tr>
<td>2018</td>
<td>91%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>88%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>91%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>94%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>94%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>42%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>91%</td>
</tr>
</tbody>
</table>

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.
State Staffing for Dam Safety

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

Dam Safety State Budget

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Note - Louisiana has a relatively small number of High Hazard Potential Dams compared to the national average.

Estimated Breakdown of Dams per Congressional District

Adequate staffing is important to program performance.
State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Louisiana discussed safety concerns with dam owners after each inspection (45 estimated total).
Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
### Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

- Federal: 4%
- Local: 26%
- Private: 50%
- State: 9%
- Utility: 11%

### Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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#### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>67%</td>
<td>56%</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>National Average</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
<td></td>
</tr>
</tbody>
</table>

#### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>58%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>18%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>100%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>8%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>50%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Weighted Percentage 56%
Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>Maine-1</th>
<th>159</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine-2</td>
<td>425</td>
</tr>
</tbody>
</table>

State Staffing for Dam Safety

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

Dam Safety State Budget

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, Maine reported that the EAP TTX (tabletop exercise) was used for advocacy and 22 were carried out in 2018.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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State NID Statistics

<table>
<thead>
<tr>
<th>400</th>
<th>NID Dams</th>
</tr>
</thead>
<tbody>
<tr>
<td>91</td>
<td>NID High Hazard Potential Dams</td>
</tr>
<tr>
<td>531</td>
<td>State-Regulated Dams</td>
</tr>
<tr>
<td>92</td>
<td>State-Regulated High Hazard Potential Dams</td>
</tr>
</tbody>
</table>

National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

**Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

**Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 4%
Local 40%
Private 46%
State 9%
Utility 1%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

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<table>
<thead>
<tr>
<th>Overall Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
</tr>
<tr>
<td>76%</td>
</tr>
<tr>
<td>59%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2018 State Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
</tr>
<tr>
<td>Inspection (4)</td>
</tr>
<tr>
<td>Enforcement (4)</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
</tr>
<tr>
<td>Permitting (3)</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
</tr>
<tr>
<td>Public Relations (1)</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

State Staffing for Dam Safety

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

Dam Safety State Budget

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Maryland-1 118
Maryland-3 36
Maryland-5 55
Maryland-7 36
Maryland-2 9
Maryland-4 30
Maryland-6 134
Maryland-8 50

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

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Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

In 2018, Maryland conducted five EAP courses and one ASDSO course.

Association of State Dam Safety Officials
239 S. Limestone Lexington, KY 40508
859.550.2788
info@damsafety.org
www.damsafety.org

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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High Hazard Potential Dams Remediating
In calendar year 2018, seven state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>70%</td>
<td>89%</td>
<td>77%</td>
<td>77%</td>
</tr>
<tr>
<td>Natl</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>91%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>82%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>83%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>67%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>77%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>72%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>8%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>77%</td>
</tr>
</tbody>
</table>
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Massachusetts reported 45 one-on-one meetings with dam owners to review progress of permitted repair projects in the field, meetings pertaining to EAPs, and field response for requests for assistance.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, three state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state's inspection frequency and scheduling.

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**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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**Overall Weighted Percentage**

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>30%</td>
<td>80%</td>
<td>91%</td>
<td>91%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

**2018 State Weighted Percentage**

- **Legislation (5)** 82%
- **Inspection (4)** 98%
- **Enforcement (4)** 100%
- **EAP & Response (4)** 89%
- **Permitting (3)** 98%
- **Education & Training (3)** 94%
- **Public Relations (1)** 58%

**Weighted Percentage** 91%
Estimated Breakdown of Dams per Congressional District

Michigan-2  45  Michigan-6  93  Michigan-10  67  Michigan-14  5
Michigan-3  53  Michigan-7  102  Michigan-11  31
Michigan-4  177  Michigan-8  65  Michigan-12  19

**State Staffing for Dam Safety**

*Total Staff (FTE)*

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

**State Budgeting for Dam Safety**

*Dam Safety State Budget*

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, Michigan reported 20 meetings, seminars, courses, and workshops that were sponsored by the state program and/or where state dam safety staff participated as a speaker. The number also includes direct meetings/contact with dam owners to discuss issues with O&M and emergency preparedness.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

**Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

**Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

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State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>10%</td>
</tr>
<tr>
<td>Local</td>
<td>27%</td>
</tr>
<tr>
<td>Private</td>
<td>35%</td>
</tr>
<tr>
<td>State</td>
<td>22%</td>
</tr>
<tr>
<td>Utility</td>
<td>5%</td>
</tr>
<tr>
<td>Federal</td>
<td>10%</td>
</tr>
<tr>
<td>Undetermined</td>
<td>1%</td>
</tr>
</tbody>
</table>

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota</td>
<td>88%</td>
<td>78%</td>
<td>76%</td>
<td>77%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>97%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>79%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>67%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>78%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>85%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>67%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>77%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>Congressional District</th>
<th>State-Regulated Dams per FTE</th>
<th>State-Regulated High Hazard Potential Dams per FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota-1</td>
<td>228</td>
<td></td>
</tr>
<tr>
<td>Minnesota-2</td>
<td>91</td>
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<tr>
<td>Minnesota-3</td>
<td>17</td>
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<td>Minnesota-4</td>
<td>11</td>
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<td>Minnesota-7</td>
<td>462</td>
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<tr>
<td>Minnesota-8</td>
<td>331</td>
<td></td>
</tr>
</tbody>
</table>

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Minnesota reported 24 direct meetings with dam owners.

Association of State Dam Safety Officials
239 S. Limestone Lexington, KY 40508
859.550.2788
info@damsafety.org
www.damsafety.org

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

- **Satisfactory** – No existing or potential dam safety deficiencies are recognized.
- **Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.
- **Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.
- **Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
- **Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

**State NID Statistics**

- **6081** NID Dams
- **381** NID High Hazard Potential Dams
- **6830** State-Regulated Dams
- **371** State-Regulated High Hazard Potential Dams

**National Inventory of Dams Condition Ratings**

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**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

**High Hazard Potential Dams Remediated** – In calendar year 2018, eight state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>87%</td>
</tr>
<tr>
<td>State</td>
<td>1%</td>
</tr>
<tr>
<td>Federal</td>
<td>1%</td>
</tr>
<tr>
<td>Local</td>
<td>11%</td>
</tr>
<tr>
<td>Utility</td>
<td>0%</td>
</tr>
<tr>
<td>Undetermined</td>
<td>0%</td>
</tr>
</tbody>
</table>

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>39%</td>
<td>73%</td>
<td>77%</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>Mississipi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
<tr>
<td></td>
<td>National Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Area</th>
<th>Weighting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td></td>
<td>85%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
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<td>100%</td>
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<tr>
<td>EAP &amp; Response (4)</td>
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<tr>
<td>Permitting (3)</td>
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<td>75%</td>
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<tr>
<td>Education &amp; Training (3)</td>
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<td>83%</td>
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<tr>
<td>Public Relations (1)</td>
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<td>42%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td></td>
<td><strong>86%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

Mississippi-1 1694
Mississippi-2 1727
Mississippi-3 1664
Mississippi-4 997

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State Outreach Highlights

Mississippi estimated thirty dam safety seminars, courses, or workshops in 2018.

Number of State-Regulated High Hazard Potential Dams with an EAP.


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Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

State NID Statistics

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5379</td>
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<tr>
<td>1463</td>
<td>NID High Hazard Potential Dams</td>
</tr>
<tr>
<td>699</td>
<td>State-Regulated Dams</td>
</tr>
<tr>
<td>474</td>
<td>State-Regulated High Hazard Potential Dams</td>
</tr>
</tbody>
</table>

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

High Hazard Potential Dams Remediated – In calendar year 2018, five state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 1%
Local 24%
Private 72%
State 3%
Utility 0%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri</td>
<td>77%</td>
<td>83%</td>
<td>52%</td>
<td>82%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>88%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>75%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>83%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>81%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>78%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>82%</strong></td>
</tr>
</tbody>
</table>
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

In 2018, Missouri reported 50 direct meetings on site with the owner to discuss the inspection, etc.

State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Missouri law exempts all agricultural purpose dams and dams less than 35 feet in height regardless of storage volume and potential hazard.

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National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.

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State NID Statistics

| 3306 | NID Dams |
| 221  | NID High Hazard Potential Dams |
| 2918  | State-Regulated Dams |
| 119  | State-Regulated High Hazard Potential Dams |
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

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### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana</td>
<td>76%</td>
<td>83%</td>
<td>91%</td>
<td>91%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Weighting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td></td>
<td>90%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td></td>
<td>78%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td></td>
<td>92%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>67%</td>
</tr>
</tbody>
</table>

**Weighted Percentage**: 91%
Estimated Breakdown of Dams per Congressional District
Montana has one Congressional District accounting for 3,301 dams.

**State Staffing for Dam Safety**
*Total Staff (FTE)*

![Graph showing state staffing for dam safety vs. national average from 1999 to 2018.]

- **State-Regulated Dams per FTE (blue) and National Average (red)**
- **State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)**

**State Budgeting for Dam Safety**
*Dam Safety State Budget*

![Graph showing state budgeting for dam safety vs. national average from 1999 to 2018.]

- **Dam Safety State Budget per Regulated Dam (blue) and National Average (red)**
- **Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)**

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.


Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Montana reported 10 outreach opportunities including several dam owner workshops focused on emergency planning held around the state. There were focused meetings with owners of dams with specific issues; Oroville lessons learned workshop in April 18; Assistance with MT association of dam owners workshop in October 18.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.

Association of State Dam Safety Officials
239 S. Limestone Lexington, KY 40508
859.550.2788
info@damsafety.org
www.damsafety.org
“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

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National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

**Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

**Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediataed – In calendar year 2018, three state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nebraska</td>
<td>84%</td>
<td>84%</td>
<td>92%</td>
<td>92%</td>
</tr>
<tr>
<td>National Average</td>
<td>79%</td>
<td>79%</td>
<td>77%</td>
<td>77%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>94%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>93%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>83%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>65%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>78%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>8%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>84%</td>
</tr>
</tbody>
</table>

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.
Estimated Breakdown of Dams per Congressional District

State Staffing for Dam Safety

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Nebraska estimated thirty direct meetings with dam owners to discuss issues with operation and maintenance.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
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High Hazard Potential Dams Remediated – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.

State NID Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NID Dams</td>
<td>525</td>
</tr>
<tr>
<td>NID High Hazard Potential Dams</td>
<td>156</td>
</tr>
<tr>
<td>State-Regulated Dams</td>
<td>664</td>
</tr>
<tr>
<td>State-Regulated High Hazard Potential Dams</td>
<td>156</td>
</tr>
</tbody>
</table>


National Inventory of Dams Condition Ratings

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**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

- Federal: 12%
- Local: 26%
- Private: 52%
- State: 4%
- Utility: 6%

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

*Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.*

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**Are States Comparing Well to the National Benchmark?**

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The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Estimated Breakdown of Dams per Congressional District

New Hampshire-1 193
New Hampshire-2 460

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, New Hampshire reported a minimum of 90 meetings with Dam owners at their annual dam inspections. There were also a minimum of 20 seminars, courses or lectures related to Dam Safety.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

“High-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

“Significant-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

“Low-hazard potential dam” is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, five state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.

State NID Statistics

| 834 | NID Dams |
| 229 | NID High Hazard Potential Dams |
| 1708 | State-Regulated Dams |
| 229 | State-Regulated High Hazard Potential Dams |

National Inventory of Dams Condition Ratings

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Jersey</td>
<td>59%</td>
<td>89%</td>
<td>93%</td>
<td>93%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>88%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>97%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>100%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>88%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>94%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>67%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>93%</td>
</tr>
</tbody>
</table>

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
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An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, New Jersey reported 100 outreach opportunities, including numerous meetings with dam owners, workshops for dam owners as well as local emergency management officials. Our website provides updated Dam Safety information. We also have continued a semiannual emailed newsletter to dam owners, local officials and engineers. Any pertinent information is also issued to owners and officials by email blasts where necessary.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.

Association of State Dam Safety Officials
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859.550.2788
info@damsafety.org
www.damsafety.org
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

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**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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**Overall Weighted Percentage**

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Mexico</td>
<td>73%</td>
<td>70%</td>
<td>80%</td>
<td>81%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

**2018 State Weighted Percentage**

- Legislation (5): 79%
- Inspection (4): 88%
- Enforcement (4): 83%
- EAP & Response (4): 94%
- Permitting (3): 88%
- Education & Training (3): 67%
- Public Relations (1): 17%

**Weighted Percentage**: 81%
Estimated Breakdown of Dams per Congressional District

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, New Mexico reported 24 direct meetings with dam owners during field inspections to discuss compliance issues, operation and maintenance practices, engineering for dam modification and rehabilitation, management of state funds for dam rehabilitation.

Number of State-Regulated High Hazard Potential Dams with an EAP.

![2018 Emergency Action Plan Data for State-Regulated High Hazard Potential Dams.](chart)

- The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.
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**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

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**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

**High Hazard Potential Dams Remediated** – In calendar year 2018, the state did not report how many high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Percentage of State-Regulated High Hazard Potential Dam Inspections Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
</tr>
<tr>
<td>60%</td>
</tr>
</tbody>
</table>

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Are States Comparing Well to the National Benchmark?

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<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>61%</td>
<td>91%</td>
<td>90%</td>
<td>79%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>91%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>87%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>89%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>90%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>94%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>58%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>90%</strong></td>
</tr>
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State Outreach Highlights

In 2018, New York frequently met with dam owners individually, and participated in numerous courses, workshops, and meetings sponsored by other organizations. The program also sent copies of all High Hazard and Moderate Hazard dam inspection reports to the municipal executive and county emergency managers for the community in which the dam is located.

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**National Inventory of Dams Condition Ratings**

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- **Satisfactory** – No existing or potential dam safety deficiencies are recognized.
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**State NID Statistics**

- **3191** NID Dams
- **1307** NID High Hazard Potential Dams
- **2252** State-Regulated Dams
- **1253** State-Regulated High Hazard Potential Dams

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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**2018 Condition Rating of State-Regulated High Hazard Potential Dams.**

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**High Hazard Potential Dams Remediated** – In calendar year 2018, thirty state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

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<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>2%</td>
</tr>
<tr>
<td>Local</td>
<td>10%</td>
</tr>
<tr>
<td>State</td>
<td>2%</td>
</tr>
<tr>
<td>Utility</td>
<td>4%</td>
</tr>
<tr>
<td>Private</td>
<td>82%</td>
</tr>
</tbody>
</table>

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>76%</td>
<td>65%</td>
<td>69%</td>
<td>81%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority Type</th>
<th>Weighting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation</td>
<td>5</td>
<td>82%</td>
</tr>
<tr>
<td>Inspection</td>
<td>4</td>
<td>65%</td>
</tr>
<tr>
<td>Enforcement</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response</td>
<td>4</td>
<td>89%</td>
</tr>
<tr>
<td>Permitting</td>
<td>3</td>
<td>77%</td>
</tr>
<tr>
<td>Education &amp; Training</td>
<td>3</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations</td>
<td>1</td>
<td>25%</td>
</tr>
</tbody>
</table>

Weighted Percentage | 81%
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, North Carolina reported 25 outreach opportunities including several EAP tabletop exercises for dams, as well as meetings with dam owners to discuss plan submittals for dam construction, repair, modification, and jurisdictional determination meetings with dam owners.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

- **Satisfactory** – No existing or potential dam safety deficiencies are recognized.
- **Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.
- **Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.
- **Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
- **Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediates (that is, construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>48%</td>
</tr>
<tr>
<td>Local</td>
<td>31%</td>
</tr>
<tr>
<td>Federal</td>
<td>17%</td>
</tr>
<tr>
<td>State</td>
<td>4%</td>
</tr>
<tr>
<td>Utility</td>
<td>0%</td>
</tr>
<tr>
<td>Undetermined</td>
<td>0%</td>
</tr>
</tbody>
</table>

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
<th>State</th>
<th>National Average</th>
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<tbody>
<tr>
<td>North Dakota</td>
<td>65%</td>
<td>46%</td>
<td>55%</td>
<td>68%</td>
<td>59%</td>
<td>66%</td>
</tr>
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</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>70%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>70%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>83%</td>
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<tr>
<td>EAP &amp; Response (4)</td>
<td>83%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>40%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>61%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Weighted Percentage**: 68%
North Dakota has only two FTEs that are devoted entirely to dam safety. The total number of FTEs given here is an estimate that includes the contributions of several other employees involved with dam safety as part of their job duties.

North Dakota does not have a separate dam safety budget, it is part of a departmental budget. Therefore, the numbers given here are estimates.

Estimated Breakdown of Dams per Congressional District
North Dakota has one Congressional District accounting for 935 dams.

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

North Dakota conducted a public awareness campaign regarding low head dams and reported nine direct meetings with dam owners in 2018.

Number of State-Regulated High Hazard Potential Dams with an EAP.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, seven state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
### Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

### Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

### Are States Comparing Well to the National Benchmark?

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Number of State-Regulated High Hazard Potential Dams with an EAP.

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Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

State NID Statistics

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>4986</td>
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<tr>
<td>449</td>
<td>NID High Hazard Potential Dams</td>
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<tr>
<td>4635</td>
<td>State-Regulated Dams</td>
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<tr>
<td>367</td>
<td>State-Regulated High Hazard Potential Dams</td>
</tr>
</tbody>
</table>

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

![Pie chart showing Dam Ownership percentages: Private 50%, State 43%, Federal 3%, Local 4%, Utility 0.1%](image)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

![Bar chart showing inspection percentages over time](image)

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**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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### Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oklahoma</td>
<td>83%</td>
<td>85%</td>
<td>82%</td>
<td>88%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
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</tbody>
</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
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</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>97%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>93%</td>
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<tr>
<td>Enforcement (4)</td>
<td>100%</td>
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<tr>
<td>EAP &amp; Response (4)</td>
<td>78%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>73%</td>
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<tr>
<td>Education &amp; Training (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>58%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>88%</strong></td>
</tr>
</tbody>
</table>
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
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Number of State-Regulated High Hazard Potential Dams with an EAP.

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State Outreach Highlights

In 2018, Oklahoma conducted 24 low hazard dam inspections, a one-day dam safety training for dam owners and public officials, presented at the ASDSO annual conference, the OFMA spring conference, and the NDSPTS in Emmitsburg, and conducted three real estate workshops.

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High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.

State NID Statistics

<table>
<thead>
<tr>
<th></th>
<th>NID Dams</th>
<th>NID High Hazard Potential Dams</th>
<th>State-Regulated Dams</th>
<th>State-Regulated High Hazard Potential Dams</th>
</tr>
</thead>
<tbody>
<tr>
<td>882</td>
<td>158</td>
<td>953</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>31%</td>
<td>65%</td>
<td>60%</td>
<td>72%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
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2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>79%</td>
</tr>
<tr>
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<tr>
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</tr>
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<tr>
<td>Education &amp; Training (3)</td>
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<tr>
<td>Public Relations (1)</td>
<td>67%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
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</tbody>
</table>
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
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State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

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Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, five state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 5%
Local 23%
Private 58%
State 10%
Utility 4%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>93%</td>
<td>96%</td>
<td>88%</td>
<td>89%</td>
</tr>
</tbody>
</table>

Pennsylvania

<table>
<thead>
<tr>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

National Average

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>97%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>87%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>83%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>98%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>72%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>50%</td>
</tr>
</tbody>
</table>

Weighted Percentage 89%
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Emergency Action Planning

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State Outreach Highlights

In 2018, Pennsylvania reported 10 workshops throughout the state for electronic EAP submittals.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Estimated Breakdown of Dams per Congressional District

Puerto Rico has one Congressional District accounting for 36 dams.

State Staffing for Dam Safety
Total Staff (FTE)

State Budgeting for Dam Safety
Dam Safety State Budget

State-Regulated Dams per FTE (blue) and National Average (red)

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
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**State Outreach Highlights**

In 2018, Puerto Rico coordinated with the Puerto Rico Emergency Management Agency for the establishment of a new alarm system for the Guajataca Dam. Provided Technical support to the Puerto Rico Aqueduct and Sewer Authority to establish a rehabilitation plan for the Toa Vaca Dam gate spillway opening system. Provided one of the presentations on the FEMA National Dam Safety Seminar in Maryland. Provided one of the presentations for the United States Bureau of Reclamation DOI office, Dam Safety seminar in Sacramento California. Received, revised and commented on all Emergency Action Plans for all dams in the Program.

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National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

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### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rhode Island</strong></td>
<td>55% (data not available)</td>
<td>76%</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td><strong>National Average</strong></td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

### 2018 State Weighted Percentage

- **Legislation (5)**: 79%
- **Inspection (4)**: 67%
- **Enforcement (4)**: 100%
- **EAP & Response (4)**: 83%
- **Permitting (3)**: 87%
- **Education & Training (3)**: 61%
- **Public Relations (1)**: 8%

**Weighted Percentage**: 77%
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

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**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

"High-hazard potential dam" is typically defined as a dam whose failure or mis-operation will cause loss of human life and significant property destruction.

"Significant-hazard potential dam" is typically defined as a dam whose failure or mis-operation will cause significant property destruction.

"Low-hazard potential dam" is typically defined as a dam whose failure or mis-operation will cause minimal property destruction.

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State NID Statistics

| NID Dams | 2343 |
| State-Regulated Dams | 2299 |
| State-Regulated High Hazard Potential Dams | 369 |
| NID High Hazard Potential Dams | 359 |

**2018 Condition Rating of State-Regulated High Hazard Potential Dams.**

National Inventory of Dams Condition Ratings

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**High Hazard Potential Dams Remediated** – In calendar year 2018, nine state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

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**State Outreach Highlights**

In 2018, South Carolina reported 65 outreach efforts including an ASDSO dam owner workshop, co-presenting at the Clemson University Master Pond Manager class on four occasions and an estimated number of one-on-one meetings with dam owners based on average of 5 per month.

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* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 6%
Local 3%
Private 83%
State 7%
Undetermined 1%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Dakota</td>
<td>72%</td>
<td>58%</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
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</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighting</th>
<th>2018 Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td></td>
<td>85%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td></td>
<td>26%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td></td>
<td>50%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td></td>
<td>62%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td></td>
<td>83%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>25%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td></td>
<td>66%</td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

South Dakota has one Congressional District accounting for 2,560 dams.

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

**Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

**Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

---

**State NID Statistics**

| 1241 | NID Dams |
| 276  | NID High Hazard Potential Dams |
| 647  | State-Regulated Dams |
| 148  | State-Regulated High Hazard Potential Dams |

Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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**National Inventory of Dams Condition Ratings**

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**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

**High Hazard Potential Dams Remediated** – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

---

**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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### Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tennessee</td>
<td>69%</td>
<td>77%</td>
<td>73%</td>
<td>73%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Weight</th>
<th>Percentage</th>
</tr>
</thead>
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<tr>
<td>Legislation (5)</td>
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<td>Inspection (4)</td>
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<td>74%</td>
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<td>Enforcement (4)</td>
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<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td></td>
<td>44%</td>
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<td>Permitting (3)</td>
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<tr>
<td>Education &amp; Training (3)</td>
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<td>72%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>17%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td></td>
<td><strong>73%</strong></td>
</tr>
</tbody>
</table>
Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

Outreach to Dam Owners, Local Officials and the Public

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State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Tennessee law exempts farm ponds that are privately owned and not open to the public, regardless of size or hazard potential category.

Association of State Dam Safety Officials
239 S. Limestone Lexington, KY 40508
859.550.2788
info@damsafety.org
www.damsafety.org

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Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

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National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, nine state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

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**Are States Comparing Well to the National Benchmark?**

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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### Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>34%</td>
<td>75%</td>
<td>79%</td>
<td>80%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

### 2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>88%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>75%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>67%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>94%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>73%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>80%</strong></td>
</tr>
</tbody>
</table>
State Staffing for Dam Safety

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

Dam Safety State Budget

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

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An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

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State Outreach Highlights

In 2018, Texas conducted three workshops and 18 meetings with the dam owners.

State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Texas law exempts privately-owned significant and low hazard potential dams storing less than a maximum of 500 acre-feet in counties with population less than 350,000, excluding dams within municipal corporate limits. ASDSO opposes the exemption of significant hazard dams because these dams can present a significant potential hazard to downstream property and the environment and they must be designed, operated and maintained to accepted standards.

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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860 NID Dams
266 NID High Hazard Potential Dams
697 State-Regulated Dams
212 State-Regulated High Hazard Potential Dams
Dam Ownership

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Are States Comparing Well to the National Benchmark?

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
</tr>
<tr>
<td>59%</td>
</tr>
<tr>
<td>59%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2018 State Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
</tr>
<tr>
<td>Inspection (4)</td>
</tr>
<tr>
<td>Enforcement (4)</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
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**High Hazard Potential Dams Remediated** – In calendar year 2018, one state-regulated high hazard potential dam was remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

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Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>29%</td>
<td>47%</td>
<td>69%</td>
<td>89%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
<th>Weighted Percentage</th>
</tr>
</thead>
<tbody>
<tr>
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<td>91%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>93%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>89%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>25%</td>
</tr>
</tbody>
</table>

Weighted Percentage | 89%
Estimated Breakdown of Dams per Congressional District

Vermont has one Congressional District accounting for 368 dams.

**State Staffing for Dam Safety**

*Total Staff (FTE)*

**State Budgeting for Dam Safety**

*Dam Safety State Budget*

**State-Regulated Dams per FTE (blue) and National Average (red)**

**State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)**

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.
Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

National Inventory of Dams Condition Ratings

Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

**Satisfactory** – No existing or potential dam safety deficiencies are recognized.

**Fair** – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

**Poor** – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

**Unsatisfactory** – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

**Not Rated** – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, thirteen state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 1%
Local 9%
Private 35%
State 3%
Utility 2%
Undetermined 50%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>Virginia</td>
<td>75%</td>
<td>74%</td>
<td>96%</td>
<td>96%</td>
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<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
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2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Area</th>
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<tbody>
<tr>
<td>Legislation (5)</td>
<td>94%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>97%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>100%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>94%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>89%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>92%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td><strong>96%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>District</th>
<th>Total Staff (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia-1</td>
<td>467</td>
</tr>
<tr>
<td>Virginia-2</td>
<td>69</td>
</tr>
<tr>
<td>Virginia-3</td>
<td>41</td>
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<tr>
<td>Virginia-4</td>
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<tr>
<td>Virginia-5</td>
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<tr>
<td>Virginia-6</td>
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<tr>
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<tr>
<td>Virginia-10</td>
<td>191</td>
</tr>
<tr>
<td>Virginia-11</td>
<td>64</td>
</tr>
</tbody>
</table>

**State Staffing for Dam Safety**

*Total Staff (FTE)*

![Graph showing State-Regulated Dams per FTE](image)

*State-Regulated Dams per FTE* (blue) and National Average (red)

![Graph showing State-Regulated High Hazard Potential Dams per FTE](image)

*State-Regulated High Hazard Potential Dams* per FTE (blue) and National Average (red)

**State Budgeting for Dam Safety**

*Dam Safety State Budget*

![Graph showing Dam Safety State Budget](image)

*Dam Safety State Budget per Regulated Dam* (blue) and National Average (red)

![Graph showing Dam Safety State Budget per Regulated High Hazard Potential Dam](image)

*Dam Safety State Budget per Regulated High Hazard Potential Dam* (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

State Outreach Highlights

In 2018, Virginia conducted 873 dam-related trainings for Dam Owners and Dam Engineers. Topics included dam operation and maintenance, emergency preparedness, safety procedures at dams, education discussions revolving around dam construction, toe drain education, staff gauge education, and various other dam related educational training requested by Dam Owners while on Dam visits.

State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Virginia law exempts dams operated primarily for agricultural purposes which are less than 25 feet in height or which create a maximum impoundment capacity smaller than 100 acre-feet.

Number of State-Regulated High Hazard Potential Dams with an EAP.


* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

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Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, zero state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 12%
Local 20%
Private 54%
State 5%
Utility 9%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

The National Dam Safety Program, in cooperation with ASDSO, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations.

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Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>66%</td>
<td>88%</td>
<td>86%</td>
<td>87%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighting</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td></td>
<td>91%</td>
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<td>Inspection (4)</td>
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<tr>
<td>Enforcement (4)</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td></td>
<td>79%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td></td>
<td>78%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td></td>
<td>25%</td>
</tr>
<tr>
<td><strong>Weighted Percentage</strong></td>
<td></td>
<td><strong>87%</strong></td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

<table>
<thead>
<tr>
<th>Congressional District</th>
<th>Total Staff (FTE)</th>
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</thead>
<tbody>
<tr>
<td>Washington-1</td>
<td>73</td>
</tr>
<tr>
<td>Washington-2</td>
<td>80</td>
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<tr>
<td>Washington-3</td>
<td>101</td>
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<td>Washington-4</td>
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<td>Washington-9</td>
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<tr>
<td>Washington-10</td>
<td>22</td>
</tr>
</tbody>
</table>

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An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Outreach to Dam Owners, Local Officials and the Public

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State Outreach Highlights

In 2018, Washington reported 86 meetings during periodic on-site inspections in which DSO engineers review Emergency procedures and O&M plans with the dam owner or representative and 12 technical assistance visits to dam sites.

Number of State-Regulated High Hazard Potential Dams with an EAP.

<table>
<thead>
<tr>
<th>Year</th>
<th>% with an EAP</th>
<th>Compared to National Average</th>
<th>% Full EAP*</th>
<th>% Exercised**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

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**High Hazard Potential Dams Remediated** – In calendar year 2018, two state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

* Inspection percentages may vary above and below 100% for any given year based on a state's inspection frequency and scheduling.

Are States Comparing Well to the National Benchmark?

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<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Virginia</td>
<td>62%</td>
<td>78%</td>
<td>89%</td>
<td>90%</td>
</tr>
<tr>
<td>National Average</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
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2018 State Weighted Percentage

<table>
<thead>
<tr>
<th>Authority</th>
<th>Weighted Percentage</th>
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<tr>
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<tr>
<td>EAP &amp; Response (4)</td>
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<td>Permitting (3)</td>
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<td>Education &amp; Training (3)</td>
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Number of State-Regulated High Hazard Potential Dams with an EAP.

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Outreach to Dam Owners, Local Officials and the Public

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Association of State Dam Safety Officials

239 S. Limestone Lexington, KY 40508
859.550.2788
info@damsafety.org
www.damsafety.org

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Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, ten state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
Dam Ownership

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

Federal 7%
Local 37%
Private 33%
State 12%
Utility 9%
Federal 7%
Undetermined 2%

Percentage of State-Regulated High Hazard Potential Dam Inspections Completed

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The tables here present the state’s response to a series of yes/no questions on the authorities for each chapter and an overall weighted percentage for the program. The tables also show how the state’s weighted averages compare to the national averages over time. Higher percentages indicate greater alignment of the state program with the model and lower percentages can be indicative of needed improvement in authority. The areas are weighted by importance (listed in order with weightings indicated in parentheses) for the overall percentage. Areas of concern where additional state authorities may be needed are highlighted.

Overall Weighted Percentage

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td>86%</td>
<td>93%</td>
<td>93%</td>
<td></td>
</tr>
<tr>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
<td>Wisconsin</td>
</tr>
<tr>
<td>National Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2018 State Weighted Percentage

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation (5)</td>
<td>100%</td>
</tr>
<tr>
<td>Inspection (4)</td>
<td>85%</td>
</tr>
<tr>
<td>Enforcement (4)</td>
<td>100%</td>
</tr>
<tr>
<td>EAP &amp; Response (4)</td>
<td>94%</td>
</tr>
<tr>
<td>Permitting (3)</td>
<td>96%</td>
</tr>
<tr>
<td>Education &amp; Training (3)</td>
<td>94%</td>
</tr>
<tr>
<td>Public Relations (1)</td>
<td>42%</td>
</tr>
<tr>
<td>Weighted Percentage</td>
<td>93%</td>
</tr>
</tbody>
</table>
Estimated Breakdown of Dams per Congressional District

State Staffing for Dam Safety

Total Staff (FTE)

State-Regulated Dams per FTE (blue) and National Average (red)

State-Regulated High Hazard Potential Dams per FTE (blue) and National Average (red)

State Budgeting for Dam Safety

Dam Safety State Budget

Dam Safety State Budget per Regulated Dam (blue) and National Average (red)

Dam Safety State Budget per Regulated High Hazard Potential Dam (blue) and National Average (red)

Adequate staffing is important to program performance. State numbers significantly above the Regulated Dams per FTE and Regulated High Hazard Potential Dams per FTE national averages can be indicators of the need for additional staff resources.
Emergency Action Planning

An Emergency Action Plan (EAP) identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to help prevent loss of life and minimize property damage. Dam owners work with state and local officials to prepare and update EAPs to help mitigate losses resulting from dam failures. The EAP specifies actions the dam owner should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans.

Number of State-Regulated High Hazard Potential Dams with an EAP.

State Outreach Highlights

In 2018, Wisconsin conducted three Dam Safety workshops for dam owners and consultants.

State Regulatory Exemptions

A small, but unfortunately growing number of states exempt categories of dams from inspection based on the purpose of the impoundment or the owner type. ASDSO opposes these types of exemptions because all dams, regardless of their purpose or owner, present a potential hazard to people and property downstream and they must be designed, operated and maintained to accepted standards. Wisconsin law exempts dams associated with cranberry production and dams not located on a watercourse.

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859.550.2788
info@damsafety.org
www.damsafety.org

* The % Full EAP bar represents the percentage of high hazard potential dams with an EAP that contain all the elements from FEMA-64, Federal Guidelines for Dam Safety: Emergency Action Planning. The elements include a notification flowchart, inundation maps, and sections on emergency detection, responsibilities and preparedness.

** The % Exercised bar indicates the percentage of high hazard potential dams with EAPs that were exercised in the past five years. After an EAP has been developed, it must be exercised so it does not become outdated and ineffective.
Dams are a critical part of our nation’s infrastructure and all Americans enjoy the valuable benefits they provide, including flood protection, water supply, hydropower, irrigation and recreation. Our dams are aging and deteriorating, while downstream populations are increasing. Thousands of U.S. dams have the potential to fail with tragic consequences, and Americans need to understand the risks associated with potential incidents and failures. This demands greater attention to and investment in measures that reduce risks to public safety and economic assets.

State dam safety programs regulate 70% of the 91,468 dams listed in the National Inventory of Dams (NID). State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness. State Dam Safety Officials, all members of the Association of State Dam Safety Officials (ASDSO), are experts dedicated to ensuring the safety and security of our nation’s dams. However, many state programs lack adequate budgets, staff and authority to ensure public safety.

National Inventory of Dams Condition Ratings
Since 2009, the NID has collected condition data on state-regulated high hazard potential dams. For the 2018 NID update, 85% of state-regulated high hazard potential dams were rated. Although a voluntary submission, most states participate and the number of not rated dams continues to decrease.

Satisfactory – No existing or potential dam safety deficiencies are recognized.

Fair – No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency.

Poor – A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

Unsatisfactory – A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Not Rated – The dam has not been inspected or has been inspected but, for whatever reason, has not been rated.

High Hazard Potential Dams Remediated – In calendar year 2018, two state-regulated high hazard potential dams were remediated (that is construction was completed) in the calendar year because of hydraulic/structural deficiencies.
**Dam Ownership**

Unlike most components of U.S. infrastructure, the majority of dams listed in the National Inventory of Dams are privately owned. (Dam Ownership percentages are based on the 2018 NID dataset for the state for total NID-sized dams.)

*Federal: 14%  Local: 5%  Private: 79%  State: 1%  Utility: 1%  *

**Percentage of State-Regulated High Hazard Potential Dam Inspections Completed**

*Inspection percentages may vary above and below 100% for any given year based on a state’s inspection frequency and scheduling.*

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**Overall Weighted Percentage**

<table>
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<tr>
<th></th>
<th>1989</th>
<th>1998</th>
<th>2010</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wyoming</td>
<td>59%</td>
<td>66%</td>
<td>77%</td>
<td>79%</td>
</tr>
<tr>
<td>National Average</td>
<td>43%</td>
<td>67%</td>
<td>60%</td>
<td>56%</td>
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</table>

**2018 State Weighted Percentage**

- **Legislation (5)**  **64%**
- **Inspection (4)**  **49%**
- **Enforcement (4)**  **100%**
- **EAP & Response (4)**  **17%**
- **Permitting (3)**  **48%**
- **Education & Training (3)**  **72%**
- **Public Relations (1)**  **8%**
- **Weighted Percentage**  **56%**
Estimated Breakdown of Dams per Congressional District

Wyoming has one Congressional District accounting for 1,613 dams.

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Outreach to Dam Owners, Local Officials and the Public

Increasing the awareness of the risks related to dams, and effective methods for living safely with dams is an important goal of state dam safety programs, ASDSO and the National Dam Safety Program. Dam owners and operators need to be aware of their state’s dam safety laws and regulations, the associated responsibilities and liabilities, and the proper operation, maintenance and inspection of their dams. In addition, local emergency management officials, first responders, and people who live and work in areas downstream of dams need to understand the risk and plans for response in an emergency situation. State programs respond to these needs through direct meetings and workshops with dam owners, workshops with local officials, and publications and outreach to the public.

State Outreach Highlights

In 2018, Wyoming held five dam owner workshops and 15 meetings with owners/operators.

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