

Improving Regional Resilience: Bringing It All Together

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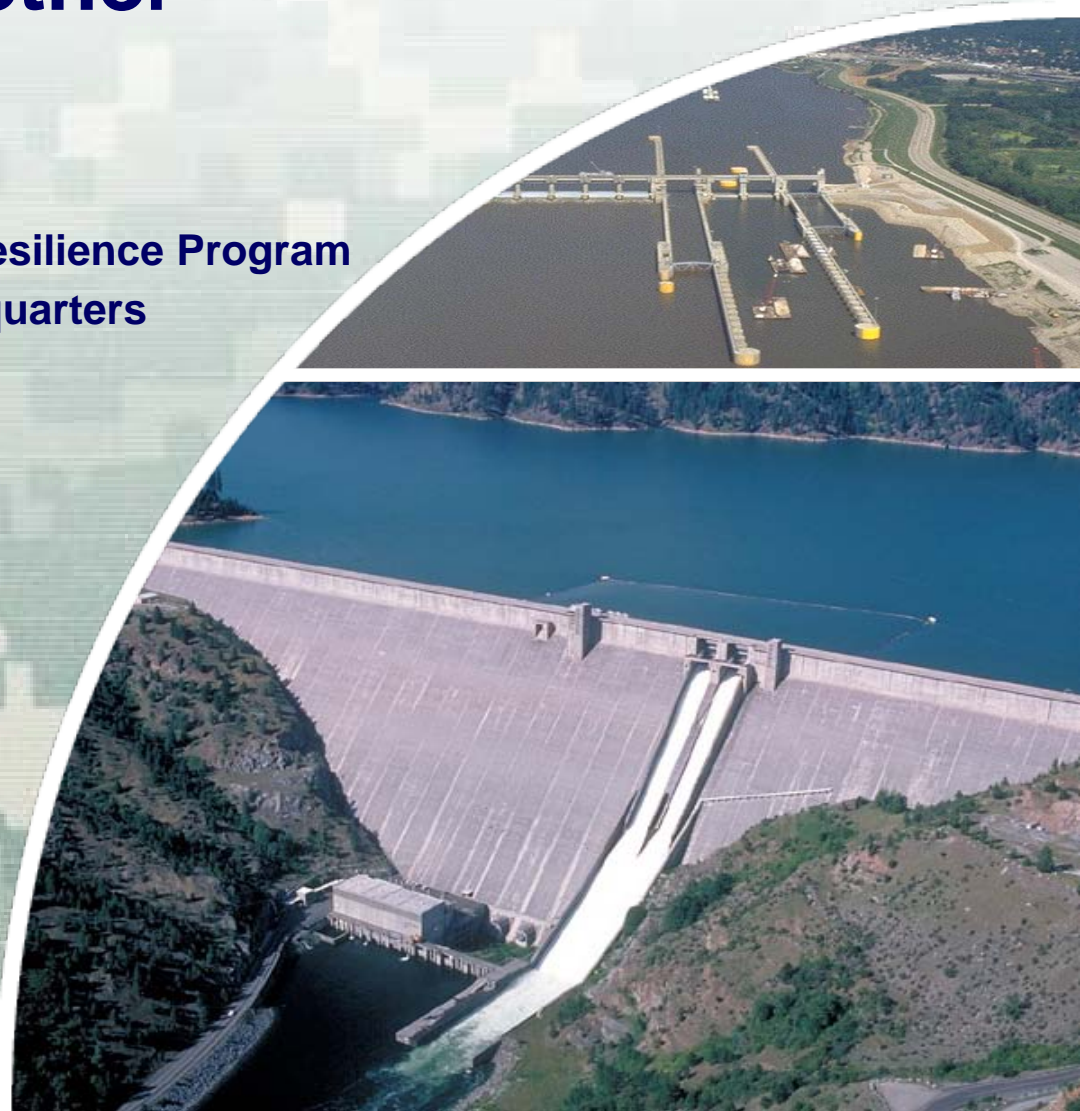
28-29 September 2010

Arlington, Virginia



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Dams as Critical Infrastructure

- Dams Sector encompasses not only “conventional” dams but also locks (and navigation dams), levees (flood protection systems), hydropower facilities, mine tailings, and other water retention or control structures.
- DHS Office of Infrastructure Protection designated as Sector-Specific Agency.



Dams...



Locks...



... and Levees

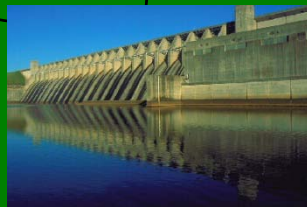


U.S. Army Corps of Engineers (USACE) as Dams Sector Stakeholder

627 Shallow Draft Harbors



25% of Nation's Hydropower Production



383 Major Lakes & Reservoirs
376 M visitors/yr

11,000 miles Inland Waterways

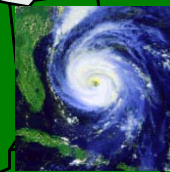
299 Deep Draft Harbors



400 miles Coastal Structures



Emergency Operations



4340 Recreation Areas

653 Dams
276 Locks

\$500M annual Dredging Costs

14,000 miles of Levees

11.7 Million Acres Public Lands



Environmental Stewardship

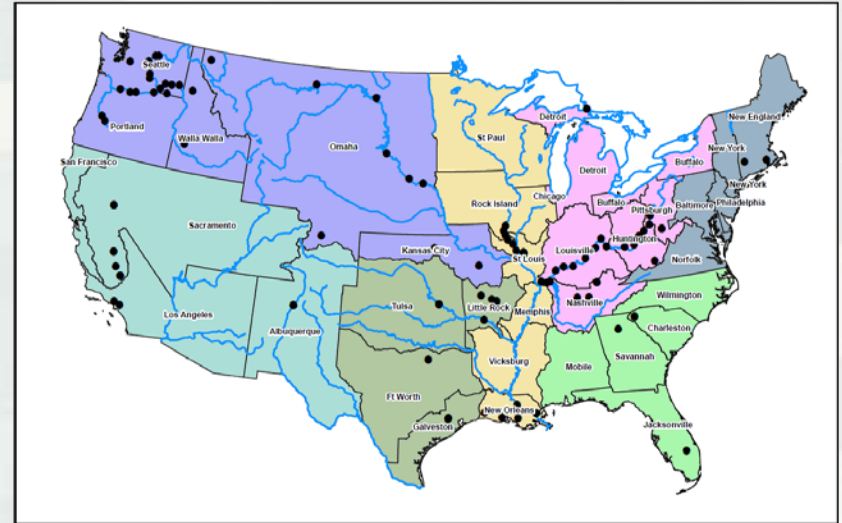


Regulatory Responsibilities

Cumulative Flood Damage Reduction >\$419 Billion

USACE Critical Infrastructure Protection & Resilience (CIPR) Program

- **Program Goal:**
 - Improve protection, resilience, and lifecycle investment in critical infrastructure.
- **Program Vision:**
 - Achieve a more secure and more resilient civil works critical infrastructure by enhancing its protection in order to prevent, deter, or mitigate the effects of manmade incidents and improve preparedness, response, and rapid recovery in the event of an attack, natural disaster, and other emergencies.



- **Integrated Approach:**
 - Portfolio-Centric
 - System/Regional Focus
 - All Hazards Coordination

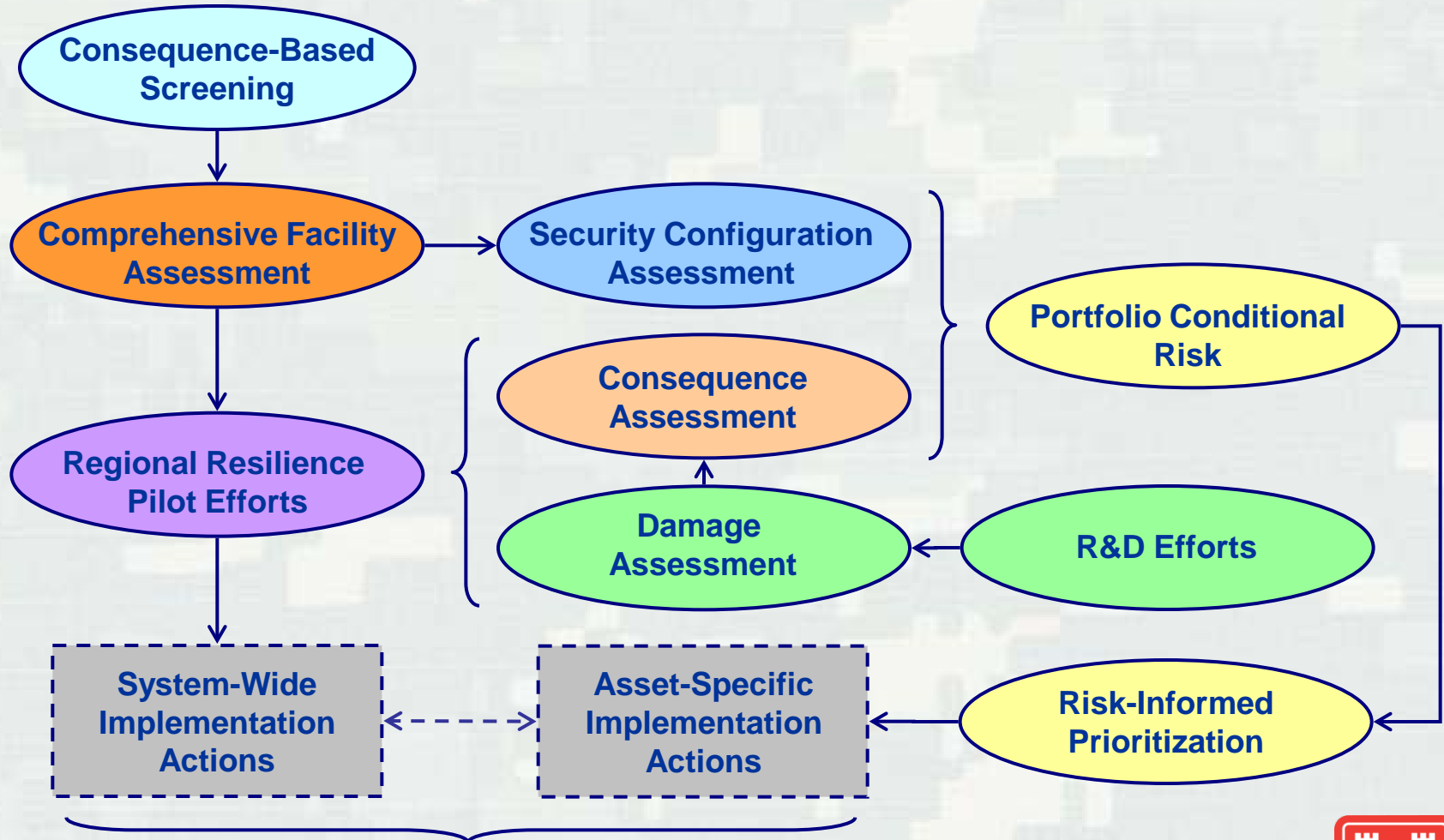


Challenge: A Complex Risk Profile

- **Driven by multiple sources:**
 - **Natural hazards**
 - **Structural deficiencies**
 - **Aging**
 - **Accidents**
 - **Malfunctions**
 - **Deliberate aggressor actions**



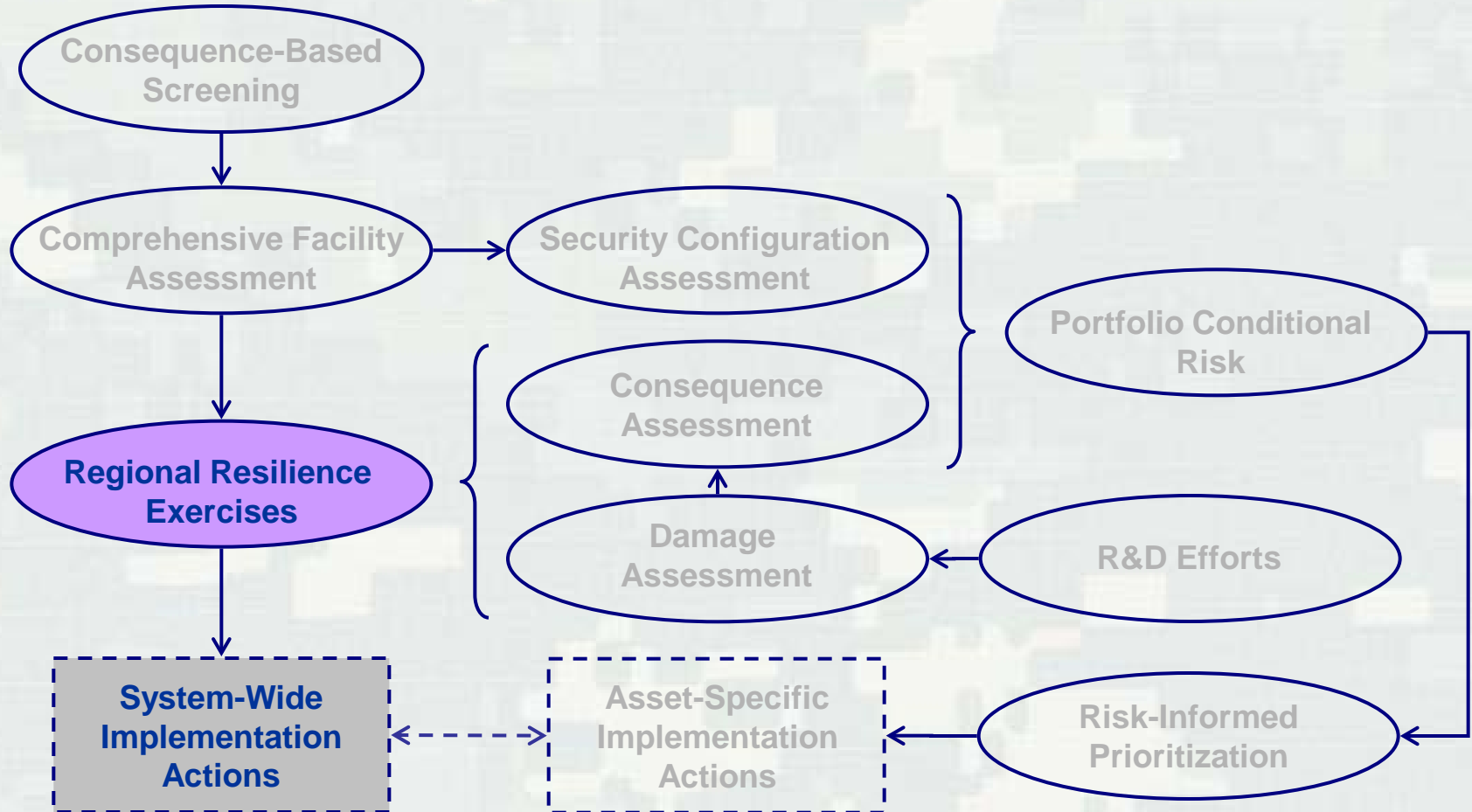
USACE Critical Infrastructure Protection & Resilience (CIPR) Program



Integrated Approach for Enhanced Protection & Resilience



USACE Critical Infrastructure Protection & Resilience (CIPR) Program



Regional Resilience Efforts: Dams Sector Exercise Series (DSES)

- Collaborative process to identify, analyze, assess, and enhance regional preparedness and disaster resilience involving a wide array of public & private stakeholders.
- For a given region, a particular scenario serves as the triggering event to analyze impacts, disruptions, critical infrastructure interdependencies, and stakeholder roles and responsibilities.
- Three major regional efforts conducted to date:
 - Bagnell/Truman Dams (DSES-08)
 - Columbia River Basin (DSES-09)
 - Green River Valley (DSES-10)



2010 Dams Sector Exercise Series – Green River Valley (DSES-10)

▪ Goals:

- Understand potential impacts associated with significant flooding events along the Green River Valley (State of Washington).
- Identify and prioritize critical infrastructure dependencies and interdependencies.
- Assist public/private stakeholders in improving recovery strategies and business continuity plans.



DSES-10 Approach

- Implemented through a series of discussion-based activities (meetings, seminars, workshops, etc), complemented by data gathering and analysis efforts.
- A systematic process is followed to consolidate findings, and support a framework to inform future resource requirements and investment justifications.
- Comprised of 3 major areas:
 - 1) Regional Baseline Assessment
 - 2) Regional Consequence Assessment
 - 3) Regional Resilience Strategy



DSES-10 Initial Planning Workshop

- Conducted on April 28, 2010 in Seattle, WA.
- Served as an effective forum to discuss the multiple aspects of the DSES-10 effort.
- Over 151 participants, including 114 Federal, State, and local government representatives, 27 private stakeholders, and 10 representatives from non-profit organizations.

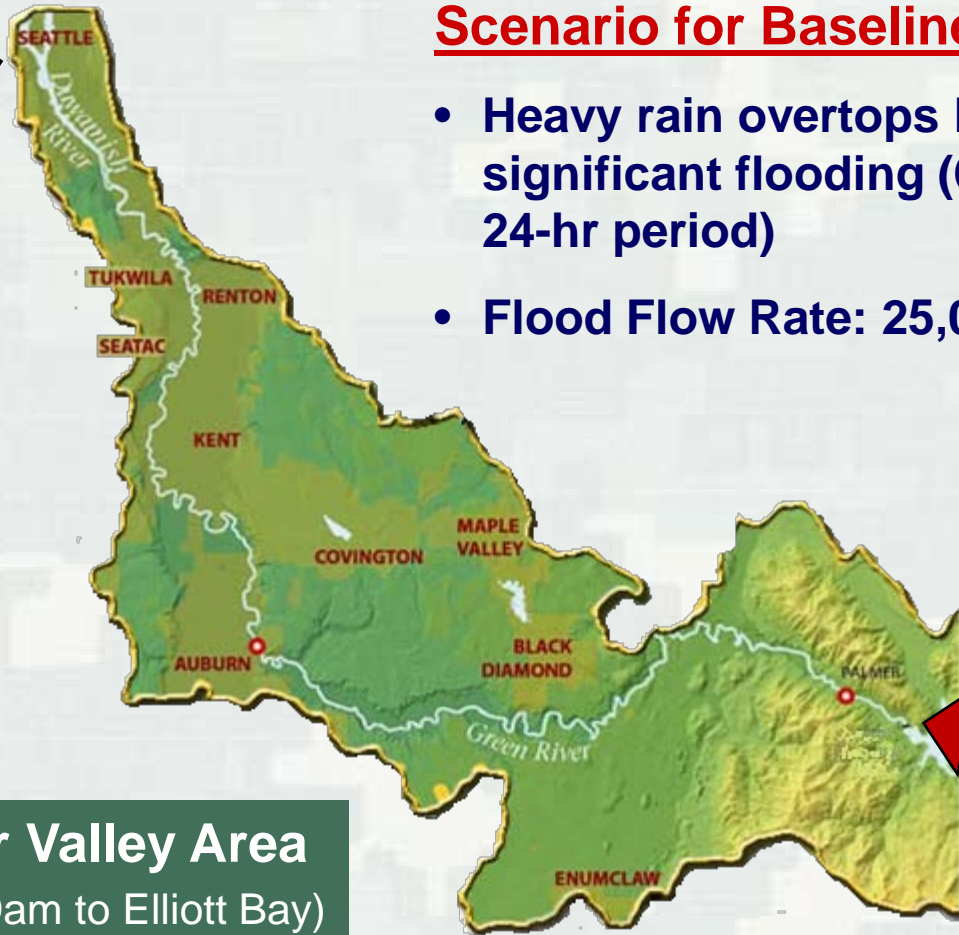


DSES-10 Triggering Event:
A significant flooding scenario affecting the King County communities of Auburn, Kent, Renton, and Tukwila.



Scenario and Geographic Scope

Harbor
Island
Area



Green River Valley Area
(62 miles from Dam to Elliott Bay)

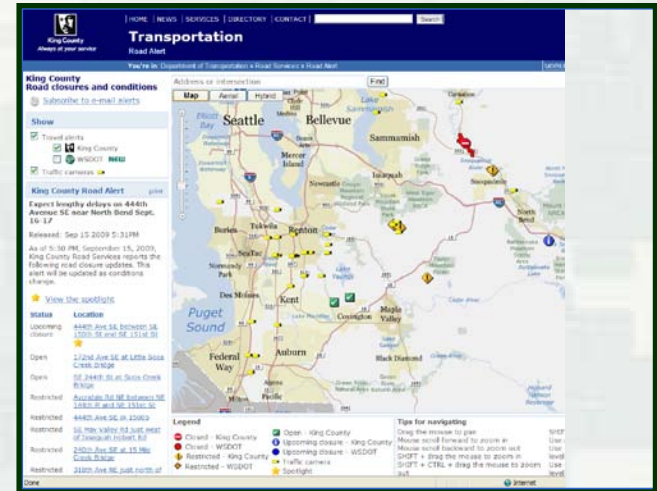
Scenario for Baseline Assessment:

- Heavy rain overtops levees resulting in significant flooding (6-in rain over a 24-hr period)
- Flood Flow Rate: 25,000 cfs

Howard
Hanson
Dam

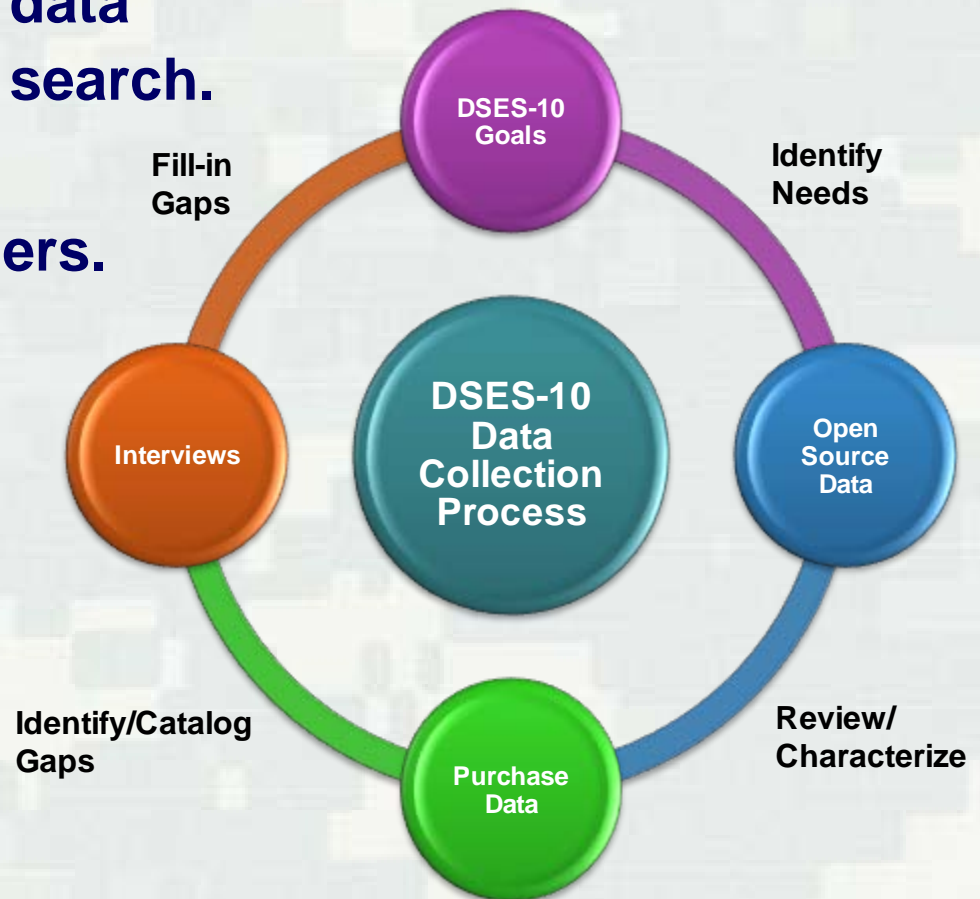
1) Regional Baseline Assessment

- Consolidate regional baseline information.
 - Economic structure, industrial development, social landscape.
 - Potential disruption scenarios.
- Identify current public and private capabilities.
 - Preparedness, mitigation, response, and recovery.
- Identify information sharing and collaboration mechanisms used during disaster lifecycle.
- Assess infrastructure interdependencies.



Data Collection Process

- Leverage from previous studies and regional workshops.
- Conduct “open source” data collection and literature search.
- Interview process with public/private stakeholders.
 - State and local
 - Private owners
 - Non-profit organizations

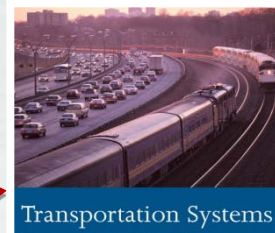


Cross-Sector Interdependencies

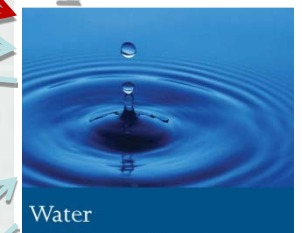


Flooding Scenario

- Airports
- Roads
- Railroads



- Natural gas pipelines
- Oil terminals; Pump stations
- Electric substations



- Water facilities
- Wastewater facilities

A disruption in one critical infrastructure sector may impact other(s) critical infrastructure sector(s).

18 Critical Infrastructure Sectors

Sector Specific Agency	Critical Infrastructure and Key Resources Sector
Department of Agriculture* Department of Health and Human Services*	Agriculture and Food
Department of Defense*	Defense Industrial Base
Department of Energy	Energy*
Department of Health and Human Services	Healthcare and Public Health
Department of the Interior	National Monuments and Icons
Department of the Treasury	Banking and Finance
Environmental Protection Agency	Water*
Department of Homeland Security Office of Infrastructure Protection	Chemical Commercial Facilities Critical Manufacturing Dams Emergency Services Nuclear Reactors, Materials, and Waste
Office of Cybersecurity and Communications	Information Technology Communications
Transportation Security Administration	Postal and Shipping
Transportation Security Administration United States Coast Guard*	Transportation Systems*
Immigration and Customs Enforcement, Federal Protective Service	Government Facilities*

DSES-10 Regional Baseline Assessment Workshop

- **Conducted on June 30, 2010 in Seattle, WA.**
- **Served as a working session to review and evaluate ongoing regional baseline assessment, discuss preliminary findings, and gather active feedback and recommendations from regional stakeholders.**
- **Over 65 participants from Green River Valley public and private stakeholders.**



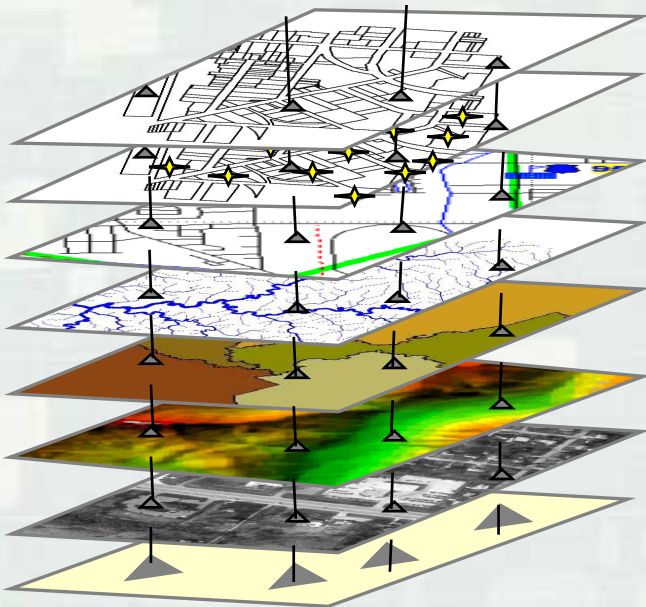
2) Regional Consequence Assessment

- Estimate extent of regional direct and indirect consequences associated with significant flood events.
- Refine existing models and procedures to assess regional short-term and long-term impacts associated with significant disruption scenarios.
- Conduct scenario-specific identification of critical infrastructure dependencies and interdependencies.



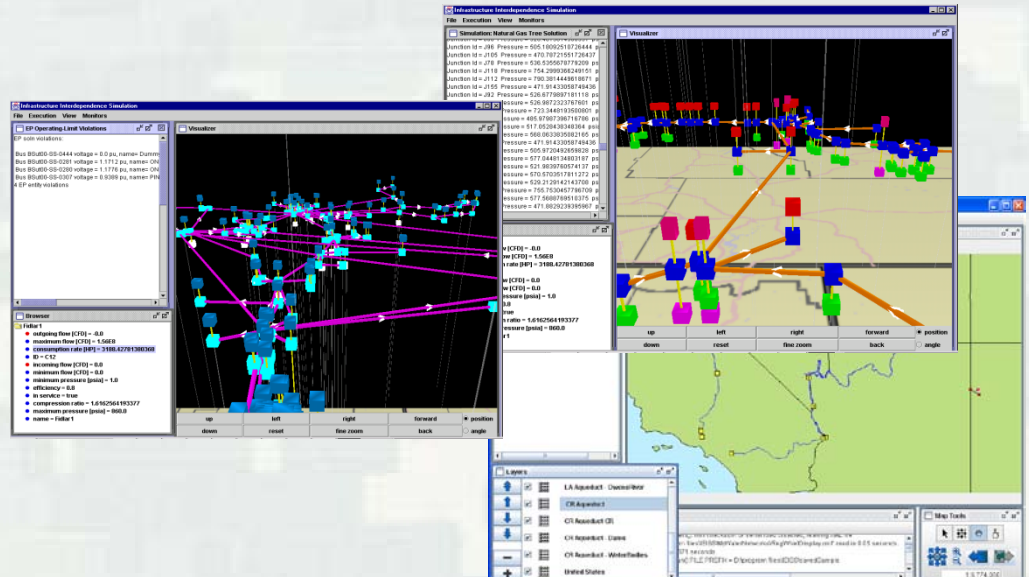
Modeling of Secondary Impacts

Critical Infrastructure Interdependencies



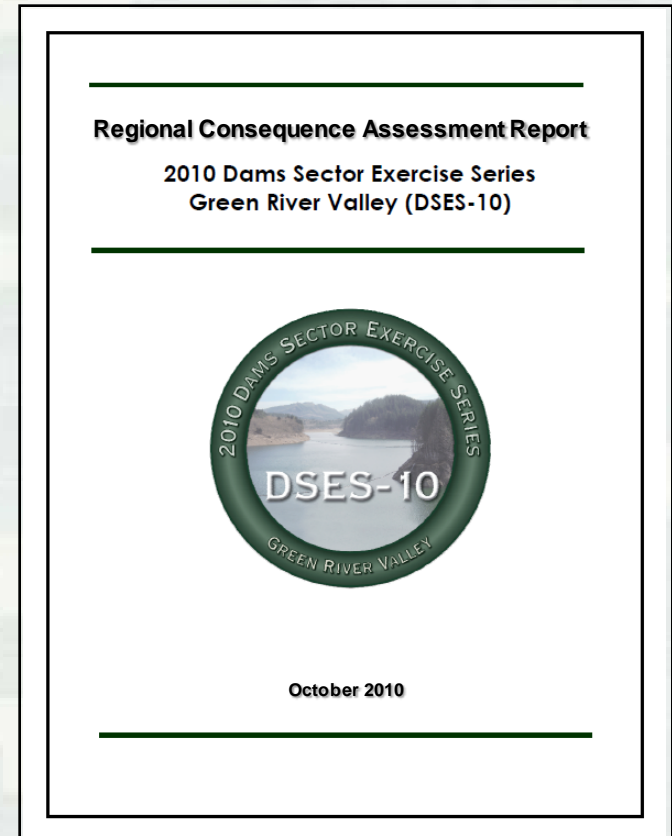
• Infrastructure Models:

- Electric Power
- Natural Gas/Crude Oil
- Telecommunications
- Water
- Healthcare/Public Health



DSES-10 Regional Consequence Assessment Workshop

- **Scheduled for October 21, 2010 in Seattle, WA.**
- **Working session to review and discuss regional consequence assessment preliminary findings, and gather feedback and recommendations from regional stakeholders.**
- **Participants will include Green River Valley public and private stakeholders.**



3) Regional Resilience Strategy

- **Assist public and private stakeholders in jointly enhancing regional resilience.**
- **Support identification of integrated post-disaster recovery solutions and prioritize recommended short-term and long-term actions to improve regional disaster resilience.**
- **Identify regional strategy implementation mechanisms and support strategic flood risk reduction efforts and other interagency initiatives.**



Towards and Integrated Outcome

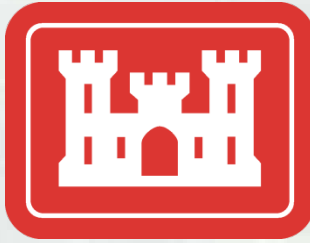
DSES-10

**Regional
Baseline
Assessment**

**Regional
Consequence
Assessment**

**Regional
Resilience
Strategy**





**US Army Corps
of Engineers ®**

For Additional Information:

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