Climate Resilient Mitigation Activities

Disaster Resilience

"Instead of repeated damage and continual demands for federal disaster assistance, resilient communities proactively protect themselves against hazards, build self-sufficiency, and become more sustainable."

Godschalk et al. 2009

Disaster Stats

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The number of disasters each year is increasing but only 50% of events trigger federal assistance.

2011 Floods

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Disaster damages totaled roughly $50,000,000.00

The state could have saved $37,500,000.00

(Formulas based on a $4.00 savings)

Photo courtesy of Helena IR

Photo courtesy of Helena IR

2012 Fires

- Estimated fire costs $396,366.00. The state and county may have saved $270,275.00

Formulas based on a $4.00 savings

Photo courtesy of Helena IR

Dahl Fire Musselshell County

Drought to Flood Connection: Oroville Dam

Climate Resilient Mitigation Activities

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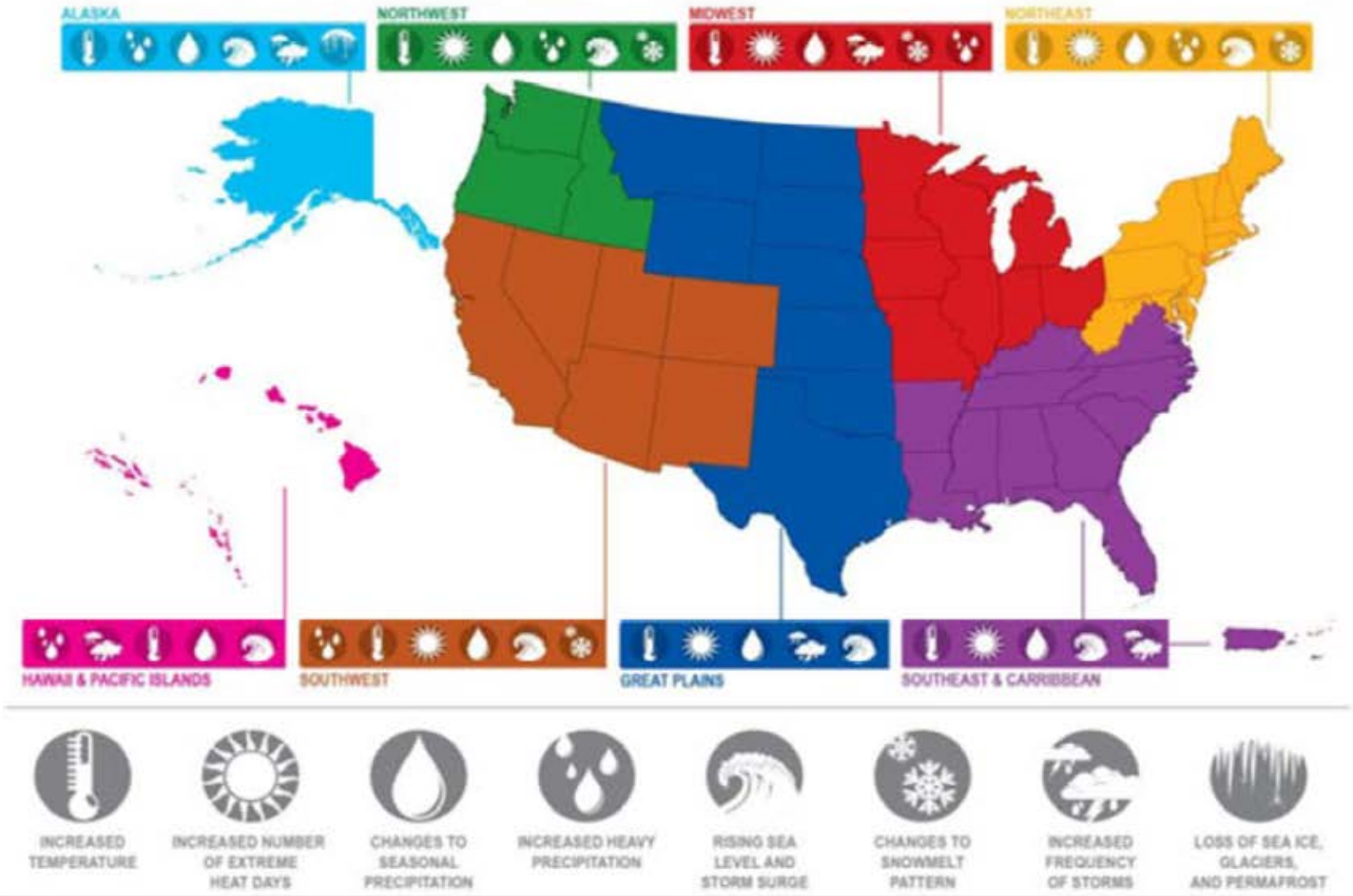
Boulder, Colorado 2013

Climate Change Impacts



Climate Resilient Mitigation Activities

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Drought Hazards

- Can be exacerbated by climate change
- Compound risks to communities from other hazards (e.g., wildfire)
- Increase risk to existing infrastructure and the built environment

Drought Mitigation

- Currently eligible for Mitigation Grant Funding
- Very few drought-related applications get submitted

FEMA considered drought mitigation activities that reduce risk and address the impact of climate change.

- Water Supply
- Water quality and ecosystem services/benefits
- Flood control

Climate Resilient Mitigation Activities

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FEMA selected 3 activity types to prioritize of 14 allowable project types:

- Aquifer Storage and Recovery
- Flood Water Diversion, Storage, & Recovery
- Floodplain & Stream Restoration

What is Green Infrastructure?

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Green Infrastructure provides a framework and methodology for designing and implementing climate resilient mitigation activities

Green Infrastructure definition:

Those projects that use an integrated, natural systems based sustainable design approach to effective water management (storm and flood), resulting in measureable flood and drought risk reduction

Focus is on re-establishing a site's pre-development natural hydrology and reducing damage to life and property

Examples of Green Infrastructure Projects

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Localized flood risk reduction

- applies to site(s) and/or corridor(s)

Non-localized flood risk reduction

- applies to basin(s), watershed(s), and or region(s)

Soil Stabilization

- applies to all areas at risk of erosion and/or scour

Potential Benefits of Green Infrastructure

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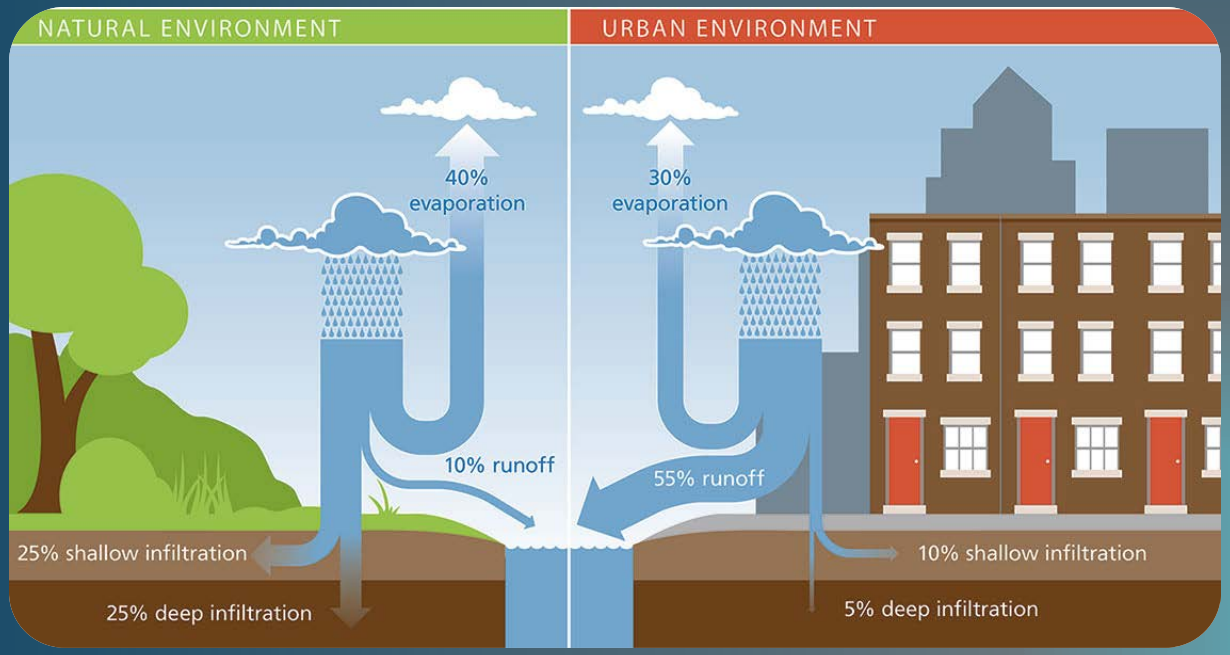
Risk Reduction Benefits

- Water supply
- Scalability
- Flood Risk Reduction
- Compatibility

Ecosystem Services Benefits

- Water Quality
- Air Quality
- Native habitats for wildlife



Flood Diversion and Storage

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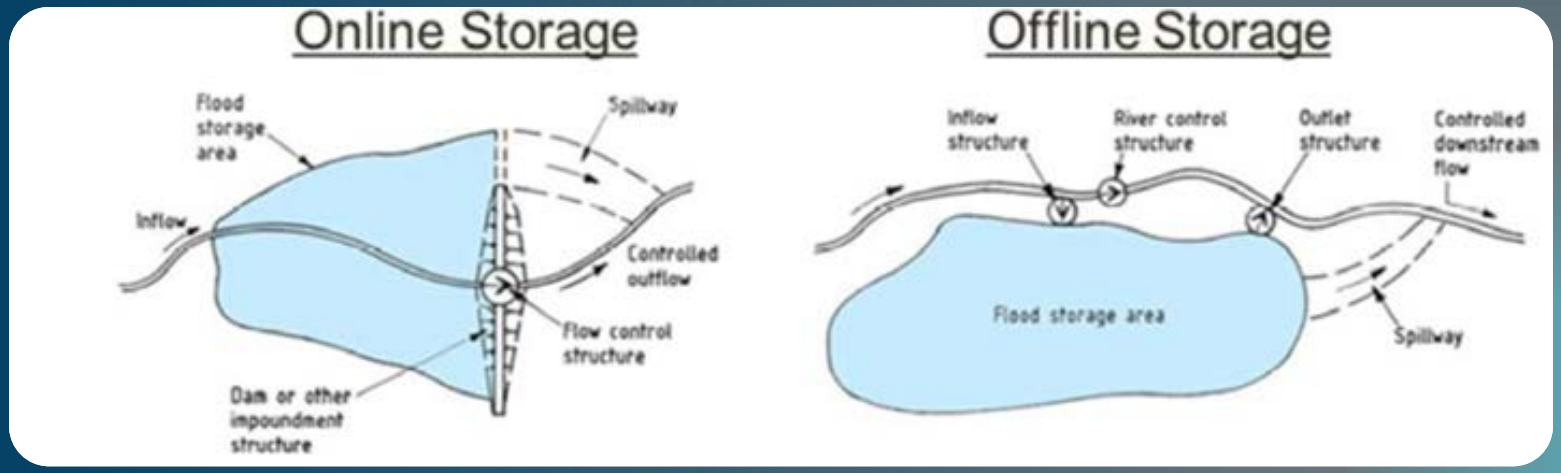
Definition

Redirection of storm or floodwaters into lakes, channels, floodplains, irrigation canals, wetlands, or other natural or manmade green infrastructure surface storage (e.g., bio-retention, bio-detention basins)

Main categories of storage types:



Potential Benefits of Flood Diversion and Storage

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Risk Reduction Benefits

- Flood Risk Reduction
- Diminished peak flood flows
- Redirected flood waters
- Expanded capacity

Ecosystem Services Benefits

- Water and Air Quality
- Restoration of wetland and native habitat
- Dual space use

Figure 4: *The Buffalo Bayou Promenade in Houston, Texas, retrofitted a formerly impervious area and restored this major drainage way as green infrastructure. The Bayou now has improved floodwater conveyance, in addition to providing other community and environmental benefits. Photo courtesy of Tom Fox.* **http://www.asla.org/2009awards/104.html**

Floodplain & Stream Restoration

- Definition: Restoration of the original function of floodplains and associated wetlands of flood-prone river and stream systems to pre-development conditions

Potential Benefits of Flood Diversion and Storage

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Risk Reduction Benefits

- Manage and withstand hazard risks
- Floodway capacity for bank overflow
- Reduced risk to property/infrastructure
- Erosion control and bank stabilization
- Surface and groundwater resources

Ecosystem Services Benefits

- Restoration of watershed and wetland
- Water and air quality
- Native habitats for wildlife and fauna

Mitigation Project Resources

- FEMA Mitigation Idea's : https://www.fema.gov/media-library-data/20130726-1904-25045-0186/fema_mitigation_ideas_final508.pdf
- FEMA Climate Resilient Mitigation: https://www.fema.gov/media-library/assets/documents/110202
- FEMA Climate Resilient Webinars: https://www.fema.gov/media-library/assets/documents/117228
- Montana Mitigation Grant Information: http://readyandsafe.mt.gov/Emergency under the Mitigation Tab

Questions?

Nadene Wadsworth
State Hazard Mitigation Officer
Montana Disaster and Emergency Services
(406)324-4785
Nwadsworth@mt.gov

Ada Montague
Water Planner
DNRC
(406)444-6628
amontague@mt.gov