

FEMA Mitigation Grants – How to?

NORFMA ANNUAL CONFERENCE Post Falls, Idaho

Steven Randolph, FEMA Region X – Seattle

Senior Hazard Mitigation Programs Specialist

September 24, 2015



FEMA

FEMA Hazard Mitigation Grants

- FEMA has three Hazard Mitigation Assistance grant programs – known as “HMA” :
 - FMA Flood Mitigation Assistance program
 - HMGP Hazard Mitigation Grant Program
 - PDMC Pre-Disaster Mitigation Grant Program
- Fund hazard mitigation projects & planning
- Cost-shared (most) at 75/25, or some at 90/10
- Projects must be cost-effective & NEPA compliant
- Grants provided to States/Tribes to “pass-through”
- Single *HMA Unified Guidance*, updated annually
- Can fund private property via a govt sponsor



FEMA

FEMA Hazard Mitigation Grants

Typical types of (flood) projects

- Flood buyouts – conversion to Open Space
- Elevation of flood-prone buildings (can floodproof)
- Erosion protection and preventative buyouts
- Retrofit/upgrade public utility facilities
- Stormwater management + green infrastructure
- Tsunami - facility relocation or vertical evacuation
- Non-flood: Wildfire – defensible space; structural retrofits for seismic, wind, wildfire; landslide buyouts
- NEW – Burn Area Remediation/Post-fire Flood Protect



FEMA

FMA – Flood Mitigation Assistance

- Funded by the NFIP Reform Act of 1994 + BW12
 - Annual Appropriation from \$25M up to \$150M
 - Annual Funding Cycle – timing varies
 - Must benefit NFIP-insured structures
 - Semi-competitive nationally – NO state set asides anymore
 - Includes former *Severe Rep Loss (SRL)* and *Repetitive Flood Claims (RFC)* grant programs
- Priorities for several years have been SRL & RL
 - *SRL – 2 or more claims exceed value of structure*
 - *RL – 2 claims minimum; avg of claims \geq 25% structure value*
 - *SRL – 4 or more claims of \$5,000 or more*
- Sliding cost match scale: 75/25, 90/10, 100% (!!)
- eGrants – get Sub-app users registered via State



FEMA

HMGP – Hazard Mitigation Grant Program

- Funded by Presidential Disaster Declarations
 - Only available to DECLARED States and Tribes
 - Usually declared “statewide” not just in impact area
 - 15-20% of Federal disaster costs at 1-year mark
- 1-year Application Period – but don’t have to wait
 - Expedited, immediate needs projects are encouraged
- Projects submitted & funded thru NEMIS
- Most flexible of the HMA grant programs
 - Phased Projects – Phase 1 Design/EHP + Phase 2 Construction
 - 5% Initiative projects – no BCA required – warning systems
 - 7% set aside for HM Planning grants
- NEW – Fire Mgt Assist Grants FMAG: \$331K - \$441K



FEMA

PDMC – Pre-Disaster Mitigation

- The “pre-disaster” companion to HMGP
- Intended to provide hazard mitigation funding stream independent of Disaster Declarations
- Nationally-competitive (that’s the “C”)
- Annual appropriation – from \$200M down to \$25M
- Subject to vagaries of Federal Budget process
- Typically 3-mo App cycle - \$250K State set-aside
- 90/10 match for Small and Impoverished places
- eGrants – get Sub-app users registered via State



FEMA

The Application:

What should it tell us?

- WHO – WHAT – WHEN – WHERE - HOW
- Who – is the applicant?
- Who – will benefit?
- Who – was coordinated with?
- What – is the problem?
- What – are the alternatives?



FEMA

The Application:

What should it tell us?

- Where – is the problem located?
 - And...what might the project impact at that site?
- How – will it be mitigated?
- How – does it conform to the HM plan?
- How much – will it cost?
- When – will the project start & finish?
 - And...milestones for the project?



FEMA

What FEMA needs to determine from the Application?

- Is the project eligible?
- Is the project feasible? Cost-effective?
- Are the project costs eligible?
- Does the project comply with:
 - Building Codes, NFIP, ASCE24, Eng. Standards
 - Program regulations and guidance
 - Environmental and Historic Preservation (NEPA)
 - Federal Grants Management requirements & & finish?



FEMA

Speaking of cost-effective...

- BCA waived for substantial damage in SFHA
- Multi-structure BCAs can be “aggregated”
- Pre-Calculated Benefits – buyout & elevation
 - \$276,000 for a buyout
 - \$175,000 for an elevation
 - Adjust by locality multiplier
- Environmental Benefits for flood buyouts
 - Just Open Space - \$7,853/acre per year
 - RIPARIAN open space - \$37,493/acre per year
 - Must show a 0.75 BC ratio, then add Env Benefits
- New Landslide BCA methodology



FEMA

Speaking of Climate Change...

- The President is serious...
 - Presidential Executive Order 13514 – October 2009
 - Federal Interagency *Climate Change Adaptation (CCA)* Task Force Report – December 2010
 - Presidential Executive Order 13653 – November 2013
 - 3rd National Climate Assessment in 2014 and www.globalchange.gov
- FEMA *Strategic Foresight Initiative* - Climate Change issue paper – August 2011
 - How will communities manage projected changes?
 - Will growth continue in high-risk areas?
 - Can we afford to adapt vulnerable infrastructure?
 - How should the EM community become engaged in climate change issues?
 - How should the EM community prepare for the potential?



FEMA

Out of the Frying Pan

The forces of global environmental change are expected to bring major challenges and new opportunities to the United States. How we choose to cope with them may well be the biggest unknown we face.

Considering the environmental landscape, two forces are combining to increase the Nation's risks to natural hazards. First, the frequency of extreme weather is accelerating, with events like Hurricane Sandy threatening to become the norm. Secondly, fiscal pressure and political gridlock has resulted in piecemeal action to mitigate future risks and adapt to the growing dangers. Meanwhile, critical infrastructure is undermined by extreme weather and overburdened by increased use. Insurance companies are increasingly pulling out of risky areas, leaving the public to address the increased risk. This trajectory points to higher vulnerability for the Nation, unless we move now to take substantive preventive and adaptive action.

key trends



Unforeseen accelerations 2012 was the warmest year ever recorded in the contiguous United States since the first weather records began in 1895. In summer 2012, Arctic sea ice shrunk to its smallest extent on record, melting at a much faster rate than scientists anticipated. In the future, melting permafrost and thinning ice are expected to further accelerate warming by mechanisms and magnitudes that are difficult to predict with scientific models. This raises concerns that climate models underestimated the rate of warming and sea-level rise observed to date, raising prospects that climate change impacts will be felt faster.



No drive to act At the 2012 climate meeting in Doha, Qatar, negotiators were unable to forge an emissions reduction agreement that would keep global temperature increases below 2°C—a threshold that most climate scientists believe is on the outer bounds of “safe” warming. Without meaningful action to reduce emissions today, scientists believe impacts will increase in magnitude over the medium and long-term, with temperatures potentially reaching 4-6°C by the end of this century.

Background image courtesy of Flickr user granger

VS

Making Lemonade

While severe weather remains a major threat, opposing dynamics propel the United States to make the best of a difficult situation. Recovery efforts in New York and New Jersey after Hurricane Sandy, for example, were buoyed by improved remote-sensing data and new technology that sped up the distribution of relief funds. The wide-spread damage from Hurricane Sandy forced government to seriously focus on adaptation planning and reducing risk exposure. Relatedly, research shows that growing first-hand experience with extreme weather impacts increases public support for climate action. While weather and climate are not synonymous, the public continues to link the two ideas, complicating outreach efforts. Meanwhile, states, cities, and businesses are instituting collaborative efforts to tackle climate change adaptation and improve mitigation. This path, therefore, has silver-linings: the challenges posed by climate change encourage collective, cost-effective actions, which bolster disaster resilience.

key trends



(Momentary) positives Melting sea ice opened new Arctic shipping routes and enabled extraction of useful minerals and oil deposits. Changes like increased atmospheric CO₂ and a decline in the number of frost days expected to initially increase crop yields in North America (with strong variations). In the long run, food production may suffer from shifts in temperature and rainfall. Emissions in the sensitive Arctic may further accelerate the rate of melting and warming, especially with added pressures from burning oil and gas uncovered in the region. But for now, these momentary positive impacts are being exploited.



Catalyzing events Hurricane Sandy, the worst U.S. drought in a half-century, and the 2012 Colorado wildfires brought new attention to the topic of climate change. In the same vein that public opinion shifts with growing exposure to severe weather, recent events demonstrated the need to further embrace a more forward-looking and adaptive position. The drive to implement an integrated approach to reducing risk exposure now influences rebuilding decisions for housing and infrastructure. Relatedly, the modeling and management of risk is changing, and stronger design standards are being developed.



FEMA

FEMA CCA Policy *January 23, 2012*: 7 “Initial Actions” and a CCA Plan

1. Partnerships with other Federal agencies:
 - For climate science data
 - For climate change adaptation expertise
2. National Flood Insurance Program:
 - Study climate change impacts on the NFIP
 - Incorporate climate change considerations
3. FEMA grants (e.g. *planning, projects, training*):
 - How can grants incorporate climate change considerations
 - Include long-term climate change risks in “cost-effectiveness” evaluations for project grants



FEMA

FEMA – 7 Initial Actions (cont.)

4. State, Local, Tribal, and Territorial governments:
 - Encourage + assist external partners to address climate change
5. Building Standards and Development Practices:
 - Update standards to address climate change considerations
 - Encourage integration of CCA in city planning + development
6. Risk Analysis for Planning and Operations:
 - Incorporate long-term climate change in risk analyses and plans
7. Workforce Adaptation - changing hazard events:

Lastly, develop a FEMA *Climate Change Adaptation* Implementation Plan



FEMA

So...what about HMA Grants??

- 2015 HMA Unified Guidance tread new ground...
- PAGE 2: *“HMA Commitment to Resilience and Climate Change Adaptation”*
- Sea-Level Rise – we can fund extra freeboard and include SLR in the Benefit Cost Analysis
- Planning – encourage and fund climate change in HM Plans and development of strategies to address
- NEW - Climate Change Adaptation Project Type – you define – will review on case-by-case basis
- Green infrastructure – we will fund, we do encourage



FEMA

Hurricane Sandy Recovery

- FEMA's 1st serious attempt at integrating Climate Change Adaptation into Disaster Recovery
 - Encouraged communities to build back smarter, stronger
 - Provided ABFEs - Advisory Base Flood Elevations –
 - Reflect changed conditions – available on-line
 - Not mandatory – not regulatory – not used for NFIP rating
 - Sea Level Rise Planning Tool –
 - NOAA data for New York & New Jersey – accessible on-line
 - **GreenGov** Presidential Award for 2013 as Climate Champion
 - Federal Recovery Support Strategies
 - FUNDED “Future risks” increased safety margins for repair/upgrade and reconstruction projects



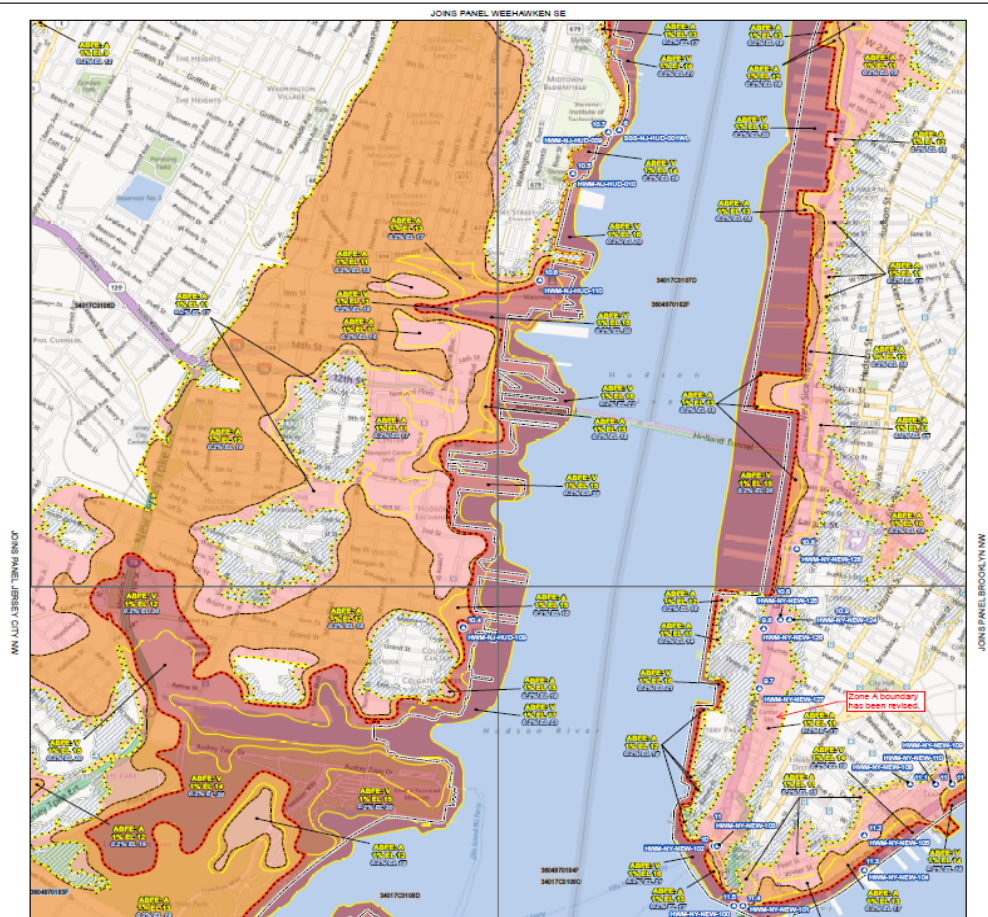
FEMA



ADVISORY BASE FLOOD ELEVATION MAP
NEW YORK-KINGS-HUDSON COUNTIES
NEW JERSEY AND NEW YORK

MAP ID: JERSEY CITY NE

DATE OF MAP: APRIL 08, 2013



FEMA

Designing for Flood Levels Above the BFE After Hurricane Sandy



FEMA

HURRICANE SANDY RECOVERY ADVISORY

RA5, April 2013

Purpose and Intended Audience

Flooding in New York and New Jersey extended far beyond mapped Special Flood Hazard Areas (SFHA) and exceeded base flood elevations (BFEs) by several feet in some areas. Lessons learned from Hurricane Sandy can be used to guide repair and reconstruction efforts and design of new buildings to reduce susceptibility to future flood damage.

This Recovery Advisory reviews how coastal Flood Insurance Rate Maps (FIRMs) and BFEs are established and provides guidance on elevating buildings to minimize flood damage in cases where flood levels exceed the BFE. The intended audience for this advisory is primarily homeowners and designers, but it may be helpful to anyone involved in selecting lowest floor elevations for new construction and reconstruction of buildings in areas affected by Sandy.

Key Issues:

1. Elevating to the BFE does not provide complete protection against flooding. Storms more severe than the base flood can and do occur.
2. FIRMs are only as accurate as the topography, bathymetry, and technical information used, and the technical analyses performed, to create them. FIRMs are a snapshot in time and may become outdated as physical conditions, climate, and engineering methods change.
3. Once flood levels exceed the lowest floor of a building, the extent of damage increases dramatically, especially in areas subject to coastal waves (Figure 1).
4. Design and construction practices can minimize damage to buildings, particularly by elevating the building higher than the minimum required elevation.

This Recovery Advisory Addresses:

- FIRMs, FISs, and flood risk
- Building damage when flood levels rise above the lowest floor
- How high above the BFE a building should be elevated
- Effect of building elevation on flood insurance premiums
- Additional design considerations for mitigating flood damage, inside and outside mapped flood hazard zones

Terminology

Flood Insurance Rate Map (FIRM): A map produced by FEMA to show flood hazard areas and risk premium zones. The SFHA and BFE are both shown on FIRMs.

Special Flood Hazard Area (SFHA): Land areas subject to a 1 percent or greater chance of flooding in any given year. These areas are indicated on FIRMs as Zone AE, A1-A30, A99, AR, AO, AH, V, VO, VE, or V1-30. Mapped zones outside of the SFHA are Zone X (shaded or unshaded) or Zone B/Zone C on older FIRMs.

Base Flood Elevation (BFE): Elevation of flooding, including wave height, having a 1 percent chance of being equaled or exceeded in any given year (also known as "base flood" and "100-year flood"). The BFE is the basis of insurance and floodplain management requirements and is shown on FIRMs.



Figure 1: Back wall failure due to flood level above the lowest floor of a house in Ortle Beach, NJ



FEMA



WHAT WE DO

Study Climate & Global Change

Prepare The Nation For Change

ASSESS THE U.S. CLIMATE

Overview

Background & Process

Opportunities for Engagement

Draft Report Information

Previous Assessments

NCA & Development Advisory Committee

Production Team

Indicators System

Coastal Resilience Resources

Make Our Science Accessible

Link Climate Change & Health

Provide Data and Tools

Coordinate Internationally

Sea Level Rise Tool For Sandy Recovery



Hurricane Sandy is a vivid reminder that coastal communities are vulnerable to the risk of damage from storms and flooding. Sea level rise increases the frequency and severity of coastal flooding in human and natural systems, even if storm patterns remain the same. FEMA provides [information about risk based on current conditions](#). By statutory requirement, FEMA's Flood Insurance Rate Maps (FIRMs) and other mapping products depict today's flood risk. Addressing flood risk based on current conditions has immediate, short-term benefits to communities, but does not adequately account for increasing flood risk resulting from sea level rise.

Post-Sandy recovery provides an opportunity to reduce vulnerability and increase resilience further into the future by incorporating sea level rise information into decisions about how and where to rebuild, or to start new development. Using the best available science and data, federal agencies have jointly developed this tool to help state and local officials, community planners, and infrastructure managers understand possible future flood risks from sea level rise and use that information in planning decisions.

Disclaimer: Please contact your local floodplain manager for assistance in interpreting this information. Professional engineers and surveyors can assist in translating this information for recovery planning. These maps and tools have no regulatory implications and do not affect National Flood Insurance Program requirements or rates. [For FAQs click here.](#)

Sea Level Rise Maps

NOAA, in partnership with FEMA and the U.S. Army Corps of Engineers, has created a set of map services to help communities, residents, and other stakeholders consider risks from future sea level rise in planning for reconstruction following Hurricane Sandy.

These map services ([click here](#) for NJ and NY State counties and [click here](#) for NYC) integrate the best available FEMA flood hazard data for each location with information on future sea level rise from two different peer-reviewed sources ([click here](#) for a [visual guide](#) to the data sources used in the tool):

- A NOAA-led interagency report prepared as input to the National Climate Assessment, [Global Sea Level Rise Scenarios for the United States National Climate Assessment](#). Scientists from multiple federal agencies and academic institutions synthesized the best available science to create a



FEMA

So...what about the Northwest?

Snohomish River near Monroe 2014-2100

- UW Climate Impacts Group

<http://warm.atmos.washington.edu/2860/>

Hydrologic Climate Change Scenarios for the Pacific Northwest Columbia River Basin and Coastal Drainages

- Total precipitation is not projected to change significantly (*though temperatures will be rising – so that will reduce the effectiveness of mid-year rainfall!!*).
- Winter monthly streamflows are up significantly: November through March.
- Summer monthly streamflows are down, below current flow levels in all scenarios: May to Sept.



FEMA

So...what about the Northwest?

Snohomish River near Monroe 2014-2100

- Peak daily flows are up significantly by mid-century
- Low-flows are even lower (*negative impacts on keeping streams cool enough for baby salmon, especially with warmer summer temps*).
- More winter peak/flow flood events. More droughty summer conditions.
- Faster meltdown of Cascades snowpack due to projected warmer temperatures.
- Sounds like California is moving North!



FEMA

National Flood Insurance Program

- General Accountability Office (GAO) very concerned about Climate Change impact on NFIP
- Commissioned a NFIP Climate Change Impact study that was issued June 11, 2013, by AECOM
- Community Rating System (CRS)
 - Added NFIP rate reduction incentives for Climate Change Adaptation measures – “*higher regulatory standards*”
- *Coastal Construction Manual* FEMA P-55 was updated to address Sea Level Rise (8/2011)
 - Refers design engineers to USACE *Sea Level Change Considerations* for buildings, roads, utility systems, etc.
 - Shows how to determine SLR and incorporate in design plans



FEMA

NFIP AECOM Study – by 2100...

- 45% increase in SFHA nationwide
- SFHA areas in the Northwest may increase more
- NO DECREASE in SFHA or flood depth *anywhere*
- Median flows may increase even in drier areas
- In urban areas, 30% increase is due to growth, and 70% due to climate change
- Coastal SFHA increase 55% nationwide, less on Pacific Coast
- Average loss cost per policy is up 50%



FEMA

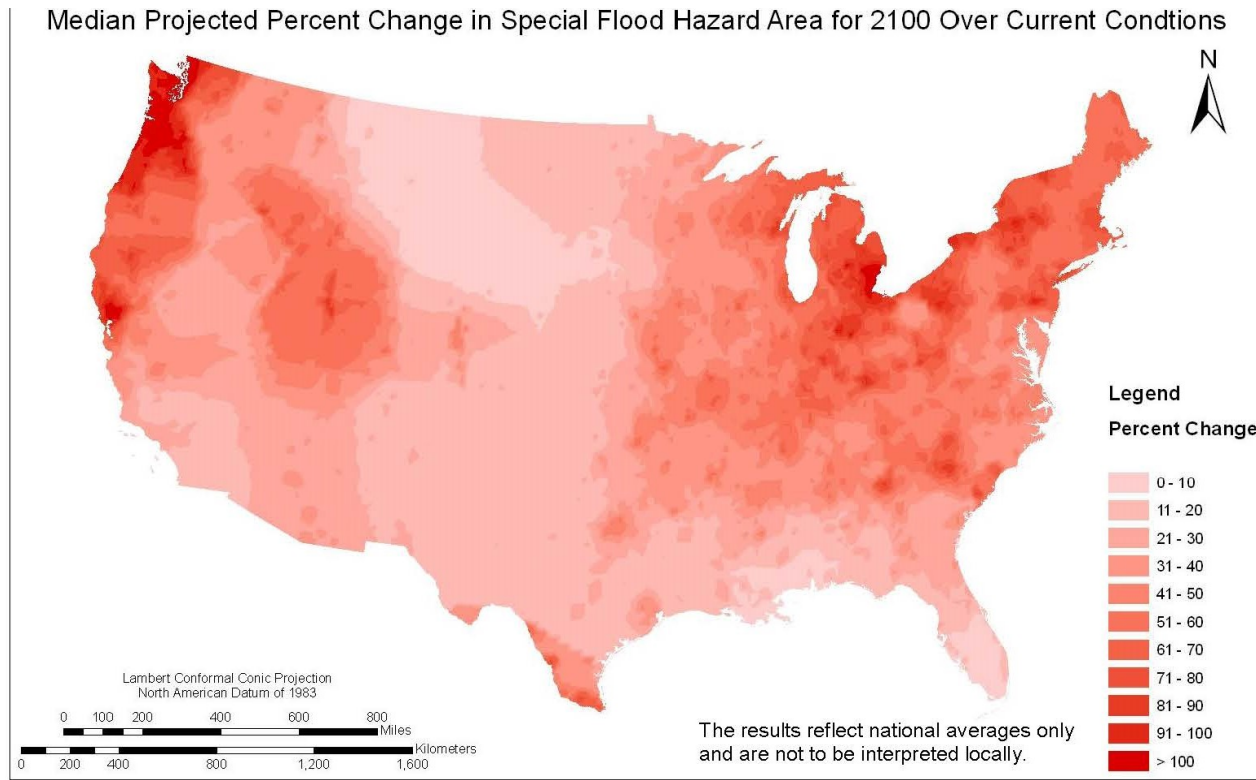


Figure 4-10. The median (50th percentile) relative change of the SFHA at epoch 5 (2100). Changes are with respect to current conditions.

4.0 PROJECT

AECOM Report for NFIP - % change in SFHA



FEMA



Coastal Construction Manual

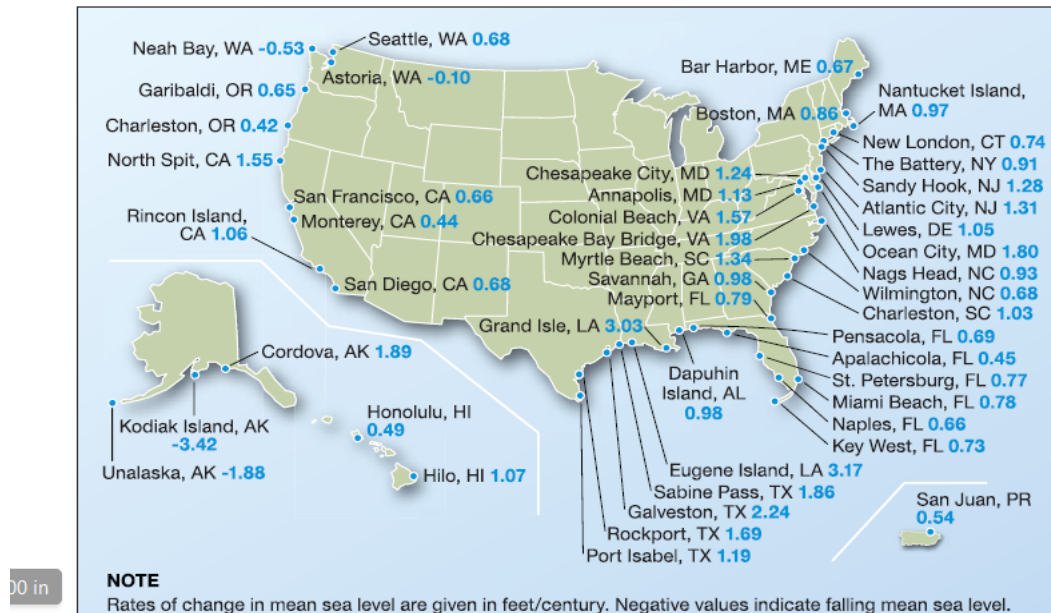


FEMA

3.3.4.1 Sea and Lake Level Rise

Coastal flood effects, described in detail in Section 3.4, typically occur over a period of hours or days. However, longer-term water level changes also occur. Sea level tends to rise or fall over centuries or thousands of years, in response to long-term global climate changes. Great Lakes water levels fluctuate both seasonally and over decades in response to regional climate changes. In either case, medium- and long-term increases in water levels increase the damage-causing potential of coastal flood and storm events and often cause a permanent horizontal recession of the shoreline.

Global mean sea level has been rising at long-term rates averaging 1.7 (+/-0.5) millimeters annually for the twentieth century (over 6 inches total during the twentieth century) (Intergovernmental Panel on Climate Change [IPCC] 2007). Rates of mean sea level rise along the Louisiana and Texas coasts, as well as portions of the Atlantic coast, are significantly higher than the global average (as high as 3.03 feet per century in Grand Isle, LA). Records for U.S. Pacific coast stations show that some areas have experienced rises in relative sea levels of over 1 foot per century. Other areas have experienced a fall in relative sea levels; Alaska's relative sea level fall rate is as high as 3.42 feet per century (see Figure 3-13).



FEMA



Mitigation Ideas

A Resource for Reducing Risk to Natural Hazards



FEMA

Topics from Public Discussion

“Mitigation Ideas” - January 2013

- **Ideas** for Hazard Mitigation activities to fulfill mitigation plans
 - Also ideas for *Climate Change Adaptation*
- *NOT regulatory –not mandatory –not always grant fundable*
- Drought, Extreme Temperatures, and Wildfire
- Sea Level Rise and Storm Surge
- Severe storms: wind, hail, lightening, winter
- Floods, including flash flooding and urban stormwater management



FEMA

“Mitigation Ideas” for Extreme Temperature Events – *an example*

- *All these are just suggestions - ideas to consider*
- Reduce the Urban Heat Island Effect.
 - Urban tree planting
 - Green roofs, green walls, and rain gardens
 - “Cool roofing” technology to reduce heat gain
 - Open space preservation – pocket green spaces
- Educate residents
 - Their own yards, patios, and balconies.
 - How to protect themselves from extreme heat and cold



FEMA



Green roof & walls, and a park! Fukuoka Japan



FEMA

Thank you for your attention. For further information:

www.fema.gov

<http://www.fema.gov/strategic-planning-analysis-spa-division/strategic-foresight-initiative>

http://www.fema.gov/pdf/about/programs/oppa/climate_change_paper.pdf

<http://www.region2coastal.com/sandy>

http://www.fema.gov/.../fema_mitigation_ideas_final508.pdf

<http://www.fema.gov/mitigation-best-practices-portfolio>

<http://www.globalchange.gov/what-we-do/assessment/coastal-resilience-resources>



FEMA