

REGION 3

ADDRESSING FUTURE CONDITIONS

State and District Hazard Mitigation Plans

WHAT IS REQUIRED?

The Code of Federal Regulations (CFR) requires States to consider the risks of hazards, identify associated vulnerabilities, and provide suggested actions to mitigate those risks and vulnerabilities. Specifically, the regulation 44CFR §201.4(c)(2)(i) states the risk assessment must include:

*An overview of the type and location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, **as well as the probability of future hazard events**, using maps where appropriate.*

Addressing the probability of future hazard events requires consideration of the potential risks and vulnerabilities posed by diverse future conditions. Federal Emergency Management Agency (FEMA) Region 3 mitigation staff is committed to working with states to identify tools and approaches to address this requirement and support the improvement of long-term resiliency.

WHAT ARE FUTURE CONDITIONS?

Future conditions could include changes to the community, such as population growth or decline; changes to land use, such as suburban sprawl and urbanization; changes to weather, such as increased drought and flood risk; and even changes to the land and water resources themselves, such as erosion, sea level rise, and salt water intrusion.

These changes should be examined independently and in conjunction with each other, as certain changes may impact each other, resulting in even greater hazard risks and vulnerabilities. For example, both urban populations and temperatures are expected to increase in Region 3. The urban heat island effect (where urban areas experience temperatures several degrees higher than the suburban and rural areas that surround them) may be felt more acutely during high temperature events, especially by vulnerable populations, including the elderly, young, impoverished, and those with disabilities or access and functional needs.

ANTICIPATED IMPACTS

While each State is unique, there are anticipated trends in the future conditions expected across Region 3.

POPULATION AND LAND USE

In general, major metropolitan areas have grown in population in the last two decades, and the population in many rural areas has declined, a trend that is likely to continue. This has implications for land use, including increased development in urban centers, and aging infrastructure within the suburban periphery. These dynamics vary by State and metropolitan area, and should be analyzed during the state planning process.

WEATHER

FEMA Region 3 is already experiencing higher overall temperatures, more frequent instances of extreme heat, more frequent high precipitation events and storms, and more severe and lengthier droughts. These changes to weather patterns are expected to continue, and they will have far-reaching impacts on hazards and vulnerabilities.

LAND AND WATER RESOURCES

Increased risks and vulnerabilities are anticipated for the coastlines, as sea levels rise and storms intensify and become more frequent. Coastal erosion and saltwater intrusion are also likely to increase. As a result, flood risk will increase throughout Region 3, in both coastal and upland areas.

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Future conditions may vary both in terms of the extent, magnitude, or severity of the events and how vulnerable a State is to those hazards. For example, major precipitation events are expected to increase both in severity and frequency (the extent of the hazard). As these storms affect aging infrastructure, the effects of future events may be more costly and damaging than they would be if they occurred today (the vulnerability to the hazard). The tools and resources below can provide a factual basis for hazard assessments and profiles, including information about coastal erosion, drought, extreme temperature, floods, hurricanes and tropical storms, wildfires, and winter storms. Many of the resources include tables, charts, and figures that can be used in State mitigation plans. Land cover and sea level rise maps can be downloaded and used to inform the analysis in the plan.

The following resources may be useful in assessing current and future conditions:

TOOL	DESCRIPTION	LOCATION
U.S. Census Population Trends	Current population estimates are available for the nation, states, counties, cities, and towns, as well as population trends and projections.	https://www.census.gov/to pics/population.html
Land Cover Changes Tool	Interactive tool with land cover changes and trends by county or watershed that can reveal vulnerabilities due to extensive impervious surfaces, or assets due to landscape-level green infrastructure.	https://coast.noaa.gov/cca patlas/#
Coastal Flooding Tool	Interactive tool showing increased vulnerabilities due to various levels of sea level rise on the coastline.	https://coast.noaa.gov/slr/
Drought Impacts- NIDIS	The National Integrated Drought Information System led the Northeast Drought and Climate Outlook Forum and provides Quarterly Climate Impacts and Outlook; Region 3 States are covered in the Northeast and Southeast region reports.	https://www.drought.gov/d rough/resources/reports
FEMA Climate Change Report	The predicted impact of climate change and population growth on the National Flood Insurance Program through 2100.	http://www.aecom.com/fe ma-climate-change-report/
State Climate Summaries	These four-page summaries from NOAA's National Centers for Environmental Information provide key messages and detailed tables on temperature and precipitation change.	https://statesummaries.nci cs.org/
EPA Climate Change Impacts by State	These two-page fact sheets provide an overview of what climate change means for each State and the District of Columbia.	https://19january2017sna pshot.epa.gov/climate- impacts/climate-change- impacts-state_.html
NESDIS Technical Reports	National Environmental, Satellite, Data, and Information Service reports provide various types of data, including Regional Climate Trends and Scenarios.	https://www.nesdis.noaa.g ov/content/technical- reports
National Climate Assessment	This multi-agency initiative provides detailed reports on current and future impacts. For this assessment, the Northeast region includes the District of Columbia, Delaware, Maryland, Pennsylvania, and West Virginia while the Southeast region includes Virginia.	http://nca2014.globalchan ge.gov/

PLANNING PROCESS

Since future conditions affect a variety of disciplines, it is crucial to involve a wide range of stakeholders in the hazard mitigation planning process. Having a diverse State planning team engaged throughout the entire process of updating the hazard mitigation plan will determine the best resources and summary of future impacts to include in the hazard profiles. Have the regional planning organizations been involved? Has the State Climatologist been engaged? Are there statewide urban or regional planning, resiliency, or adaptation teams that could be invited to provide input? Are State universities or Non-Governmental Organizations engaged in the study of future conditions? Their analysis and plans could be resources for the State hazard mitigation plan and their participation will improve the plan. Start by reviewing the stakeholder lists from previous updates and annual plan reviews, and start to identify other partners that the team has worked with on issues of hazard identification and risk reduction since the last update to involve in this planning process.

WAIT, *THAT'S* "MITIGATION?"

"Mitigation" has come to mean different things in different disciplines. FEMA defines mitigation as "the sustained effort to reduce loss of life and property by lessening the impact of disasters." In contrast, NASA defines mitigation as efforts that reduce levels of greenhouse gases in the atmosphere. In that context, "adaptation" includes steps taken to adapt to the new normal.

STATE MITIGATION CAPABILITIES

Descriptions of the State's capabilities should detail the efforts your State is currently taking to study and adapt to future conditions. It should include descriptions of existing resilience action plans and committees, as well as the individual strategies and actions that are being spearheaded by other agencies and organizations. An example of such an outside organization is a university that may be an international leader in climate and demographic analysis. Including university expertise and data in the planning process can lend legitimacy to the effort and help ensure mitigation strategies address climate change as well as land use and demographic changes.

MITIGATION STRATEGY

States should consider how the new analysis in their risk assessment should be reflected in the mitigation strategy. Considering diverse future conditions could lead to the revision or addition of goals, objectives, and actions in the hazard mitigation plan. Since an increase in intensity and frequency of many hazards is projected, it is likely that mitigation actions addressing those hazards will need to be added or expanded upon in order to address future conditions. For example, sea level rise could prompt State-level guidance for additional freeboard requirements in local floodplain management ordinances.

Examining the impact that changes in future conditions will have on a region's landscape and resources—including demographics and land use, weather and climate, and land and water resources—will yield a landscape-level vision for how to best address these hazards. Reviewing green as well as grey infrastructure on a broader level can lead to mitigation actions that address upstream hazards, ultimately reducing vulnerabilities to valuable infrastructure and human life. For example, reducing runoff into streams through consistent and wide riparian forest buffers can reduce peak storm flows, thereby reducing damage during flood events. Impervious surfaces are associated with both increased runoff and stormwater and rising urban temperatures, so green infrastructure may be incorporated to address both

flood risks and extreme heat. Many mitigation strategies may address more than one hazard, especially given how interrelated future conditions can be on each other. State mitigation plans should highlight these synergies, wherever possible, and consider them when prioritizing actions.

Existing resources about demographic changes and climate change mitigation and adaptation could be used to inform the mitigation strategy. These resources may be on a national, State, regional, or local scale. Smaller scale resources may yield the most useful data and predictive information, but they are not always available. Consider adding mitigation actions to collect and analyze data for the next update to help address any gaps in information between local-scale resources.

While hyper-local data may be most useful, some helpful national and State resources available include:

NATIONAL RESOURCES	STATE RESOURCES
<ul style="list-style-type: none"> ❑ The Environmental Protection Agency’s Smart Growth Strategies for Disaster Resilience and Recovery ❑ The National Oceanic and Atmospheric Administration’s Planning and Land Use for Resilience ❑ FEMA’s Mitigation Ideas guide ❑ Intergovernmental Panel on Climate ❑ Change’s Climate Change 2014: Mitigation of Climate Change 	<ul style="list-style-type: none"> ❑ Climate Ready DC: The District of Columbia’s Plan to Adapt to a Changing Climate ❑ Climate Framework for Delaware and Climate Action in Delaware: 2016 Progress Report ❑ 2016 Annual Report – Maryland Commission on Climate Change ❑ Pennsylvania Climate Change Action Plan and 2015 Climate Impacts Assessment Update ❑ Virginia’s 2015 Report of the Governor’s Climate Change and Resiliency Update Commission

SUMMARY

States have many resources that enable them to address future conditions in their State hazard mitigation plan updates. Tools from the National Climate Assessment and from agencies engaged in the national effort are available to incorporate into hazard profiles. Incorporating demographic, climate, and land use and infrastructure changes into the planning process and capability assessment involves asking and following up with new partners, plans, and resources that will improve the overall hazard mitigation plan. The mitigation strategy will address changing risk by building on existing actions and adding new ones. Together, these steps will address the changing conditions, building resiliency for both present and future hazards.