

Midwest

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Key Message 24.1

Climate-Smart Practices May Offset Complex Climate Interactions in Agriculture

Crop production is projected to change in complex ways (*likely, medium confidence*) due to increasing extreme precipitation events and transitions between wet and dry conditions (*likely, medium confidence*), as well as intensification of crop water loss (*likely, low confidence*). Changes in precipitation extremes, timing of snowmelt, and early-spring rainfall are expected to pose greater challenges for crop and animal agriculture, including increased pest and disease transmission, muddier pastures, and further degradation of water quality (*likely, high confidence*). Climate-smart agriculture and other adaptation techniques provide a potential path toward environmental and economic sustainability (*medium confidence*).

Key Message 24.2

Adaptation May Ease Disruptions to Ecosystems and Their Services

Ecosystems are already being affected by changes in extreme weather and other climate-related changes, with negative impacts on a wide range of species (*likely, high confidence*). Increasing incidence of flooding and drought is expected to further alter aquatic ecosystems (*likely, medium confidence*), while terrestrial ecosystems are being reshaped by rising temperatures and decreasing snow and ice cover (*very likely, high confidence*). Loss of ecosystem services is undermining human well-being, causing the loss of economic, cultural, and health benefits (*medium confidence*). In response, communities are adapting their cultural practices and the ways they manage the landscape, preserving and protecting ecosystems and the services they provide (*low confidence*).

Key Message 24.3

Climate Adaptation and Mitigation Strategies Improve Individual and Community Health

Climate change has wide-ranging effects on lives and livelihoods (*very likely, very high confidence*), healthcare systems (*high confidence*), and community cohesion (*high confidence*). These diverse impacts will require integrated, innovative response from collaborations between public health and other sectors, such as emergency management, agriculture, and urban planning. Because of historical and systemic biases, communities of color are especially vulnerable to these negative impacts (*very likely, very high confidence*). Mitigation and adaptation strategies, such as expanded use of green infrastructure, heat-health early warning systems, and improved stormwater management systems, when developed in collaboration with affected communities, have the potential to improve individual and community health (*high confidence*).

Key Message 24.4

Green Infrastructure and Investment Solutions Can Address Costly Climate Change Impacts

Increases in temperatures and extreme precipitation events are already challenging aging infrastructure and are expected to impair surface transportation, water navigation, and the electrical grid (*likely, medium confidence*). Shifts in the timing and intensity of rainfall are expected to disrupt transportation along major rivers and increase chronic flooding (*likely, high confidence*). Green infrastructure and public and private investments may mitigate losses, provide relief from heat, and offer other ways to adapt the built environment to a changing climate (*medium confidence*).

Key Message 24.5

Managing Extremes Is Necessary to Minimize Impacts on Water Quality and Quantity

Climate-related changes to water quantity and quality are increasing the risks to ecosystem health, adequate food production, surface water and groundwater uses, and recreation (*high confidence*). Projected increases in droughts, floods, and runoff events across the Mississippi River basin and the Great Lakes will adversely impact ecosystems through increased erosion, harmful algal blooms, and expansion of invasive species (*likely, high confidence*). Federal and state agencies and nongovernmental organizations are cooperating on adaptation efforts related to streamflow, water quality, and other water issues (*high confidence*).

Extreme Precipitation Impacts

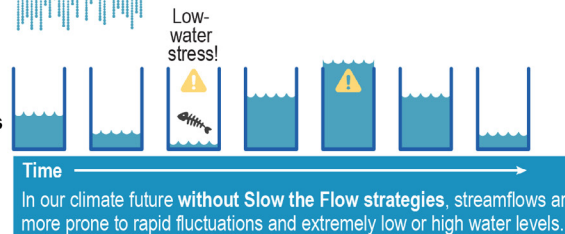
Extreme precipitation events have adverse impacts on aquatic and terrestrial ecosystems, human health, infrastructure, and economies. Conservation and management strategies can help moderate these impacts.

Figure 24.5. Extreme precipitation events can degrade aquatic ecosystems, threaten human health and safety, damage infrastructure and communities, and yield billions of dollars in economic damage. The conservation and management of natural lands can reduce these negative effects—reducing erosion and flood risk, improving water quality, increasing carbon sequestration, and reducing the economic cost of flooding. This conceptual drawing, showing a Midwestern landscape with an extreme storm on the horizon and water flowing into streams and rivers, illustrates how land management choices affect downstream flooding, infrastructure, and ecosystem services. Landscape features and land management practices that slow the flow of water across the surface can improve habitat and water quality, reduce flood and drought risks, and have a variety of other benefits. Adapted with permission from Palmer et al. 2020 (see full chapter for detailed citation).

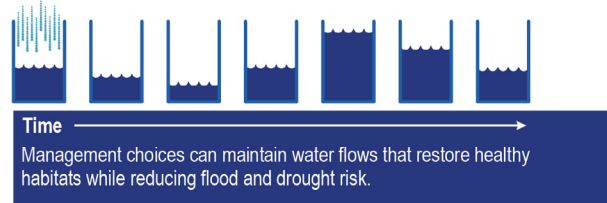


Flood and drought risk


No adaptation
More extreme precipitation increases risks



With adaptation
Adaptation reduces risks



Adaptation benefits

-  Increase watershed storage
-  Improve fish habitat
-  Increase recreation opportunities
-  Improve water quality
-  Reduce erosion

Recommended Citation

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