Climate Change and the 303(d) Program

Climate change is expected to have ongoing and future significant impacts on water resources (finding from the Intergovernmental Panel on Climate Change [IPCC]). For instance, higher water temperatures and changes in the timing, intensity and duration of precipitation, which could result in more intense storm events in some areas and increased drought in others, may adversely affect water quality nationwide. In addition, collective climate-related impacts, including sea level rise, increased damage from floods and storms, and increasing temperature and acidification of marine waters, are expected to have a significant harmful effect on coastal ecosystems.

The Office of Wetlands Oceans and Watersheds (OWOW) is working on several key adaptation and mitigation activities as part of EPA's larger National Water Program Climate Strategy (http://water.epa.gov/scitech/climatechange/strategy.cfm), including:

- Developing and evaluating practical methods to factor climate change impacts into future listing and TMDL development (see below for more information)
- Developing Climate Ready Estuary Partnerships to provide climate change adaptation information to coastal communities
- Reviewing/revising nonpoint pollution management measures for nutrients and sediments so that they are better tailored to climate change impacts
- Incorporating climate change effects in national water surveys such as the National Wetlands Survey or wadeable stream assessments.

Clean Water Act 303(d) Program:

Currently there are no established methodologies for considering climate change impacts into 303(d) listing and TMDLs. We are continuing to evaluate how increasing carbon deposition to coastal waters that leads to ocean acidification (OA) can be assessed, including working with other partners to update our recent 2010 Integrated Reporting guidance on OA (see attached fact sheet). We are also partnering with EPA's Global Change Research Program (GCRP) in the Office of Research and Development (see attached fact sheet) to begin to explore different analytical techniques that could be used to evaluate climate change impacts on water quality in a TMDL context. In particular, this project uses available finer-scale climate outputs from Regional Climate Models (RCMs) to project changes in future precipitation and temperature under different greenhouse gas emission scenarios. Outputs from these RCMs will then be applied to watershed models to evaluate how pollutant discharges to waters might change in the future in several local case studies. Ultimately, the goal of this project is to identify a suite of cost-effective tools for TMDL developers that will allow them to incorporate climate change impacts into TMDL water quality analyses. Also, this work could be expanded to include climate change assessment tools for 303(d) listing by using model results to identify water quality vulnerabilities to climate change in already stressed and/or unstressed ecosystems.

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