The Clean Water Council *of New Jersey*

2009 PUBLIC HEARING EXECUTIVE SUMMARY

WATER POLICY & CLIMATE CHANGE

The New Jersey Clean Water Council (NJCWC) has statutory responsibility to hold at least one public hearing annually on a water quality management topic. On December 7, 2009, the NJCWC held a hearing on the potential impacts of climate change on water quality management, specifically:

- *What are the high priority risks to clean water posed by the increasing variability of climate and weather events?*
- *What changes to water management policies are needed to increase flexibility and adaptive management, and how will NJ meet the cost?*

During the course of the hearing, the Council heard from experts who had been invited to address the issue from their diverse perspectives as well as from the general public. Following opening remarks by NJDEP Assistant Commissioner Nancy Wittenberg, David Robinson, New Jersey State Climatologist, provided a New Jersey focus on climate change and its potential state impacts. Carol Collier, Executive Director of the Delaware River Basin Commission, spoke about water management in the Delaware River Basin as related to climate change. Marjorie Kaplan, Manager of NJDEP's Office of Climate and Energy, gave an overview of the Department's approach to green house gas (GHG) reduction and mitigation plan development. Council then heard verbal public testimony from 12 members of the public. Additional or supplemental written testimony was also received, including a letter from Senator Robert Menendez who noted his concerns about climate change and the need for New Jersey to create new renewable energy and energy efficiency policies. A list of all who gave or sent testimony follows this summary.

There is general consensus that climate change is occurring, and it is affecting water resources in a variety of ways including warmer air and surface water temperatures, more intense storms intermixed with longer periods of dry weather, and rising sea levels. While the contributory causes may be debated, the potential impacts of climate change on water resources and related infrastructure need to be clearly identified and properly managed.

NJ has largely been focusing efforts on reducing contributions to greenhouse gas emissions. Since climate change is a world-wide process that is already modifying New Jersey resources, proactively adjusting our resource management strategies is also a rational and necessary response.

The over-arching message from the public hearing and supported by the NJCWC is that New Jersey should integrate consideration of the effects of changing climatic conditions into its planning, assessment and regulatory programs *to increase program flexibility, avoid foreseeable negative impacts, and maximize programmatic and fiscal efficiency.*

This document synthesizes the major points of the public testimony and recommendations for action. An official transcript of the hearing is available from Ms. Geraldine Skrajewski at NJDEP, Geraldine.Skrajewski@dep.state.nj.us.

I. WHAT ARE THE HIGH- PRIORITY RISKS TO CLEAN WATER POSED BY THE INCREASING VARIABILITY OF CLIMATE AND WEATHER EVENTS?

A. GENERAL EFFECTS

- **Baselines are changing.** It is no longer acceptable to design for the future based on past records, e.g., "100 year storm frequency" and 7Q10 flow statistics may no longer be accurate for planning and regulating. Accurate measurements & predictions of sea level necessary for infrastructure repair/replacement. Accurate flood evaluations and predictions necessary to protect public safety. Additional monitoring may be necessary.

- **Infrastructure may be at risk from multiple effects**. Coupled with a repeat of the 1960s drought-of record, increases in sea level rise & tidal excursions up river could put some (Delaware River) surface water intakes at risk; vulnerability of wells and well fields needs to be assessed. Since water infrastructure usually links to waterways or coasts, the secure and protected location of infrastructure (pipelines, intakes and discharges), as well as new development, is critical.

- **Water quality effects are largely unknown; synergistic effects may be heightened.** For example, higher temperatures that encourage bacterial growth could also result in higher levels of arsenic and other metals in water as they are made available through biological processes. Dissolved oxygen levels will fall, imperiling sensitive aquatic species.

- **Climate change could exacerbate existing problems.** Impacts associated with development, population growth, and aging infrastructure are likely to be exacerbated by climate change effects on energy and water demand.

B. SPECIFIC EFFECTS

New Jersey is most vulnerable to sea level rise. It is undisputed that sea levels are rising. Although the projected rate of future change is subject to debate, a vulnerability analysis needs to be conducted and steps taken now to begin mitigating problem areas. Expected impacts include:

- Further upstream advances of saline water affecting water intakes
- Salt water intrusion into aquifers
- More homes and industries vulnerable to coastal flooding may prompt revisions to programs that support rebuilding in damaged coastal and other flood prone areas
- Wetland protection and restoration programs could be jeopardized by inundation
- Changes to natural systems (wetlands & shorelines)
- Infrastructure disruption - pipelines, treatment works, etc. - in coastal and low-lying riverine areas

Storms appear to becoming more intense. Whether this is a short or long term effect remains subject to debate. However, water management policies need to consider the potential impacts of changes in the delivery of precipitation (snow and rain) on existing and proposed development and the use and provision of water including:

- Longer drought periods affecting water supply plans, pricing & conservation
- Wetland ecosystem changes

- Increasing incidence of wildfires during extended low flow periods (especially Pinelands)
- Overloaded wastewater treatment plants during heavy rain events
- Lower lake levels and degraded water quality affecting recreation and tourism
- Soil moisture impacts affecting agriculture from both drought and flooding
- Annual streamflow changes could affect mixing zone allocations and permit limits
- More urban flooding affecting water quality, stormwater management design & cost
- Seasonal variations in the availability of drinking water (especially southern NJ)

Local and regional temperatures have been rising and the earth is getting warmer. Impacts could affect stream classifications, uses, and discharge controls. Warmer air and water could be responsible for localized aquatic organism changes, algal blooms, lower dissolved oxygen (DO) levels. Attention needs to be given to such issues as:

- Greater evapo-transpiration, which reduces recharge and stream flows
- Increased water demand, stressing existing supplies
- Warmer water shifts aquatic species distribution & population
- Increased range of invasive aquatic plants
- Fish spawning & survival
- Lower DO, more algal blooms & larger hypoxic zones

II. WHAT CHANGES TO WATER MANAGEMENT POLICIES ARE NEEDED TO INCREASE FLEXIBILITY AND ADAPTIVE MANAGEMENT, AND HOW WILL NJ MEET THE COST?

Programmatic flexibility means being able to respond effectively and efficiently so that the application of programs and policies remain relevant as conditions change. NJDEP may need improved monitoring, analysis and feedback pathways to ensure this flexibility. The goal is to ensure that policies, prioritizations, and manpower are adjusted to meet desired outcomes.

Adaptive management. Several of the recommendations in "Meeting New Jersey's 2020 Greenhouse Gas Limit: New Jersey's Global Warming Response Act Recommendations Report"(2009) offer relevant approaches for adaptive water resources management. The NJCWC is available to work with NJDEP staff to evaluate and develop additional strategies.

A holistic approach. All three components of water management must be considered holistically: supply, distribution and treatment. Smart growth planning concepts can be considered in concert with water management policies to ensure effective implementation.

Finance through existing funds and programs. Financing new initiatives is especially problematic in the current fiscal climate. Leveraging of staff and financial resources is necessary. Cost savings should not lead to inaction, because action is necessary now. Changing existing programs to incorporate consideration of potential climate change effects would be one cost-effective way to encourage adaptive management.

Efficiency. Testimony supported efficiencies in energy use, water use and reuse, land use and redevelopment. Many existing programs, policies and practices could be given more emphasis to achieve financial and resource efficiencies, including, but not limited to LEED certification programs and green building codes, green infrastructure for stormwater management, the policies of the State Development and Redevelopment Plan, and energy efficiency programs for property owners.

Efficiency in permitting and improved communication and coordination were cited as desired strategies, which should be employed both within NJDEP and between NJDEP and other agencies. For example, agricultural water management should be more closely linked with NJDEP's water management programs. Efficient irrigation techniques, drought tolerant practices, water re-use capability and use of agriculture for carbon sequestration are concepts that need to be integrated into a statewide water management program.

III. RECOMMENDATIONS

NJDEP as well as other local, state, national and international groups and organizations are studying climate change in an effort to determine the proper path forward to address probable impacts. The integration of climate change with water policy is evolving on many fronts, although no single approach has emerged. A reliance on information sharing and collaboration among organizations would provide the most cost-effective and efficient approach at this time.

The testimony at the public hearing emphasized that adaptive management will provide NJDEP with greater flexibility to evaluate agency policies, priorities and manpower. This will in turn enable NJDEP to more efficiently address and minimize increasing climate-related risks to water resources, including those that will directly affect water supply and wastewater systems.

The causes of climate change and their relative contributions continue to be debated and models that project future trends and impacts continue to be refined. However, New Jersey does not have to wait for better models or more data to implement responsible changes to its water management programs. Common sense initiatives can be undertaken while awaiting improvements in predictive modeling. Examples include:

1. ***Use cost-effective adaptation strategies*** to identify, address and minimize climate-related risks to water supply, wastewater and stormwater systems. Adaptive management strategies are needed that can cost-effectively address cross-functional issues. For example, integrating strategies for stormwater management and grey water re-use could address water demand, stormwater runoff and combined sewer overflows (CSO).

2. ***A statewide climate change adaptation plan***, integrated with regional and national activities, should be developed and adopted. Smart growth planning concepts should be considered in concert with water management policies to ensure more effective implementation. All three components of water management must be considered holistically: supply, distribution and treatment.

3. ***Increase the flexibility of regulatory programs*** to enable them to respond more nimbly to changes in ambient conditions. Up-to-date information and trend analysis is critical to the timely identification of potentially critical impacts. Data of concern include water temperature, nutrients and metal concentrations, salinity, sea and flood levels, as well as a better understanding of the synergistic effects on water quality and aquatic life.

4. ***Develop incentives to stimulate investment*** in mitigation, adaptation and infrastructure needs. Needs assessments should incorporate the expected effects of climate change on the availability and quality of water resources, as well as on infrastructure. This should include planning and engineering costs associated with anticipated impacts.

5. ***Recognize the value of collaboration; make use of specialized skill sets***. Many New Jersey organizations are poised to help state agencies with the tasks that lie ahead, including, those that participated in the December 2009 hearing. An open planning process engaging interested parties would leverage resources and result in a speedier response to the issues at hand.

It can no longer be acceptable simply to react as problems become evident. New Jersey has the opportunity to proactively prepare NOW to respond to the future impacts from climate change.

In addition to invited speakers, the following persons provided testimony for the 2009 Clean Water Council Public Hearing:

NAME	ORGANIZATION	FORMAT
Jenny Vickers	NJ Environment Federation	Oral & Written
Abigail Fair	Association of NJ Environmental Commissions	Oral & Written
Marie Banasiak	NJ Farm Bureau	Oral
Emmanual Charles	US Geological Survey	Oral & Written
Glen Carleton	US Geological Survey	Oral & Written
Joseph Hochreiter	NJ Builders Association	Oral & Written
Julia Barringer	US Geological Survey	Oral & Written
Bill Wolfe	NJ Public Employees for Environmental Responsibility (PEER)	Oral
Fred Akers	Great Egg Harbor Watershed Association	Oral
Nick Tufaro	NJ American Society of Landscape Architects	Oral & Written
Joy Farber	NJ Office of Smart Growth, DCA	Oral & Written
Ed Clerico	US Green Building Council, NJ Chapter	Oral & Written
Sen. Robert Menendez	US Senate	Written
Sri Rangarajan	American Society of Civil Engineers, NJ Chapter	Written
Jennifer Adkins	Partnership for the Delaware Estuary	Written
Joseph Ruggeri	NJ Association for Floodplain Management	Written