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## **PNCWA Climate Change Position Paper 2015**

### **Climate Change Resiliency and Action for PNCWA Members**

PNCWA’s mission statement includes promoting the advancement of science and technology needed to protect human health and the environment. Climate change is a profound challenge that directly impacts human health and the environment. This position paper summarizes information about climate change resiliency and action for PNCWA members.

#### **PNCWA’s Position**

Climate change is dramatically altering the world’s water environment, as evidenced through changing precipitation patterns, more severe droughts and floods, reduced mountain snowpack, more variability in streamflow, rising sea levels, and degraded water quality. PNCWA believes it is critical for local utilities and the water sector to responsibly manage water resources in our communities in order to minimize the impacts of climate change on the reliable water supply and water quality. PNCWA also believes it is vital for the water/wastewater sector to reduce our greenhouse gas emissions through reasonable energy conservation and renewable energy projects.

The scientific community at large has come to the conclusion that climate change puts the well-being of people of all nations at risk. Water environment managers must work to minimize social, economic, environmental, and public health risks by adapting systems and supplies to the projected effects of climate change.

We consider it to be our responsibility as water professionals to ensure, to the best of our ability, that people understand what we know to be true: Human-caused climate change is happening. We face risks of abrupt, unpredictable, and potentially irreversible changes. Responding now will lower the risk and cost of taking action.

The overwhelming evidence of human-caused climate change identifies significant costs from current impacts and extraordinary future costs and risks to society and natural systems. Not only will the water sector have to contend with distributional challenges due to a changing water supply, but increases in local populations will also affect the demand for water and related services.

This PNCWA Climate Change Position Paper uses text from *What We Know: The Reality, Risks, and Response to Climate Change* by the American Association for the Advancement of Science (AAAS), 2013 and was also informed by *Climate Change in the Northwest Summary* by Mote, P.W., J. Bethel, S.M. Capalbo, M.M. Dalton, S.E. Eigenbrode, P. Glick, L. Houston, J.S. Littell, K. Lynn, R.R. Raymond, W.S. Reeder, and A.K. Snover, 2013. Additionally, this position paper was developed using information from *Protecting Water Resources and Infrastructure from the Impacts of Climate Change* by the Water Environment Federation (WEF), 2010, of which PNCWA is a member association.

# The Scientific Consensus on Climate Change

Surveys show that many Americans think climate change and its human causes is still a matter of scientific debate. Thus, it is increasingly urgent for PNCWA members and the public to know there is consensus among climate scientists that human-caused climate change is real.

Climate change has been scientifically studied for more than 100 years, with greater intensity over the past 50 years, so there is a large body of peer-reviewed science to draw from.

The following are three key messages about climate change:

## **1. Climate scientists agree: Climate change is happening here and now.**

Based on well-established evidence, 97% of climate scientists and virtually every membership organization of experts in this field have now concluded that human-caused climate change is happening. Average global temperature has increased by about 1.4°F over the past 100 years. Sea level is rising, and some types of extreme events—such as heat waves and heavy precipitation events—are occurring more frequently. Recent scientific findings indicate that human-caused climate change is likely responsible for the increase in the intensity of many of these events in recent years.

## **2. We are at risk of pushing our climate system toward abrupt, unpredictable, and potentially irreversible changes with highly damaging impacts.**

Earth's climate is on a path to warm beyond the range of what has been experienced over the past millions of years and has warmed at a pace well beyond that observed throughout the Earth's history. We are certain about the general amount of warming and that is enough to cause significant consequences to society and the environment. In addition, as global temperatures rise, there is a real risk, however small, that one or more critical parts of the Earth's climate system will experience abrupt, unpredictable, and potentially irreversible changes. Disturbingly, scientists do not know how much warming would trigger such changes to the climate system.

## **3. The sooner we act, the lower the risk and cost. And there is much we can do.**

Waiting to take action in response to climate change will inevitably increase costs, escalate risk, and foreclose options to address the risk. The CO<sub>2</sub> we produce accumulates in Earth's atmosphere, not just for decades, but for centuries and longer. Unlike other forms of pollution that respond quickly to the effects of targeted policies, the effects of CO<sub>2</sub> emissions cannot be reversed from one generation to the next. Moreover, as emissions continue and warming increases, the risk increases.

By making informed choices now, we can reduce risks for ourselves, our workplaces, and future generations and ourselves, and help communities adapt to climate change. People have responded successfully to other major environmental challenges, such as wastewater treatment to address water pollution. Scientists working with economists believe there are ways to manage the risks of climate change while balancing current and future economic prosperity.

See [REFERENCE [AAAS What We Know...](#)] for more information on climate change.

# Climate Impacts in the Pacific Northwest

Climate change in the Northwest has been extensively studied by climate researchers at Oregon State University, the University of Washington, the University of Idaho, Boise State University, the US Forest Service and others.

Water-related climate change impacts in the Pacific Northwest include the following:

- **Fish:** Salmon and other coldwater species will experience additional stress as a result of rising water temperatures and declining summer streamflows.
- **Coastal Impacts:** Sea level rise along vulnerable coastlines will result in increased erosion, loss of land, flooding, and damage to nearshore infrastructure including wastewater treatment facilities.
- **Snowpack:** Declining springtime snowpack will lead to higher streamflow in winter and reduced streamflow in summer, straining water availability for municipalities, industry, agriculture, and instream water uses. Barring other mechanisms for water storage, the seasonal timing of water supplies will shift resulting in declines in summer water availability. Scarcities in summer water availability will call for tradeoffs among competing uses, and potentially lead to water conflicts.
- **Wildfires:** Increased wildfires followed by heavy precipitation events will increase sediment and turbidity in rivers.
- **Flooding:** Higher frequency of flooding will increase risk to people, ecosystems, and infrastructure.
- **Landslides:** Projected heavier winter rainfall may cause an increase in saturated soils and therefore a greater number of landslides, particularly where there have been intensive development or forest practices on unstable slopes.
- **Agriculture:** Agriculture, ranching, and natural lands—already under pressure due to an increasingly limited water supply—are very likely to be further stressed by rising temperatures, drought and flooding.
- **Drought:** Decreased winter snowpack may lead to more severe droughts; the need for alternative water supply and better watershed management will be crucial in the future.
- **NPDES Permits:** Lower summer streamflows, coupled with warmer stream temperatures and lower water quality will change 7Q10 and will impact NPDES permits and 303(d) listings in many watersheds.
- **Taxes:** Municipalities and utilities will need to raise water rates and/or taxes to cope with increased infrastructure costs.

See [REFERENCE [Climate Change in the Northwest Summary](#)] for more information on climate change impacts in the Pacific Northwest.

## PNCWA's Climate Response

**The sooner we act, the lower the risk and cost.**

What steps society takes to meet the challenge of climate change—the questions of when, how, and to what extent we respond—are a matter on which all Americans must decide. We urge that these decisions be guided by two inescapable facts: First, the effects of any additional CO<sub>2</sub> emissions will last for centuries. Second, there is a risk of abrupt, unpredictable, and potentially irreversible changes in the Earth's climate system with massively disruptive impacts.

Emissions of greenhouse gases today commit the planet to unavoidable warming and other impacts in the future. As we continue to increase greenhouse gas emissions, we accelerate and compound the effects and risks of climate change into the future. Conversely, the sooner we make a concerted effort to curtail the burning of fossil fuels as our primary energy source and releasing the CO<sub>2</sub> into the air, the lower our risk and cost will be.

### **There is much we can do.**

The United States is a nation of problem solvers. When scientists identified the grave environmental threats posed by discharge of untreated wastewater to rivers, they worked together with other stakeholders—consumers, industry, and government—to develop solutions that would successfully reduce the threat while minimizing short- and long-term economic impacts. Successfully responding to climate change will test our resolve and ingenuity in ways unlike any other environmental challenge we have faced.

There are two primary categories of action which pertain to PNCWA members:

1. Provide information to other professionals, leaders, policy makers and the public.
2. Assist agencies and utilities with mitigation and adaptation measures.

We believe that it is our responsibility as environmental, water, and wastewater professionals to ensure, to the best of our ability, that people fully understand the climate realities and risks we face. Prior experience shows that we and future generations will be better off when science effectively informs decision-making and action.

In summary, responding effectively to the challenge of climate change requires a full understanding that there is now a high degree of agreement among climate scientists about the fact that climate change is happening now, because of human activities, and that the risks—including the possibility of abrupt and disruptive changes—will increase the longer human-caused greenhouse gas emissions continue.

## **Recommendations**

There will be significant environmental, social, economic, health, and safety impacts in the absence of global action on climate change, particularly action to significantly reduce greenhouse gas emissions. PNCWA's recommended actions and considerations are as follows:

1. **Interaction and information sharing with policy makers:** PNCWA recommends interaction with public policy makers in order to share peer-reviewed and science-based information on climate science and climate impacts. Communication should include:
  - Recommending that policy makers include effective strategies for the reduction of greenhouse gas emissions in public policy.
  - Recommending that policy makers include climate change adaptation planning in public policy.
  - Recommending that policy makers enact local, state and federal funding legislation for water resource recovery and renewable energy projects.
  - Recommending that policy makers eliminate fossil fuel subsidies.
2. **Integrated watershed management:** PNCWA promotes Integrated Watershed Planning and Management, to develop the most efficient, common-sense approach for water quality issues within a given watershed. PNCWA supports holistic water quality and quantity trading policies, such as those endorsed by the National Association of Clean Water Agencies, the Water Environment Federation and the EPA.
3. **Climate adaptation planning:** PNCWA recommends that climate adaptation planning should be incorporated at the local level since the effects of climate change are not uniform. City and County governments need to begin planning for the impacts of climate change by engaging with community leaders and scientists to create resilient systems and protect vulnerable communities and infrastructure. Examples of specific actions include evaluating climate scenarios and the potential range of future design storms, and considering if changes are warranted in design criteria for wastewater and stormwater collections systems and treatment systems.

- An example of a tool available to assist organizations with this type of analysis is EPA's Surface Water Management Model (SWMM 5) that includes a Climate Adjustment Tool (CAT). SWMM-CAT provides a set of location-specific adjustments that are derived from global climate change models.
4. **Broader water reuse:** PNCWA promotes water efficiency, reclamation, and reuse as adaptation strategies which can assist urban and agricultural communities in dealing with a decreased water supply as a result of climate change.
  5. **Investment in energy conservation and efficiency projects:** PNCWA promotes energy audits and energy efficiency projects as a means to conserve energy, save money and reduce greenhouse gas emissions. PNCWA recommends that the water sector participate in both energy conservation efforts and traditional renewable energy activities, including:
    - Solar radiation captured at facilities
    - Wind power captured at facilities
    - Electrical or mechanical energy from hydropower using plant influent or effluent
  6. **Investment in energy recovery:** PNCWA promotes energy recovery projects as climate change mitigation strategies. Energy derived from wastewater treatment is a renewable energy resource. Energy generated from water resource recovery processes can include:
    - Electrical energy, heat, or biofuels from utilization of digester gas (biogas that consists mainly of methane (natural gas) and carbon dioxide)
    - Electrical energy and heat from thermal conversion of biomass (biosolids)
    - Electrical energy from biosolids products used by other entities (e.g., pellets used in power plants, cement kilns, or industrial furnaces)
    - Heating or cooling energy using plant influent or effluent as heat source or sink for a heat pump

PNCWA recommends utilizing current incentives to assist with funding water resource recovery and renewable energy projects.
  7. **Larger scale green infrastructure:** PNCWA promotes larger scale use of green infrastructure in order to reduce energy use and capacity needs by keeping stormwater out of collection and treatment systems.
  8. **Continued climate science-related research:** PNCWA supports continued research to advance the understanding of the past and present operation of the climate system. The focus should be on refining understanding and predicting climate at regional and global scales, and also better understanding of how sensitive natural systems and infrastructure are to climate change.

## REFERENCES

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