

Climate Change Research North American Direction

**Water Research Foundation
Robert Renner, Executive Director**



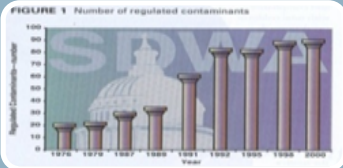
**WATER
RESEARCH
FOUNDATION™**

ADVANCING THE SCIENCE OF WATER®

Overview



About the Foundation



Identified Needs



Research Direction



Summary

Water Research Foundation

**Advancing the science of water to
improve the quality of life**



Foundation's Contribution to the Water Community

- Practical applications to help utilities optimize operations and ensure customer satisfaction
- Early alert and proactive solutions on future issues
- Direct, immediate benefits to utility subscribers



Foundation Research Needs Workshops

- Locations
 - Denver
 - London
 - Edinburgh
- Participants from the US, UK, Canada, France, Germany, Netherlands and Australia



Research Needs

Water Resources

- Downscaling of climate change models to facilitate watershed-level water supply planning
- Decision support tools and adaptive strategies for water supply planning
- Impacts of carbon sequestration on groundwater quality

Water Quality

- Identification of best indicators for tracking & assessing impacts on water quality & aquatic ecosystems
- Impact of climate change on algal blooms
- Desalination efficiency and concentrate disposal

Research Needs

Infrastructure

- Assess and mitigate impacts of sea level rise on infrastructure
- Risk exposure of key infrastructure to climate extremes
- Develop planning and design principles for climate-resilient infrastructure

Energy

- Measure and reduce greenhouse gas emissions and carbon footprints
- Adapt to changing energy sources and availability
- Extend water supply through diversification of sources with low energy impacts

Research Direction

- Water Resources
- Water Quality
- Infrastructure
- Energy and Environment

Water Resources

- Tools to Incorporate Climate Change Information in Water Utility Planning
- Vulnerability Assessment and Risk Management Tools for Climate Change
- Changes in Water Use Under Regional Climate Change Scenarios

Water Resources

- Improving Climate Modeling to Assist Water Utility Planning for Climate Change
- Ground Water Sustainability Under Climate Change
- Reservoir Operations Under Climate Change

Water Quality

- Algal toxins: Detection, removal, early warning
- Impacts of underground carbon sequestration on the water quality of groundwater
- Water quality impacts of extreme weather events

Infrastructure

- Effects of climate change on water quality planning criteria and design standards
- Planning and design of water assets to ensure sustainability under climate change
- Aquifer storage and recovery

Energy and Environment

- Water system design and operation for maximum energy efficiency
- Greenhouse gas emission inventory guidance and management strategies
- Regulatory changes required to respond to climate change

Climate Change Clearinghouse Web site

 Home - Climate Change Clearinghouse

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CLIMATE CHANGE CLEARINGHOUSE

For the Water Community



Thank you for visiting our new Climate Change Clearinghouse website. To help us improve our website, we would be grateful if you could spend a few moments telling us what you thought of your visit to the site and providing any suggestions for improvement that you may have.

[Click Here to submit your feedback](#)
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The Climate Change Strategic Initiative of the Water Research Foundation

[The Initiative](#) [The Objectives](#) [The Expert Panel](#) [Work Products](#)

Research by the Water Research Foundation

Energy Management

Foundation Research on Water Utility Energy Management and Climate Change


Infrastructure

Foundation Research on Infrastructure and Climate Change

Utility Mgmt & Comm's

Foundation Research on Water Utility Management and Communications and Climate Change

Water Quality

Foundation Research on Water Quality and Climate Change

Water Resources

Foundation Research on Water Resources and Climate Change

Website Feedback Request

Thank you for visiting our new Climate Change Clearinghouse - For the Water Community website. To help us improve our website, we would be grateful if you could spend a few

Algal Research

- 25 projects valued at \$8.5 Million
- Topics covered are:
 - Algae detection and removal strategies
 - Algal toxins
 - Early warning systems



Vegetation Change in Watersheds

- Watershed vegetation controls erosion, captures sediments, and filters contaminants.
- Higher temperatures, heavy precipitation and wildfires may alter watersheds



Pine Beetle



Vegetation Change in Watersheds

- Focuses on vegetation change due to: wildfire, storms, urbanization, drought
- Provides information on the changes in water quality and quantity
- Provides information on management strategies



Utility Guidance for Mitigating
Catastrophic Vegetation Change
in Watersheds

↓ Subject Area: Water Resources and Environmental Sustainability



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Conclusions

- Climate is changing regardless of cause
- Climate change directly impacts water quality, quantity of water and infrastructure
- Relevant adaptation strategies must be developed to protect water supply

Questions?

For more information on
Water Research Foundation's
Climate Change Program, visit

www.theclimatechangeclearinghouse.org

Thanks!

