

Wisconsin is a mosaic of forests, grasslands, hills, plains, farms and communities, endowed with thriving natural areas, agricultural lands and urban environments. The Great Lakes frame our northern and eastern borders, the Mississippi River hugs us to the west, and miles of streams and rivers dissect the landscape, itself dotted with thousands of inland lakes and wetlands.

Wisconsin's climate is changing consistent with changes occurring at the global scale, but those changes vary from region to region across the state. This report focuses on the impacts of climate change on a broad range of Wisconsin's human and natural systems.

Climate change affects Wisconsin's natural, social and economic environments. We need to adapt to the impacts that are occurring today and prepare for those that are likely to occur tomorrow. While people have always adapted to changes in their environment, the rate and scale of the changes we are seeing today – and those projected for the next century – require us to be more intentional and systematic in our adaptation strategies and plans. The Wisconsin Initiative on Climate Change Impacts (WICCI) seeks to identify climate impacts, vulnerabilities and risks and to develop adaptation strategies to build our state's resilience, prepare for or prevent negative consequences, and seize opportunities that may arise.

THE WISCONSIN INITIATIVE ON CLIMATE CHANGE IMPACTS

The Wisconsin Initiative on Climate Change Impacts (WICCI) is a statewide collaboration of scientists and stakeholders formed as a partnership between the Nelson Institute for Environmental Studies at the University of Wisconsin-Madison and the Wisconsin Department of Natural Resources. Since its formation in the fall of 2007, WICCI has grown to include representatives from other state and federal agencies, several UW System schools, tribal organizations, businesses and nonprofit groups totaling more than 70 collaborating entities.

WICCI comprises a science council composed of a diverse group of scientists from a range of disciplines that oversees 15 working groups, which are in turn made up of experts from a variety of fields; an advisory committee of stakeholders from the public and private sector; an outreach committee; and an operations unit.

The goals of WICCI are to:

- **Assess and anticipate climate change impacts upon Wisconsin's natural and built environments.**
- **Evaluate risks and vulnerabilities within our ecosystems, infrastructure, industries, agriculture, tourism and other human and natural systems.**
- **Recommend practical adaptation strategies and solutions that businesses, farmers, public health officials, municipalities, resource managers and other stakeholders can implement.**

Please see www.wicci.wisc.edu for more information.

INTRODUCTION

Wisconsin's Changing Climate: Impacts and Adaptation is the first in what will be a series of climate impact and adaptation reports by WICCI. This report is the first step in what will be a long-term, collaborative process to prepare Wisconsin for the changes ahead and to preserve our natural resources, our economy and our enjoyment of all that our great state has to offer.

This assessment of climate impacts in Wisconsin is written for Wisconsin policy-makers, managers and decision-makers in governmental bodies at all levels, including the state, counties, cities and municipalities. It is also written for people and organizations whose businesses, farms, properties and special places have been or will be affected by a changing climate and for others interested in climate change and its potential impacts.

Throughout this report, contributing scientists look at our climate history to learn from our past and look to the future using state-of-the-art climate models. Wisconsin is diverse in its ecological and human landscapes, and climate change impacts vary across different areas. In order to develop effective adaptation strategies, we zoom in on each topic area, region or group of resources and then step back to look at how each part fits into the whole.

This report represents the work of more than 200 researchers, managers, educators and other experts with intimate knowledge of Wisconsin and its climate, waters, fish and wildlife, forests and other natural communities, cities and farms and public health. Fifteen working groups have assessed climate change impacts and developed adaptation strategies for various sectors of the state. Some working groups adopted broad purviews; others focus on specific issues or regions. In some topical areas, we have a wealth of data and working groups offer well-supported strategies. In

other areas, the research is preliminary, and we are only beginning to know the right questions to ask.

WICCI is in the early phases of addressing these issues at the appropriate scales for planning and action. Successive assessments at four- or five-year intervals will keep us ahead of the many issues and concerns that will need to be addressed. As WICCI progresses in the years ahead, we anticipate more detailed climate projections upon which to build our assessments. We will broaden our research, adding topics and sectors, even as existing working groups continue to gather data, analyze impacts and make further recommendations. We will document our progress in future assessment reports.

Wisconsin's Changing Climate is organized into three main sections. Part 1: *Changes* details the science of climate change and introduces the concept of climate adaptation. Part 2: *Impacts* describes the impacts of climate change on various natural, cultural and economic resources in Wisconsin. Part 3: *Actions* provides a more comprehensive discussion of adaptation to climate change in Wisconsin, in which we look at the ways in which the adaptation strategies presented in each chapter fit together and overlap. We lay out a framework to move forward and implement adaptation strategies, and we touch on topics that we plan to expand as WICCI continues to study climate change impacts in Wisconsin.

Finally, an appendix includes the executive summaries of the technical, scientific working group reports. The executive summaries contain the main findings of each working group. The research, reports and documentation on which this assessment is based are available on the WICCI Web site (www.wicci.wisc.edu).