

# Solving the Puzzle:

Researching the Impacts of Climate Change Around the World



NATIONAL SCIENCE FOUNDATION

**On the cover:** The climate change “puzzle” includes pieces from science and engineering fields including ecology, glaciology, atmospheric science, behavioral science, and economics. The photos in this puzzle collage represent the various fields that contribute to our full understanding of Earth’s climate. The missing puzzle piece symbolizes the need for continued basic research on global climate change and variability.

**Cover design:** Adrian Apodaca, National Science Foundation

**Cover photo credits:** © 2009 JupiterImages Corporation (background)

**Sphere:** top row, left to right: David Cappaert, Bugwood.org, © University Corporation for Atmospheric Research; © 2009 JupiterImages Corporation. Second row: Eva Horne, Konza Prairie Biological Station; © 2009 JupiterImages Corporation (2). Third row: © 2009 JupiterImages Corporation; Jeffrey Kietzmann, National Science Foundation; © Forrest Brem, courtesy of NatureServe; Digital Vision, Getty Images. Fourth row: Jim Laundre, Arctic LTER; © 2009 JupiterImages Corporation; Lynn Betts, USDA Natural Resources Conservation Service; Peter West, National Science Foundation. Bottom row: David Gochis © University Corporation for Atmospheric Research; © University Corporation for Atmospheric Research

# SOLVING THE PUZZLE:

**Researching the Impacts of Climate Change Around the World**

# TABLE OF CONTENTS

Introduction	1
Sky	8
Sky Research Highlights	16
Sea	27
Sea Research Highlights	33
Ice	43
Ice Research Highlights	52
Land	62
Land Research Highlights	66
Life	74
Life Research Highlights	79
People	90
People Research Highlights	98