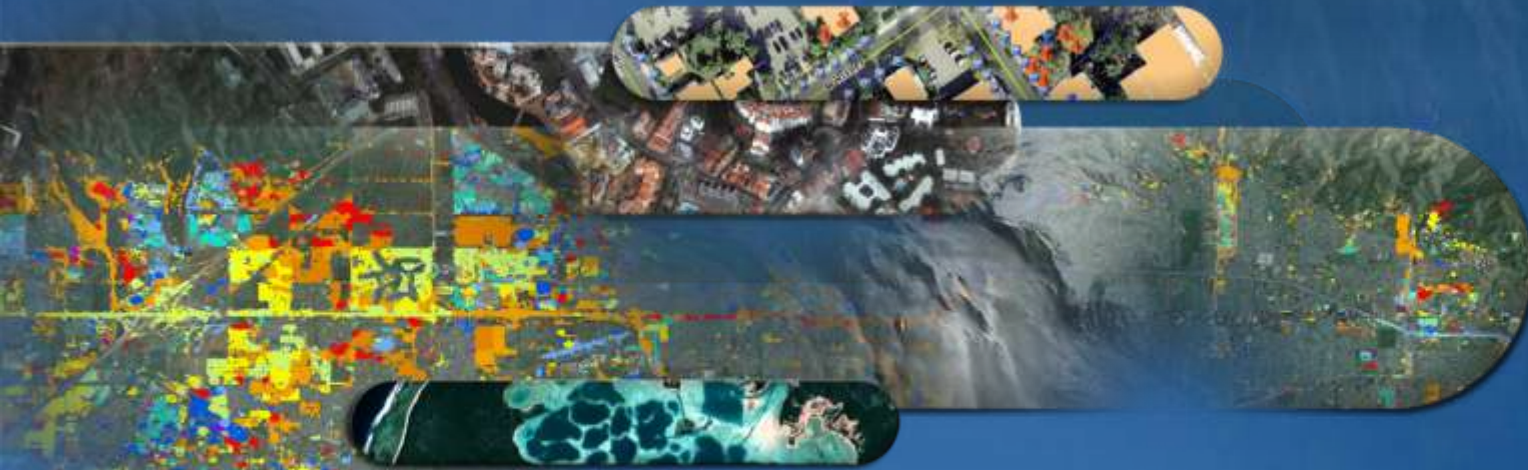


GIS and Climate Change: our integrated world



Carmelle J. Terborgh, Ph.D., ESRI
Leif Toudal Pedersen, DMI

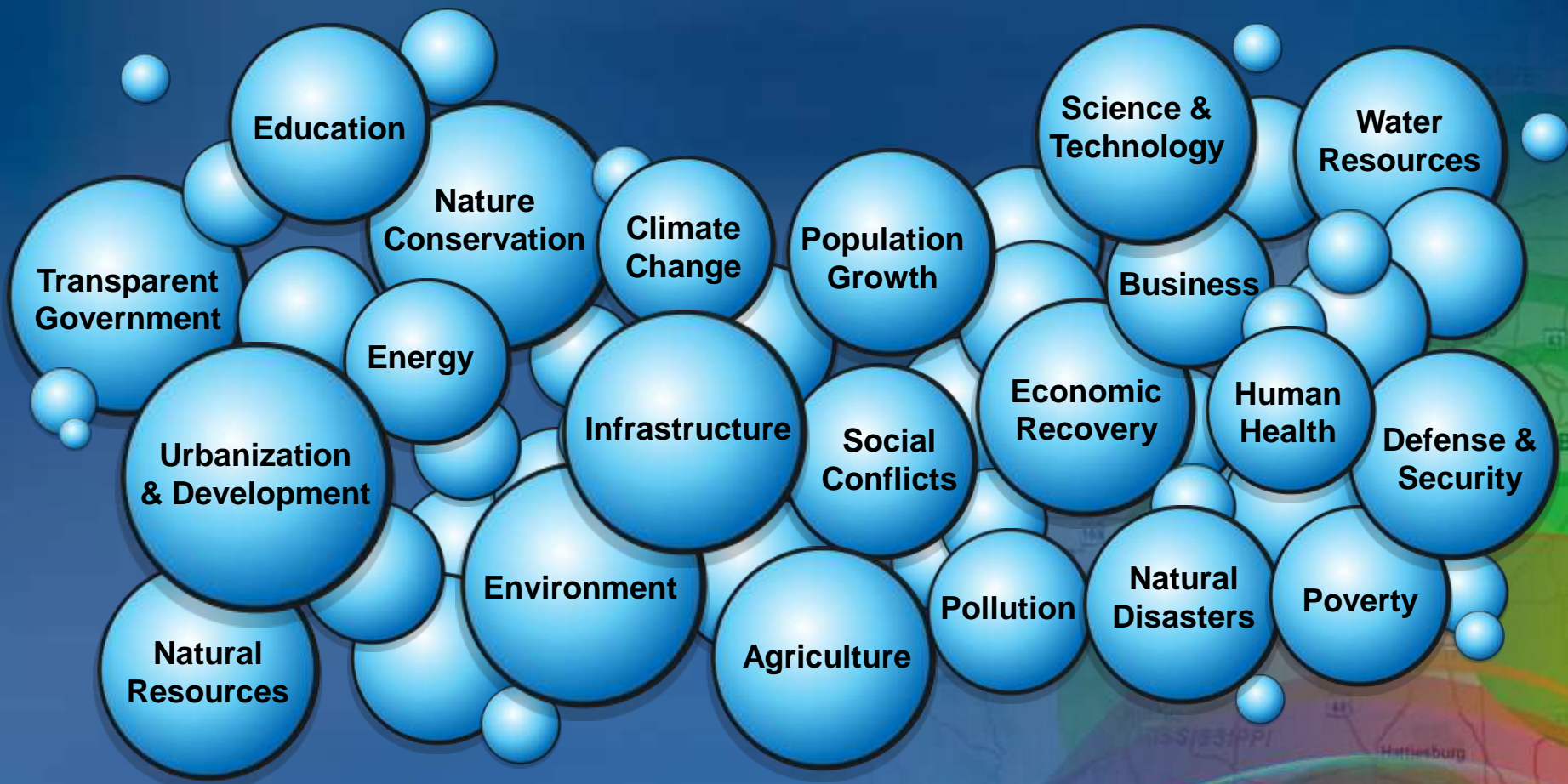
A Geographic Information System (GIS)

A GIS is a system for the **Management, Analysis, Visualization** and **Dissemination** of Geographic Information...



...for effective, timely, and efficient **collaboration, problem solving,** and **decision-making.**

GIS: Applied to Our World's Challenges



*... Implementing an Information Infrastructure
... For Creating a Sustainable Future*

2010



Natural World



Human Footprint



Climate Change

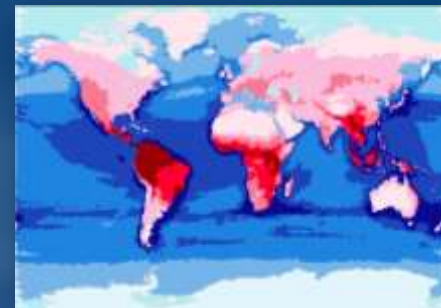
Environment

Change in Ice Shelf



Antarctic

Threatened Species



Sea Level Rise



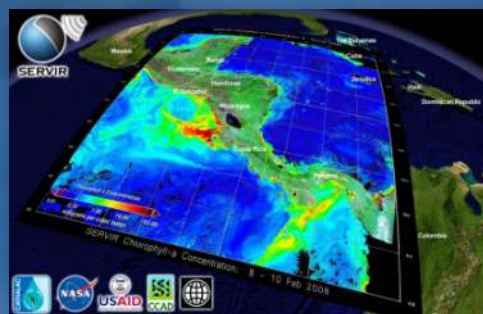
New England, USA

Air Pollution



Czech Republic

Ocean Chlorophyll



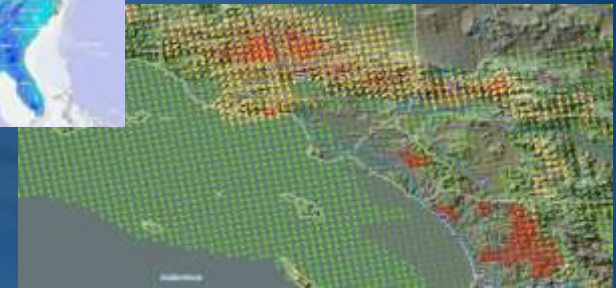
Central America

Climate & Renewable Energy

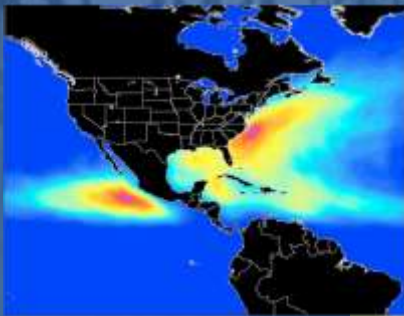
Wind Farm Design
Massachusetts



Wind Generation Potential
USA

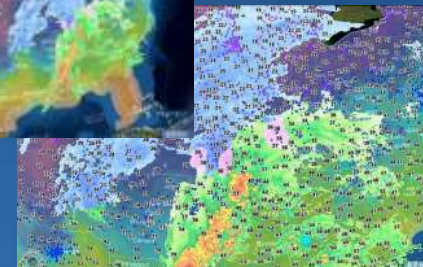


Tropical Cyclones
National Hurricane Center



Solar Energy Potential
Washington

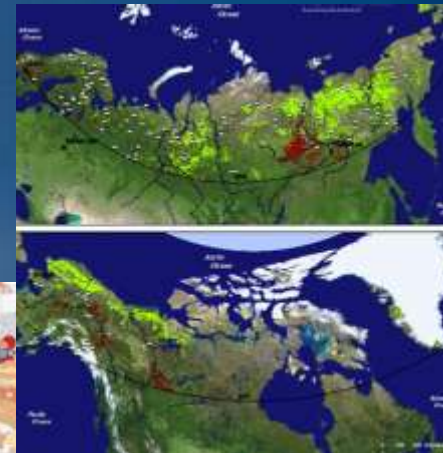
Weather Monitoring
USA



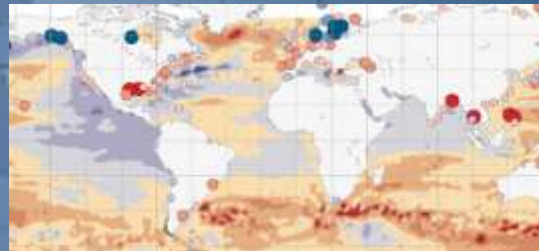
Wind Modeling
California

Impacts of Global Climate Change

Vegetation Trends
Arctic



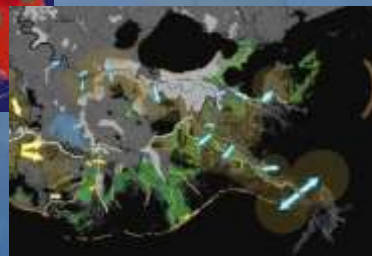
Sea Level Change
Global



Sea Level Rise Modeling
Florida

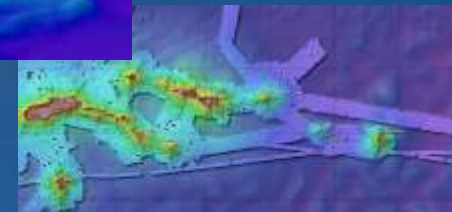
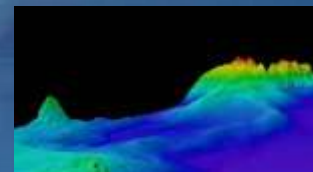


New York



Coastal Zone Planning
Louisiana

Continental Shelf
Portugal



Oceanographic Studies
American Samoa

GIS: an ICT for Planning Our Future

For Geographic Planning & Decision Making

GIS



Design



Plan



Evaluation

GIS Servers are Playing an Increasing Role

Powering Enterprise & Web Applications

Mapping



Enterprise Integration



Cloud Computing



Web GIS



Mobile



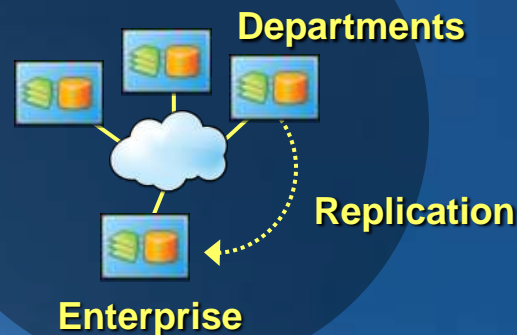
Visualization



Mashups



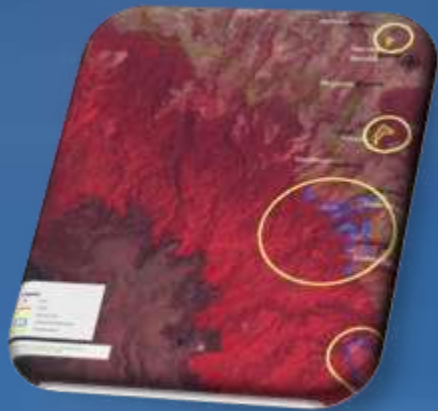
Distributed (SDI)



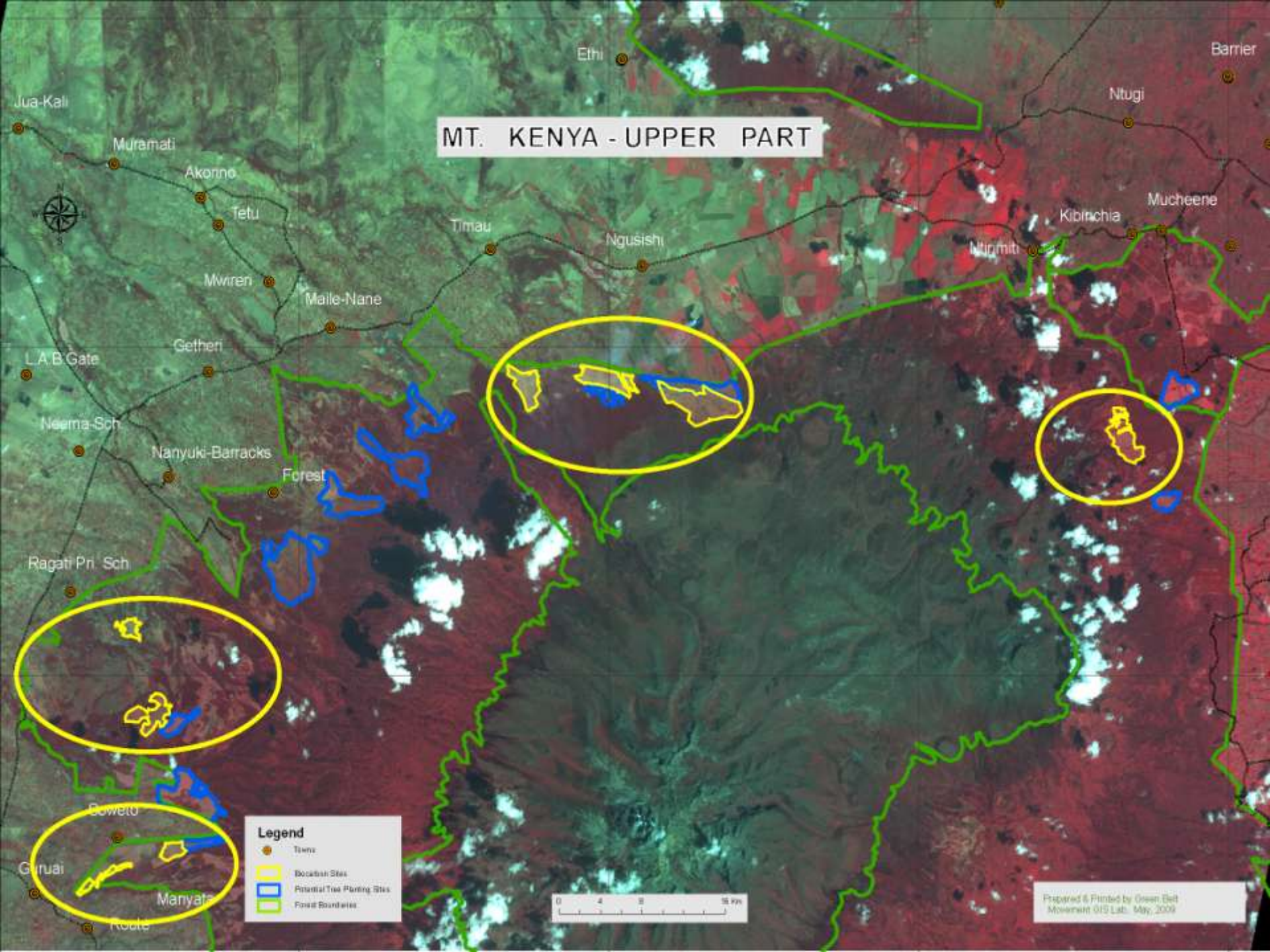
Sea Ice Monitoring by Danish Meteorological Institute

- **DETAILS TO BE ADDED SOON!**

Monitoring Biocarbon Sites by Green Belt Movement



MT. KENYA - UPPER PART

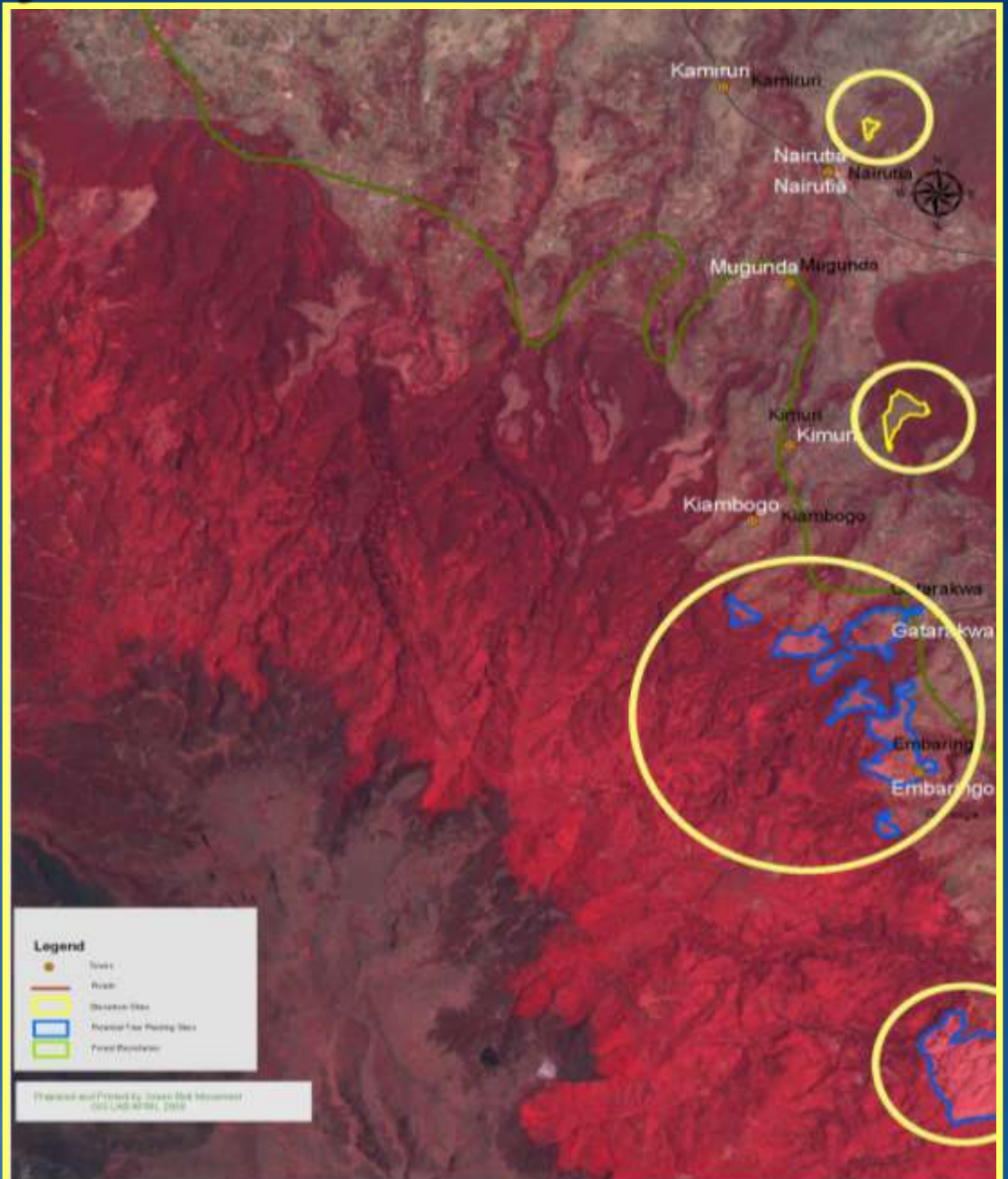


Legend

- Towns
- Location Sites
- Potential Tree Planting Sites
- Forest Boundaries



Aberdares Ranges, Kenya

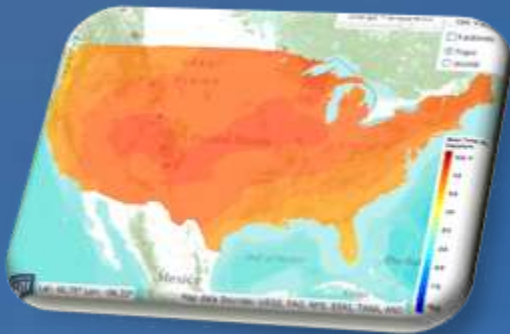


Green Belt Movement Side Event

- December 11th at 11am-12:30pm
- Green Belt Movement: Livelihoods, Forest, Climate
- Prof. Wangari Maathai
- More information at: www.greenbeltmovement.org

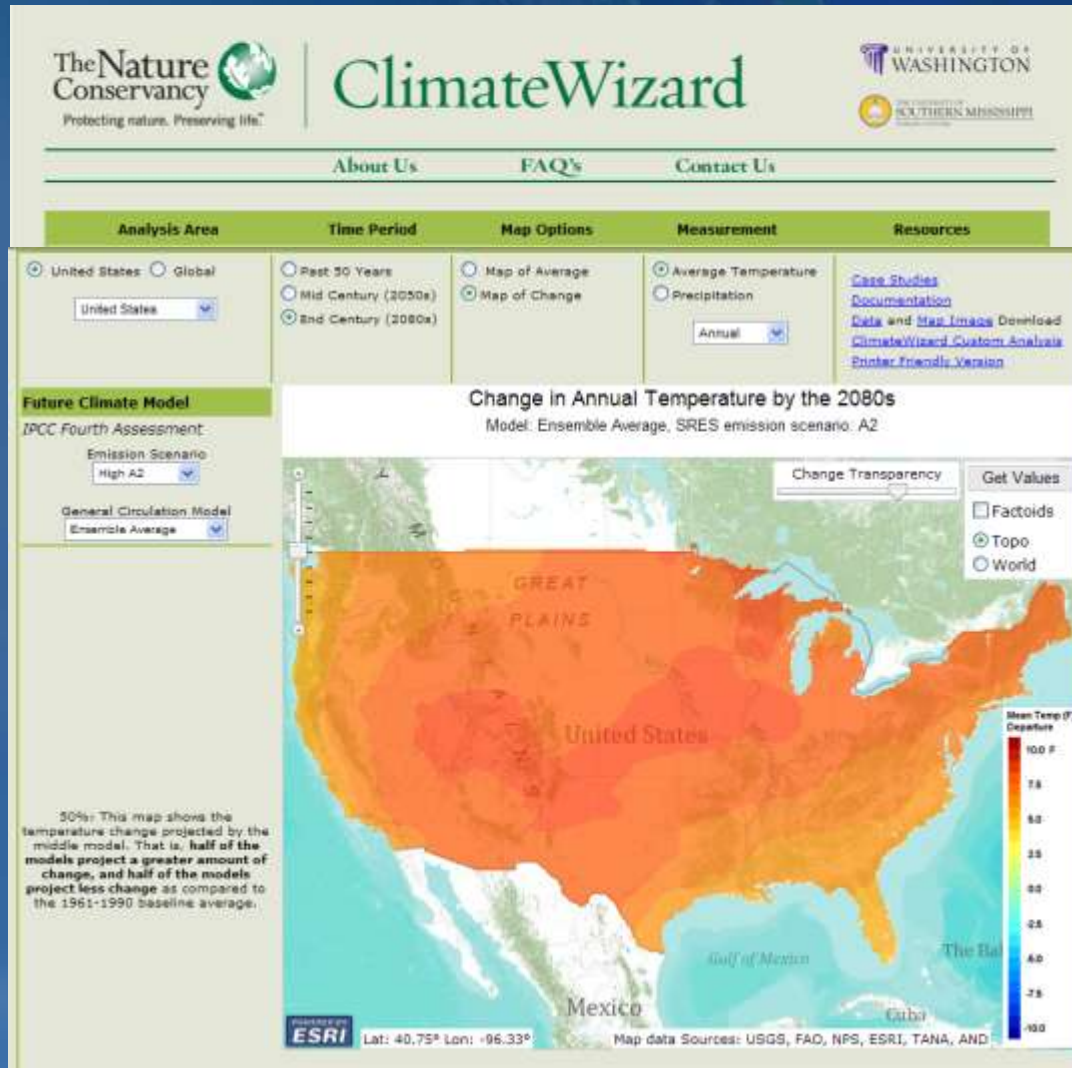
Climate Wizard

by The Nature Conservancy, University of Washington,
University of Southern Mississippi



ClimateWizard

www.climatewizard.org

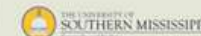


Future Climate Models



Future Climate Models

Static PNGs Image Service



Visit the [Climate Wizard](#) page for more options.

Analysis Area

- United States
- Global

Time Period

- Mid Century (2050s)
- End Century (2080s)

Map Options

- Map of Average
- Map of Change

Measurement

- Average Temperature
- Precipitation

Climate Models

- Ensemble Average
- Ensemble Lowest
- Ensemble 20%
- Ensemble 40%
- Ensemble 60%
- Ensemble 80%
- CGCM3.1 (T47)
- CNRM-CM3
- GFDL-CM2.0
- GFDL-CM2.1
- GISS-ER
- INM-CM3.0
- IPSL-CM4
- MIROC3.2 (medres)

BCCR-BCM2.0



Low B1

Medium A1B



High A2

CSIRO-Mk3.0



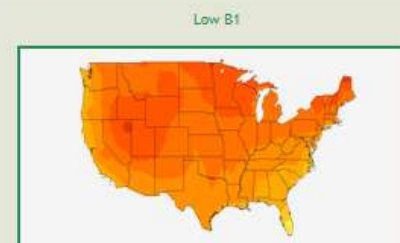
Low B1

Medium A1B



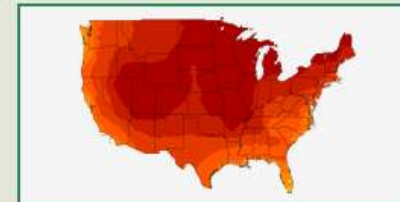
High A2

Ensemble Highest



Low B1

Medium A1B



High A2

Cycle

- Annual
- Dec - Feb
- Mar - May
- June - Aug
- Sept - Nov
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Adaptation Atlas by Resources for the Future

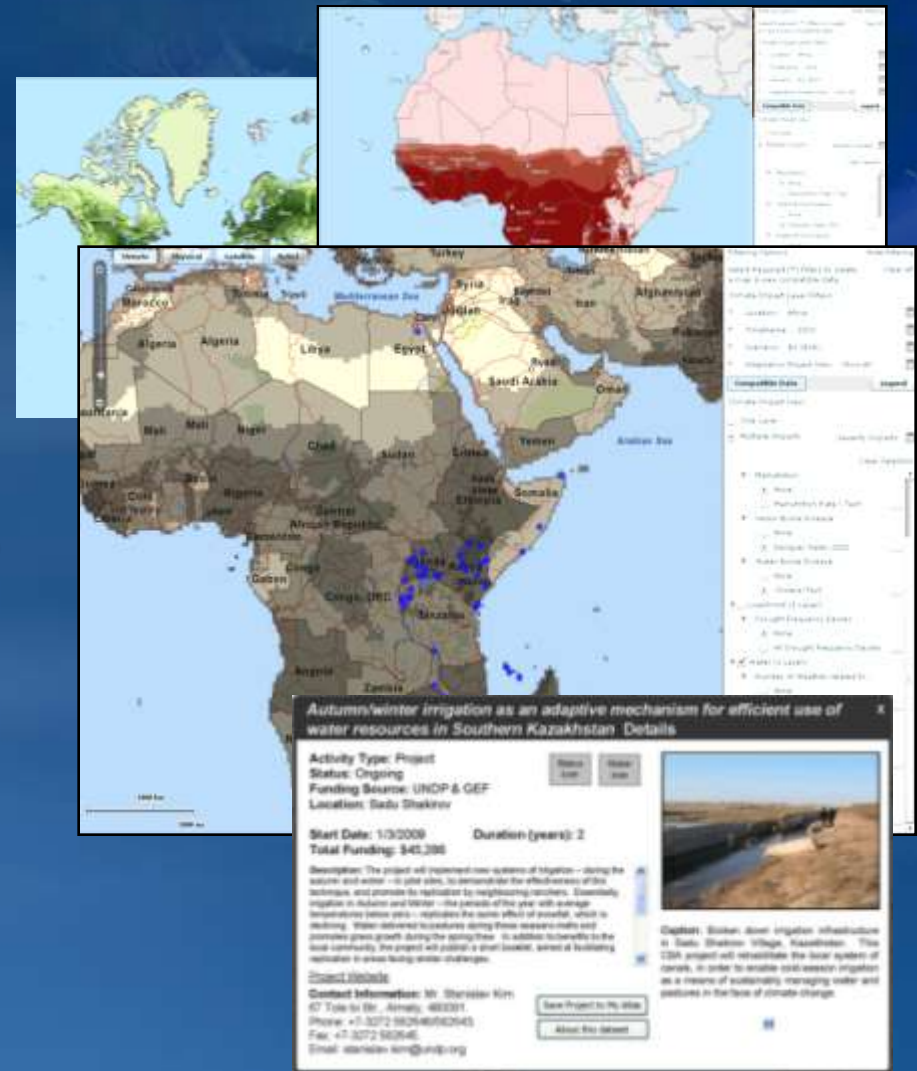


Mapping: the Missing Link in Establishing Priorities and Strategies for Action on Adaptation

- **Geography and spatial information** are common threads connecting impact science and policy
 - Climate impacts: site- & population-specific
 - Populations in greatest need are often least able to adapt
- **Need for coordination** of scientific research, policy and on-the-ground activity
 - Maps showing current and projected climate impacts and adaptation activity can help in setting strategy for interventions and investments
 - This is the aim of the Adaptation Atlas

What is the Adaptation Atlas?

- Web-based application enables user driven, dynamically generated maps of climate impacts and adaptation activities:
 - Database of impacts from peer reviewed climate studies
 - Repository of adaptation projects
 - Data available for download and uploads of new data supported
 - User can select different locations, timeframes, scenarios and overlay resulting data across sectors
 - Detail pages give more information on selected layers/studies and adaptation activities

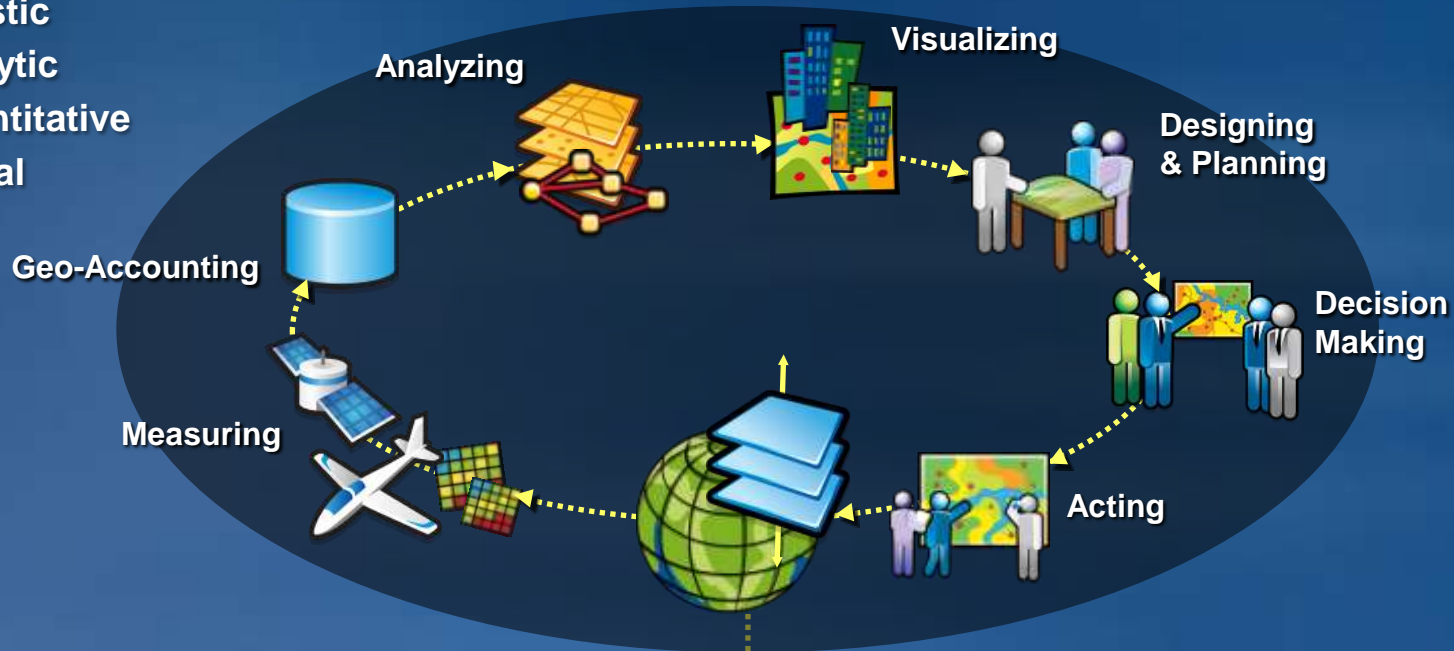


Adaptation Atlas: Exhibits and Side Events

- Exhibit Booth in Hall H from Dec 7-18th
- Presentation at UNFCCC's ISeeT area on Dec 8th, 3pm
- European Environment Agency Side Event on Dec 10th, 2-4pm
- UNFCCC's ISeeT Exhibit on Dec 11th and 12th
- More Information at: www.adaptationatlas.org

GIS is Changing How We Work

- Systematic
- Holistic
- Analytic
- Quantitative
- Visual



A Science Based Approach

... And ... How We Act

Thank You!

