NASA EARTH EXCHANGE
IN SUPPORT OF THE
NATIONAL CLIMATE ASSESSMENT

Earth Science Division/NASA Advanced Supercomputing
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To provide enabling tools for the Earth science community supporting the National Climate Assessments.
Leveraging collaborative research tools at NASA
NCA@NEX Objectives

- Creation/distribution of high resolution historical and projected climate data.
- Development of climate change indicators and monitoring: Analysis of long-term satellite data for the U.S. to quantify spatial and temporal patterns in indicators of terrestrial ecosystem condition.
- Facilitate climate impacts modeling: Facilitate ensemble modeling experiments to quantify changes in biogeochemical cycling in response to changes in climate as well as land use.
NEX Activities

- Creating ready-to-use data sets for NCA
- NCA Community Engagement
- Technology Development/NEX
Data sets

- **Historical Climate Gridding**
  - In collaboration with NTSG/U of MT, we created a 1km daily gridded historical climate data from 1950 to 2010
  - Complimentary to PRISM data but at daily resolution
  - Useful for downscaling GCM output at daily timescales.
  - This dataset supports a number of hydrology/ecosystem models

- **30 years of satellite-derived Leaf Area Index**
  - In collaboration with Boston U, we implemented and customized the MODIS LAI algorithm for AVHRR
  - Obtained and processed GIMMS AVHRR NDVI data
  - Created a first generation LAI product spanning 1981 to 2010
- **Climate gridding**
  - *University of Montana*
  - *California State University*
  - *ORNL*

- **Satellite data analysis**
  - Boston University
  - GSFC
  - University of Maryland

- **Climate downscaling**
  - Climate Central
  - University of Montana
  - Santa Clara University
NCA Community Engagement

- **Climate data analytics**
  - University of Minnesota

- **Data-model intercomparison**
  - ORNL
  - Northern Arizona University
  - Colorado State University
  - Boston University
NCA Community Engagement

- **Ecosystem modeling**
  - University of Montana
  - Oregon State University
  - Montana State University
  - Yale University
  - WHRC

- **Hydrology modeling**
  - Climate Central
  - BLM
  - Santa Clara University
- NEX infrastructure implementation plan completed
- VisTrails workflow management tools implemented
- Testing iRODS data management
NCA Contributions

- Chapter 5: Evolving Weather and Climate Conditions of the Southwest United States, R. Nemani

- Climate impacts on Ecosystems, NCA, F. Melton
- Hashimoto et al., 2012 Exploring simple algorithms for estimating gross primary production in forested areas from satellite data, Remote Sensing, 4, 303-326; doi:10.3390/rs4010303
- More papers are in review or in preparation