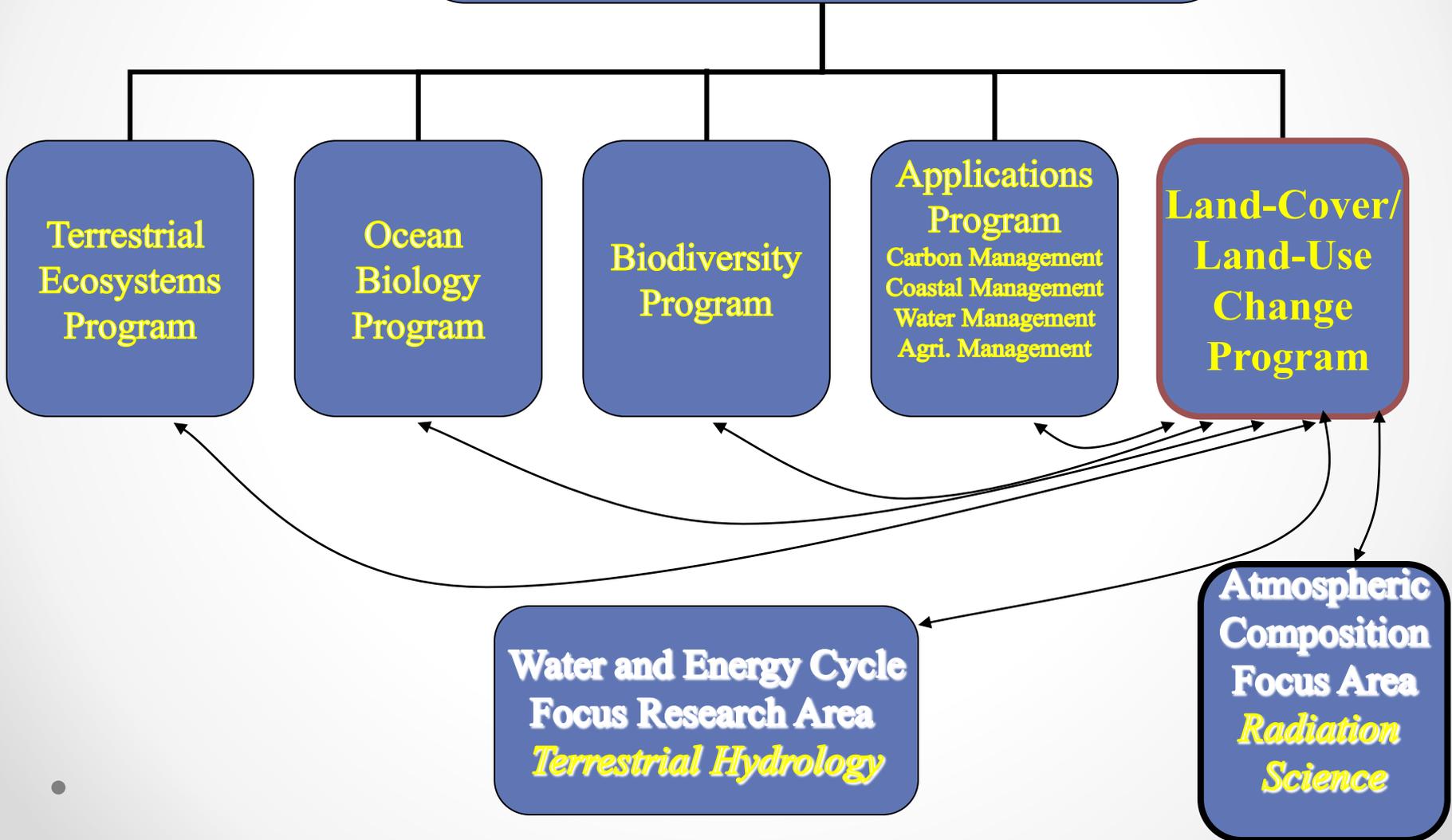


# NASA's Land-Cover/Land Use Change Program: An Update

Garik Gutman,  
NASA Headquarters  
Manager, LCLUC Program



**Carbon Cycle and  
Ecosystems Focus  
Research Area**



# External Linkages: National

- NRC review of Land-Use Models, co-sponsored by NASA LCLUC and USGS has been published (Dan Brown, U. Michigan)
- National Climate Assessment (land use scenarios)
- LCLUC Projects Site visits
  - U. Wisconsin (16 months ago)
  - Ohio State U. (9 months ago)
  - U. Oklahoma (4 months ago)



# External Linkages: International



## • GOFC-GOLD

- Fire Implementation Team office at UMD
- South Asia Network (SARIN) is being formed as a result of the LCLUC meeting in Coimbatore (India), January 2013
- Central Asia Network (CARIN) got a boost at the international regional LCLUC ST meeting in Tashkent, Uzbekistan, November 2013
- South-Central Europe Regional Information Network (SCERIN) will continue its activities in Krakow (Poland), June 2014
- South East Asian Regional Information Network (SEARIN) will be enhanced at link to CARIN in Myanmar, November 2015



Krishna Vadrevu  
(UMD)



Jiaguo Qi (MSU)



Petya Campbell  
(NASA)

## • CEOS/GEO

- Co-lead GEOGLC (Global Land Cover)
- Co-lead GEOGLAM (Global Ag Monitoring)
- Contribute to GFOI (Global Forest Observations Initiative)

# International Partnerships

- Northern Eurasia Earth Science Partnership Initiative (NEESPI) - support of Project Scientist, meetings and research projects
- Monsoon Asia Integrated Regional Study (MAIRS) - support of Project Scientist, meetings and research projects
- Moving to Future Earth...
- China issue remains
- Russia issue came up
- NEESPI is shrinking!



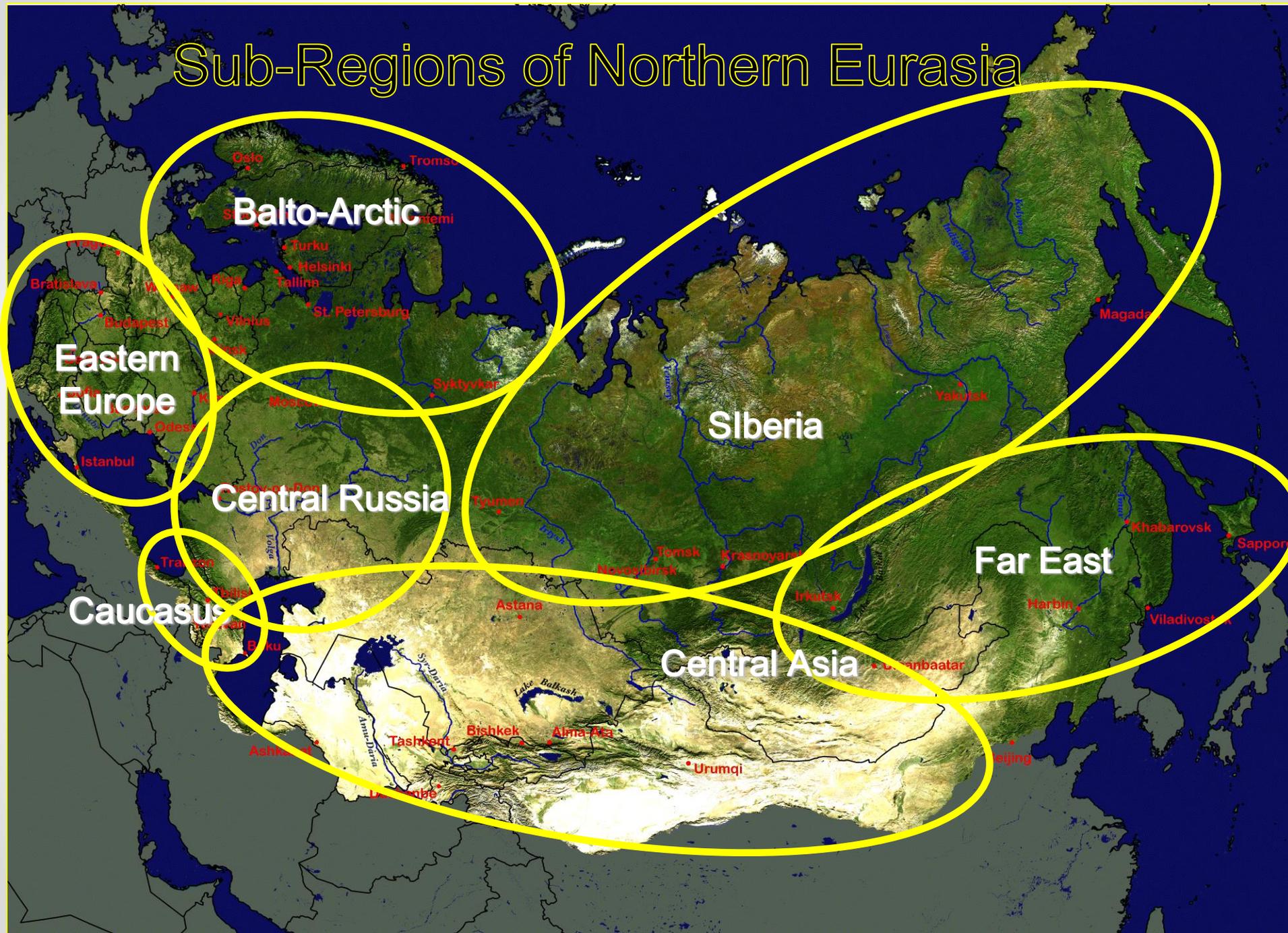
Project Scientist  
NASA-NEESPI  
Pasha Groisman



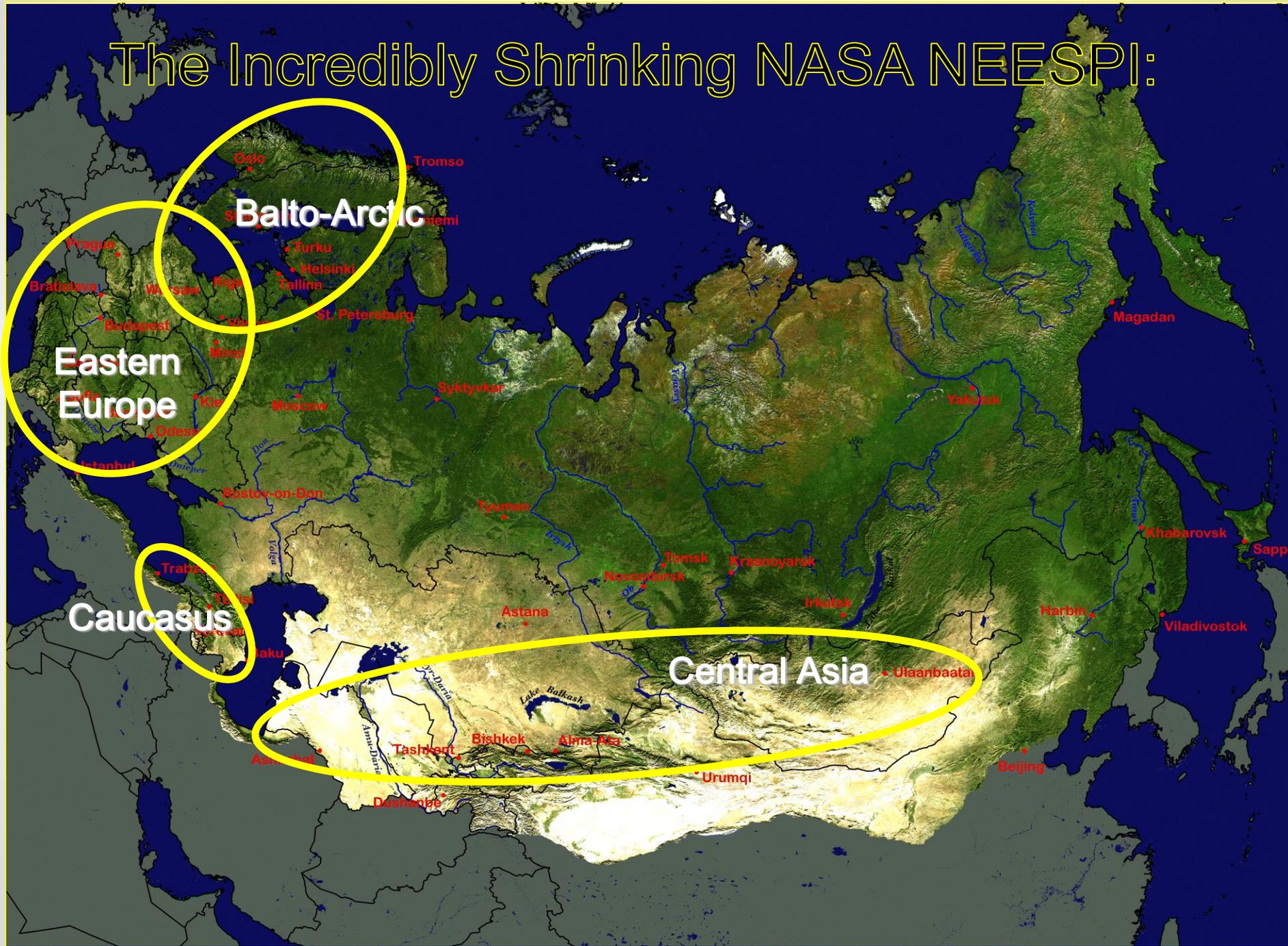
Project Scientist  
NASA-MAIRS  
Jiaguo Qi, MSU

- ESA Sentinel-2 Program
- CNES/CESBIO on Landsat/Sentinel2 joint higher-level data products

# Sub-Regions of Northern Eurasia



# The Incredibly Shrinking NASA NEESPI:



# Program Components



Total ~40 projects : Forests, Ag,  
Urban, Wetlands

- Detection/Monitoring/Observations
- LCLUC Predictive Modeling
- LCLUC impacts on
  - Carbon and Water Cycles
  - Climate and Environment
- Drivers of Change
- Climate impact on LCLUC
- Vulnerability, Impacts and Adaptation
- Synthesis studies



LCLUC ST Meeting Apr 2013,  
Rockville, MD

# LCLUC Urban Component

- Remote sensing from satellites is a critical tool providing details on urban changes, such as expansion or conversion
- Rapid changes in most populous countries in Asia

# Ongoing LCLUC Urban Projects

- **Karen Seto, Yale U. (with Arizona State U. and U. Wisconsin)**
  - Multi-Scale and Multi-Sensor Analysis of Urban Cluster Development and Agricultural Land Loss in China and India
- **Cristina Milesi, NASA Ames (with Columbia U.)**
  - Mapping of Urban Expansion Using Multi-Decadal Landsat and Nightlights Data Over North America
- **Eric Brown de Colstoun, NASA GSFC (with U. Maryland)**
  - Using Landsat Global Land Survey Data to Measure and Monitor Worldwide Urbanization
- **Yuyu Zhou, Joint Global Change Research Institute**
  - Mapping and Monitoring of Wetland Dynamics for Improved Resilience and Delivery of Ecosystem Services in the Mid-Atlantic Region
- **Stephen Leisz, Colorado State U.**
  - Increased accessibility, landscape changes, rural transformations, and urbanization: impacts in the east-west economic corridor from Da Nang, Vietnam to Khon Kaen, Thailand

# Ongoing IDS Urban Projects

- **Son Nghiem, JPL (with Columbia U. and Stanford U.)**
  - Mega Urban Changes and Impacts in the Decade of the 2000s
- **Soe Myint, Arizona State (with U. NC and Yale U.)**
  - Understanding Impacts of Desert Urbanization on Climate and Surrounding Environments to Foster Sustainable Cities Using Remote Sensing and Numerical Modeling
- **Doug Stow, NASA GSFC (with U. Maryland)**
  - The Urban Transition in Ghana and its relation to land cover and land use change through analysis of multi-scale and multi-temporal satellite image data
- **Geoff Henebry, South Dakota State U. (with NOAA, U. Michigan, Columbia U., U. Oklahoma, U. Minnesota)**
  - Storms, Forms, and Complexity of the Urban Canopy: How Land Use, Settlement Patterns, and the Shapes of Cities Influence Severe Weather
- **Mark Friedl, Boston U. (with Worcester State U.)**
  - Increased accessibility, landscape changes, rural transformations, and urbanization: impacts in the east-west economic corridor from Da Nang, Vietnam to Khon Kaen, Thailand
- **Lahouari Bounoua, NASA GSFC (with NASA MSFC, Joint Global Change Res.Inst.)**
  - Combining Satellite Data and Models to Assess the Impacts of Urbanization on the Continental United States Surface Climate
- Combining satellite data and models to assess the impacts of urbanization on the continental United States surface climate

# Reporting and Communication



- The Web site: <http://lcluc.hq.nasa.gov>
  - Abstracts, progress reports, presentations
  - Lists of publications and references
  - Announcements, events, job ops, news
  - Outreach (journal covers, media coverage, books)
  - Metadata page – please help populate with project metadata and data set links



Catherine Nakalembe

- To our website support team
  - all of the above on an ongoing basis
- To me: sensitive info, project updates
  - 1 slide in bullets + visual



Jon Nordling

- PI's are encouraged to host their own websites to showcase their results in more detail and to make their data sets available - provide links (and faces!)

# Data Aspects



- NASA Earth Exchange (NEX) portal
  - NEX is a virtual collaborative that provides resources (core data sets, software/workflows, and computing) for data- and compute-intensive, NASA-supported Earth science grand challenges
  - Vision: To engage and enable the Earth science community to address global environmental challenges
  - Goal: To improve efficiency and expand the scope of NASA Earth science technology, research and applications programs
- All LCLUC projects are listed on the NEX site -- PI's are encouraged to register
- NASA LCLUC program expects its PI's to make their data and products available to the community for free and open access
- LCLUC metadata page
- High resolution data for NASA-affiliated scientists



<https://nex.nasa.gov>

# Solicitations

## ◎ROSES-2013

- ◎ *LCLUC (33 invited to submit full proposals by Jun1)*
- ◎ *LCLUC in mountainous regions*
- ◎ *Synthesis of LCLUC studies*
- ◎ *Carbon Cycle Science (2 funded by LCLUC)*

## ◎ROSES-2014

- ◎ *No regular/annual LCLUC call*
- ◎ *An amendment later in the year is planned to build a Land Imaging Science Team to develop higher-level products from mid-resolution data from Landsat-like sensors - FY15 special funding line*

# Education and Outreach

- Bringing early career scientists (ECS) into the program
  - Continue with ECS sessions at LCLUC ST meetings
  - Continue with ECS solicitations (this year couldn't)
  - Continue training sessions as an integral part of each international LCLUC ST meeting
  - Continue Trans-Atlantic Training Initiative (Krakow)
  - Possibly, NEX LCLUC virtual school next year
- PR and interactions with a wider community
  - Continuous improvements of the LCLUC site and Facebook page (many likes – mostly from India)
  - Quarterly Newsletter
  - Webinars



# Enjoy Washington in Bloom

Special thanks to the organizers of this meeting