

CyberGIS Center for Advanced Digital and Spatial Studies

Shaowen Wang

CyberGIS Center for Advanced Digital and Spatial Studies
CyberInfrastructure and Geospatial Information Laboratory (CIGI)
Department of Geography and Geographic Information Science
Department of Computer Science
Department of Urban and Regional Planning
National Center for Supercomputing Applications (NCSA)
University of Illinois at Urbana-Champaign

Sustainable Funding and Business Models
for Academic Cyberinfrastructure Facilities

Workshop II

Washington DC

October 2, 2013

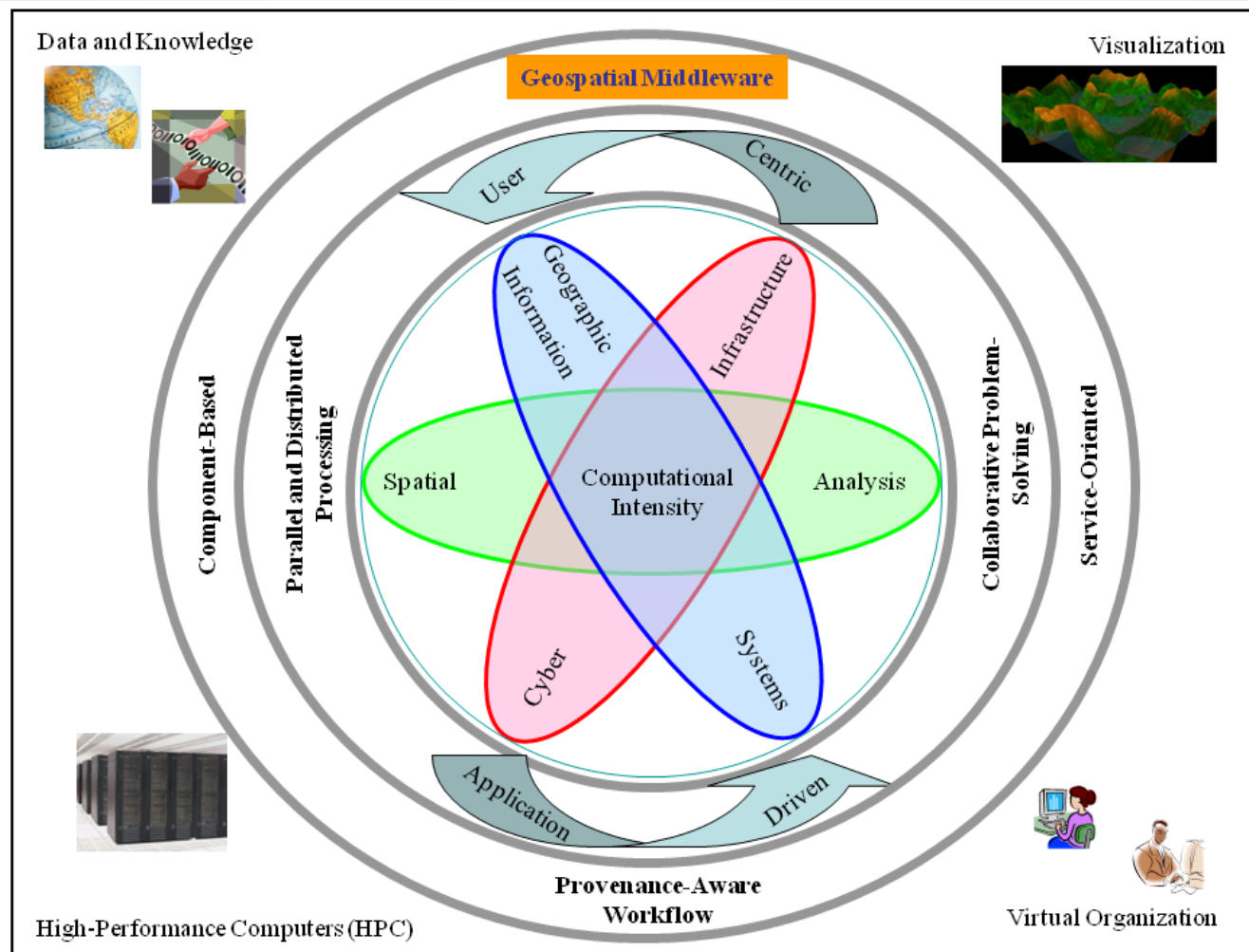
Acknowledgments – UIUC

- **College of Liberal Arts and Sciences**
- **Department of Geography and Geographic Information Science**
- **Graduate School of Library and Information Science**
- **National Center for Supercomputing Applications**
- **Office of the Vice Chancellor for Research**
- **Prairie Research Institute**
- **School of Earth, Society, and Environment**

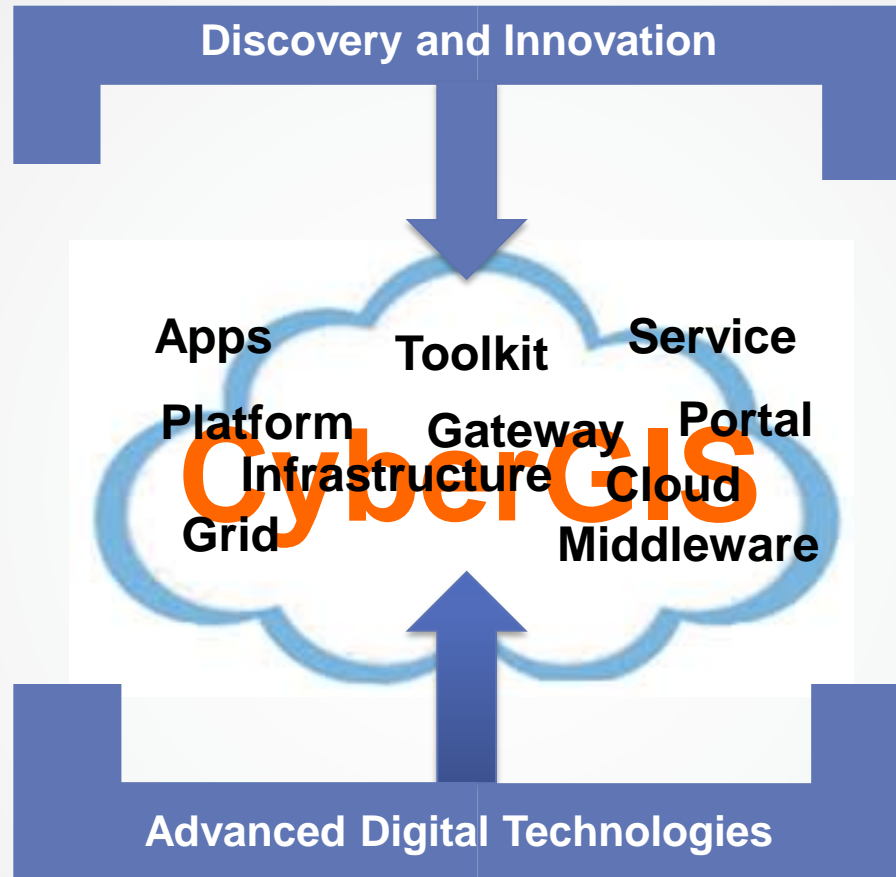
People

- Director
- Executive committee
- Program coordinator
- Technical coordinator
- Education, training and outreach coordinator
- Project manager
- Two research programmers
- Two postdoctoral researchers
- Students

What is CyberGIS?

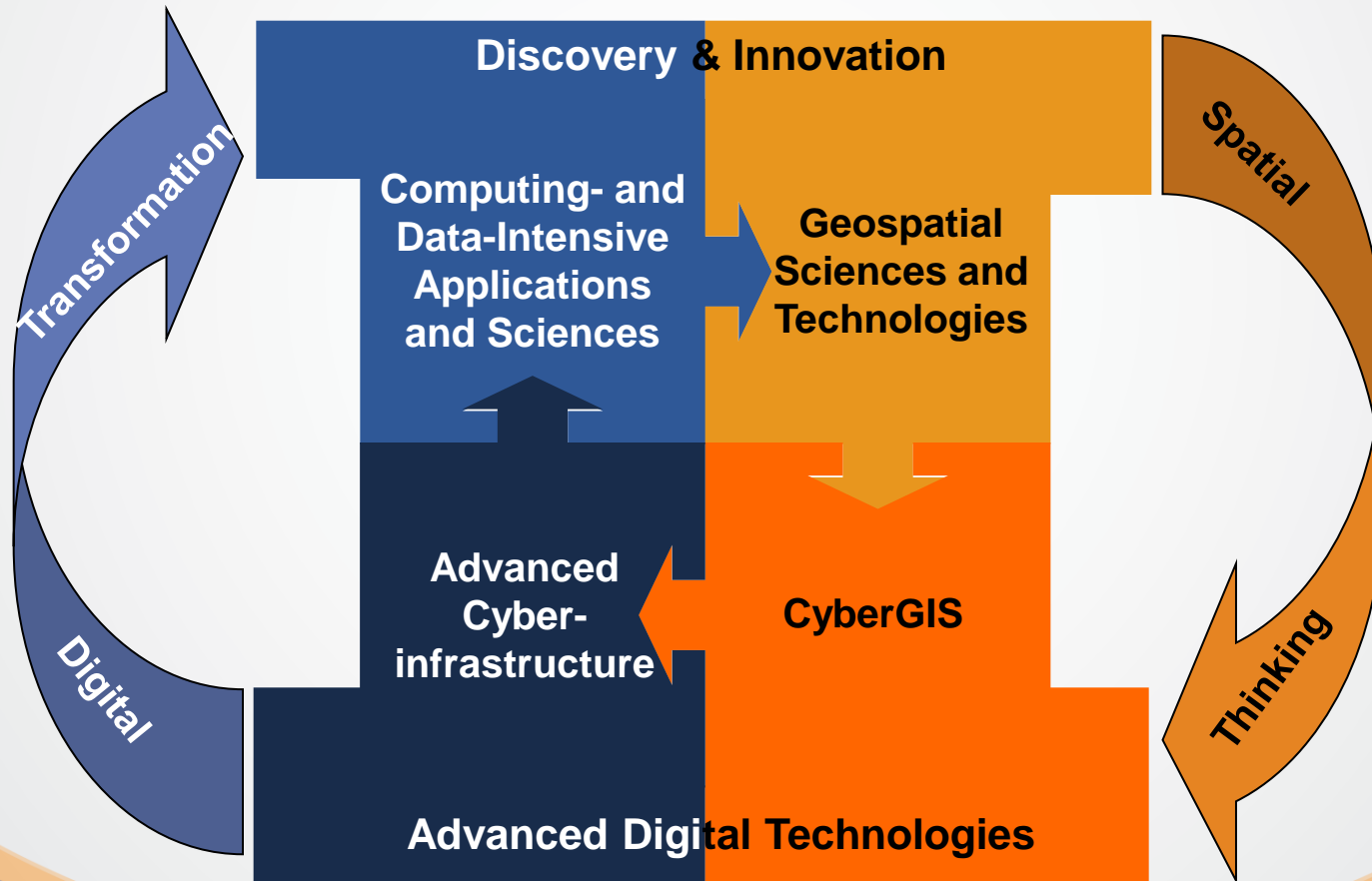


Wang, S. 2010. "A CyberGIS Framework for the Synthesis of Cyberinfrastructure, GIS, and Spatial Analysis." *Annals of the Association of American Geographers*, 100(3): 535-557



Wang, S. 2013. "CyberGIS: Blueprint for Integrated and Scalable Geospatial Software Ecosystems." *International Journal of Geographical Information Science*, 27 (11), in press

Vision



Grand Challenges?

Big Spatial Data

[Home](#) | [Apps](#) | [Visualization](#) | [Community](#) | [Support](#) | [About](#) | [Feedback](#)

[Logout](#) | [shaowen's Profile](#)

App: Viewshed Analysis <<

My Analysis: cybergis-ahm13 +

Data and Parameters -

Data Source | Study Area | View Points

Data Source: USGS National Elevation Dataset (NED) - 1/3 arc (10-meter) resolution

Provider: USGS National Elevation Dataset (NED) - 1/3 arc (10-meter) resolution

Coverage:

Lower-left: [-125.001, 23.999]

Upper-right: [-65.999, 50.001]

Coverage in Native Projection:

Lower-left: [-125.001, 23.999]

Upper-right: [-65.999, 50.001]

Coordinate System: EPSG: 4269

Vertical Unit: m

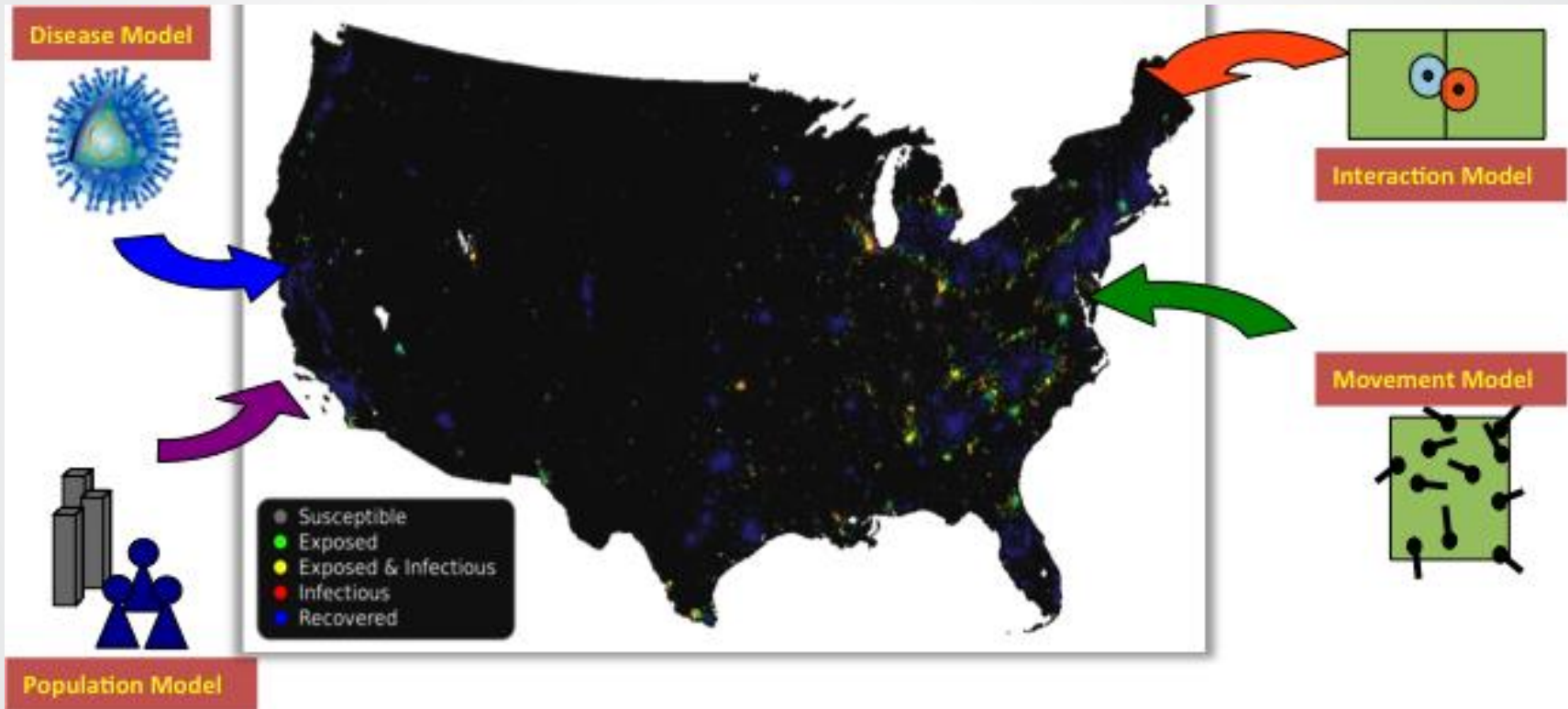
Submit Analysis

Results +

Copyright © 2010-2013 CIGI. CyberGIS Gateway, powered by GISolve OpenTopography

CyberGIS Gateway is based upon work supported by the National Science Foundation under Grant No. OCI-1047916. Any opinions, findings, and conclusions or recommendations expressed in the Gateway are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Big Spatial Simulation



Collaborative Work by *Eric Shook and Shaowen Wang*

Complex Spatial Decision Making

Collaborative Work by *Hao Hu, Tao Lin, Yan Liu, Luis F. Rodríguez, and Shaowen Wang*

Geodesign



Image source: <http://spatiallyadjusted.com/2010/01/09/thoughts-on-the-geodesign-summit/>

NSF SI2-SSI: CyberGIS Project

\$4.43 million, Year: 2010-2015

Principal Investigator

- Shaowen Wang

Co-Principal Investigators

- Luc Anselin
- Budhendra Bhaduri
- Timothy Nyerges
- Nancy Wilkins-Diehr

Senior Personnel

- Michael Goodchild
- Sergio Rey
- Xuan Shi
- Marc Snir
- E. Lynn Usery

Chair of the Science Advisory Committee

- Michael Goodchild

Project Manager

- Anand Padmanabhan

Project Staff

- ASU: Wenwen Li and Rob Pahle
- ORNL: Ranga Raju Vatsavai
- SDSC: Choonhan Youn
- UIUC: Yan Liu and Anand Padmanabhan
- Graduate and undergraduate students

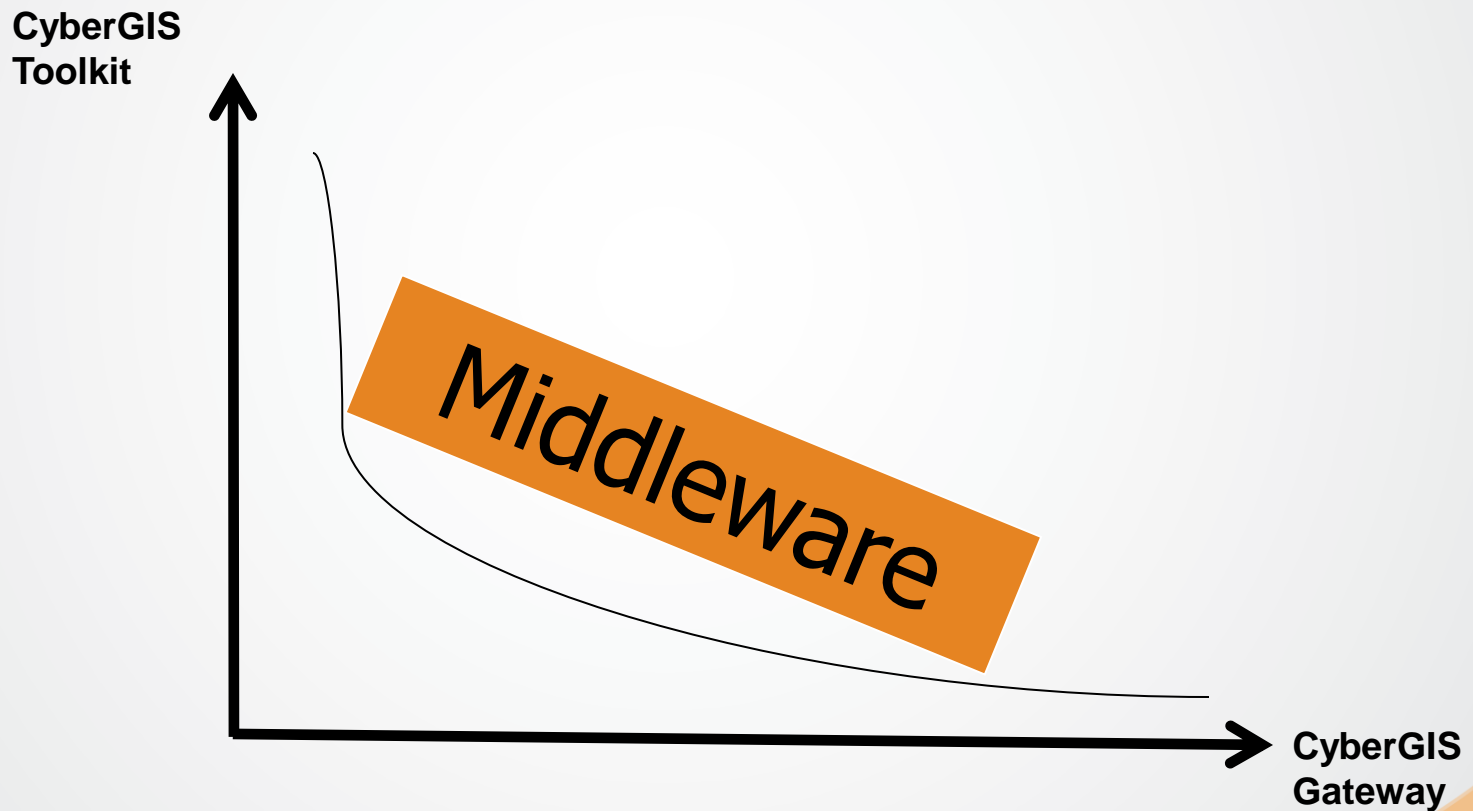
Industrial Partner: Esri

- Steve Kopp and Dawn Wright

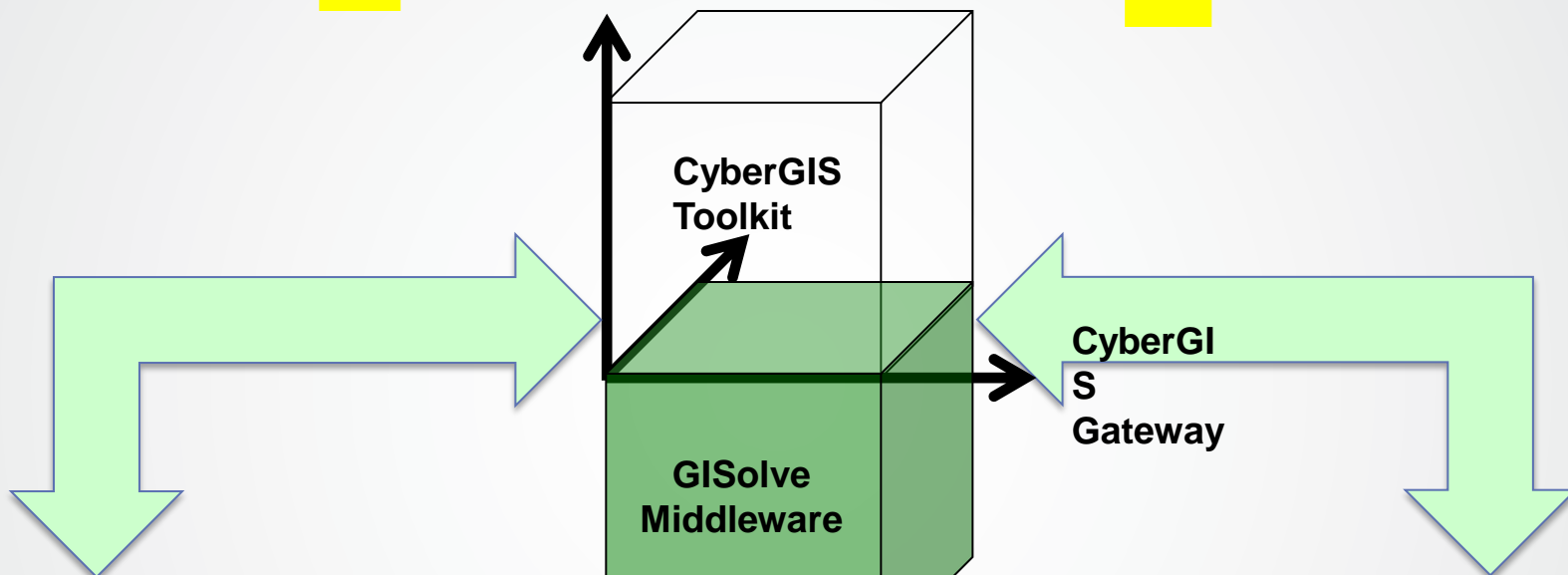
CyberGIS Communities

- **Science and Technology Communities**
 - Advanced cyberinfrastructure
 - Climate change impact assessment
 - Emergency management
 - Geographic information science
 - Geography and spatial sciences
 - Geosciences
 - Social sciences
 - Etc.
- **User Communities**
 - Biologists
 - Geographers
 - Geoscientists
 - Social scientists
 - General public
 - Broad GIS users
 - Etc.

CyberGIS for What and Whom?

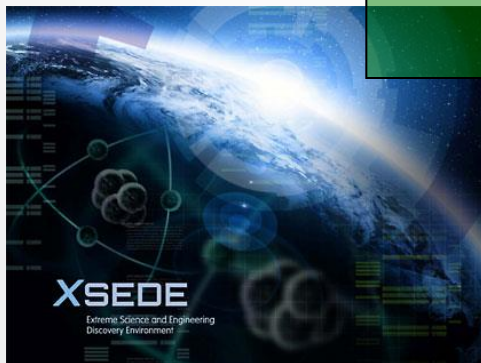


Integrated Digital and Spatial Studies



BLUE WATERS
SUSTAINED PETASCALE COMPUTING

www.ncsa.illinois.edu/BlueWaters/



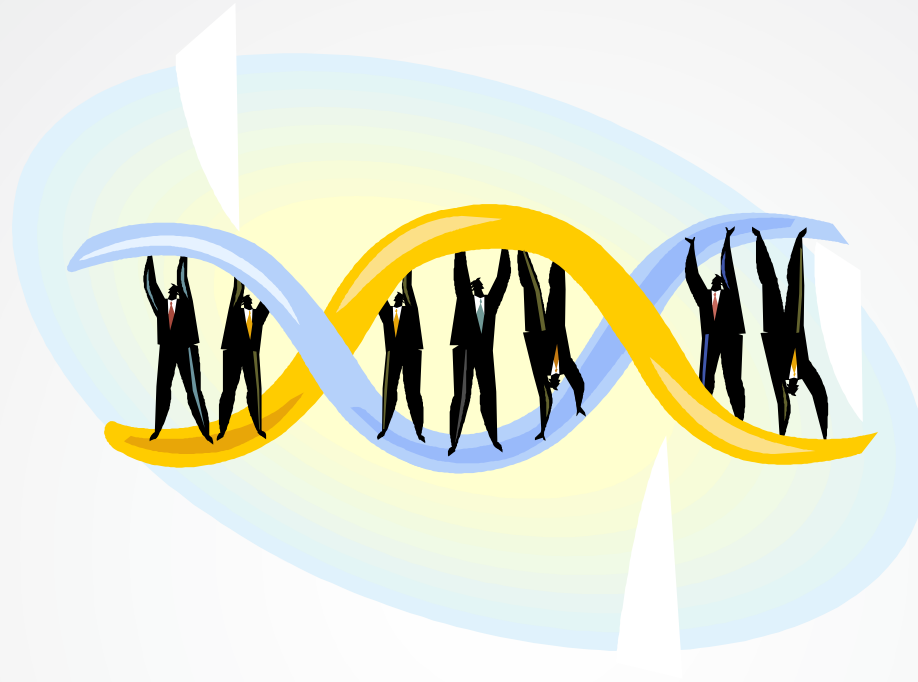
www.xsede.org



www.opensciencegrid.org



<http://lakjeewa.blogspot.com/2011/09/what-is-cloud-computing.html>



- Curriculum and pedagogy
- Partnerships
- Open ecosystems

Sustainability

- Intellectual frontiers
- Financial
 - Research challenges are long term and multidisciplinary
 - Reward mechanisms
 - Accelerate and enable scientific discoveries
 - Education
 - Innovation
 - Reusability
- Open
 - Standards
 - Technologies
- Social and organizational
 - Community engagement
 - Partnerships
 - Academia
 - Government
 - Industry

Acknowledgments

- **Federal Agencies**

- **Department of Energy's Office of Science**

- **National Science Foundation**

- BCS-0846655

- EAR-1239603

- OCI-1047916

- IIS-1354329

- PHY-0621704

- PHY-1148698

- TeraGrid/XSEDE SES070004

- **US Geological Survey (USGS)**

- **Industry**

- **Environmental Systems Research Institute (Esri)**

Thanks!

- **Comments / Questions?**
- **Email: shaowen@illinois.edu**