

# GEON—the Geosciences Network

GEON : The Geosciences Network - Mozilla Firefox

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http://www.geongrid.org/

Windows Marketplace

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## GEON THE GEOSCIENCES NETWORK

Search site

### About GEON

- Calendar
- Newsletter
- Participants
- Annual Reports

### Science

- Workshops
- Papers

### Resources

- Data
- Tools

### Education

- Summer Institute
- Courses

### Contact Us

### Featured Science Activity

#### PaleoIntegration Project (PIP)

Integrated Paleogeographic and Paleobiological databases searchable by any combination of age, location, or content.



### About the GEON Portal : Resources for Geoscientists

The GEON Portal is the entry point for accessing online resources such as data and tools. Different sections of the portal (a.k.a. portlets) provide different functionality such as search, myGEON, and access to tools and applications. Resources available at the Portal include:

|  |   |   |   |
|--|---|---|---|
|  <h4>Data</h4> <p>Data can be shared, published, and integrated with other data at the Portal</p> |  <h4>Tools</h4> <p>Tools can be registered, accessed, and downloaded for use</p> |  <h4>Web Services</h4> <p>Web services can be registered and invoked using a standard authentication system</p> |  <h4>Knowledge Representation</h4> <p>Controlled vocabularies, hierarchies, and more complex relationships (a.k.a. ontologies) among scientific terms can be registered and accessed</p> |
|--|---|---|---|

### News

#### GEON Researchers Contribute to Development of Seismic Velocity Model of Continental U.S.

GEON Graduate Research Assistant Greg Bensen and colleagues at the University of Colorado (Ritzwoller and Shapiro) have created a new seismic velocity model

#### Southern San Andreas Laser Scan Now Available via the GEON LIDAR Workflow

unveiled at the annual meeting of the Southern California Earthquake Center (SCEC) in Palm Springs.

#### GEON Research Presented at GSA Penrose Conference in Durham, England

Chris Crosby, GEON Researcher at Arizona State University, presented a talk.

[Enter the GEON Portal](#)  
New to the GEON Portal? [click here!](#)

Recent events: CSIG 2006 Geoinformatics 2006 Beijing CI Workshop

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For further information about GEON news and updates, please e-mail [info@geongrid.org](mailto:info@geongrid.org).  
For comments/questions about the geongrid.org website, please e-mail [webmaster@geongrid.org](mailto:webmaster@geongrid.org)

[www.geongrid.org](http://www.geongrid.org)

Done

## Fossil collection and publication



## Integration of various data, datasets and databases

Search:  Map  Specify Region  Specify Coordinates  PaleoIntegration Project

1. Region  2. Age

Eratem Era:  Mesozoic

System Period:  Jurassic

Series Epoch:  Lower Jurassi

Stage Age:  - select -

3. Lithology

3.1. Sedimentary Rocks

Clastic-carbonate sediments

Climatically significant sediments

Lithology Summaries

3.2. Igneous Rocks

Acid-basic sequence

4. Fossils:

4.1. Dinosaurs

4.2. Plants

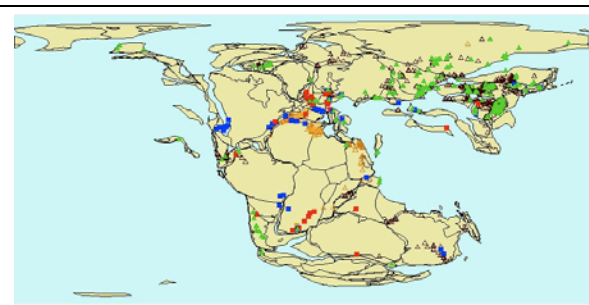
References:

Author   Search

Plot Data  Global View  Legend

View Data  View PaleoMap  Print Map

## Download search results, analyze and interpret data



| DB   | Loc # | Latitude  | Longitude | Region1 | Region2 | Region3       | Age Max  |                     |           |          |               |          |
|------|-------|-----------|-----------|---------|---------|---------------|----------|---------------------|-----------|----------|---------------|----------|
|      |       |           |           |         |         |               | Period   | Epoch               | Stage     | Division | ICS Stage Max | Period   |
| PBDB | 2522  | 53.033333 | 48.433333 | -       |         | Russian Plain | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
| PBDB | 2522  | 53.033333 | 48.433333 | -       |         | Russian Plain | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
| PBDB | 2527  | 53.173056 | 48.474444 | -       | USSR    | Russian Plain | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
| PBDB | 2543  | 14.277222 | 48.547778 | -       | Yemen   | Wadi Hajar    | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
| PBDB | 2543  | 14.277222 | 48.547778 | -       | Yemen   | Wadi Hajar    | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
| PBDB | 2544  | 14.277222 | 48.547778 | -       | Yemen   | Wadi Hajar    | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
| PBDB | 2544  | 14.277222 | 48.547778 | -       | Yemen   | Wadi Hajar    | Jurassic | Late/Upper Jurassic | Tithonian | -        | 150.800       | Jurassic |
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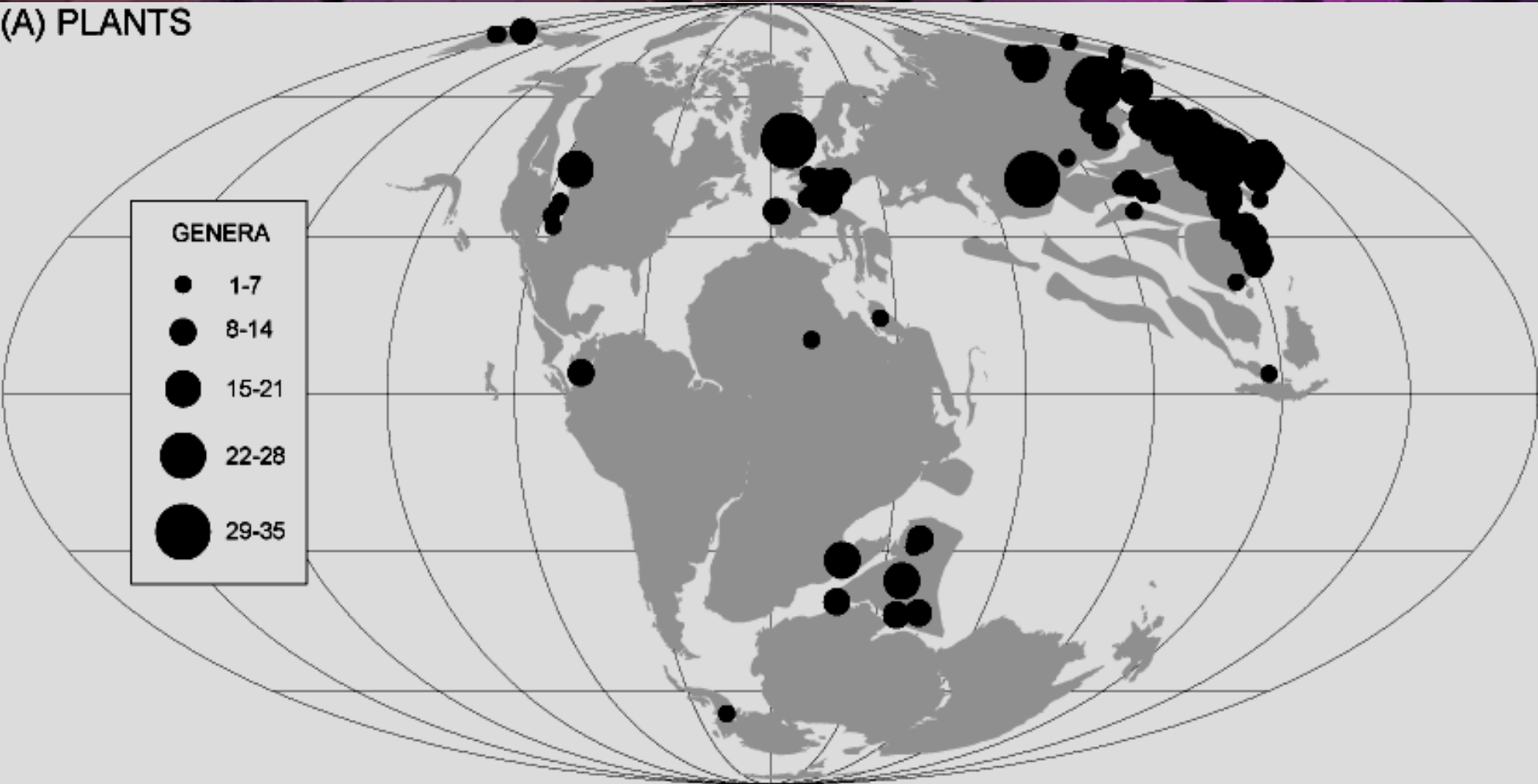
## Publish new results and interpretations?

Alistair Rees, U. Arizona

Early Jurassic Climates, Vegetation, and Dinosaur Distributions

# LATE JURASSIC PLANT DIVERSITY

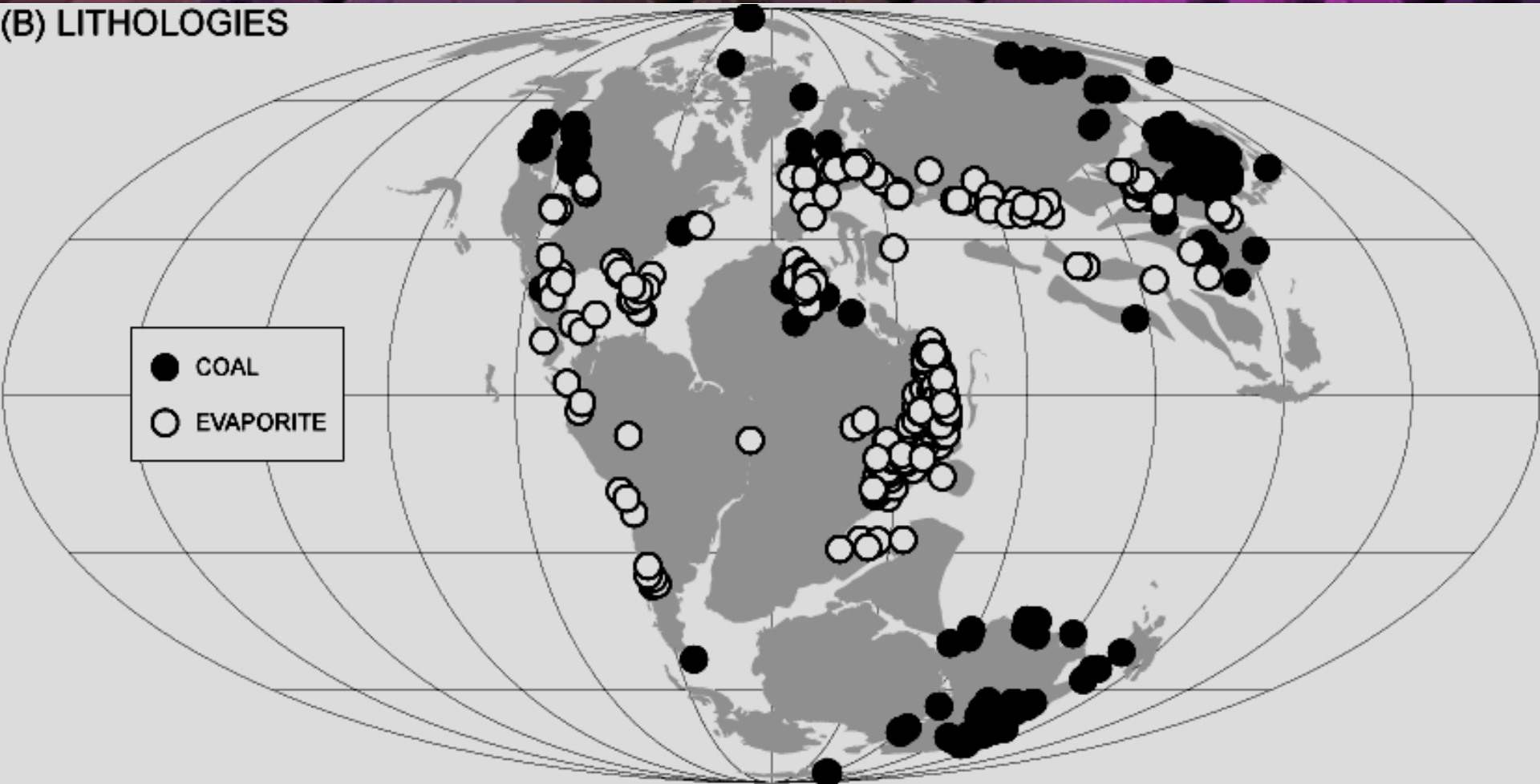
(A) PLANTS



Paleobiology Database (PBDB)  
Paleomap Project

# LATE JURASSIC COALS AND EVAPORITES

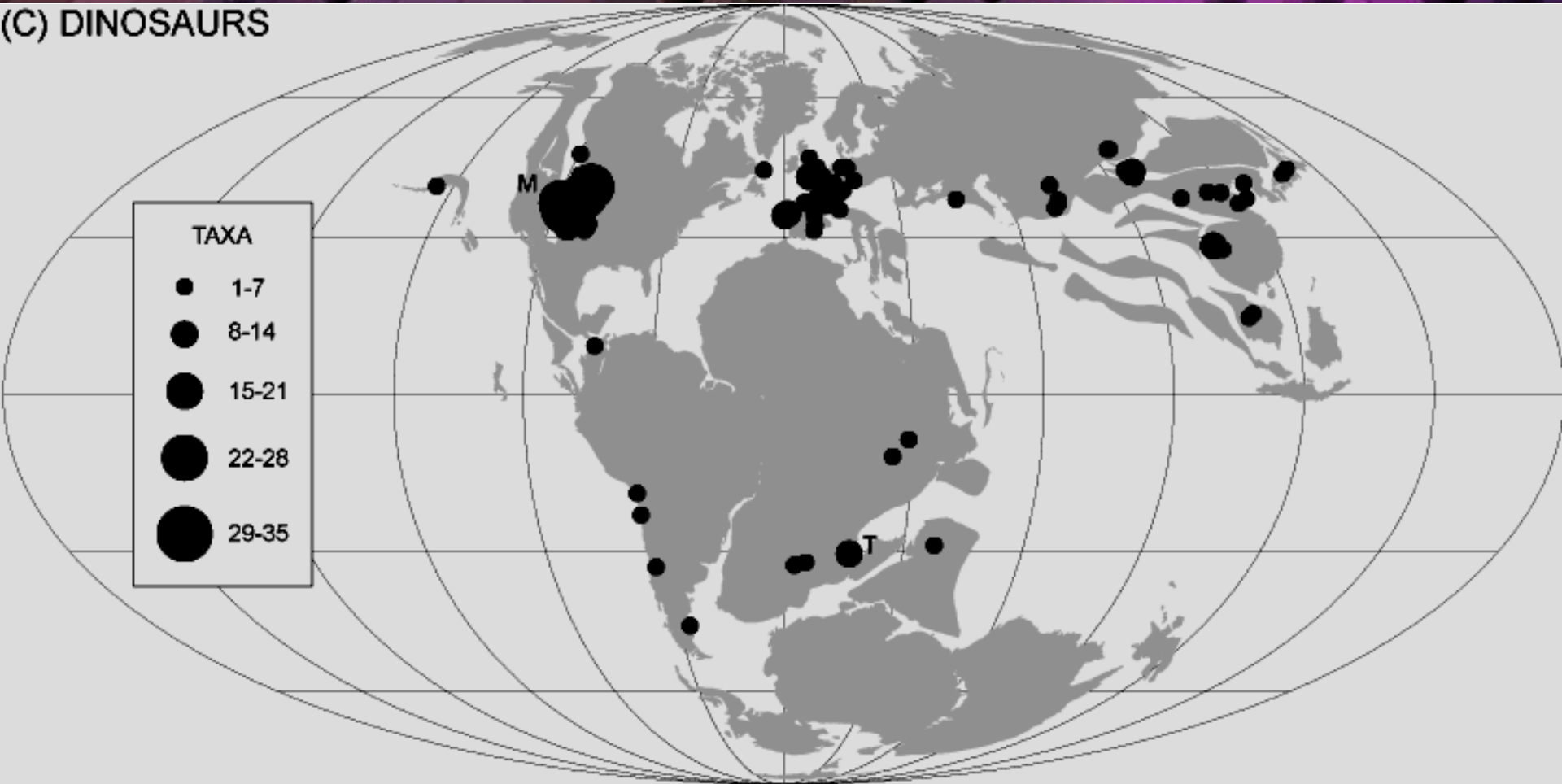
(B) LITHOLOGIES



Paleogeographic Atlas Project (PGAP)  
Oil Source Rocks Dataset (OSR)  
Paleomap Project

# LATE JURASSIC DINOSAURS

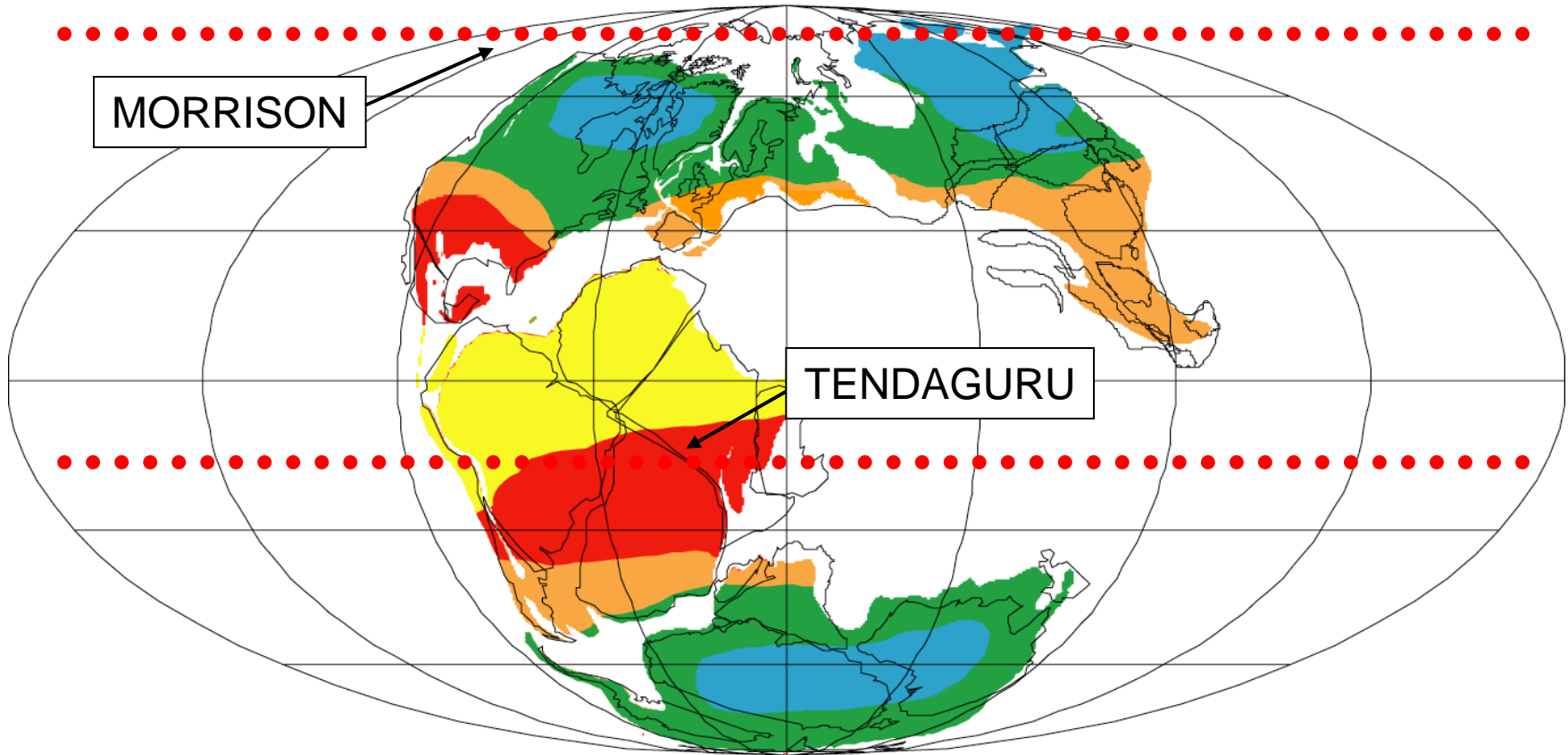
(C) DINOSAURS



Dinosauria Dataset (DINO)  
Paleomap Project

# Climate / biome reconstruction

## LATE JURASSIC BIOMES - DATA



MORRISON

TENDAGURU



# GEON SYNSEIS Integration Platform

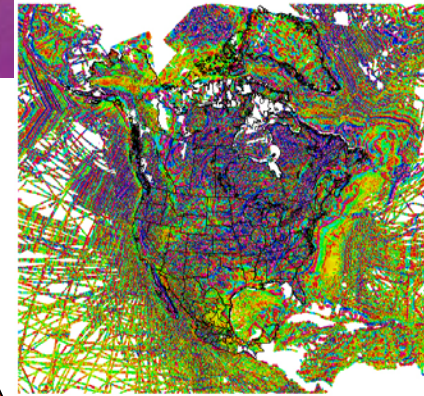
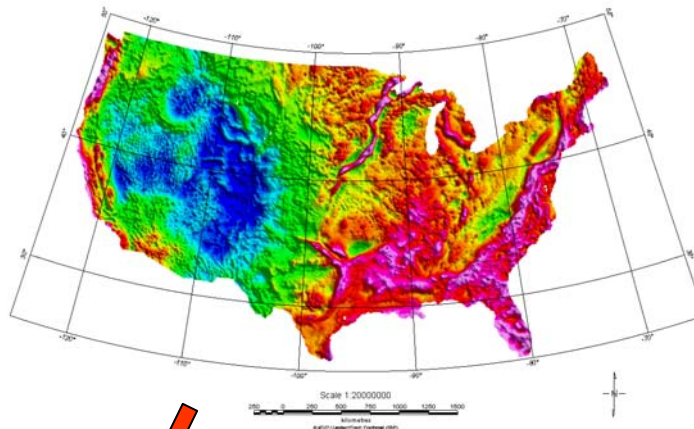
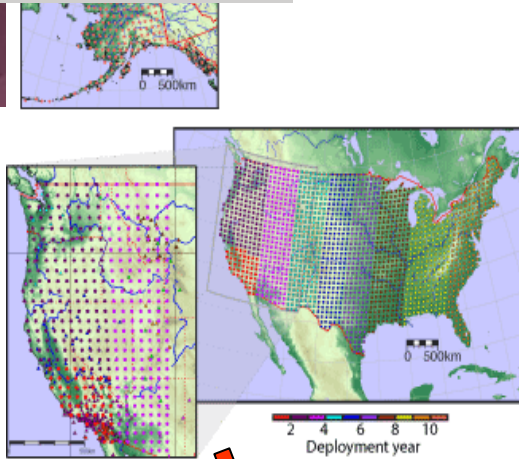
Dogan Seber, SDSC

Seismic

Gravity

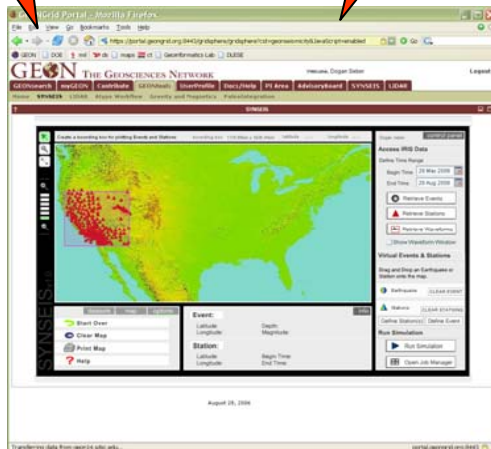
Magnetic

Internal and External Datasets



Simulation, Analyses and Integration

GEON portal and HPC Environment

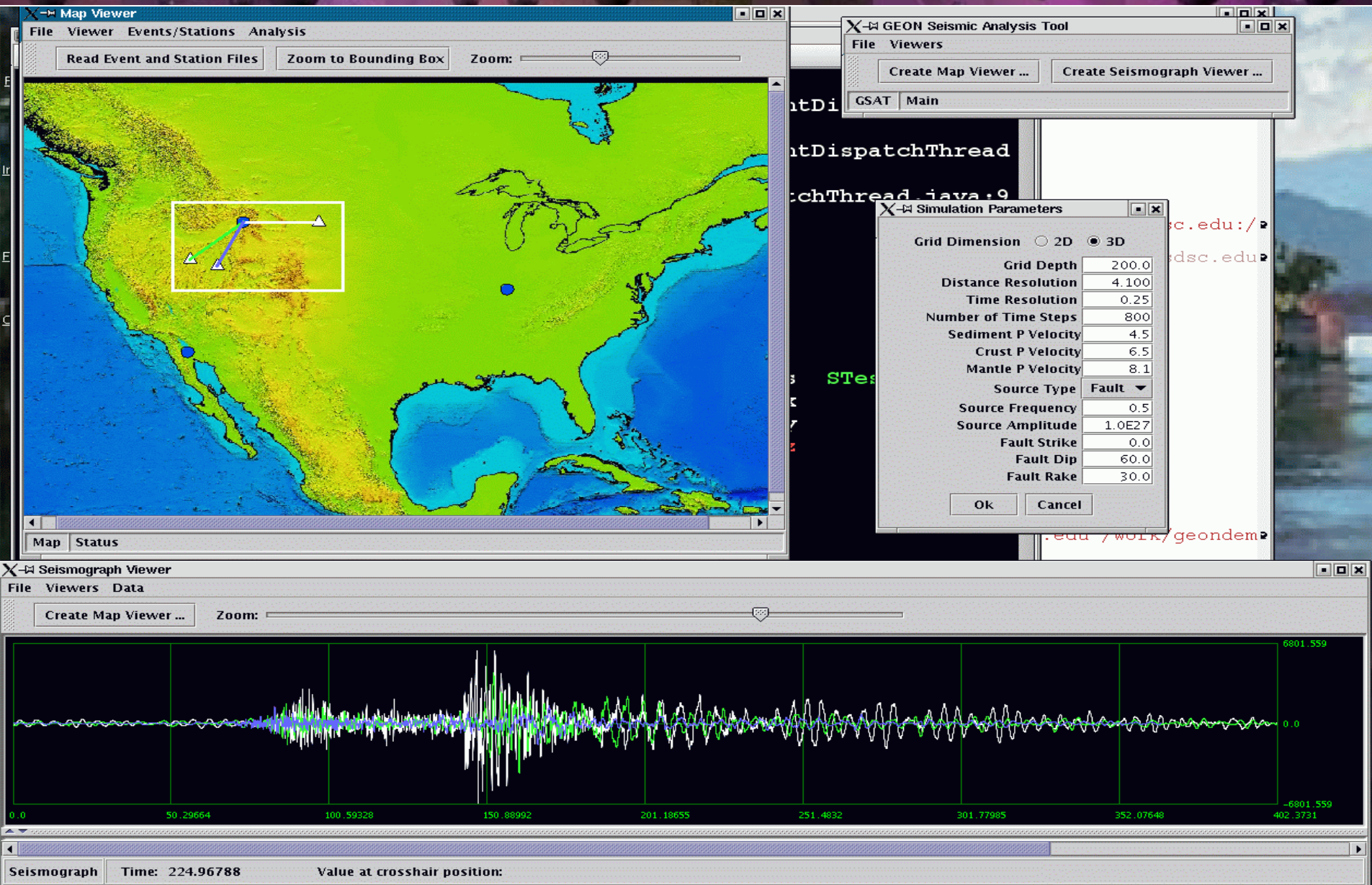


Scientific Discoveries

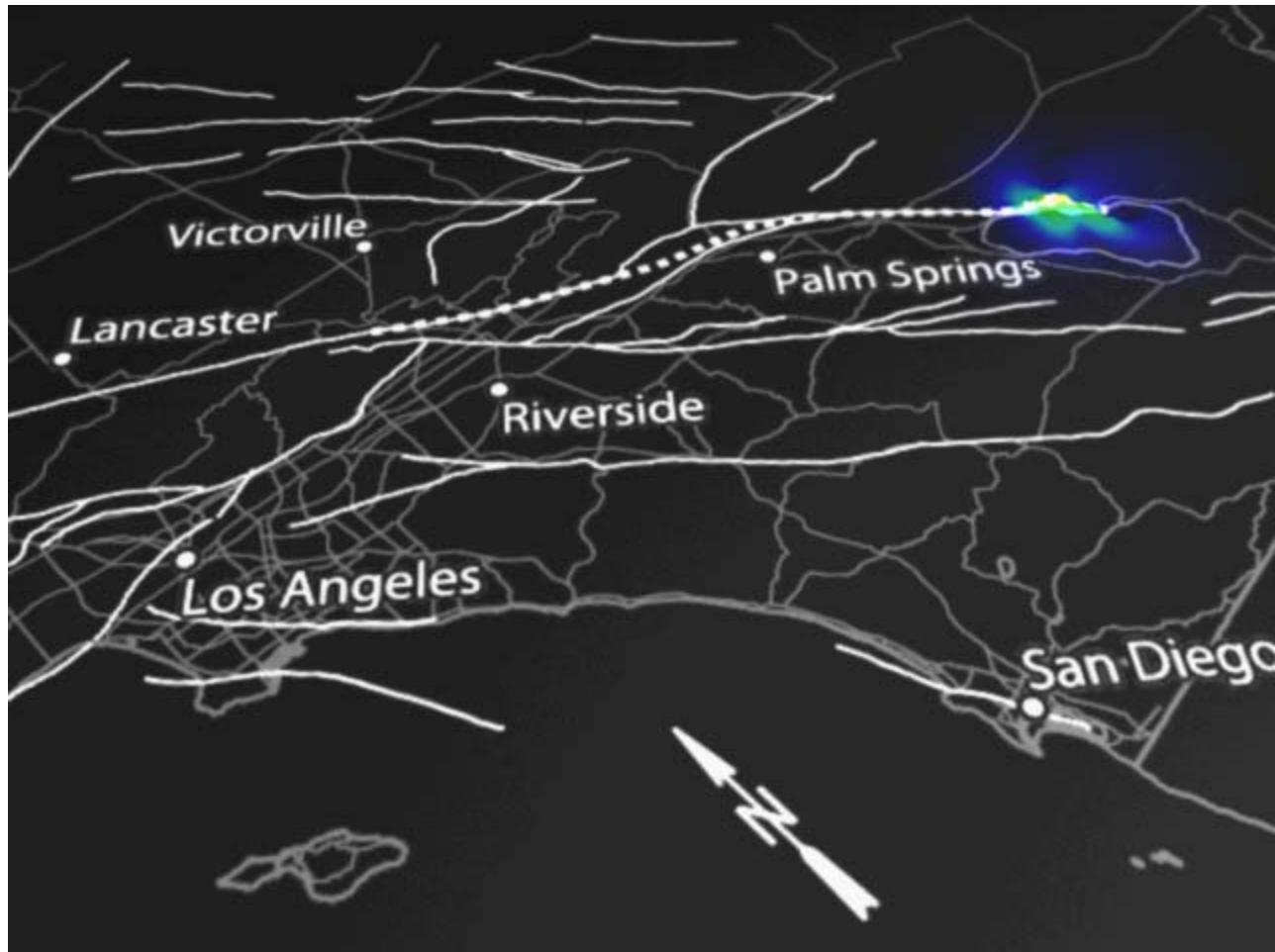
Subsurface Model



# 3D Earthquake Modeling using HPC



# Earthquake scenarios



# Rock Taxonomy (ontologically based)

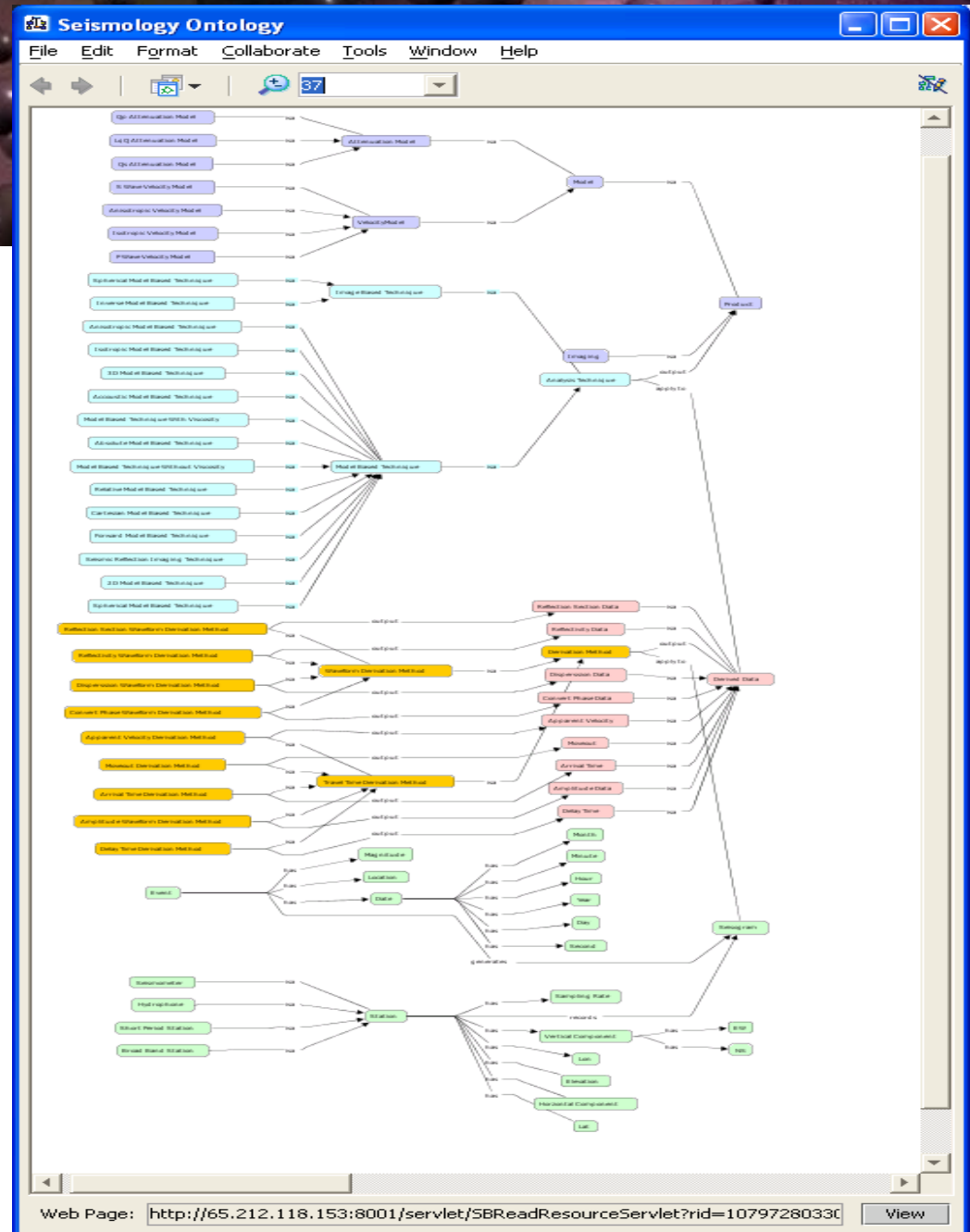
Geological taxonomy  
converted to an ontology

Gathered from experts  
during a specially convened  
workshop

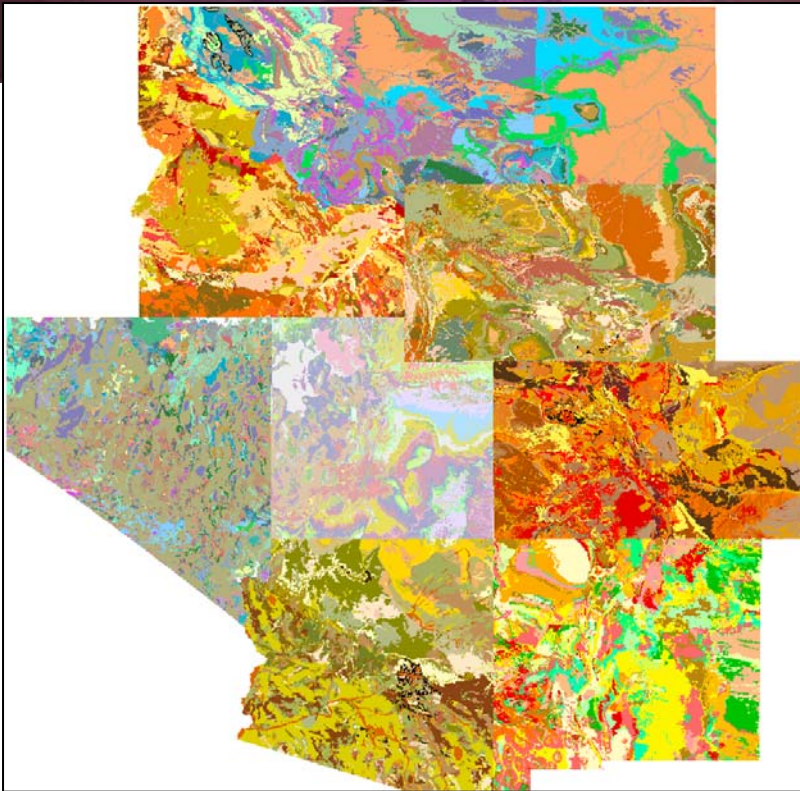
Formalizes relationships  
between concepts

**Randy Keller (UTEP),  
Bertram Ludaescher, Kai Lin,  
Dogan Seber (SDSC), et al**

e-science, knowledge  
representation and the  
semantic web



# Geologic Map Integration



After registering datasets, and their ontologies/taxonomies, mappings can be constructed between the datasets—semantic mediation (Kai Lin, SDSC)

The screenshot shows a web browser window titled "Interactive Geologic Map - Microsoft Internet Explorer". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". Below the menu bar is a toolbar with various navigation and utility icons. The main content area is titled "Interactive Geologic Map" and features a central map of a region, likely Utah, with a complex, multi-colored geological pattern. To the right of the map is a control panel with several dropdown menus and a "Query" button. The dropdown menus are labeled "GeologicAge:", "Genesis:", "Composition:", "Fabric:", and "Texture:", each with a value of "-Paleozoic", "Any", "Any", "Any", and "Any" respectively. Below the "Query" button is a "Reset" button. At the bottom of the page, there is a navigation bar with radio buttons for "Zoom In", "Zoom Out", "Pan", "Browse", "Info", and "Reset". The text "paleozoic" is displayed in the bottom right corner of the page.

Interactive Geologic Map

GeologicAge:

Genesis:

Composition:

Fabric:

Texture:

Zoom In  Zoom Out  Pan  Browse  Info

"paleozoic"



# GEON Community Engagement & Lessons Learned

- Engage key domain stakeholders early & often:
  - Equal numbers of Geo and IT project leaders
  - 2-3 face-to-face team meetings per year
  - Additional specialist meetings with domain scientists and IT staff (e.g. ontology, portal, LiDAR, inversion modelling, mantle convection)
  - Strong outreach back into the science community not directly involved. React constructively to their angry feedback
- Hold an annual, open all-hands-meeting
  - This has led to an annual conference: <http://www.geoinformatics2009.org/>
- Summer School for grad students: IT and Geo (free)
- International outreach (I-GEON)
- Embedded sociologists observing the process (David Ribes, Chris Bowker)
  - Listen to them early
- Ongoing funding depends on your perceived value to a much wider group
  - Build services that everyone needs: biggest success is a LiDAR processing service!
  - Don't be led by the specific needs of a small group of senior researchers