Application of ESRI technologies to visualization of plate tectonic, paleogeographic, and paleoclimatic simulations

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Agenda

- Underlying Technologies and Data
  - PaleoGIS (AV3)
  - Parametric Paleoclimate Simulator
- Examples
  - How the PaleoGIS works
  - Early Cretaceous Upwelling
  - Jurassic Thermal Gradients
  - Asteroid Impact Animation
Underlying Technologies

- **PaleoGIS**
  - Cross-platform Client-Server application
  - AV3 is rendering engine
  - C++ code modifies shapefiles
  - Moving to ArcGIS?

- **Parametric Paleoclimatic Simulator**
  - After J. Parrish
  - Patterns from today applied to the past
  - Written in Java without UI – AV3 is UI
Underlying Data

- Data
  - PALEOMAP Plates and Paleogeographies (C. Scotese)
    - PALEOMAP Foundation, now PALEOMAP Project
  - Climate Sensitive Lithofacies (A. Boucot)
    - Compiled with Univ. of Chicago
    - Evaporites, Coal, Bauxite, Palm Trees, Alligators, Tillites
  - GeoMark Research Oils (J. Zumberge)
    - Molecular fossils in oils, reflecting SOURCE ROCKS
      - Oil samples for Atlantic Region
      - Worldwide Petroleum System Averages
  - Impact Craters (AAPG)
    - Compiled and published in AAPG Explorer
Examples

- How the PaleoGIS works
- Early Cretaceous South Atlantic Upwelling
  - Are South Atlantic source rocks derived from upwelling?
  - Where are the marine source rocks in offshore Brazil?
  - ArcView 3
- Jurassic Thermal Gradients
  - Are modeled thermal gradients supported in data?
  - ArcGIS 9 (pre-release)
- Asteroid Impact Animation
  - Just because it is very cool...
  - ArcGlobe 9 (pre-release)
Early Cretaceous S. Atlantic Upwelling
Jurassic Thermal Gradients
Asteroid Impact Animation