

Education Component of the Ridge2K component of the Marine Geoscience Data Management System

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*Presentation to Advisory Committee
13 October 2005*

Education Component of the Ridge2K component of the Marine Geoscience Data Management System

- Input from education-oriented users into design of data access and display tools
- Development, dissemination, and testing of a small suite of exemplary data-rich student activities
- Learning science research
- What next?

Input from education users into tool design

Focused workshop on use of Ridge data in education

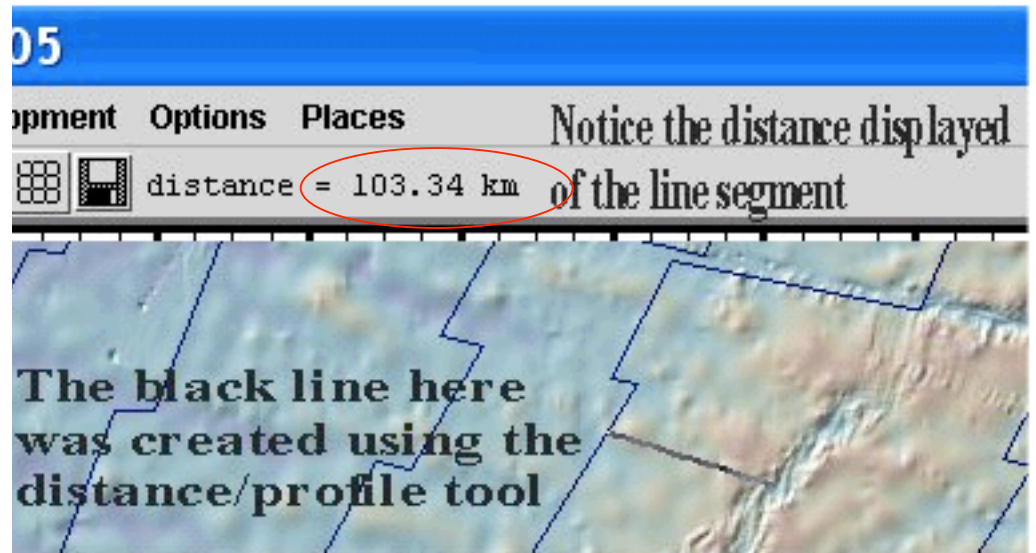
- DLESE Data Access Core Services group (co-conveners)
- K-12 teachers/ TC doctoral students
- Scientist/ undergrad educators
- RODES PI's
- Tool-builders



Input from education users into tool design

Recommendations implemented:

- Map scale (adjusts with zoom)
- Inset location map
- Distance-measuring tool
- Clearer links to information about how data were collected



Compelling recommendations remaining:

- Depth scale for earthquakes
- Overlay of place names
- Visual indicator when system is thinking
- User manual or “Help” feature

Data-rich Activities for Students


Example 1:

- bathymetry & isochrons from GeoMapApp
- by Jeff Thomas, Fairfield High School (CT), Earth Science class

Earth Exploration Toolbook

Step-by-Step Guides for Investigating Earth System Data

Home »



Investigating the Dynamics and Geomorphology of Mid Ocean Ridges

Teaching Notes Page

Case Study Page

Step-by-Step Instructions

About the Tool and Data

Going Further

Investigating the Dynamics and Geomorphology of Mid Ocean Ridges

Jeff Thomas

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August 31, 2005

Description

One of the most fundamental concepts within the earth system is plate tectonics. The theory of plate tectonics can help explain most of the dynamic geologic process that occur on our planet such as earthquakes, volcanoes, mountain building, and the rock cycle. In addition, these dynamic processes affect other parts of the earth system including our atmosphere, biosphere, and hydrosphere. Fundamentally, understanding this theory is the most important concept for students to appreciate our dynamic earth.

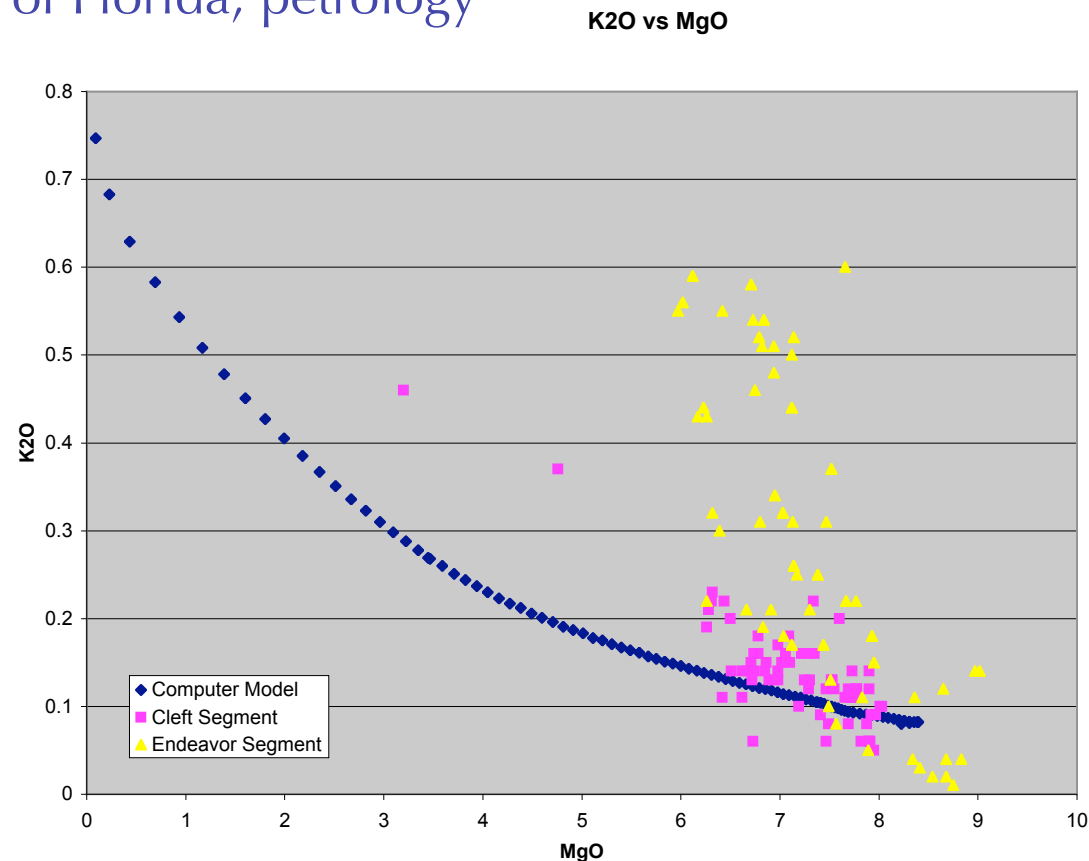
http://serc.carleton.edu/dev/eet/rodes_6/index.html

Data-rich Activities for Students

Example 2:

- analyses of MORB samples using PetDB and Excel
- by Matt Smith, University of Florida, petrology

1. Explore output from liquid line of descent model for major element chemistry.
2. Retrieve PetDB data for two Juan de Fuca segments.
3. Compare JdF segments with each other and with model.



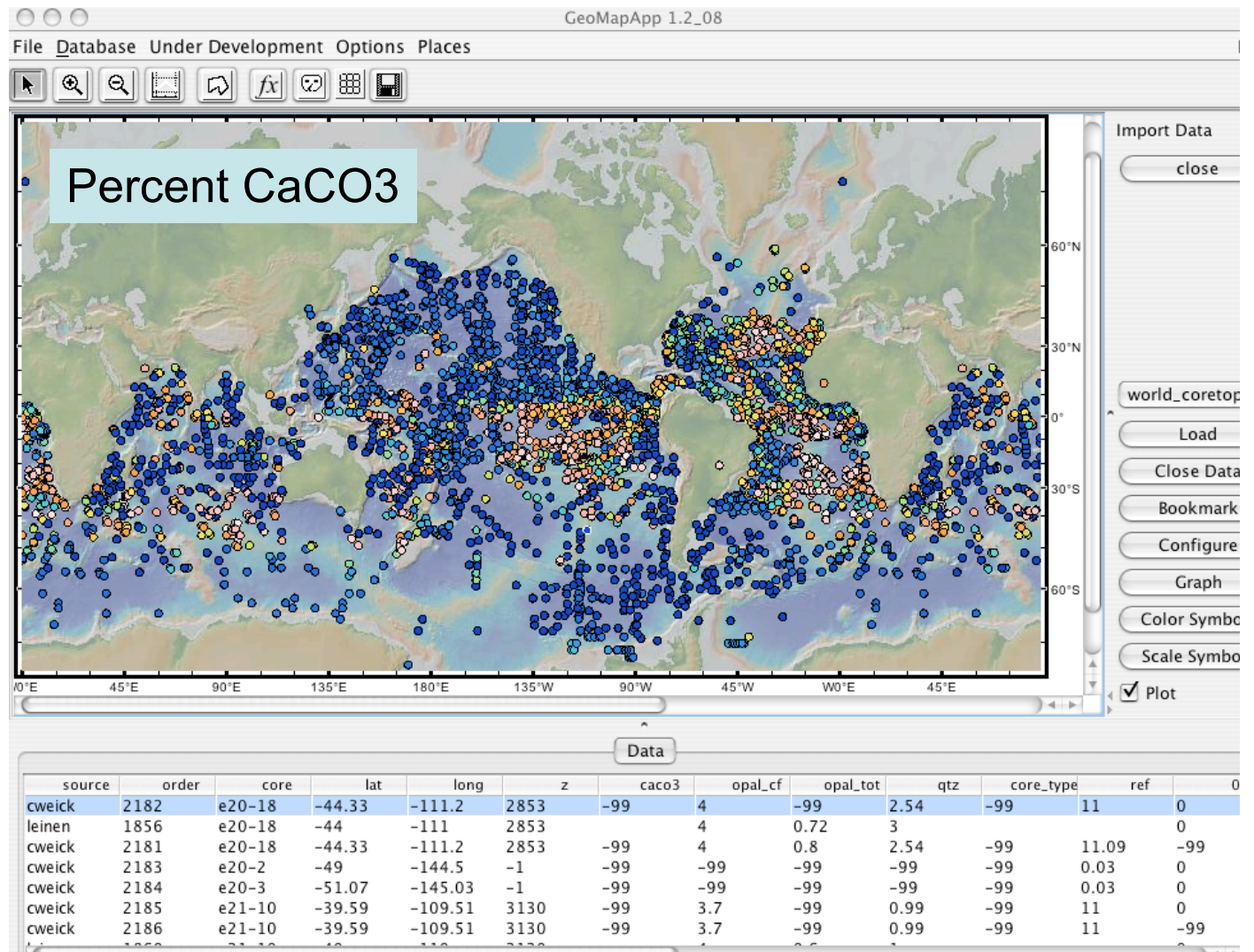
“...A large amount of variability in the K₂O would indicate that they do not share a parental source. K₂O will be sensitive to inconsistencies in parental magma sources because it is not a major constituent in any of the crystal phases....”

Data-rich Activities for Students

Compile other data-rich activities using MGDMS

Bill Ryan &
Peter DeMenocal,
L-DEO

Ocean
Sedimentation &
Stratigraphy



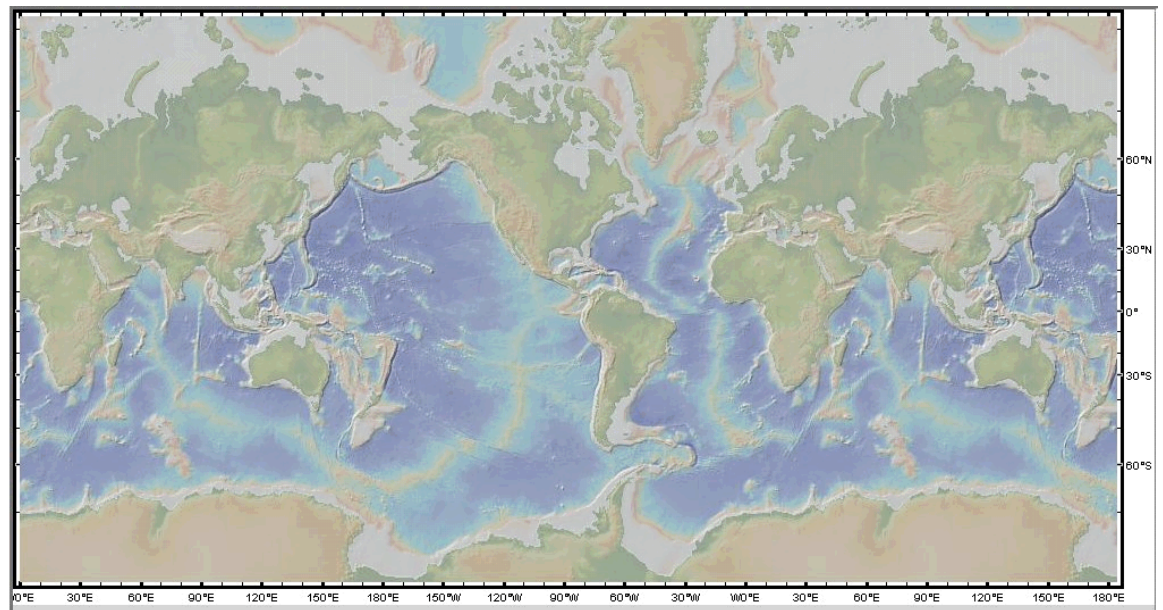
Learning Science Research

Investigator: Sandra Swenson, Teachers College
doctoral student

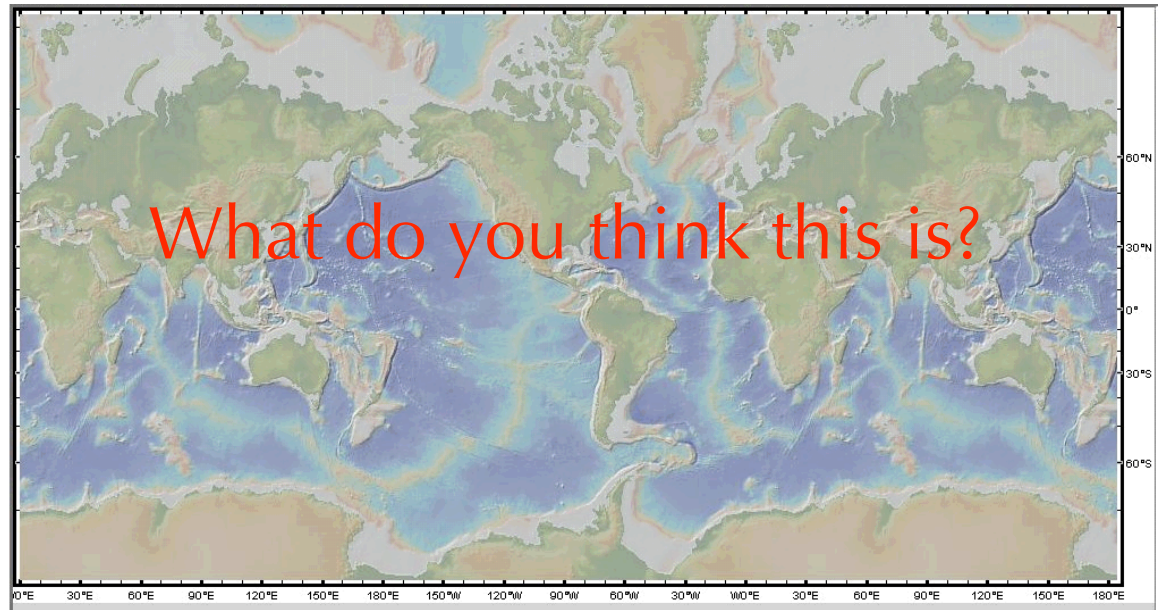
Participants: 120 total: 8th, 10th, 12th graders

Questions:

- What do you think this is?
- How do you think this was made?
- What do you think this is useful for?

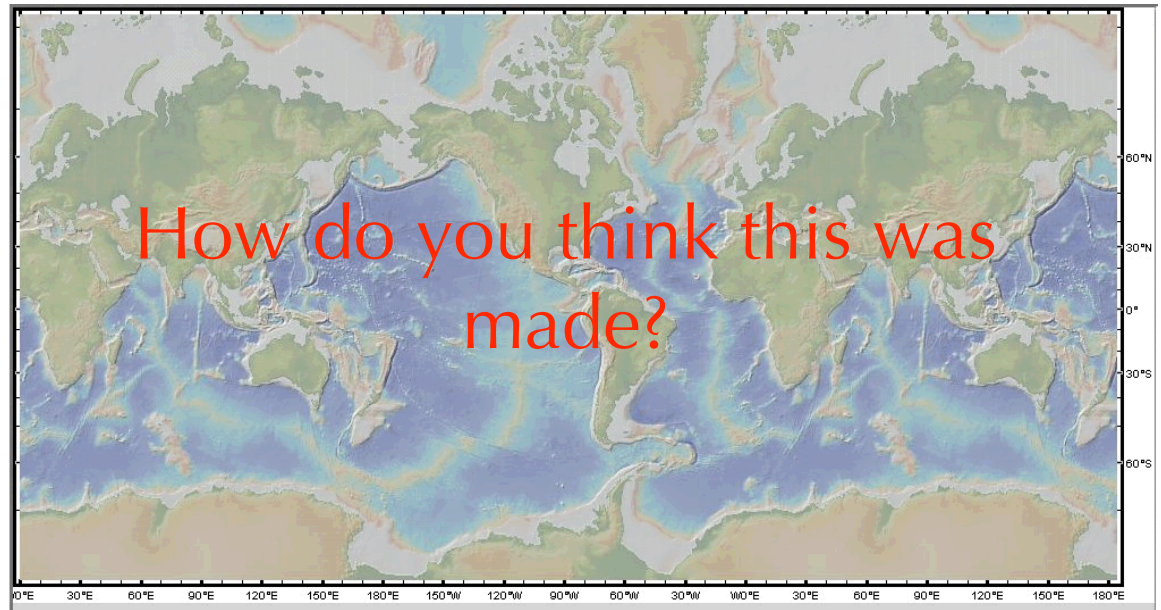


8th grade
Earth Science
students,
spring 2005



- geographical map (15)
- world map (20)
- underwater features (13)
- topography (29)
- depth of water "dark area is higher"
- plate boundaries (3)
- geological map (3)
- "shows temperature by different blue colors"
- shows where there are high levels of sodium (for fishing)"
- "a map showing tides"
- world climates (e.g. white near N. pole is snow and glaciers)"

9th grade
Honors biology
students,
spring 2005

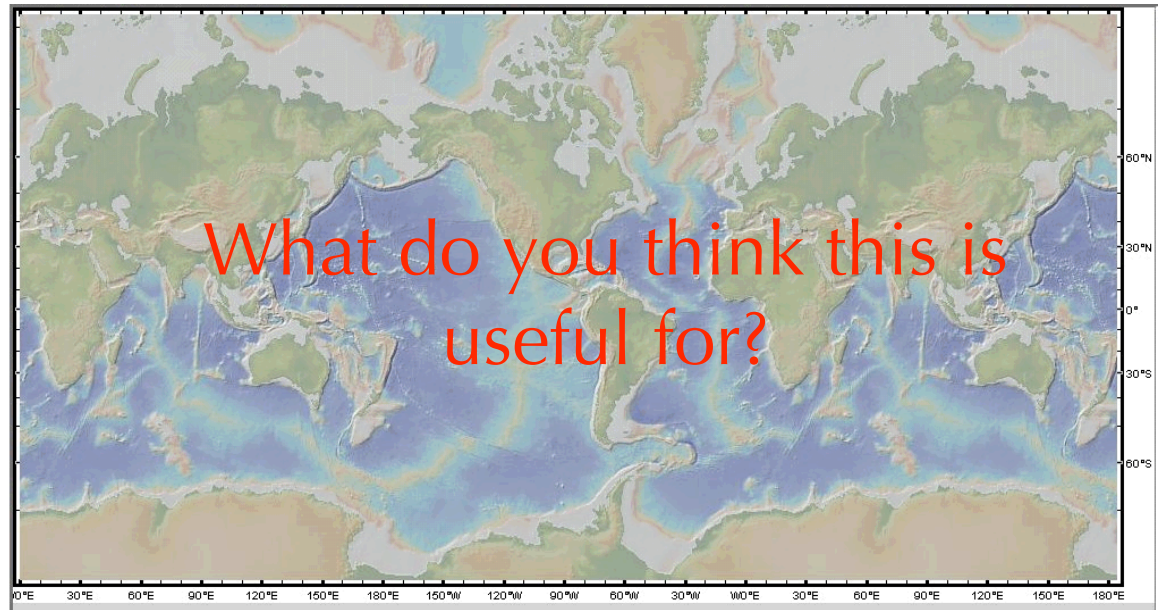


- “made by a computer” (4)
- topographic survey by satellite (4)
- “taking two pictures of the earth and sticking them together”
- “I don’t understand this question”
- “using data and analysing it over a period of time”
- “dating rocks in the ocean to find location”

- “instruments that measure depth”

(Not one student of the 120 mentioned “ship” or equivalent.)

12th graders,
A.P. science,
spring 2005



- “describing or displaying different parts of the world”
- “visualizing the continents”
- “understanding dynamics of Earth’s crust movements of tectonic plates”
- “predicting earthquake threats”
- “oil drilling rigs”
- “weather, water current patterns”
- “water temperature”

MGDMS Education: What next?

- Teacher professional development
- Low-barrier-to-entry data-using activities
- Your ideas

MGDMS Education: What next?

- Teacher professional development

Pending Proposal: “Collaborative Research: COSEE Deep: a national, theme COSEE linking deep-ocean scientists with K-12 teacher professional development” Liz Goehring, Lead

MGDMS Education: What next?

- Low-barrier-to-entry data-rich student activities, “Lamont Data Puzzles”

One figure

One question

Another question

To explore further see....

MGDMS Education: What next?

- Your ideas

- ...
- ...