Bringing Fieldwork to the Classroom
By Sara Auer & Don Duggan-Haas
PRI & its Museum of the Earth

PALEONTOLOGICAL RESEARCH INSTITUTE

NSF
The **ReaL** Earth Inquiry Project

✓ **ReaL** Earth System Science is a project of the Paleontological Research Institution (PRI) that is funded by NSF (DRK-12 0733303). The project helps teachers teach Regional and Local Earth system science using an inquiry-based approach, as a way to understand the global environment.

✓ This is undertaken through several components:

✓ A series of 7 regional **Teacher Friendly Guides** (**TFGs**) to the geology of the United States. [teacherfriendlyguide.org](http://teacherfriendlyguide.org)

✓ Teacher professional development programs

✓ The creation of **Virtual Fieldwork Experiences** (**VFEs**) [virtualfieldwork.org](http://virtualfieldwork.org)
Virtual Fieldwork Experiences

✓ Allow students to virtually explore a real location with the purpose of answering the core question:

Why does this place look the way it does?

✓ These are not intended to be field trips.
  – Field trips = Linear guided tours
  – Experiences = Inquiry driven exploration
Why does this place look the way it does?

✓ The process students undertake to answer this question mimics site-based field work.

✓ Though only key features of the site are available for student review, there is ample data for students to filter and process as they would at the actual site.
Why does this place look the way it does?

✓ Considering this question and figuring out how to engage students in the question is great professional development (that you can do outside on nice days).

✓ Virtual fieldwork is ideally a step toward actual fieldwork. As you put together a VFE, you’re considering what kids would do in the field.

✓ VFEs can be used to prepare for and process actual fieldwork.
Where Does One Find a VFE?

✓ We are currently creating a database of VFEs that have been made by PRI and other educators.

✓ These VFEs are open to the public.
Taughannock Falls Example

A preliminary view of our database, soon to be sortable & searchable by category and key words

<table>
<thead>
<tr>
<th>Sample Image</th>
<th>Title (with link)</th>
<th>Author(s)</th>
<th>Abstract</th>
<th>Download</th>
<th>Location</th>
<th>Landscape Region(s)</th>
<th>Geologic Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image.png" alt="Taughannock Falls VFE in Google Earth" /></td>
<td>Taughannock Falls VFE in Google Earth</td>
<td>Christine Besemer, Sara Auer</td>
<td>Click to download Google Earth Tour of Taughannock Falls.</td>
<td>[Download]</td>
<td>Taughannock Falls State Park, NY</td>
<td>Allegheny Plateau</td>
<td>glaciation, waterfall, Devonian, shale, sandstone</td>
</tr>
</tbody>
</table>

Norwich  VFE Database  NY Hall of Science Powers of Ten
Taughannock VFE- a quick look
What happened to create this crenaeae? Look Closer...

From 5-20-2008
In this location there are two distinct rock types. What observations can you make about these rock types? Do they play a role in this landscape?

From 5-20-2008
Some of these rocks also contain fossils (see below). Based on these fossils, we can determine that the rocks are roughly 350 million years old. Can you tell what kind of fossils they are? What kind of environment might these animals have lived in?
360° Panoramas
Gigapan-in progress

This "picture" is a compilation of 288 photos
Scientists ACTUALLY do this

✔ NASA’s Mars Rovers

✔ Scientists are learning about the Mars by examining pictures taken by the rovers

✔ The creators of VFEs are playing the role of the robotic rovers.

http://marsrovers.nasa.gov
How do you do this?

✓ Visit the site
✓ Take LOTS of photos & GOOD notes
✓ Upload selected photos to the web
✓ Insert photos into chosen web-based map application
✓ Carefully chose captions and questions
Specialty Items

✓ Web application for photo storage
  - Picasa Web Albums

✓ Web-based map application
  - Google Earth

✓ Specialty photo systems to take panoramas
  - Nodal Ninja (manual)
  - Gigapan (automated)

✓ Software designed to “stitch” the photos together
  - PT Gui
How do we do this?

✓ Visit the site & take LOTS of photos & notes
  - Videos were taken with movie function on the digital camera

✓ Specialty camera equipment:
  - Nodal Ninja (manual panoramas)
  - Gigapan (automated panoramas)

✓ Stitch panos and convert to 360° degree views
  - PT Gui (360° QTVRs open in Quick Time)

✓ Upload selected photos to the web
  - Picasa Web Albums

✓ Insert photos into a web-based map application
  - Google Earth

✓ Carefully chose captions and questions
www.virtualfieldwork.org

✓ Tutorials on website
   – Including How to use Google Earth and Picasa

✓ Database
   – Many types of VFEs
   – Choose a VFE based on goals, ability, time...

✓ Resources
   – Teacher-Friendly Guides
Questions?