### Cross Category Issues:

<table>
<thead>
<tr>
<th>Have I considered</th>
<th>Question:</th>
<th>Logistical</th>
<th>Pedagogical</th>
<th>Technical</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do I have appropriate safety and first aid equipment and materials?</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What content do I want to address?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Do I have connections in mind to at least a couple of the bigger ideas and overarching questions?</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
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<tr>
<td>• The Earth is a System of Systems.</td>
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<tr>
<td>• The Flow of Energy Drives the Cycling of Matter.</td>
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<tr>
<td>• Life, including human life, influences and is influenced by the environment.</td>
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<tr>
<td>• Physical and chemical principles are unchanging and drive both gradual and rapid changes in the Earth system.</td>
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<tr>
<td>• To Understand (Deep) Time and the Scale of Space, Models and Maps are Necessary.</td>
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</tr>
<tr>
<td>• How do we know what we know?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>• How does what we know inform our decision-making?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>How much time do I realistically have to spend on fieldwork?</td>
<td>✓</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>How much class time do I want to dedicate to fieldwork?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Am I ok with the trade-off between some expected frustration and the pedagogical payback?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Can I productively engage students in fieldwork? Or is that something to aspire to for next year?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>How does the technology I have serve the goals I wish to meet?</td>
<td>✓</td>
<td>✓</td>
<td></td>
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</tr>
<tr>
<td>Do I have enough batteries for my powered equipment?</td>
<td>✓</td>
<td>✓</td>
<td></td>
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</tr>
<tr>
<td>Is the site accessible to me? This includes legal, safety and proximity considerations.</td>
<td>✓</td>
<td>✓</td>
<td></td>
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</tr>
<tr>
<td>Are my students familiar with the site? If not, is it accessible to all of my students? If the answer to both questions is no, select another site.</td>
<td>✓</td>
<td>✓</td>
<td></td>
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</tr>
<tr>
<td>Are the required pedagogical, technological, and content skills and knowledge needed to for fieldwork within my reach? Ideally, select challenges that are just within (or just beyond) your reach so that you grow professionally.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Do I have the hardware (including field equipment) and software needed for Virtual Fieldwork creation? The bare essentials are an Internet-connected computer, a digital camera, and either PowerPoint or Google Earth.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Excerpted from: The Teacher-Friendly Guide to the Earth Science of United States
Specimen Labels:
[http://virtualfieldwork.org/Assessments_and_Student_Materials_files/SpecimenLabel.pdf](http://virtualfieldwork.org/Assessments_and_Student_Materials_files/SpecimenLabel.pdf)
### Materials to Take in the Field

#### For Safety and Comfort
- Yourself
- Appropriate footwear
- First aid supplies
- Water
- Sunscreen
- Insect repellent
- Food
- Safety goggles
- Flashlight

**Common sense** should be your guide to determine what is needed for a particular visit to the field. Trips that last a class period and are adjacent to the school may require nothing beyond materials for a typical class – a notebook and a pencil.

#### For Extending the Senses
- Ruler or scale card
- Measuring tape or meter stick
- Magnifying loupe or hand lens (about 10x magnification)
- Water test kit
- Compass
- Clinometer
- Field microscope
- Field guides

#### For Preserving and Extending Observations
- Notebook
- Pencil
- Materials for collecting
  - Baggies
  - Specimen labels
  - Sharpies
- Rock hammer
- Camera

#### For Both Extending the Senses and Preserving Observations
- Maps
- **Camera** (possibly with video)
- Probeware and interface (like the Vernier Labquest)
- Digital field microscope
- GPS unit, smartphone, or tablet
- Apps used in the field might include:
  - GPS
  - Google Earth or other virtual globe
  - Skitch or other image-annotating app, for adding notes to photos. Skitch also includes a map annotation function.
  - Photosynth or other panorama app
  - Video (Youtube’s Capture App allows for basic video editing on your smartphone or tablet)
  - Other specialized photography apps
  - Audio recorder
  - Notes
  - Photo management software, like Web Albums

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*Figure 2 Materials to Take in the Field* Items in bold are highly recommended.