Geoheritage & Undergraduate Education

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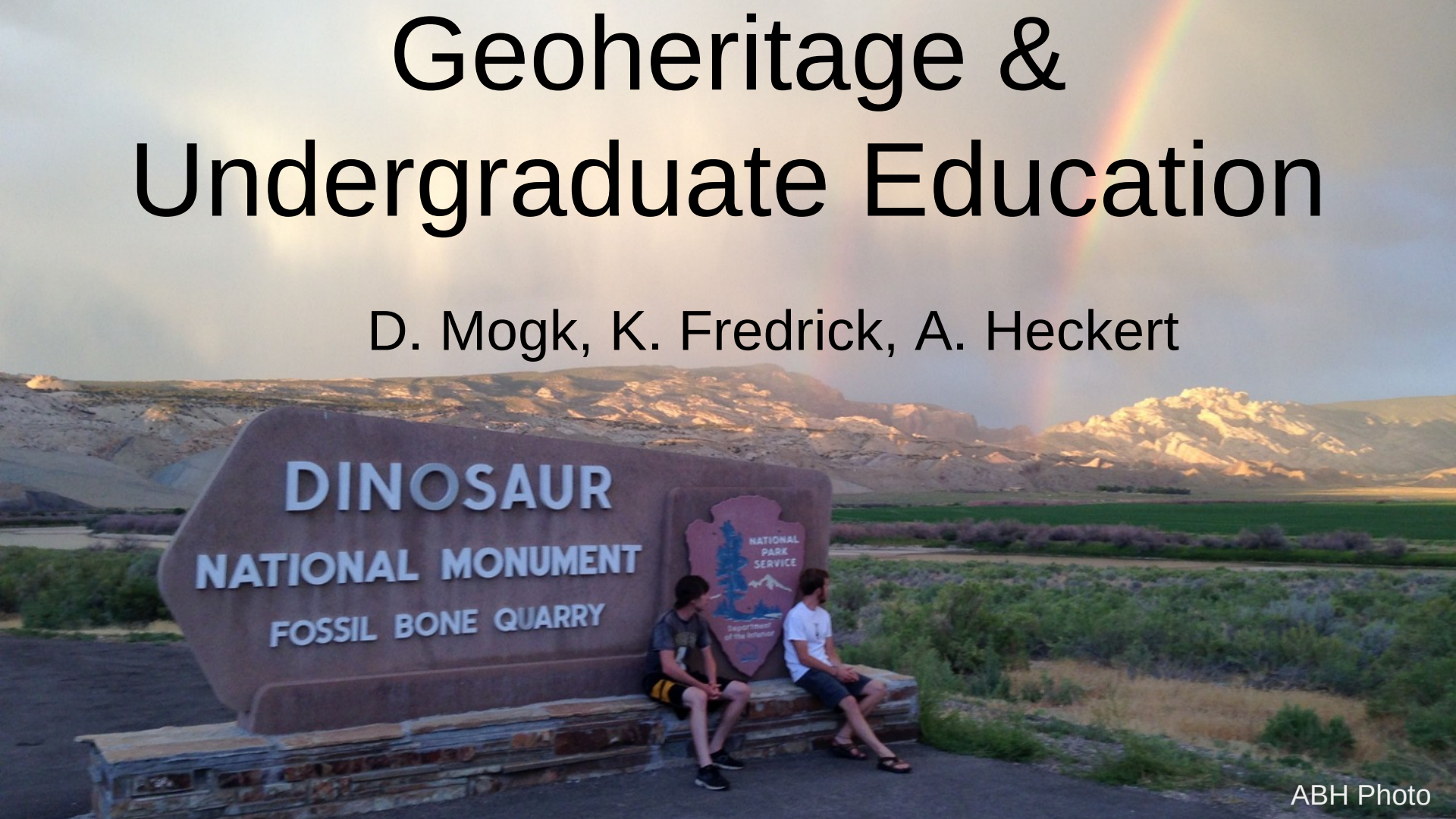


Geoscience & Undergraduate Education

- Geoheritage ought pervade the entire undergraduate geology curriculum
  - Classroom, virtual classroom, lab & field
  - Geoheritage is “Earth Systems Science”
- Go beyond “textbook examples” to exemplify synthetic education
  - Evidence-based approaches to learning
- America’s Geoheritage will gain traction if educational value is codified
  - Accessible to educators throughout formal and informal learning settings
- Codification extends to “local geoheritage.”

Geoheritage should pervade the entire undergraduate curriculum (Intro to graduate-level courses)

Geoheritage Sites are “textbook” examples but can be informed and improved by

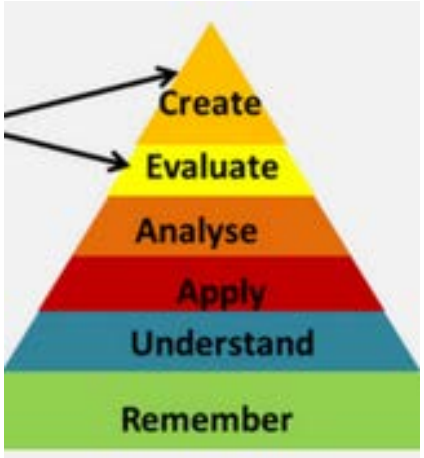
—Scaffolding of concepts from introductory to capstone courses

—Novel assignments (portfolios, service-learning, videos, etc.)

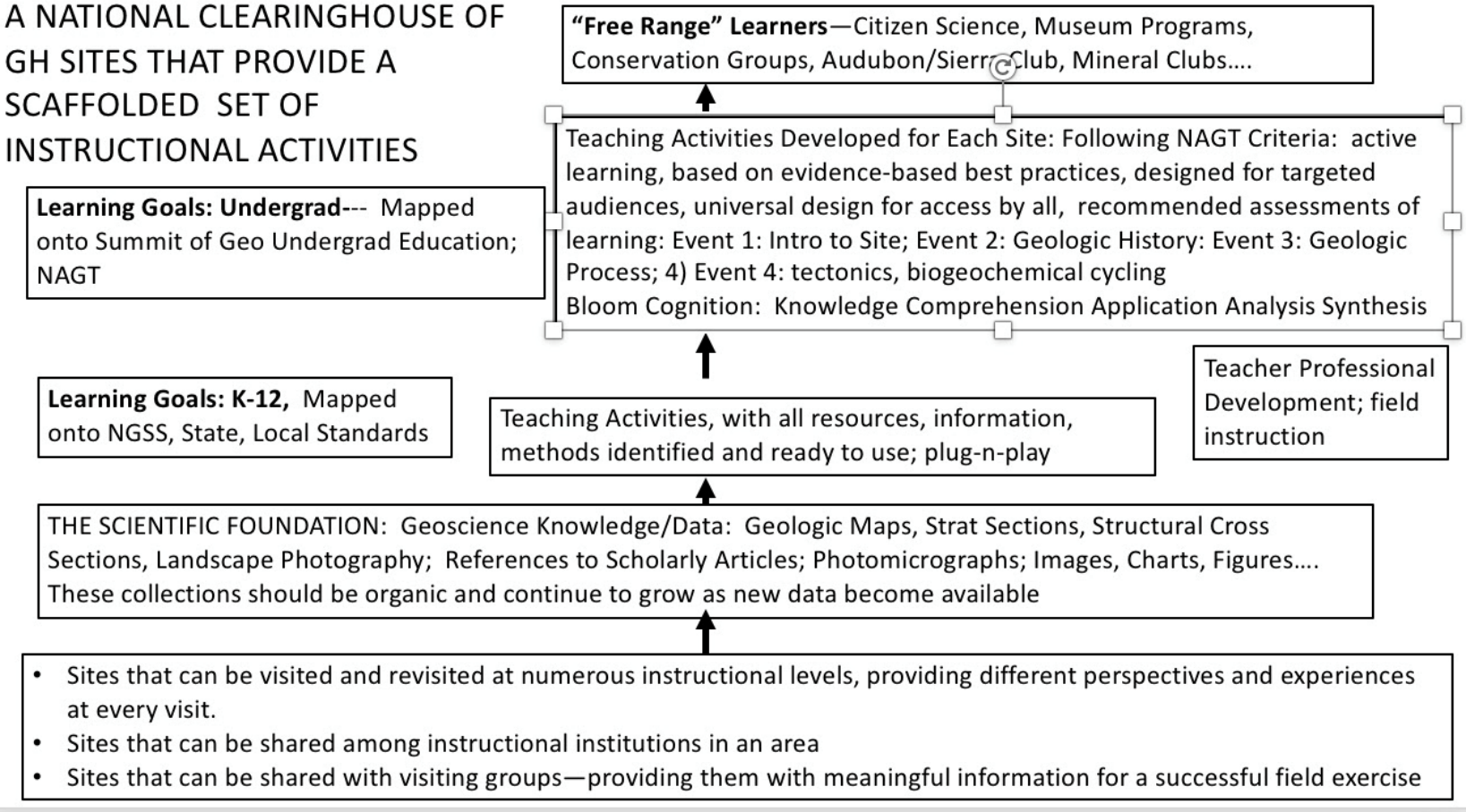
—Universal Design for Learning (ties to diverse & extramural learners) & other evidence-based approaches to learning (NAGT, https://theiagd.org/; SERC, https://serc.carleton.edu/research_on_learning/synthesis/field.html etc.)

—Undergraduate student research (REUs, Inventories, etc.)

—Field experiences, both to Geoheritage sites and local geoheritage



Concept map—Geoheritage & scaffolded education & outreach



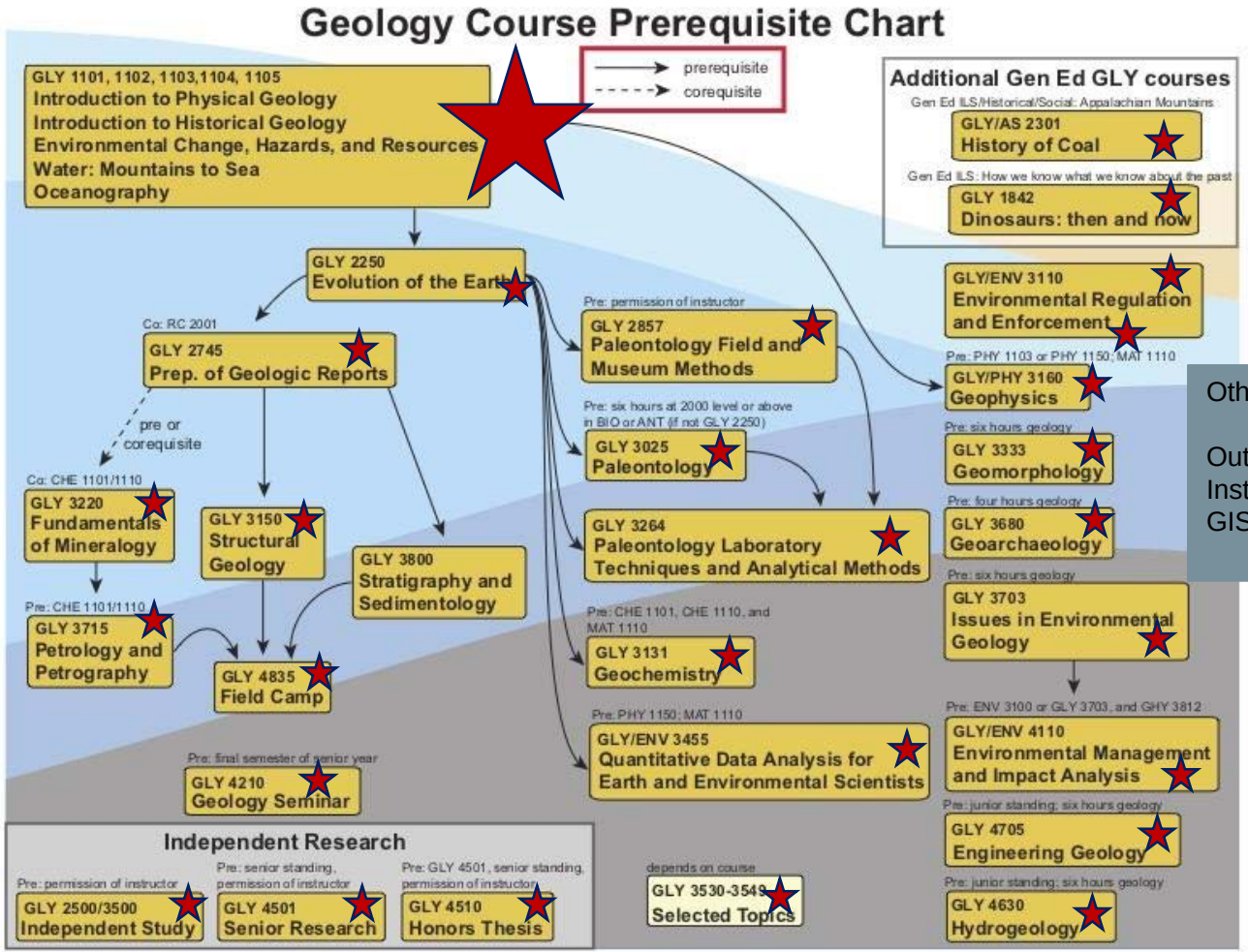
America's Geoheritage is a hook at this level

Creative assignments and conscious attempts to return to GH sites

Novice
Portfolios
Low-stakes research
Service-learning
Interviews

Specialized skills
Comparative analyses
Case studies
Course projects

Capstones
Syntheses
Research/Knowledge creation



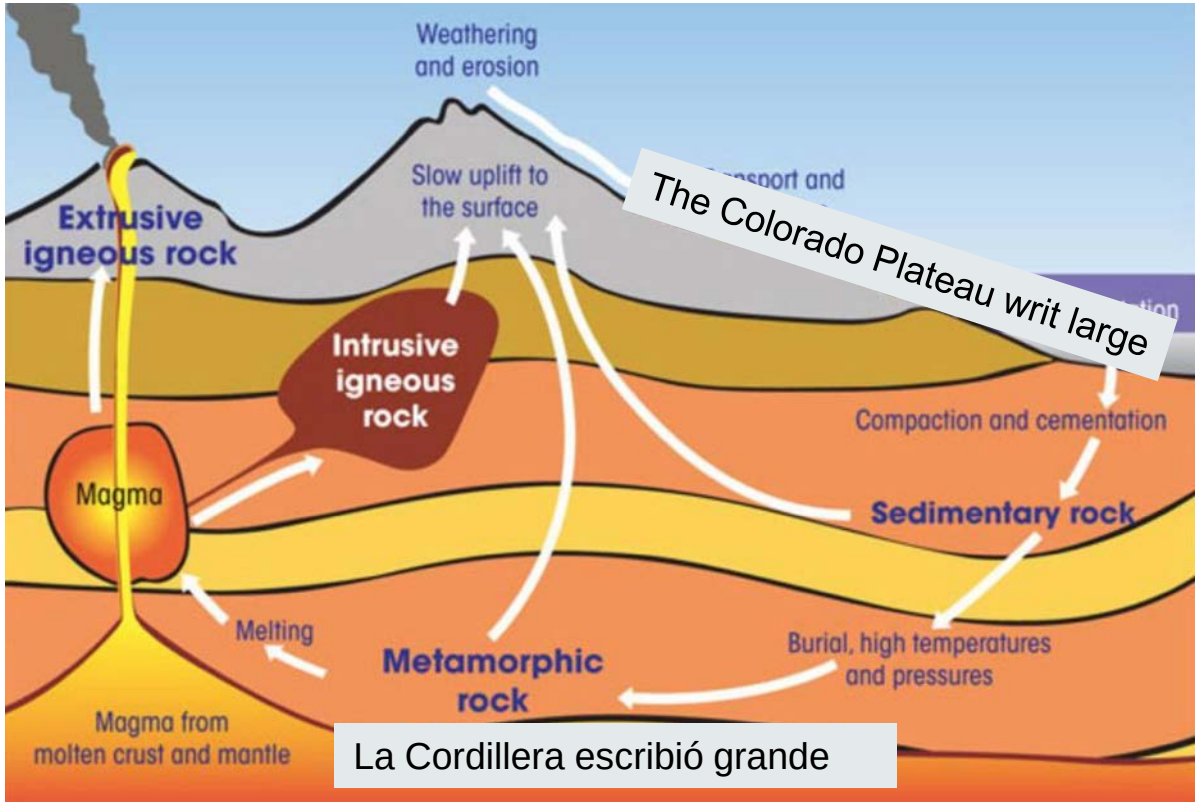
★ = courses that could tie to Geoheritage

https://earth.appstate.edu/sites/earth.appstate.edu/files/prerequisite_chart.pdf

Rock Cycle as case study/scaffolding undergraduate curricula—and why we need a Geoheritage index

Mt. St. Helens
Craters of the Moon
Hawaii, etc.

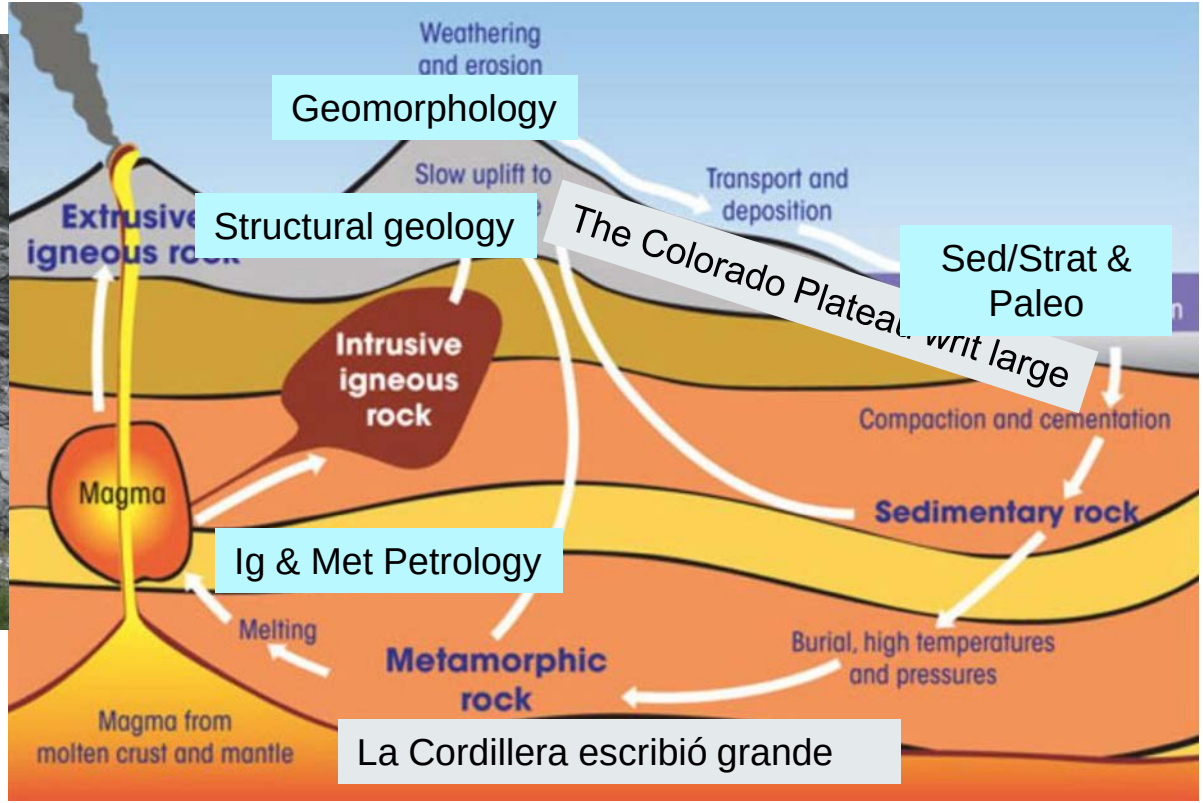
Sierra Nevada/
Yosemite
Devil's Tower etc.



https://www.forbes.com/sites/trevornace/2016/02/21/rock-cycle-kids-types-rocks-minerals/?sh=7a293f24640b

Rock Cycle as case study/scaffolding undergraduate

GES 1102 Fieldtrip
ABH Photo



Geomorphology

Structural geology

The Colorado Plateau writ large

Sed/Strat & Paleo

Hydrogeology

Ig & Met Petrology

La Cordillera escribió grande

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Geoheritage Sites vs local geoheritage

A Geoheritage Site—(inter-)nationally recognized place of geologic significance

Local sites—quarries, outcrops, field trip stops, etc.

But information could be modeled upon “Geoheritage Site” application

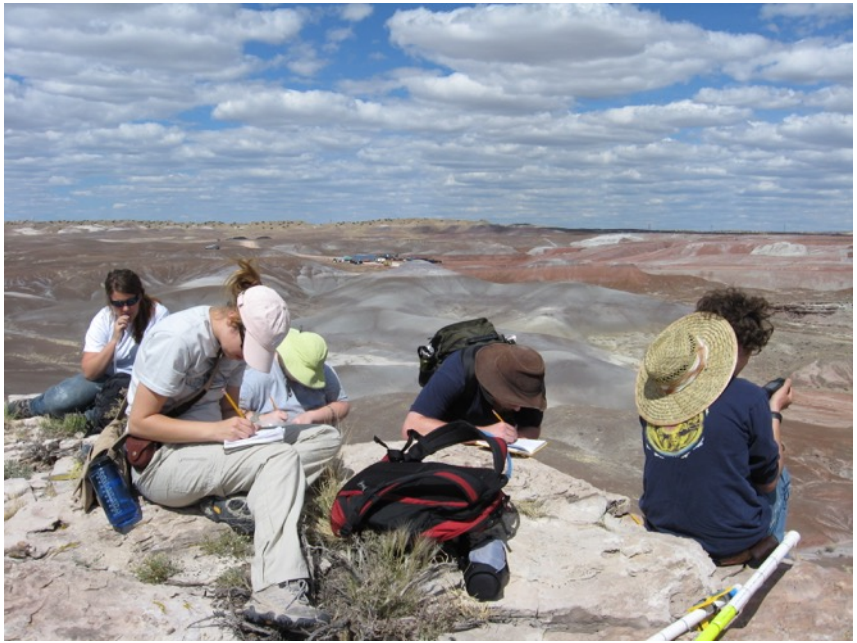
https://www.nps.gov/subjects/geology/geoheritage-registry-submittal.htm

“Welcome to Boone” stop on US 421
GES 2250, fall, 2008, ABH photo

And perhaps integrated with state interactive geologic maps

Deliberate Approach to Site Visit Planning

- What is the most useful and relevant information?
- Establish a template for educators to use and contribute
- Considerations
  - Site specifics and transportation
  - Site description and geology
  - Education goals and opportunities
  - Background and scientific resources
  - Logistics
  - Accessibility/alternative formats
- What else…?



“Triassic Trip” students, spring, 2008, ABH Photo

Example Site: Bluefield, WV

- **Location**
  - 37.275332° N, 81.161854°W; NOT protected
- **Route**
  - Approach from East on 52, take exit ramp to 460 Northbound
  - From SB 77, take last exit before the tunnels on 52 West (John Nash Blvd), 3km on 52 to exit, stop on single-lane off-ramp
  - 52 is four-lane divided highway with cross traffic (Be careful), ramp is marked by overhead signage, but not much warning for the turn
- **Access**
  - Public land, WV DOT(?)
    - Contact Information (TBD)
  - Parking
    - Ample parking for multiple vehicles on either side of the exit ramp
    - Shoulder is very wide and gently sloped; parking on left is probably best to be able to see approaching vehicles when departing
      - One-way ingress/egress, no turning around necessary
- **Site description**
  - Large, well-exposed outcrops on north/east side of ramp and west/south side
    - Slopes are steep, but there is one terrace about 8 ft above road grade
    - Abandoned cloverleaf allows for walking/exploring the area south/west of the ramp
    - Distinctive fault contact; some gradational, some distinct formation contacts; correlation across the road
  - Appropriate tools
    - Collecting is allowed, but recommended restricting to float
    - Dipping stratigraphy, limestones and shales; Bruntons, hammers, acid
  - Rock'd Information
    - Middle and Upper Devonian, includes Marcellus outcrop north of the ramp
    - Unconformity between M Dev and Lower Ordovician Beekmantown
    - St. Paul group is the southernmost exposed at this site
  - Research (journal articles, etc.)
    - LOTS available!

Google Earth® image captured by K. Fredrick

Continued…

- **Course applications**
  - Intro all the way to Upper-level field methods and structure; hydro and geomorphology are weak at the site, but the region is Valley and Ridge
  - Prerequisite materials
    - Geologic map
    - Stratigraphic column
  - Potential activities
    - Mapping, sketching, site/rock descriptions and note-taking
- **Non-geological considerations**
  - Geoethics
  - Environmental impacts/legacy
  - History
  - Resource extraction
- **Logistical considerations**
  - Nearest Health and Safety resources
  - Restrooms, nearby food
  - Nearest towns (hotels? camping?)
  - Cell signal
- **Accessibility**
  - ADA?
  - Virtual field trip?

Google Maps Streetview® image captured by K. Fredrick

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