The Grand Canyon backcountry: An invaluable classroom for earth science-based environmental education

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Introduction

• What is Environmental Education?
• Why is the Grand Canyon backcountry unsurpassed as a venue for environmental education?
• How have I used the Grand Canyon backcountry to achieve my environmental education goals?
What is Environmental Education?

• An interdisciplinary exploration of our environment and the human role in that environment

• A fusion of and cross-fertilization between:
  – Science
  – Policy
  – Values/Ethics

• Emphasizes experiential learning
  – People learn by doing
  – Get them into nature
Why is the Grand Canyon backcountry unsurpassed as a venue for earth science-based environmental education?

Reason 1: World-class illustrations of diverse geologic features and processes
Faults and Folds
Unconformities
River dynamics
Canyon cutting
Why is the Grand Canyon backcountry unsurpassed as a venue for earth-science based environmental education?

Reason 2: People care about the place
The #1 goal of environmental education is to engage the audience – when people care, they are eager to learn. The rest is easy.
Why do people care more about environmental education when it takes place in the Grand Canyon?
Because it is truly one of the wonders of the world -

A place that engenders awe and humility
Earth’s deep history is etched on its stone walls,

exposed with unparalleled clarity and detail
Here the clues that reveal that history are tangible -

Students connect directly with deep time.
How I’ve used the Canyon for environmental education

• To explore the science of the Earth
• To explore how policy is developed and implemented
• To explore personal values and ways of knowing
Exploring the science of the Earth
– With a walk through time
Experiencing the earth’s deep history layer by layer, 60,000 years to the step!
Exploring the science of the Earth

– Studying the processes and rates of landscape development
Exploring the science of the earth -

Relating the Canyon’s geology to its ecology
in space . . .
... and time
Exploring the science of the earth -
Relating geology to human history
from the ancient . . .
... to the historical
... to the modern
Exploring the science of the earth through the wonder of new discovery
Student research projects are learning tools that expand our understanding of the Canyon’s history.
You become more invested in the research

When you lug 80 pounds of rock out of the Canyon!
Exploring how policy is developed and implemented

From backcountry management . . .
to condor reintroduction . . .
... to Adaptive Management
Exploring personal values and ways of knowing
The Canyon elicits a strong emotional response from almost all its visitors.
Kindling in them a desire to understand the mysteries of its formation
The Canyon’s creation story varies depending on who is telling the tale . . .
... and everyone cares passionately about their viewpoint.
The Canyon thus provides an engaging catalyst for exploring:

What is religion?
what is science?
How do we reconcile the two and sort out the appropriate roles for each in our society?
Like all of the topics we’ve discussed, these issues could be explored from an armchair in the front country.
But personal experience in the backcountry is more powerful . . .
From direct examination of the evidence contained in the rock layers
Students are able to develop multiple working hypotheses, contemplate what evidence is scientifically admissible and what is not, and explore how data are interpreted.
The backcountry also offers profound personal spiritual experiences of place . . .
Catalyzing meaningful exploration of what we believe and why we know it to be true.
Conclusion

The Grand Canyon backcountry provides an unsurpassed natural laboratory for earth science-based environmental education because:
it offers diverse opportunities to explore science, policy, and values . . .
and most of all because people are in awe of the Canyon. This awe focuses their attention on the important interconnections between these realms.