



Using local field trips as an integral part of teaching and learning about climate change science in Nevada

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Outline

- Advantages of place-based, outdoor education
- Application of place-based learning to EPSCOR summer institutes.
- Feedback on institute field trips
- Teacher-led field trips
- Conclusion



Advantages of Place-based Learning

- Improved student achievement in most disciplines.
- Noticeable increase in problem-solving skills
- Improved critical thinking and decision-making skills
- Students engagement in learning improves
- Gains in student grades and achievement on standardized tests (Sobel, 2005)

Advantages of Outdoor Inquiries

- Authentic learning
- Student engagement and motivation increases
- Provides many opportunities for self-directed learning
- Students are naturally curious in outdoor learning environments
- Students learn to “think and act in ways associated with inquiry.” (National Research Council, 1996)



Application of place-based learning to EPSCOR summer institutes.

- Attempt to make climate change education locally relevant
- Knowledge of local resources helps teachers create more relevant lessons
- Helps students understand the relationship between global events and local changes/evidence.
- Interdisciplinary work

Summer Institute Schedule

- 2009
 - **25% of institute meeting times spent in the field**
 - **Combination of field trips, in-class inquiry activities, and guest speakers.**
 - **Most field trips to local organizations involved in outdoor education**
- 2010
 - **38% of institute meeting times spent in the field**
 - **Field trips covered:**
 - **Climate change impact on desert tortoise habitat.**
 - **Geologic evidence for climate change**
 - **Fire ecology in desert and mountain environments**
 - **Environmental monitoring**
 - **Labs at DRI and UNLV**

Summer 2009 – Forever Earth boat on Lake Mead



2009 – Tour of Springs Preserve Environmental Education Center



Summer 2010 – The Great Unconformity, Frenchman Mountain NV



Summer 2010 - Desert Tortoise Habitat



Summer 2010 – Environmental Monitoring Station, Cane Springs, NV



Summer 2010 – Recent forest fire, Spring Mountains, NV



Teacher Feedback - 2009

- 2009 End of institute survey results
 - 86% of participants rated field trips as among the strengths of the summer institute
 - 0% of participants rated field trips as among the weaknesses of the summer institute
 - When asked to rank all summer institute events on a scale from 1 (highest) to 10 (lowest), field trips received an average rating of 1.6.

Teacher Feedback - 2010

- End of institute Skills and Knowledge Assessment
 - **Q #9. Take students on science-related field trips**
 - Confidence level **increased in 63%** of participants
 - Most participating teachers had a significant amount of experience in taking their students on field trips
 - **Q #10. Teach about the local impacts of climate change in your science classroom**
 - Confidence level **increased in 88%** of participants
 - **Q #11. Use virtual field trips and other educational technologies to learn science content**
 - Confidence level **increased in 75%** of participants



Teacher Feedback - 2010

- When asked “To which parts of the institute would you give the highest rating?” 86% of the participants mentioned field trips.
- When asked to explain their rating, one participant wrote:
 - “outdoor learning ... is more powerful than just talking about the geology or ecology of the area”

Teacher-Led Field Trips During the Academic Year Following the Summer Institute

- **Three trips to Springs Preserve**
 - desert ecology, water resources, and environmental education
- **Two trips to Forever Earth**
 - lake ecology and water resources
- **One trip to Mt. Charleston**
 - fire ecology and life zones

Conclusions

- In-service teachers responded favorably to taking local, climate change oriented field trips.
- The confidence level of participants for leading field trips and investigating local climate change impacts increased significantly.
- Teachers recognize that student learning and level of interest increases when field trips are integrated into the curriculum.

