1. Abstract
This study examines the impact of a workshop on teachers’ Environmental Citizenship (EC), a series of responsibilities that impact a sustainable society and culture for the sustainable management of Social-Ecological Systems (SES). Workshop goals were to connect academic researchers and local stakeholders with teachers in order to increase teacher understanding of SES as measured through an EC framework. A paired t-test analysis of the pre-post survey suggests that EC of participants increased significantly (p=0.05) regardless of workshop location (Boise, Pocatello, or Coeur d’Alene, Idaho). Findings suggest that EC may increase as a result of an online educational intervention.

2. Background
The implementation of SES is needed in our society and education system to foster environmental awareness, knowledge, and action. The concept of environmental citizenship incorporates the belief that each person has a role to play in protecting the environment and contributing to the preservation of natural resources. This framework is grounded in social-ecological systems theory and is informed by moral and ethical considerations.

MILES Adventure Learning Workshop
Managing Idaho’s Landscapes for Ecosystem Services (MILES) is a statewide effort to research the natural resources of Idaho through universities and collaborations in order to benefit the SES of Idaho and is a program of the NSF EPSCoR program. The MILES program seeks to reach a broader audience, and therefore a teacher workshop was developed - connecting researchers with classroom teachers in a professional development opportunity called Adventure Learning.

3. Methods

3.1 Develop a Survey Instrument

- Based on the literature related to EC and SES
- Likert-type scale of five-point responses
- Open-ended and closed-ended response types
- Survey approval from school boards
- The survey was implemented
- Survey implementation

3.2 Study Design

- Pre-post intervention case-study design with quantitative analysis
- A study of three Adventure Learning workshops taking place throughout Idaho
- Participants completed a pre- and post-survey measuring Environmental Citizenship and aligned with MILES workshop goals
- Survey implementation

4. Results

- There was a significant difference in EC from pre to post survey for all participants, across all contexts
- The EC framework was aligned with workshop goals and outcomes
- The EC framework was effective in increasing participant EC
- The EC framework was useful in connecting research and practice

5. Discussion

- Professional development may have a significant impact on participants
- EC can be increased through educational interventions
- The EC framework was aligned with workshop goals and outcomes
- The Adventure Learning workshop model is effective for teacher professional development, across contexts, and with different facilitators

Future Directions
- Further development and refinement of the survey instrument, study of EC in other contexts, and further investigation into the specific activities and lessons that contribute to EC will help to advance understanding of EC.

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Terms
- Social Ecological Systems
- Social Ecological Systems Education
- Environmental Citizenship
- Adventure Learning
- Barriers to Teacher Implementation of SES

Figures:
- Figure 1: Percent change in means of EC from pre to post survey (n=57)
- Figure 2: The Five Overlapping Components of Environmental Citizenship: Developed by Berkowitz, Ford, and Brewer (2008)
- Figure 3: The Environmental Citizenship Framework used in this research
- Figure 4: The Environmental Citizenship Framework used in this research