



# Engineering Stewardship for the Inland Northwest.

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## Abstract/ Inspiration

- Early in my career, I gave students a choice of several projects. One team took an extremely strong, long-term interest in identified local environmental issues. Results of their conservation efforts, student engagement, and ecological stewardship continue benefiting our community.

## Background Information

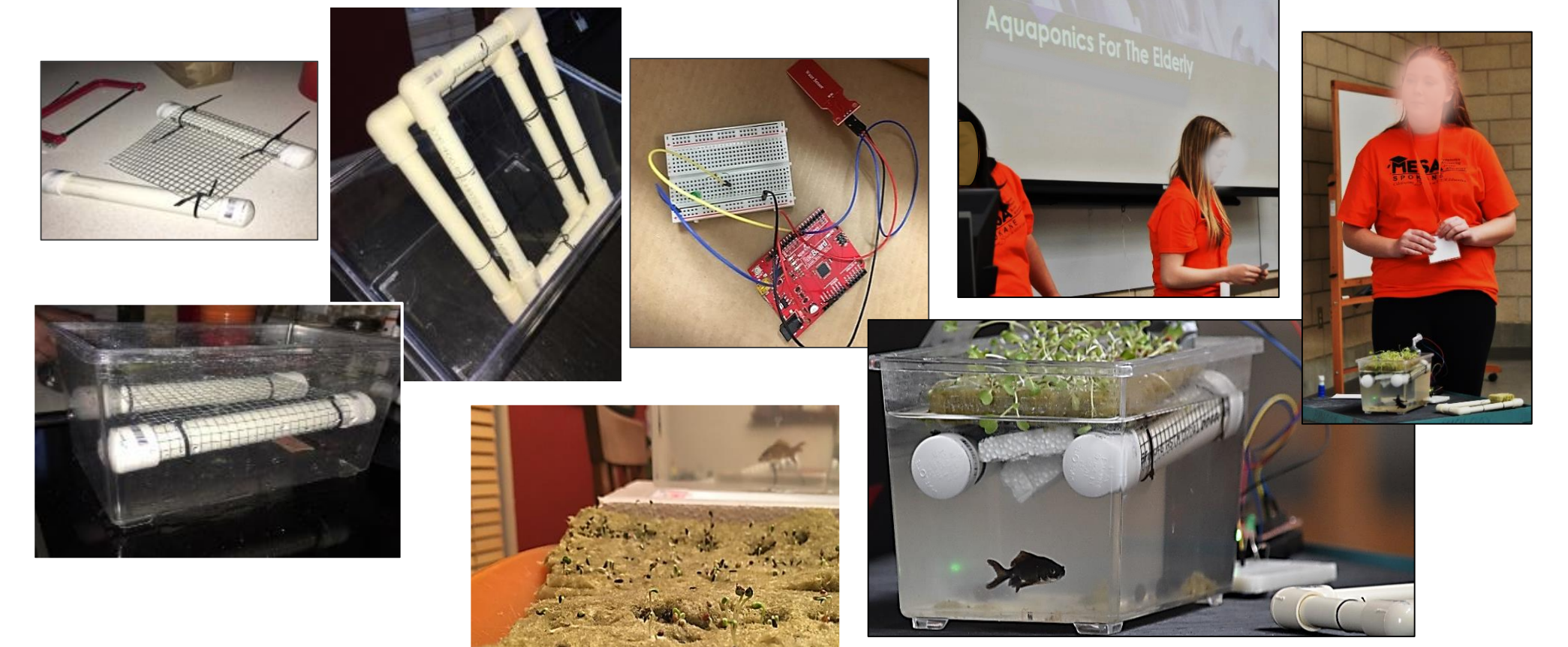
- Students involved in my classroom research project were members of the Math, Engineering, Science Achievement (MESA) program. Participants elected to join this class section to fulfill the biology course requirement with the added benefit of experiences beyond the classroom.

How does the use of place-based environmental engineering challenges influence student perceptions of stewardship for natural resources?

## Objective/ Results

- Students were tasked with identifying an environmental issue and developing a human-centered approach to ecological remediation. Students created prototypes and programmed sensors' responses to defined threshold indicators.
- Connections to local natural resources and their own community supported interest, engagement, and perception of value placed on environmental stewardship.

Ecoliteracy practice *Understanding How Nature Sustains Life* "Aquaponics for the Elderly" student project development and re-design.

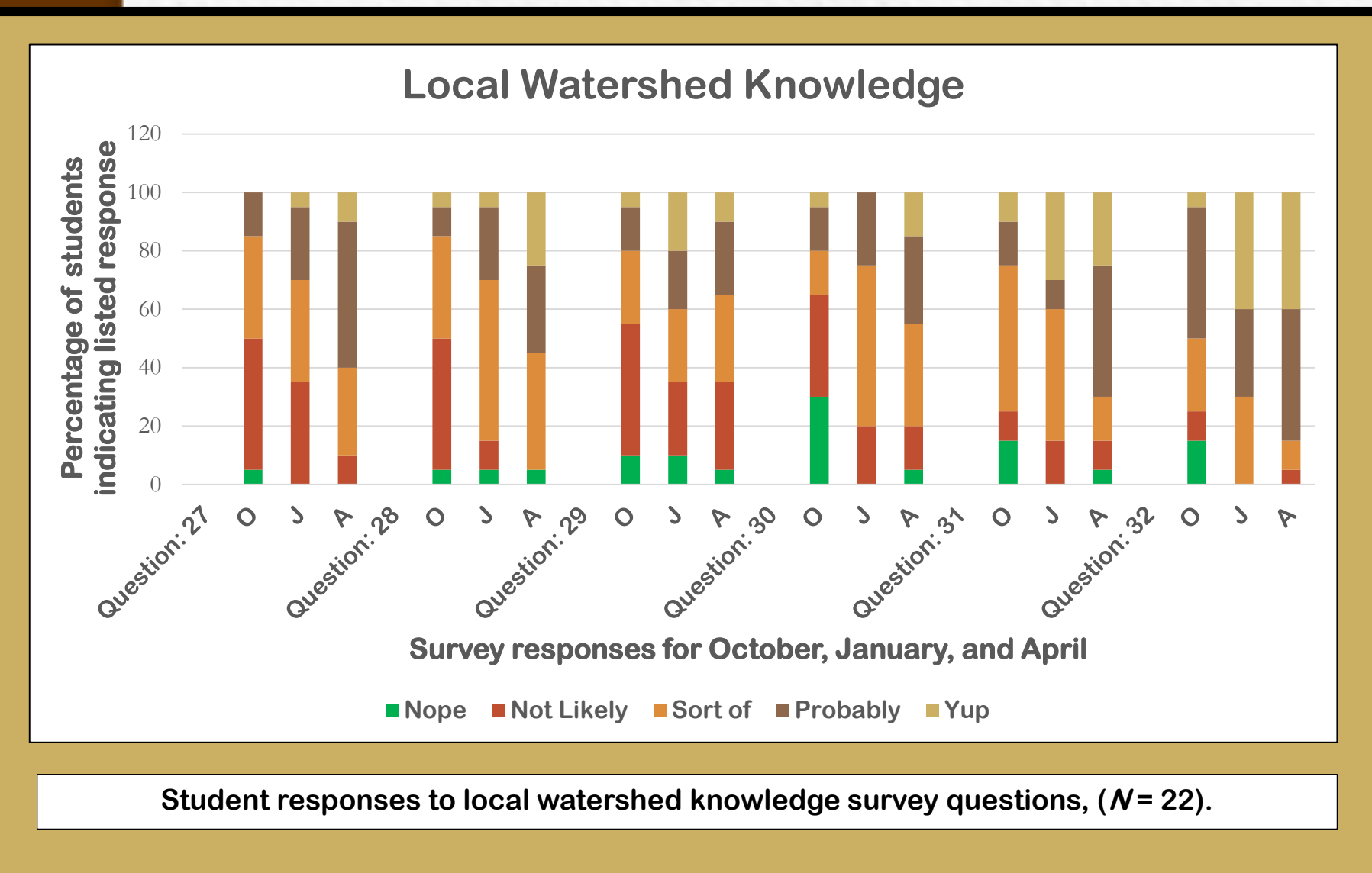


## Conceptual Framework and Value

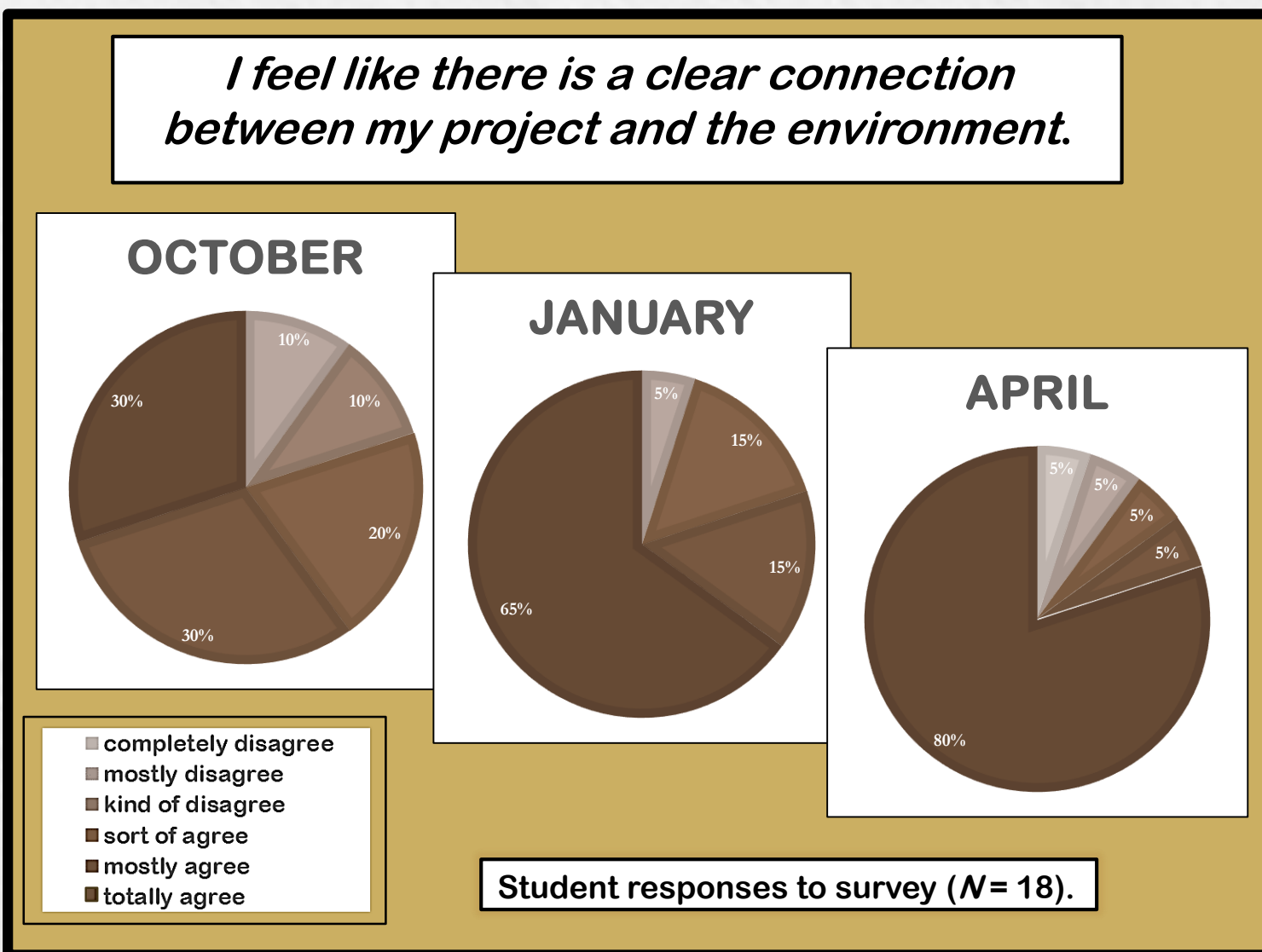
- Pilot courses and published works, along with NGSS standards, were used as developmental models for this classroom research project. Various outdoor education and community organizations across the country were examined.
- Project-based learning and locally-focused outdoor experiences provide strong support to developing student interest in conservation.
- Social implications further personal project engagement and social justice empowerment.

## Conclusion and Interpretation

- Increased ecological literacy through real-life environmental education enhances socio-scientific ties to local natural spaces and society.
- Eco-literacy allows science to become a tool for students and their community.
- Student are more likely to gain the scientific knowledge, engineering design skills, and stewardship values vital for addressing societal and sustainability challenges through environmental education.



What is the impact of using residential resources in supporting students' perceived value of ecological awareness?



How will incorporating localized water and soil science content and concepts affect student attitudes toward environmental responsibility?



Does the integration of computer technology and human-centered engineering projects support socio-scientific issues of preserving the health of natural resources?



\*Created from student survey responses, questions, and peer-provided explanations.

"When we wash dishes, water cleans them and goes down drain, and the soap helps carry the dirt and oily stuff away. [But] bodies of water have no wash 'away' place."

- 9<sup>th</sup> Grade Student