



# Large-scale Environmental Data Collection with First-year Undergraduate Students

The Freshman Research Initiative



Stuart Reichler

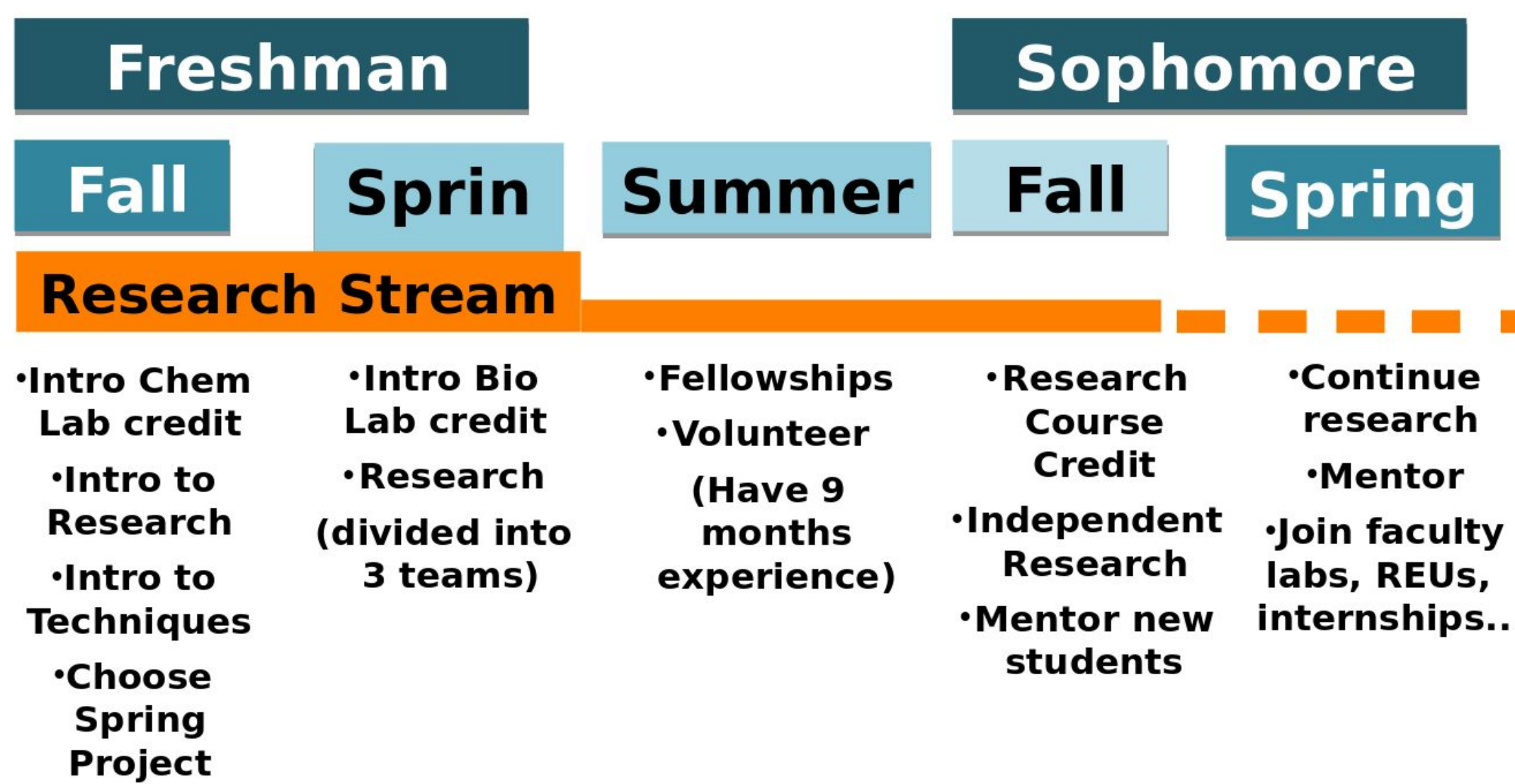
Urban Ecosystems, The University of Texas at Austin



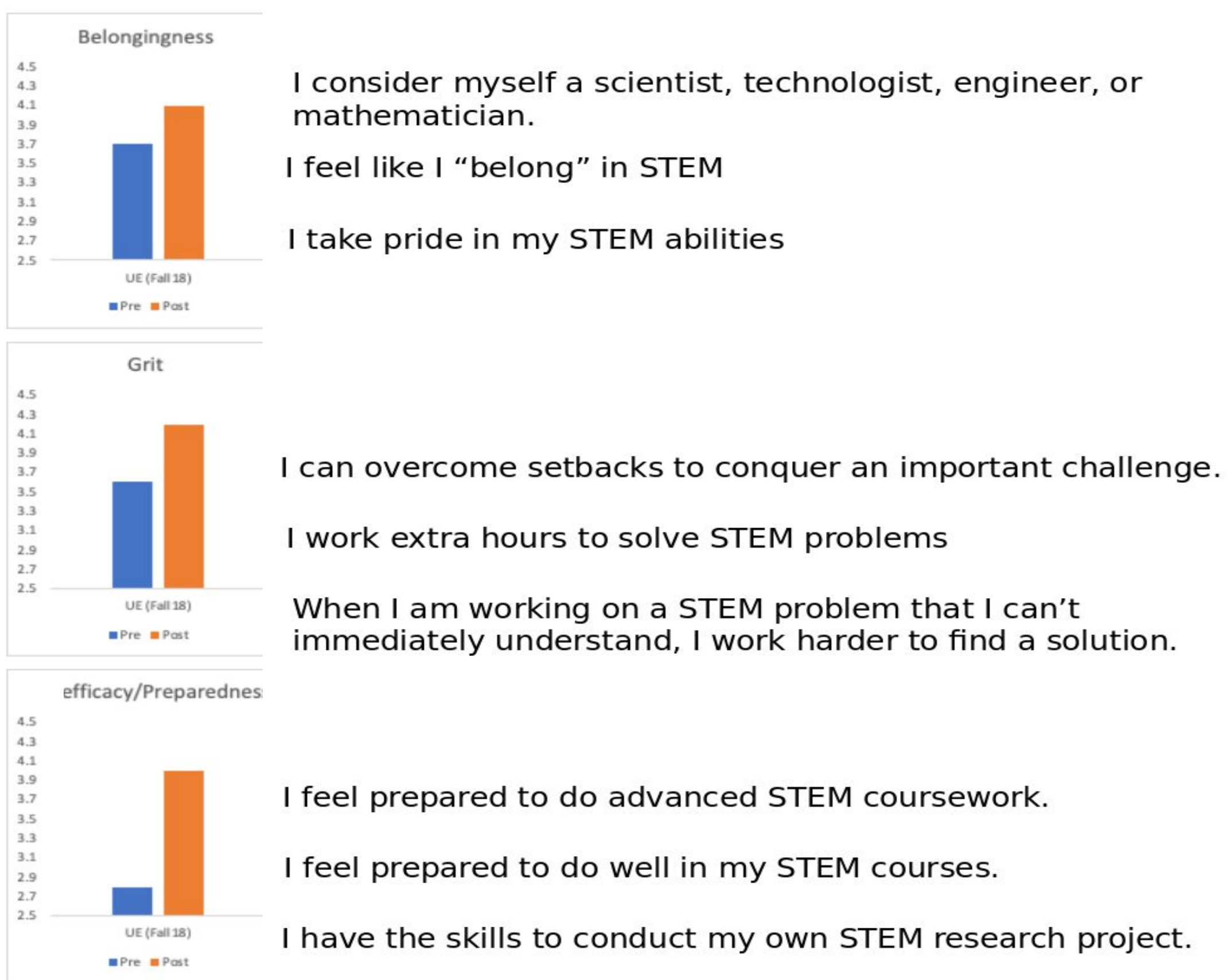
## How do we integrate teaching and research?

~60 students/year move through a guided practicum earning credit towards their degree while collecting environmental data. Experienced students progress to more advanced research projects and/or mentoring newer students.

## Urban Ecosystems Timeline



## Our students report improved confidence and motivation.



## We help STEM students graduate.

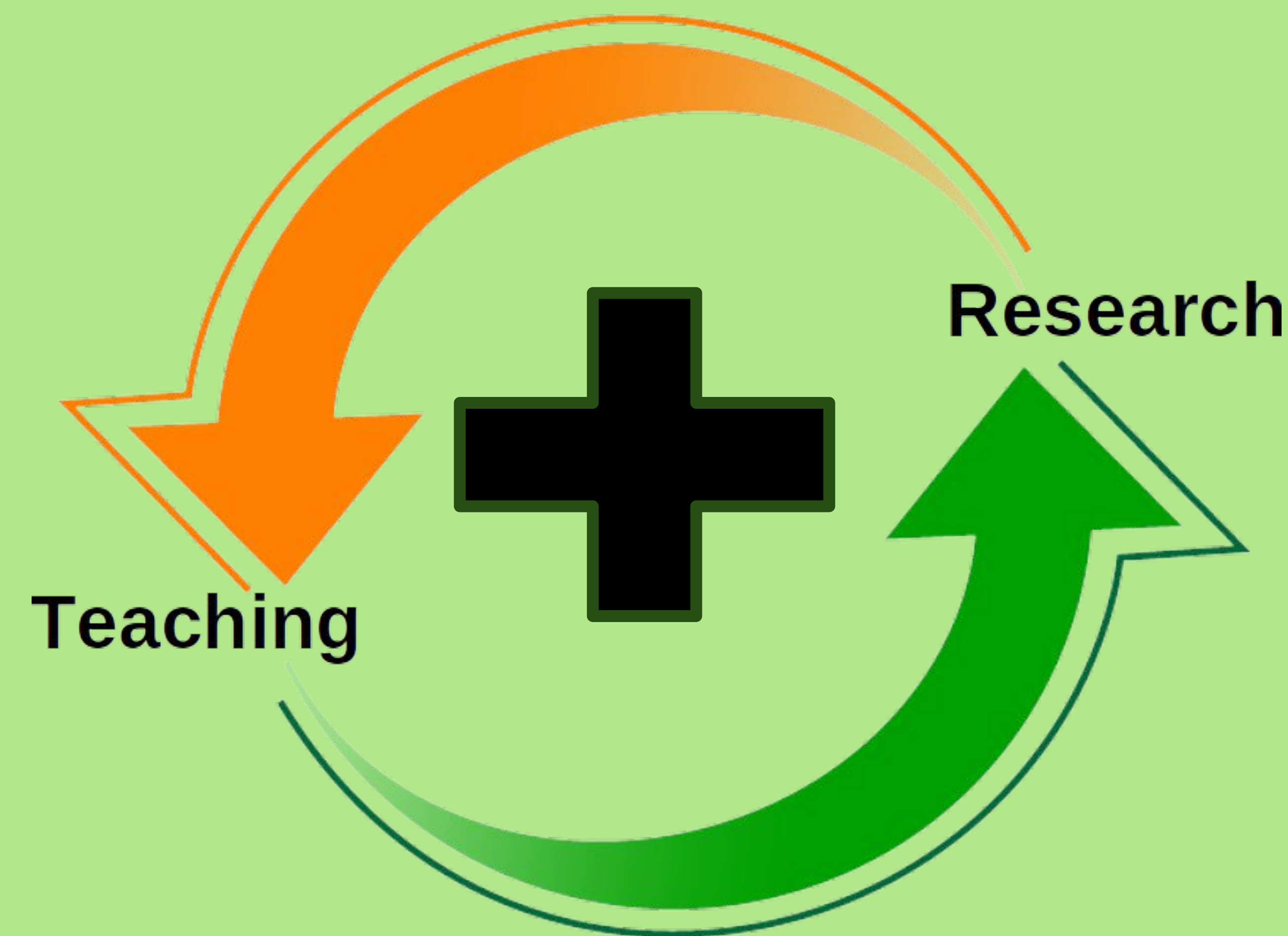


For every 100 students who enter UT intending to get a science degree, on average 17 more will graduate if they participate in FRI.

For every 100 students who graduate, on average 23 more will earn a STEM degree if they participate in FRI.

Rodenbusch et al., CBE-Life Sciences Education, June 2016

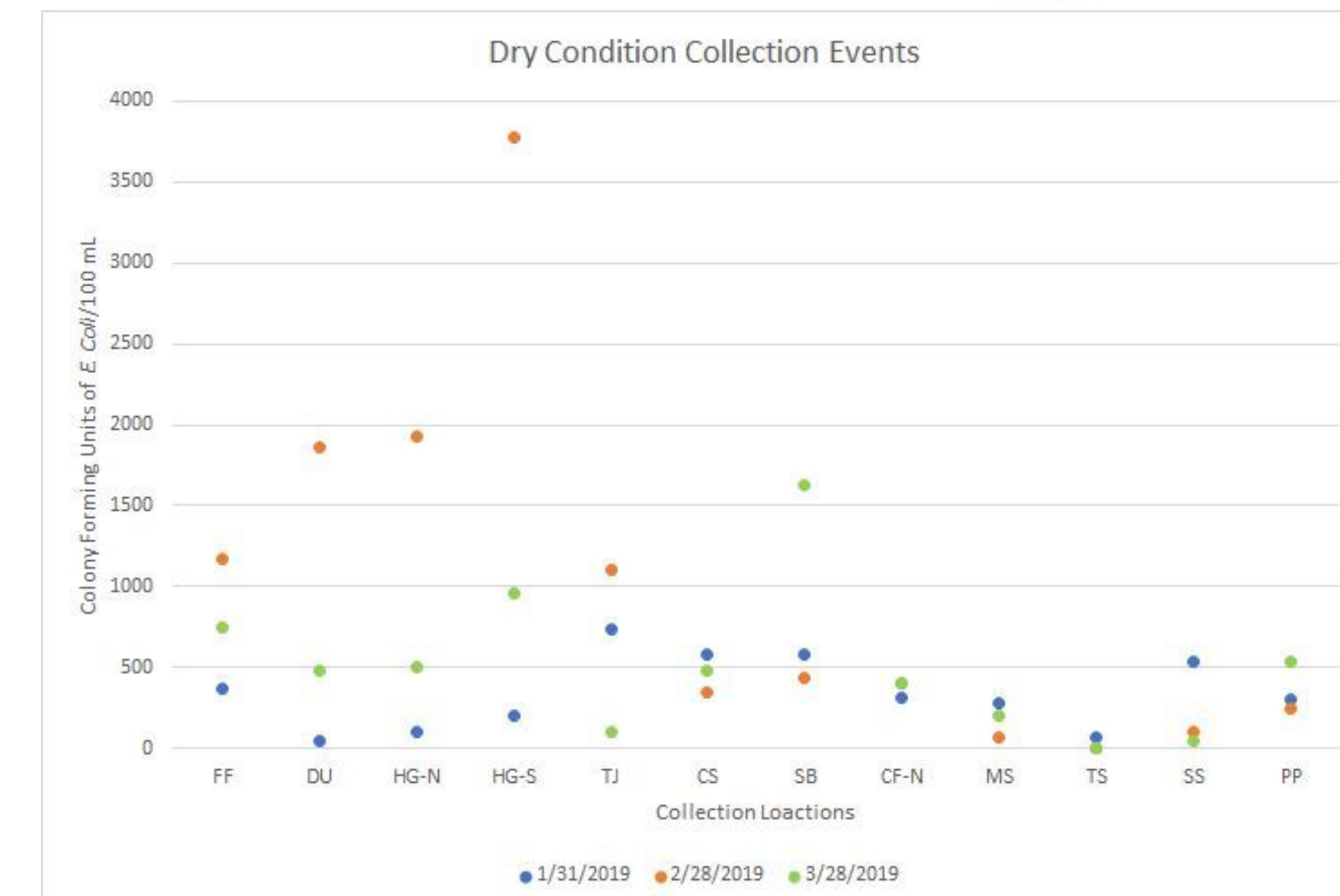
Undergraduate education should be experiential, and environmental science research can be used to teach a range of career useful skills.



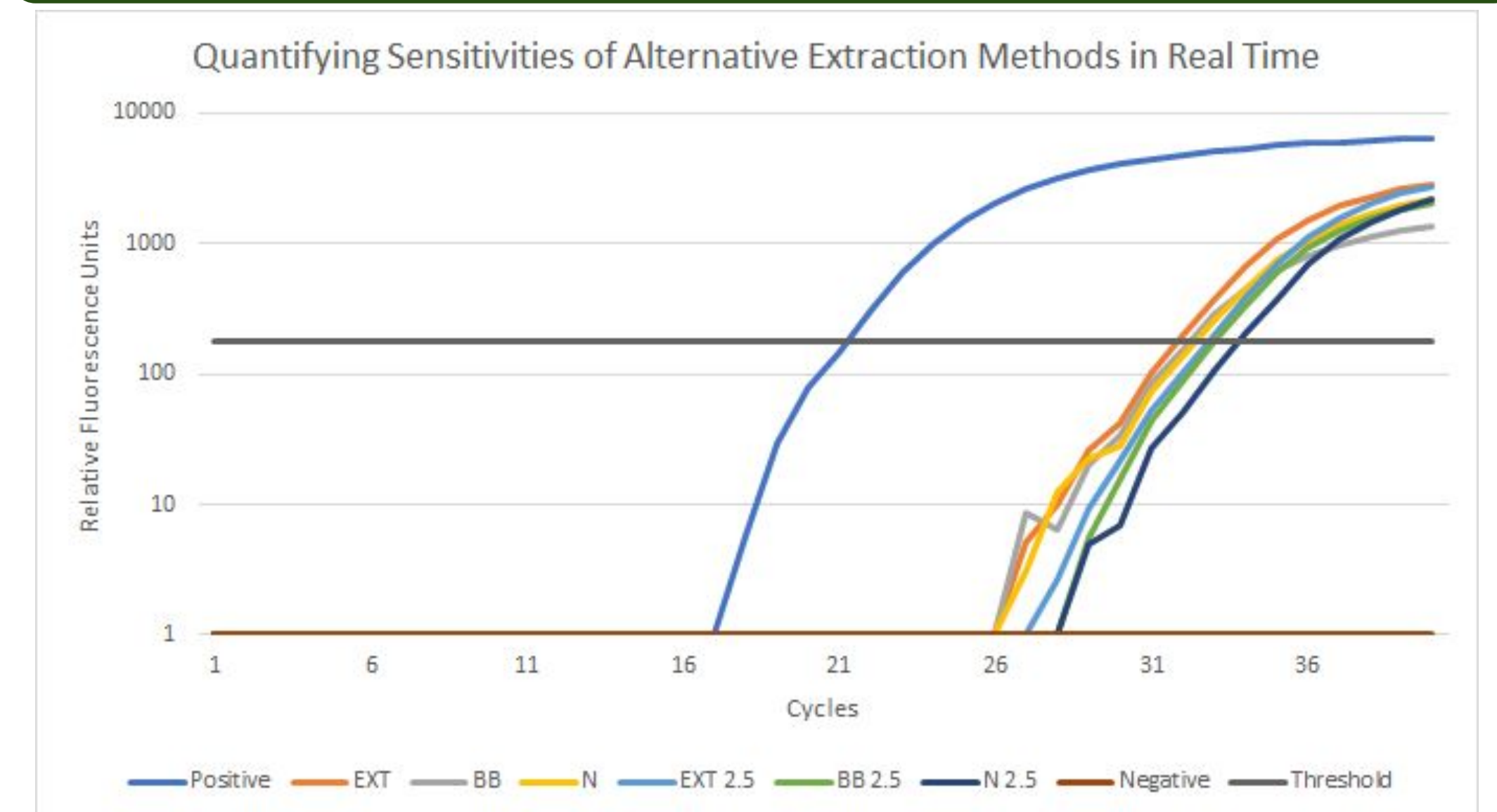
When teaching and research are the same, faculty and students become collaborators, not antagonists.



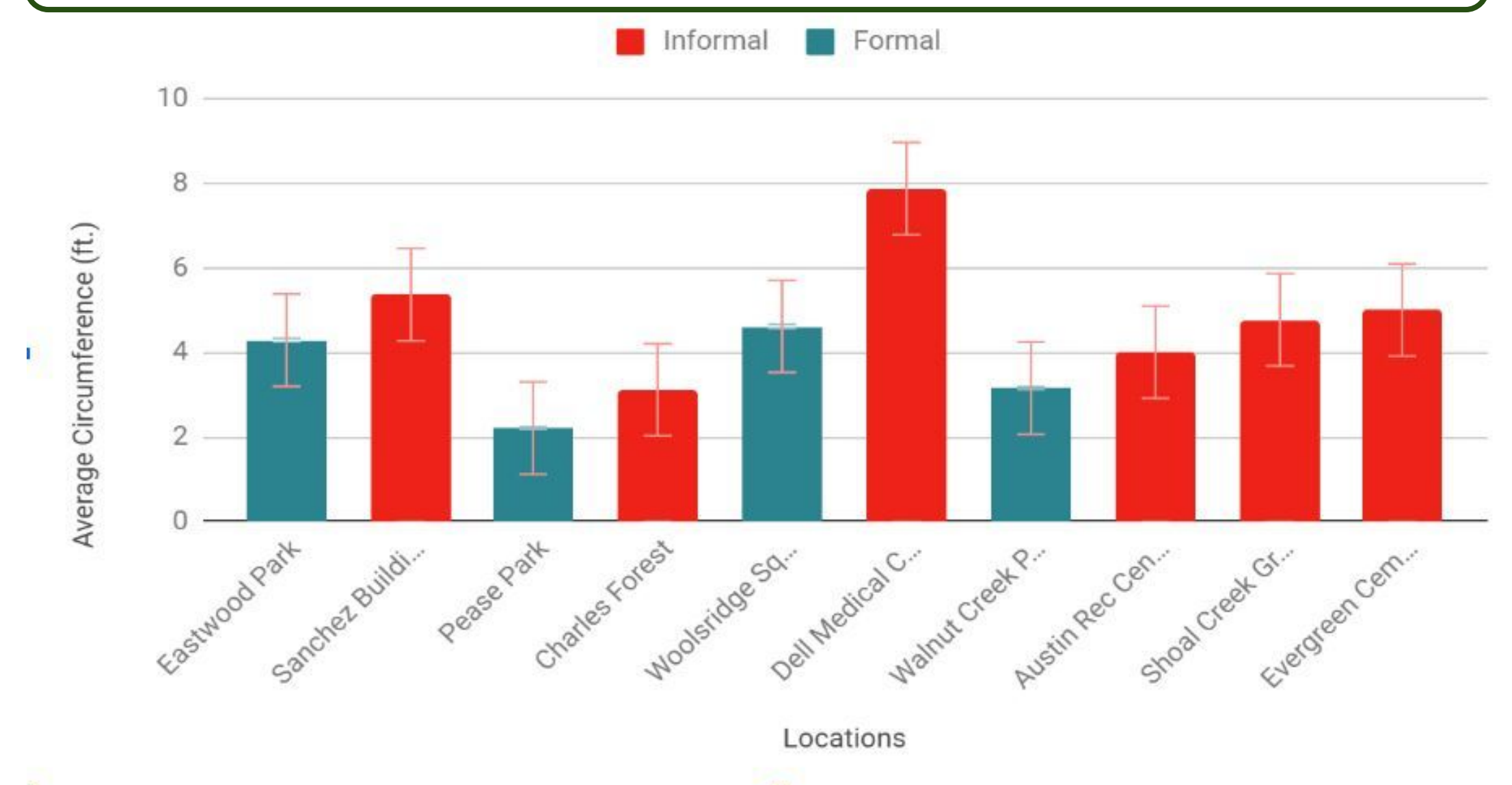
## What data do our students collect?



## FIB Quantification and Identification via qPCR



## Quantification of Ecosystem Services using iTree



## Checking for Naturalized *E. coli* by Testing Creek *E. coli* Death Rates *in vitro*

