

# A Hazards Approach to Increase Awareness and Perceived Relevance of the Geosciences: Preliminary Results from a Project Designed to Enhance Diversity

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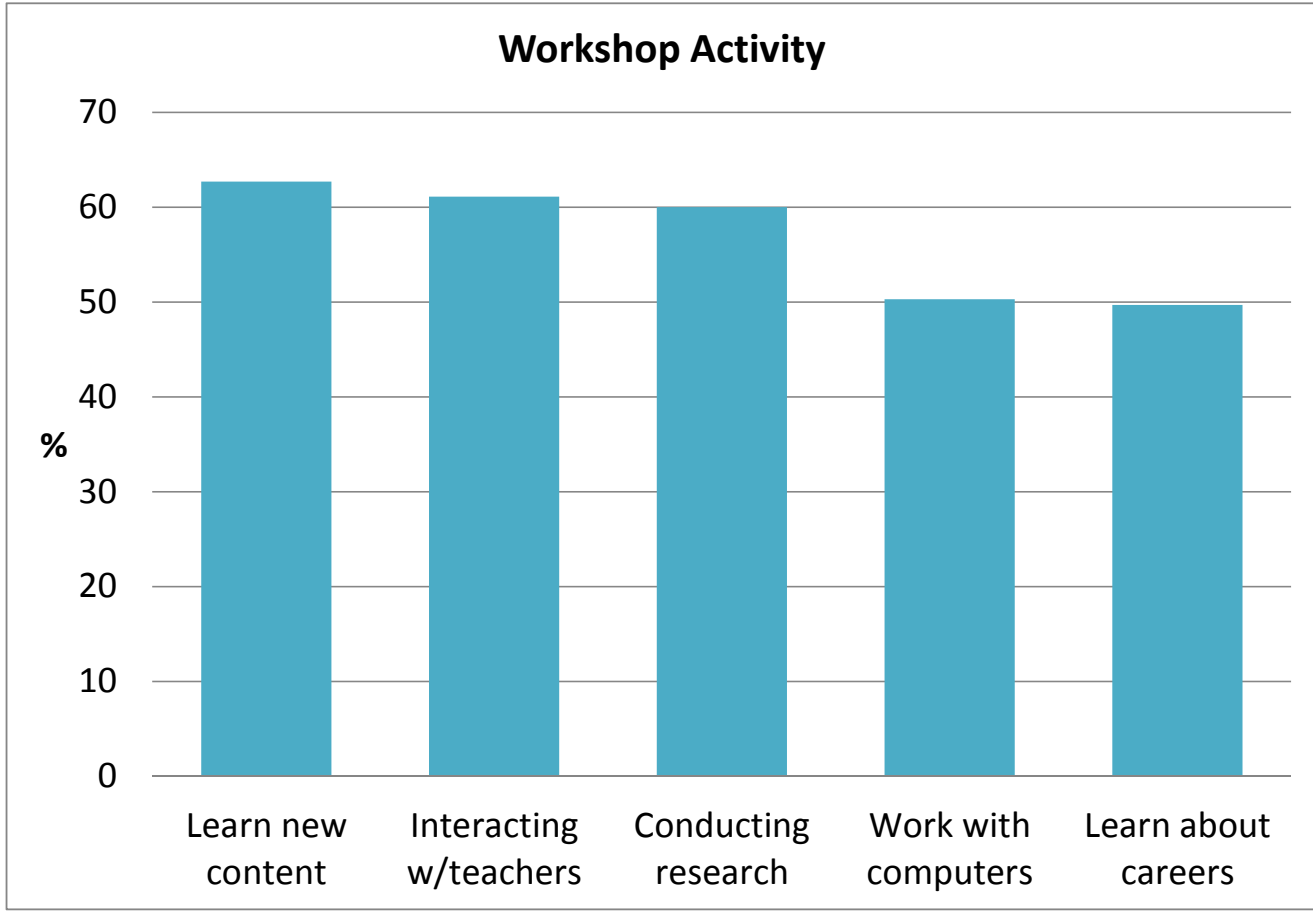
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## Selected Planning Grant Results

Content Area	Teacher Survey Rank	Workshop Survey Rank
Severe weather	1	1
Weather forecasting	2	5
Water quality	3	4
Geologic hazards	4	3
Geospatial technology	5	2
Historical geology	6	5

### K-12 and teacher survey results

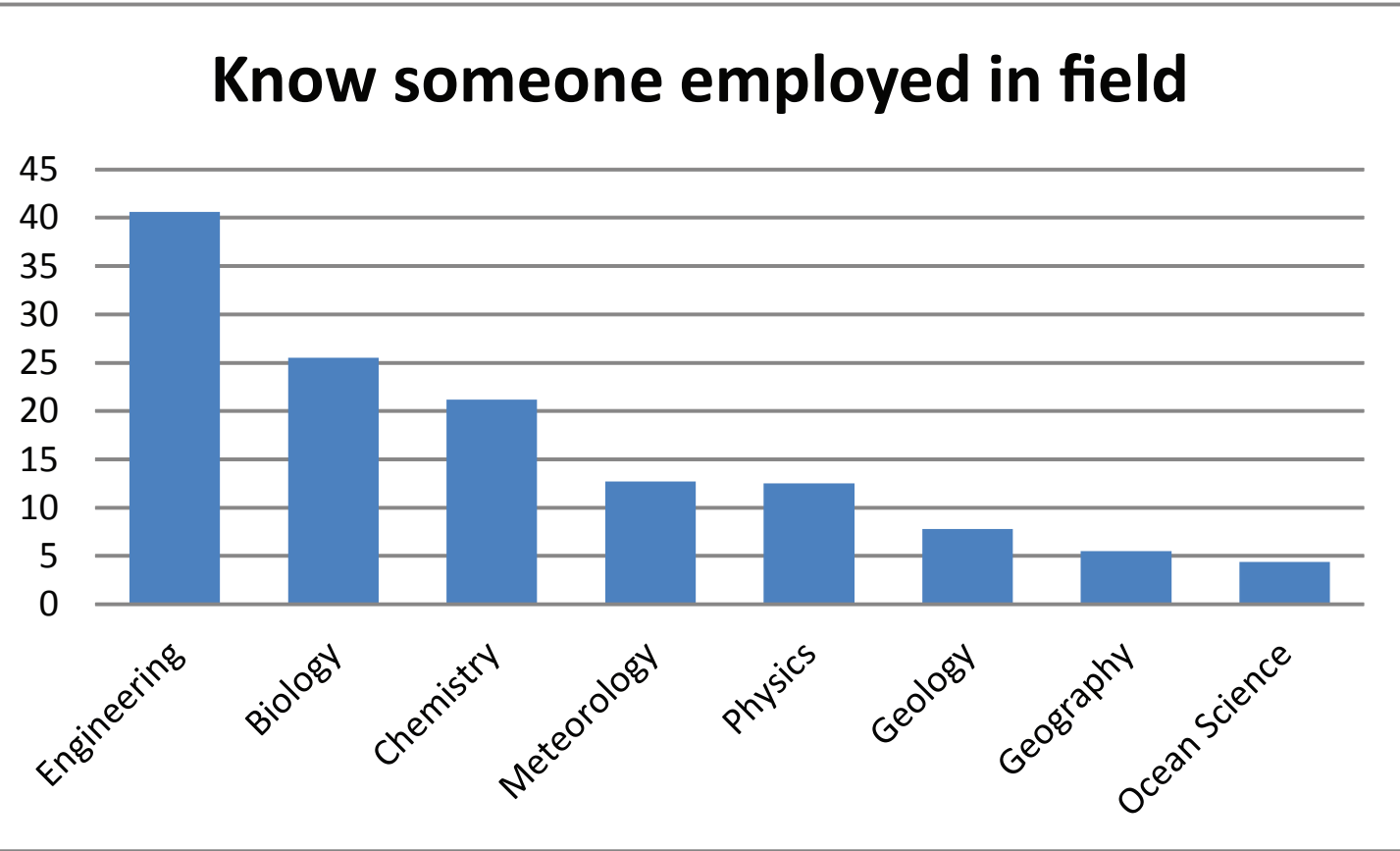
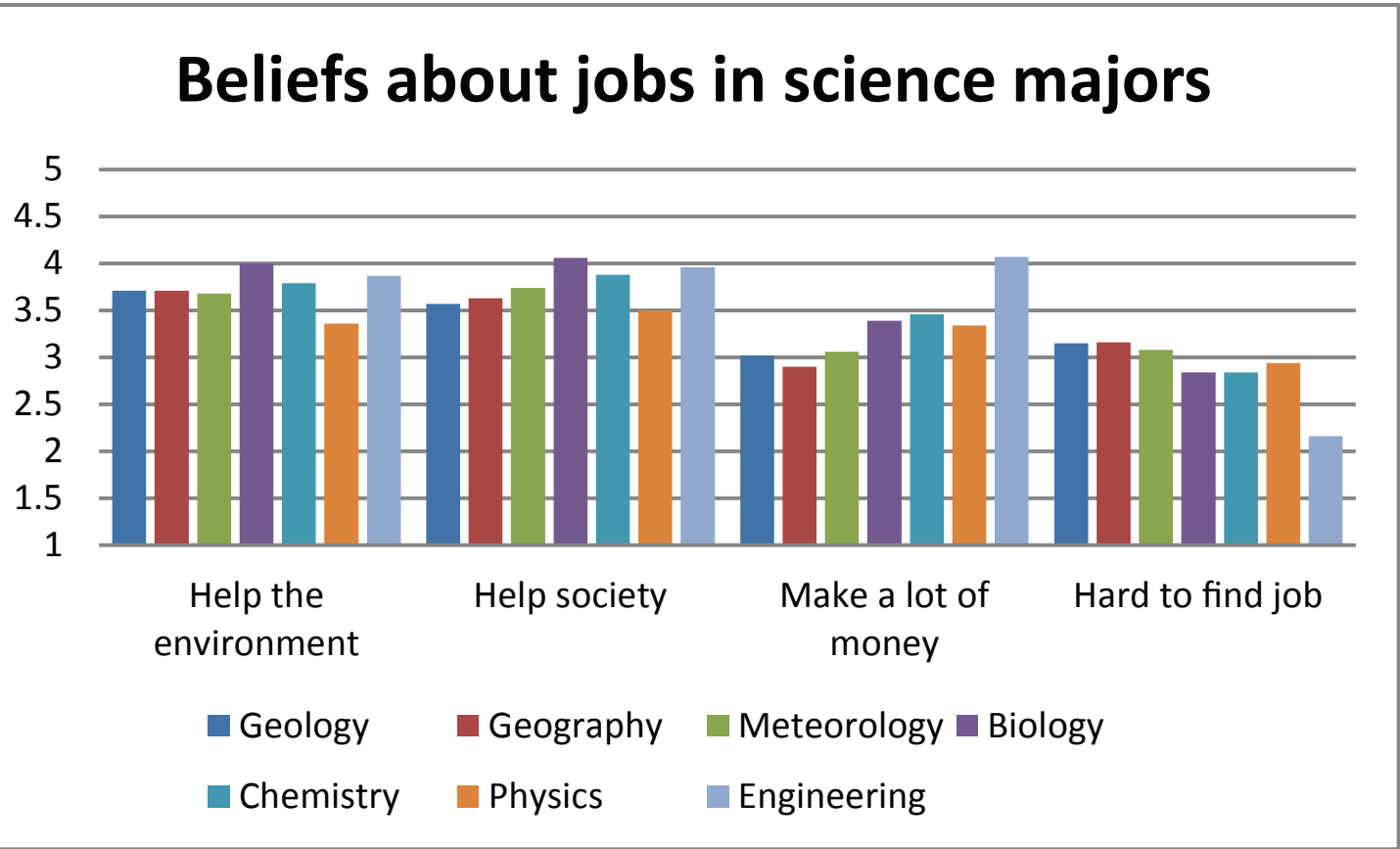
1) Severe weather was rated highest by both teachers and students. Geologic hazards were also rated high among the topics provided.  
2) Other results indicated the best timing for the workshops (Summer, multi-day followed by summer, 1-day) and what workshop activity teachers would prefer (below).



2) The belief that one’s major would help them find a job and a strong interest in it before coming to MSU were the highest chosen determinants of one’s choice of major. After being advised into a science elective, interest in a subject was the next most frequent chosen reason for choosing a science elective.

3) Helping people and helping society were the two highest ranked factors in the students’ ideal career. Students believe most sciences can do this, but geology, geography and meteorology were rated below biology, chemistry and engineering .

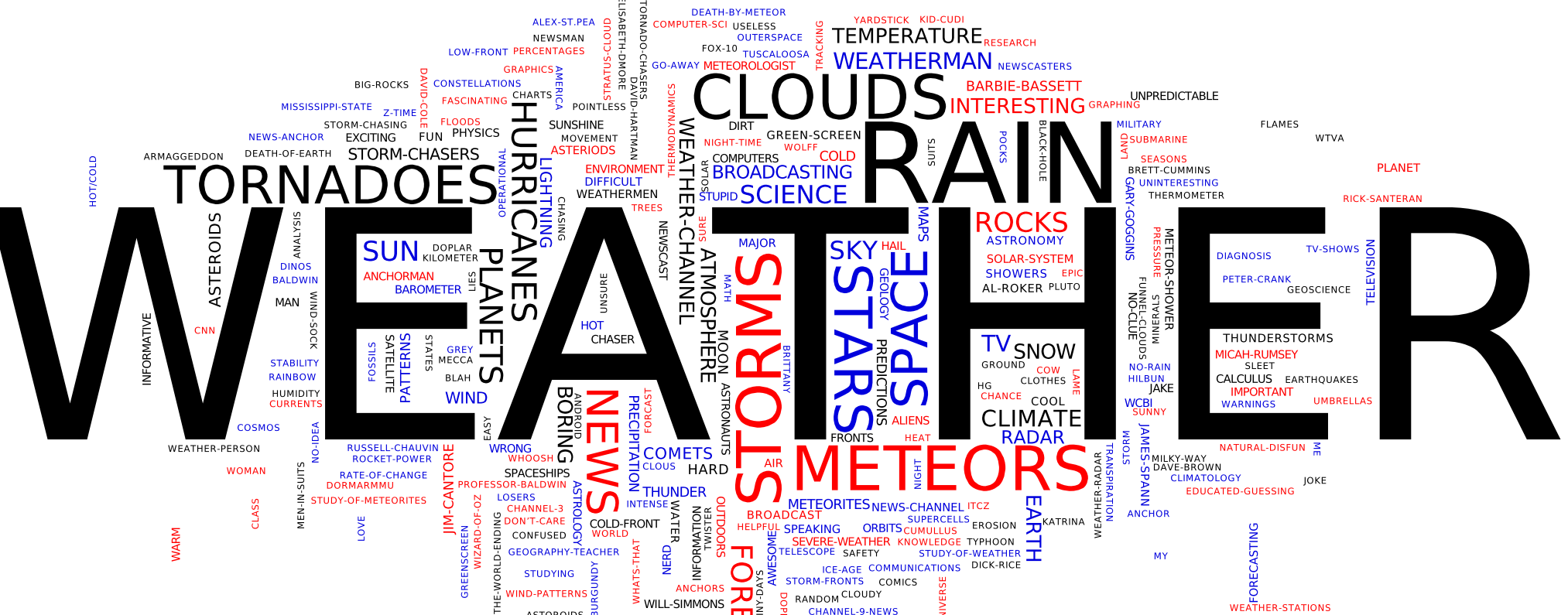
4) There was a significant difference between races in importance of all of the factors of an ideal job. Members of underrepresented groups rated helping people, helping the environment, making good money, prestige and working in an office higher than White and Asian students. The only factor that was (not surprisingly) more important for White and Asian students was working outdoors.



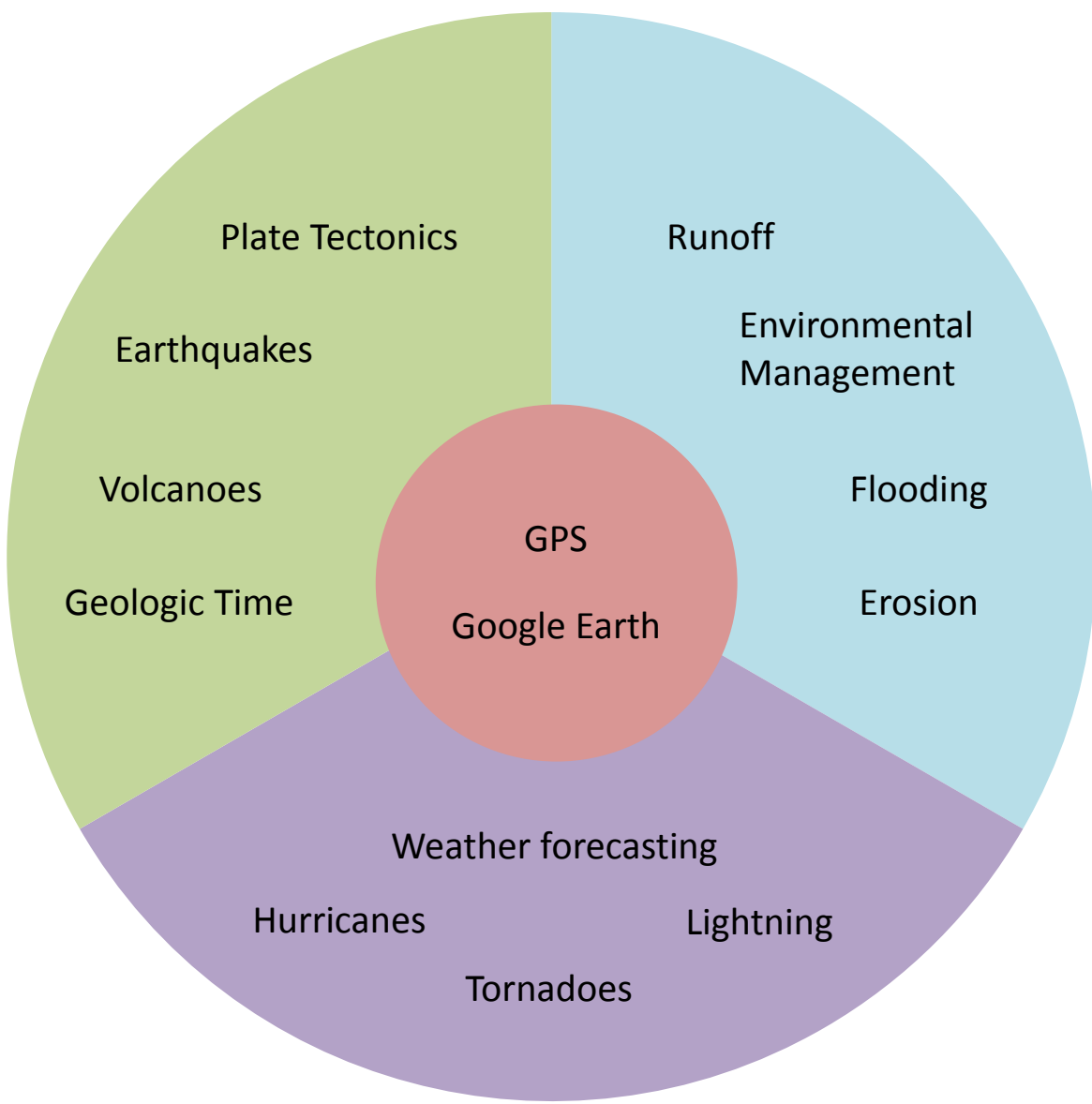
Content Area	Rank among students	Percent students interested	Rank among teachers
Extreme weather like tornadoes and hurricanes	1	72.9	1
Extreme geology like earthquakes and volcanoes	2	54.8	8
How plants and animals depend on the Earth	3	49.9	NA
How Earth has changed in the past	4	42.9	7
Why Earth has mountains, rivers, etc.	5	42.2	6
Identifying rocks, minerals and gemstones	6	41.1	5
What makes water safe/polluted	7	38.5	4
How to forecast the weather	8	37.6	2
Using a computer to map and study Earth	9	35.3	3
Why weather is different in different locations	10	34.2	9
How to be a TV weatherman/woman	11	28.3	10

### Undergraduate survey results

1) Students knew fewer people with a job in a geoscience field than engineering, biology or chemistry. Geology, geography and meteorology grouped below 3 on a 5-point scale in perception that these careers make a lot of money. They were also lower than biology, chemistry and engineering in the belief that these careers help the environment and society.



## Hazards TEAMS Goals and Activities



- 1) To increase K-12 teacher’s Earth Science content knowledge.
- 2) To expose middle or junior high school students to a college campus and laboratories.
- 3) To increase students’ knowledge of Geosciences careers and the path needed to obtain them.
- 4) To increase student interest in Geosciences through engaging lessons in the classroom and fun hands-on activities at MSU.
- 5) To expose these students to individuals with whom they can relate who are currently enrolled in majors such as geosciences or civil and environmental engineering that can lead to careers in the geosciences.

## Selected Activities

- 1) One-week summer workshop in year 1 for middle and junior high school science teachers, “partner teachers,” to increase their Earth Science content knowledge
- 2) Three-day summer workshop for additional science teachers in year 2 led by the partner teachers
- 3) Geoscience Activity Days to expose middle or junior high school students to a college campus and laboratories
- 4) A summer camp for middle or junior high school students to increase student interest in Geosciences through fun hands-on activities at MSU.



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More Information



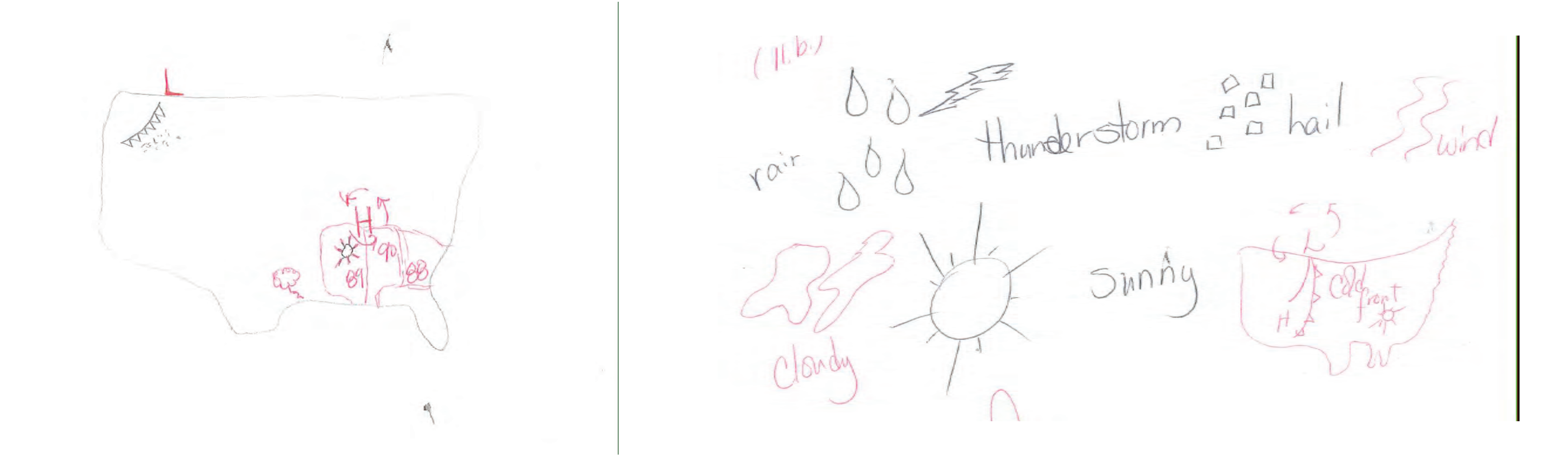
## Preliminary Hazards TEAMS Results

Geoscience attitude questions	Pre	Post
A major in Geosciences requires too many math classes for my students.	1.42	1.25
I think it would be hard to find a job in the Geosciences	1.75	1.42
I don't know much about possible careers in Geoscience.	2.42	1.17
I have a good idea of what Geoscientists do at work.	1.92	2.83

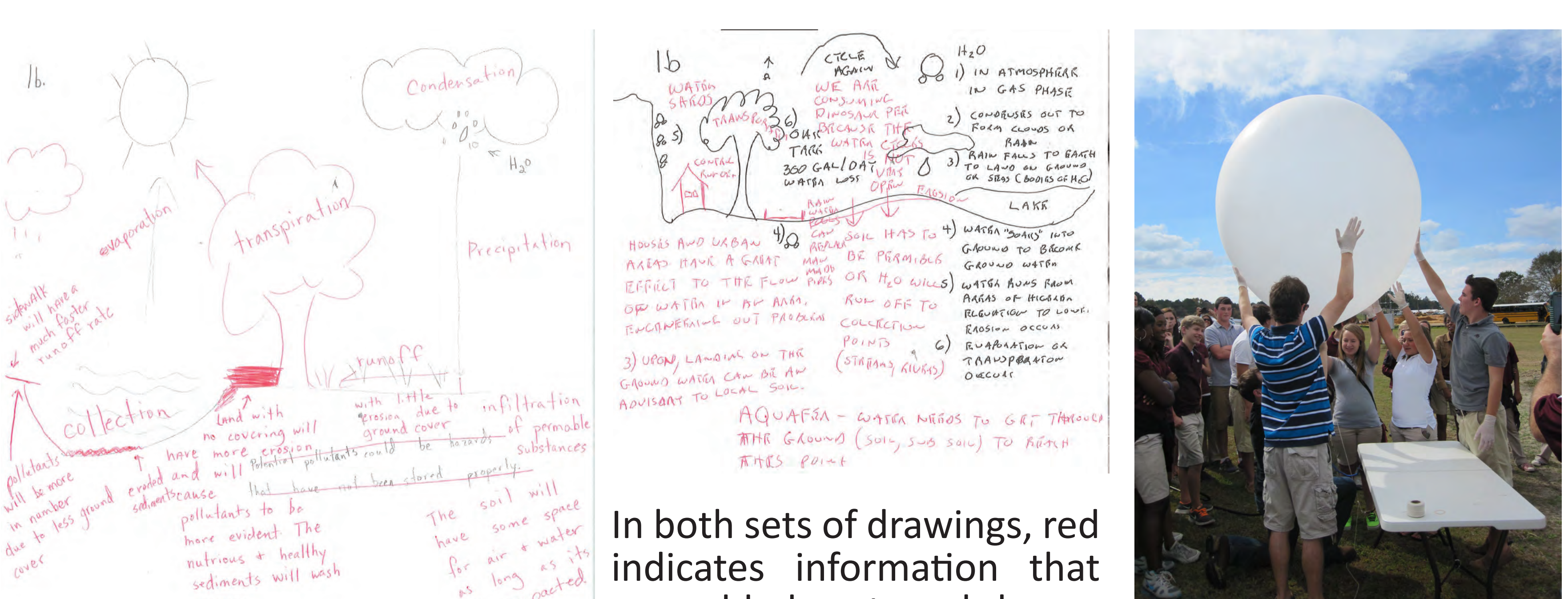
Perceived subject area confidence	Pre	Post
<b>Hydrology</b>		
Confidence in accuracy	2.00	2.42
Confidence in familiarity	1.67	2.83
Confidence in ability to teach	1.75	2.50
Confidence in knowledge	1.42	2.92
<b>Geology</b>		
Confidence in accuracy	1.71	3.00
Confidence in familiarity	1.54	2.92
Confidence in ability to teach	1.58	3.00
Confidence in knowledge	1.67	3.17
<b>Meteorology</b>		
Confidence in accuracy	1.75	2.67
Confidence in familiarity	1.33	2.83
Confidence in ability to teach	1.58	2.67
Confidence in knowledge	1.17	2.92

Perceived personal knowledge	Pre	Post
Relationship of factors that effect an Ecosystem	2.00	2.25
Impact of human activities on the environment, conservation, and efforts to maintain/restore ecosystems.	2.00	2.25
Theories pertaining to the history of the universe and concepts related to the interaction of celestial bodies.	1.25	1.92
History and evolution of the Earth	1.67	2.08
Factors used to explain the geological history of Earth	1.58	2.08
Earth systems relating to weather and climate	1.67	1.92
Earth’s position relative to objects in the universe	1.58	1.83
Plate tectonics and geochemical and ecological processes that affect Earth.	1.42	2.08
Geographic information systems.	1.50	2.08
Earth’s structure, composition, and renewable and nonrenewable resources.	1.58	1.83
Properties and structure of the sun and the moon with respect to the Earth.	1.42	1.83
Connections among Earth’s layers including the lithosphere, hydrosphere, and atmosphere.	1.21	2.33

Use a drawing and text to show a weather map that displays as many meteorological features as possible.



Use a drawing and text to explain how a single water molecule might move between the parts of the Earth that contain air, water, life, and soil (e.g. the water cycle). Be sure to include potential pollution inputs to the water molecule.



In both sets of drawings, red indicates information that was added post-workshop.

