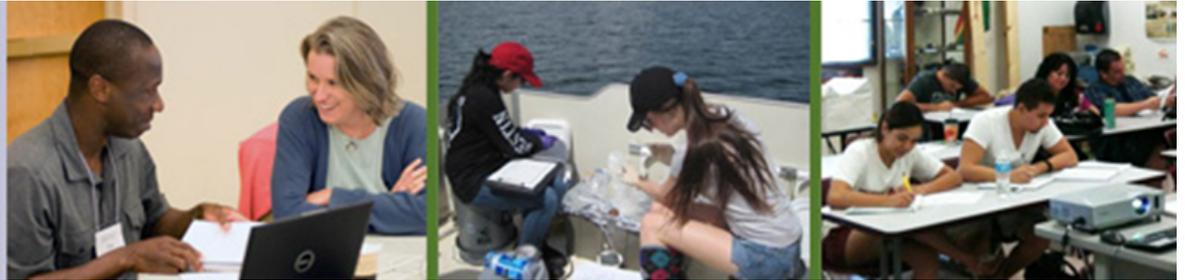


# SAGE 2YC

*Supporting and Advancing  
Geoscience Education in  
Two-year Colleges*



## Supporting and advancing geoscience education at a 2YC: Lessons from the SAGE 2YC – Faculty as Change Agents Project at Delta College

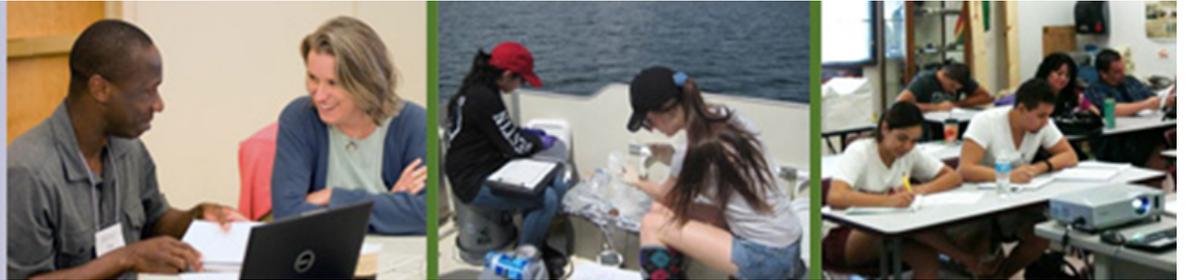
**Andrea Bair**



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*Supporting and Advancing  
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**Introducing the team  
and the project**

**Supporting student success  
and examining data**

**My professional  
transformation**

## SAGE 2YC: Faculty as Change Agents Michigan Change Agent Team (Cohort 2)



**Andrea Bair**, Assistant Professor  
Geology (Physical Sciences Discipline)

- Background in sedimentary geology and paleontology
- Post-doc in college science pedagogy (cognitive focus)
- Teaches geology courses



**Wendy Baker**, Professor  
Biology (Biology Discipline)

- Background in environmental science and ecology
- Government and field experience
- Teaches biology and environmental sciences courses



# SAGE 2YC

<https://serc.carleton.edu/sage2yc/index.html>

## *2YC Faculty as Agents of Change*

► [This site is part of NAGT's Exemplary Sites collection.](#)

### The **Supporting and Advancing Geoscience Education at Two-Year Colleges**

(SAGE 2YC) project and website helps two-year college geoscience faculty implement high-impact, evidence-based instructional and co-curricular practices at their own institutions that will lead to improved STEM learning, broadened participation, and a more robust STEM workforce.

#### What do you want to do?



Support 2YC Students

Provide students with tools to help them be successful in college and beyond.



Sustain Faculty Learning

Find and share materials that provide continued learning opportunities for faculty.



Make Change Happen

Catalyze meaningful, positive change at the departmental, institutional, or regional level.



**Much of our early work has focused on supporting our students' success.**

### **Support academic success**

- **Support the whole student**
- **Develop students' self-efficacy**
- **Learn and support student goals**

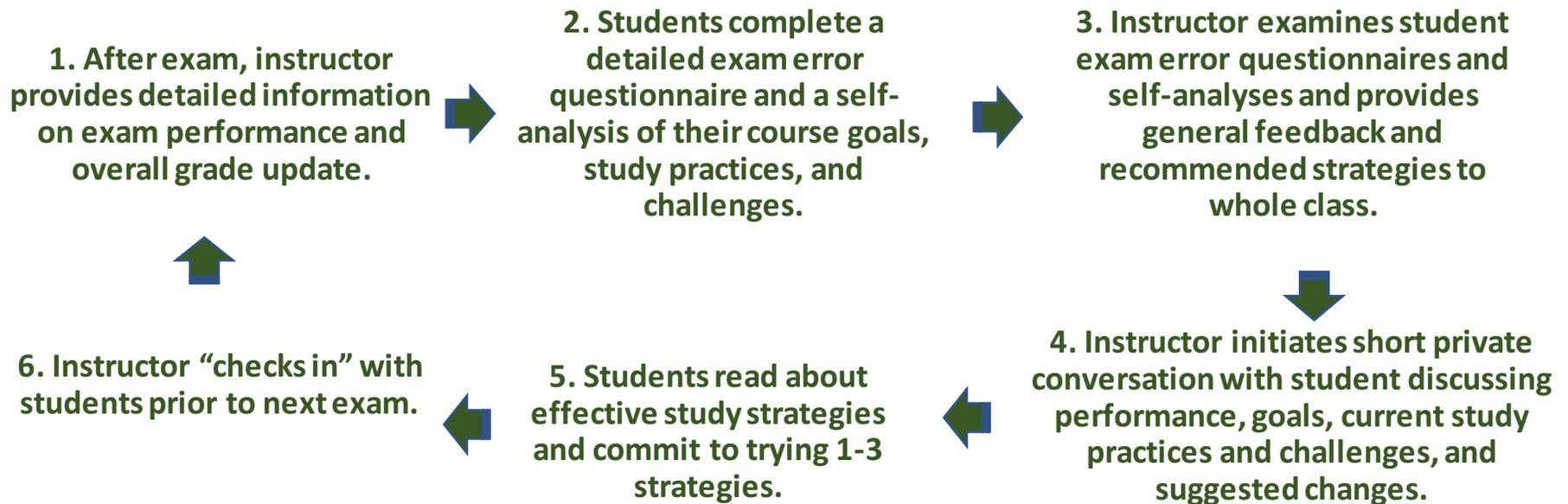
### **Broaden participation in geosciences**

- **Develop students' science identity**
- **Provide diverse examples of geoscientists**
- **Support a validating classroom.**
- **Support inclusive out of class experiences**

### **Facilitate professional pathways**

- **Develop Guided Pathways**
- **Explicit career connections in class**
- **Support inclusive out of class experiences**
- **NEW: leverage 4YC connections to support transfer**

## Exam wrapper promoting student self-efficacy and effective study practices introduced in Physical Geology in phases, 2017-2019.



Seems to promote in students: 1) greater awareness of effective study practices, 2) identification of mismatch between perceived understanding and performance, 3) more likely to initiate conversations with instructor about challenges they face and seek support.

## Ocean Scientist Spotlight #3

Please spend approximately 40-60 minutes responding in writing to the following prompt:



We've discussed challenging aspects of doing ocean research, but haven't focused much on what can be personal challenges for folks conducting the research. Dawn Wright is an oceanographer who studies many areas, including ocean floor features, climate change, and digital mapping (GIS, or Geographic Information Systems.) She has an interesting story about an experience at sea that helped establish teamwork between researchers and support crew that she shared as part of a podcast series. Besides her reputation as an excellent scientist, Dawn also is known for her fun personality, including naming her research lab "Davy Jones Locker", her love of Disney movies, and being a self-described "Lego maniac."

Please [click here](#) to read Dawn's interview, or visit: <http://www.womenoceanographers.org/Defaulte02a.html?pid=6C745379-31FC-4239-A350-6BE73835F0E9&id=DawnWright>

Be sure to click on the links to the right to read Dawn's profile, her background, and about a typical work week for her.

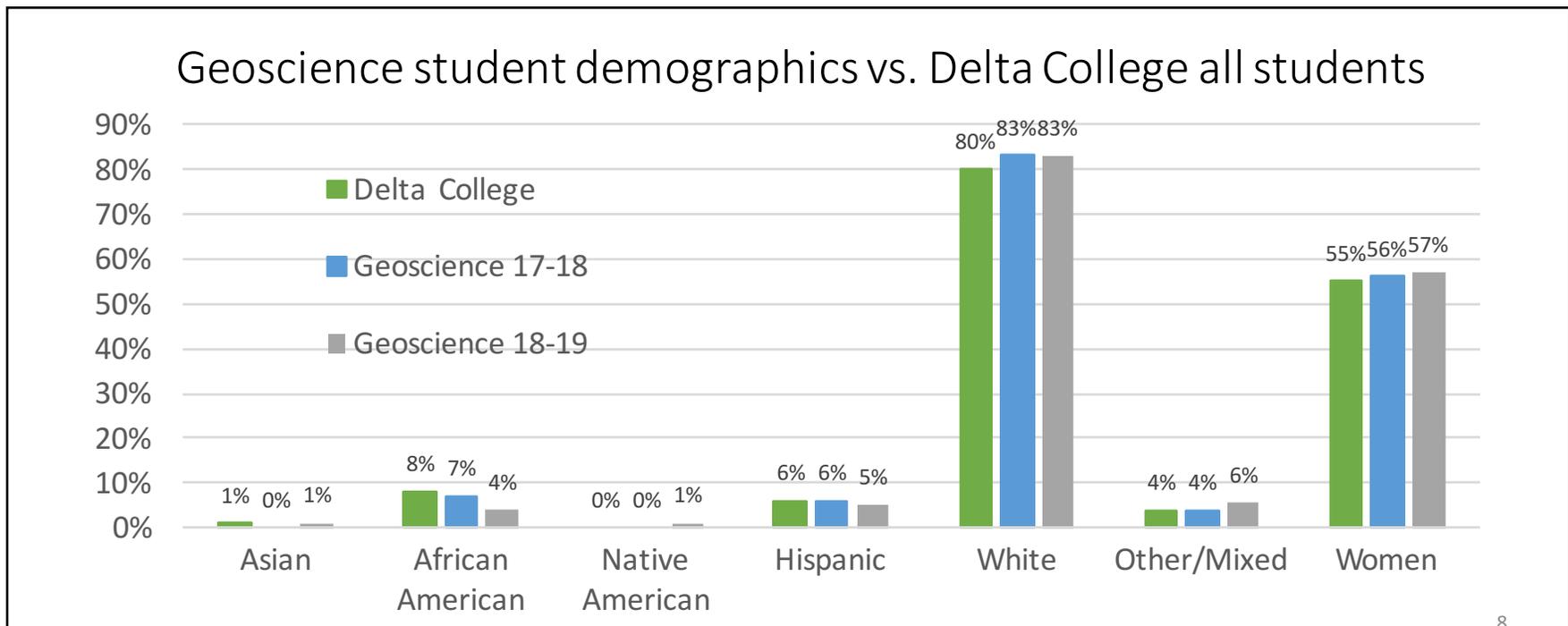
Please also listen to Dawn's story about teamwork on an ocean science research trip in this podcast, starting at 13:36 (click [here](#) or visit: <https://www.storycollider.org/stories/2017/6/9/symbiosis-stories-about-teamwork>)

You may also want to visit her webpage profile (click [here](#) or visit: <http://dusk.geo.orst.edu/bio.html>)

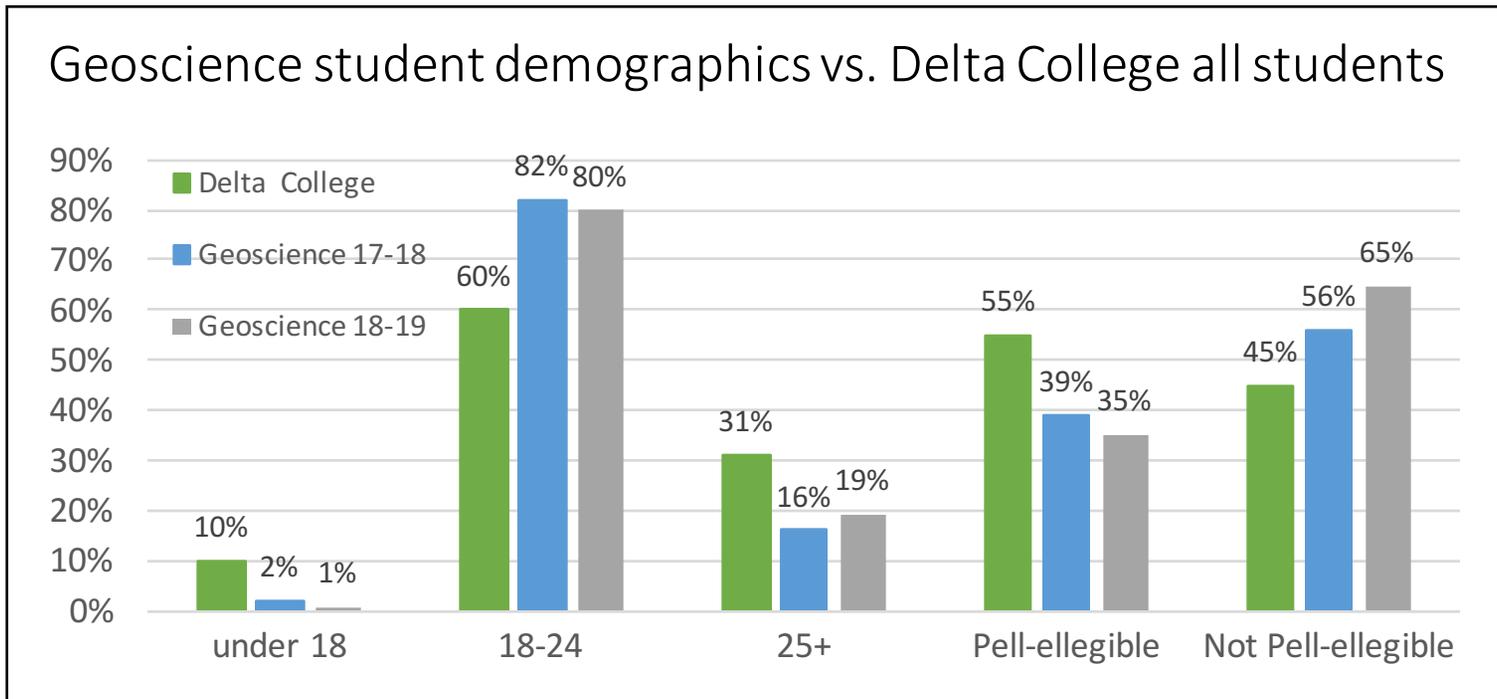
Write a 250-500 word reflection with your responses to what you read. You might discuss:

- 1) What was most interesting or surprising about Dawn's story in the podcast, her hobbies, or her research?
- 2) What is one experience in which you had to go outside of your comfort zone, and/or had to find your place?
- 3) What does this tell you about the types of people that do science and support scientific research?
- 4) What new questions do you have after reading about Dawn, her work, and her life?

## Geoscience (Geology + Environmental Science) students represent the Delta College student population in many demographic characteristics.



**Geoscience students include *more* traditional “college age” and *fewer* Pell-eligible students than Delta College students.**



**Some student groups (African American, "older", and Pell-eligible) are less successful in our geoscience courses\*, although inequities vary by year.**

Physical Geology completion/success rates (C- or better)  
by year and demographics

Year	All students	African American	Hispanic	White	Females	18-24	25+	Pell-eligible
2017-2018	81%	50%	87%	82%	85%	82%	61%	82%
2018-2019	80%	(78%)	(75%)	80%	80%	82%	70%	76%
<b>OVERALL SUCCESS</b>	<b>81%</b>	<b>61%</b>	<b>83%</b>	<b>81%</b>	<b>83%</b>	<b>82%</b>	<b>64%</b>	<b>80%</b>

Shading indicates

- More than 20 students
- 10 -20 Students
- Fewer than 10 students

\*% of total students

**This data challenges us to consider how course structure (as well as specific teaching and learning strategies) can impact student success, and how we can support all students more effectively.**

## Physical geology students taught by a *change agent* utilizing strategies promoting students success had greater course success

Instructor	Number of sections 17-18	Students enrolled	"C-" or Higher
Change agent	5	106	88%
All others (3)	5	105	73%
<b>TOTAL</b>		<b>211</b>	<b>81%*</b>

Instructor	Number of sections 18-19	Students enrolled	"C-" or Higher
Change agent	5	104	86%
All others (1)	2	44	68%
<b>TOTAL</b>		<b>148</b>	<b>80%*</b>

\*% of total students

Instructor	Number of sections 17-19	Students enrolled	% students "C-" or Higher
Change agent	10	210	<b>87%</b>
All others (3)	7	149	72%
<b>TOTAL</b>		<b>359</b>	<b>81%*</b>

**Challenge: how to promote more effective teaching practices and support non-change agent faculty in making changes (including adjuncts.)**

# Building a regional network of faculty teaching with environmental connections at 2YC – First Steps



## 15 faculty (12 at 1<sup>st</sup> workshop) from 9 2YCs:

Delta College  
Kalamazoo Valley CC  
Lansing CC  
Mott CC  
Muskegon CC  
North Central Michigan College  
Oakland CC  
St. Clair County CC  
Washtenaw CC

## Subjects/Courses taught in:

Chemistry: 2  
Earth System Science: 3  
Environmental Science: 5  
Geology: 9  
Microbiology: 2  
Natural Science: 1  
Ocean Science: 2

## Full-time/Part-time/Adjunct:

Full-time permanent: 12  
Full-time temporary: 1  
Adjunct: 2

## SAGE 2YC has been transformative to my professional life and identity!



### Changing relationships

- Embrace a "Pedagogy of Kindness\*"
- Share own experiences and path; include human side of doing science
- High expectations, scaffolded support for the "hidden curriculum"

*Funding for travel support for student field and other out of class experiences*



### Embracing a mentor identity

- Planning 2<sup>nd</sup> regional workshop
- Partnering with Faculty Center for Teaching Excellence to provide PD workshops for all faculty



### Confidence to be a leader

- New leadership roles at college level
- Faculty coordinator of STEM outreach program

\* Excellent reflective essay at <https://hybridpedagogy.org/pedagogy-of-kindness>

**A participant's view of what makes SAGE 2YC successful:**

***These PEOPLE!***



## A participant's view of what makes SAGE 2YC successful:

### Nature of Professional Development:

- Targeted
- Practical
- Sustained
- Research-based
- Empowering
- Self-reflective



### How do they do it? (I don't know!)

### Goals and Focus of Professional Development:

- Includes pedagogy, change theory, and leadership skill-building.
- Emphasizes connections between pedagogic goal, pertinent research, variety of implementation strategies at different levels.
- Provides support through communities of practice

### **"Practice what we preach"**

**Meet participants where they are,  
Emphasize growth mindset,  
Appreciate context,  
Set goals at low to high levels  
(always a component of challenge and slight  
discomfort – "zone of proximal learning"?),  
Kindness and encouragement always!**