

FOUNDATIONS

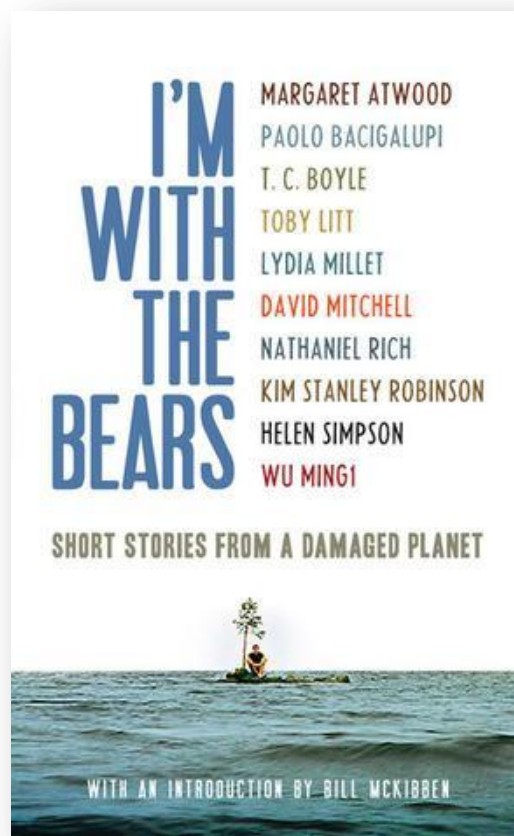
NEWSLETTER OF THE GEO2YC DIVISION OF THE NATIONAL ASSOCIATION OF GEOSCIENCE TEACHERS
 Volume VI, Issue 2: May 2017

Cli-Fi @ 2Y: Learning Geoscience Through Climate- Change Fiction

By **Steve Winters & Elizabeth Trobaugh**
Holyoke Community College, Holyoke, MA

Responding to the challenges of teaching geoscience in the liberal arts setting, we have developed an interdisciplinary course that fulfills both lab science and English graduation requirements. At Holyoke (Massachusetts) Community College, we team-teach a course called “Cli-Fi: Stories and Science of the Coming Climate Apocalypse.” “Cli-fi” refers to climate-change fiction, a now-popular subgenre of science fiction. Our course combines introductory literature and composition with first-year physical geology (including laboratory and field exercises). With interdisciplinary/thematic content and a seminar-style learning environment, our course attracts a variety of students -- science majors, English majors, environmentalists, science fiction fans, etc. We read Paolo Bacigalupi’s cli-fi novel *The Windup Girl* and shorter works from recently published anthologies. Standard college-level geology texts and excerpts from science magazines and journals complement our literary readings. To help students focus on climate change issues and themes, we use a “climate-change stress index” that we have developed to tabulate and categorize climate change impacts. For each story we read, students locate and describe several features of the climate-changed world, such as adaptation/mitigation, breakdown in civilization/social order, climate imbalance/disorder, extinction, illness/disease, and

resource scarcity. For the final project, students write their own original cli-fi stories using the storytelling techniques and the climate change science they have learned and researched. Our students present their projects at an end-of-semester cli-fi/science mini-conference on campus.

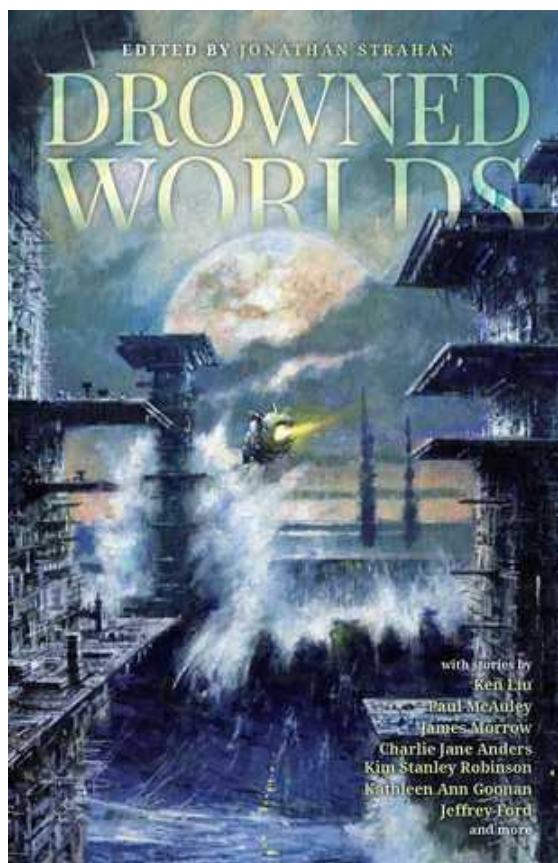


Published by Verso in 2011, this text compiles works by a number of Cli-Fi big-hitters.

Learning in Communities at Holyoke Community College

Holyoke Community College (HCC) has a well-established history of interdisciplinary learning. For over 30 years, our college has supported and promoted learning communities, courses that integrate two disciplines united by a shared theme. Two professors from different divisions combine

their curricula and join in one classroom to deliver a course that invites students to actively participate in a community of learning where the professors, too, are learning each other's disciplines alongside the students. Our course fulfills three graduation requirements for the largest degree program HCC offers, the Liberal Arts and Sciences Associates Degree: college composition II, a lab science, and integrative learning. While also teaching the principles of good writing, research, and using supporting evidence, our course provides students with a first-year geology curriculum, including labs and field exercises. Labs and field trips offer particularly rich climate-science learning opportunities: trips to a local natural history museum and dinosaur trackways to study species extinctions face-to-face; visits to a local community garden to assist rain-garden installation and other green-infrastructures to conserve and enhance our threatened water supplies.



What is *Cli-Fi*?

Cli-fi is a term coined by climate change blogger and activist Daniel Bloom to describe an emergent sub-genre of science fiction. Modelled after the assonance of sci-fi, cli-fi refers to a body of literary fiction that is responding to anthropogenic global climate change. As cli-fi novelist Claire Vaye Watkins says, cli-fi brings the imagination to the problem-solving equation. We use literature to ignite students' sense of wonder and curiosity. Some believe that literature, in fact, can play a role in galvanizing people's attention and interest in the changes occurring across the globe. Some even believe that climate-change fiction – i.e., “cli-fi” – can motivate people to take action to protect the planet. For example, articles in [The Atlantic](#), [The New York Times](#) and the Natural Resources Defense Council magazine [On Earth](#) have all recently suggested that cli-fi is capturing a growing awareness and concern about environmental degradation, and these works of fiction and

imagination are pushing people to care (see also this piece in [Reuters](#)).

Some popular cli-fi novels include *The Year of the Flood* (Margaret Atwood); *Science in the Capital Trilogy* and (just out) *New York 2140* (Kim Stanley

Robinson); *The Windup Girl* and *The Water Knife* (Paolo Bacigalupi). Some of the best cli-fi storytelling takes the form of short fiction. Some anthologies we've used are *I'm With the Bears* (edited by Mark Martin, Verso); *Drowned Worlds* (edited by Jonathan Strahan, Solaris); and *Loosed Upon the World* (edited by John Joseph Adams, Saga).

It All Begins with a Story ... and the Climate-Change Stress Index

For our course, we have developed a tool we call the Climate-Change Stress Index (CCSI) to help students identify the evidence of climate-change impacts in the fictional setting of each story. This stress-index technique helps us use cli-fi's settings, plots, and characters not

just as jumping off points for general discussion but as windows through which students get an integrated view of science and fiction in one lesson. For example, when reading *The Windup Girl*, students notice that resource scarcity, specifically the scarcity of fossil fuels, not only propels the plot but also leads to technological regression: in the world Bacigalupi has created, machines run on animal and human power, rather than on electricity or fossil fuel. This adaptation has the benefit of reducing carbon emissions in a runaway greenhouse atmosphere, but it also places a premium on calories in a climate-changed world of extinctions and agricultural plagues. Identifying real climate science in a literary text motivates students to take the projected outcomes of climate change fiction seriously and to engage critical thinking and research skills to assess a story's verisimilitude. The CCSI marks the beginning of the students' critical analysis of the climate fiction and acts as a window through which students can get an integrated and in-

depth view of fiction and science in one lesson. The CCSI lists nine climate-change impacts on society and on the natural world:

- ☐ Adaptation/mitigation
- ☐ Breakdown in infrastructure
- ☐ Breakdown in civilization/social order
- ☐ Climate imbalance/disorder
- ☐ Ecosystem imbalance – flora and fauna
- ☐ Illness/disease
- ☐ Positive/negative feedbacks

- ☐ Regression (psychosocial, biological, technological, etc.)
- ☐ Resource scarcity

For example, with student contributions, the CCSI for Robert Silverberg’s “Hot Sky” (from *Loosed*), looks like the following:

Instructions: Please contribute one factor (an example and a brief quote with page number). Find passages that illustrate the following themes and features of the climate-changed world:

| Stress factor/impact | Example from the text -- record a brief quote, with page number, and bullet point observation(s). | Contributor (put your initials here) |
|--|---|--------------------------------------|
| Adaptation/mitigation | Robert Silverberg writes, “The shot of screen he’d taken at dawn still simmered like liquid gold in his arteries. He could almost feel it as it made its slow journey outwards to his capillaries and went trickling cozily into his skin, where it would carry out the daily refurbishing of the body armor that shielded him against ozone crackle and the demon eye of the sun” (203). <ul style="list-style-type: none"> This shows how humans had to create a new method of protecting themselves against the sun’s UV rays. | KS |
| Breakdown in infrastructure | The narrator writes, “The berg was due to go to San Francisco, which was in a bad way for water just now. The whole west coast was. There hadn’t been any rain along the Pacific seaboard in ten months” (205). <ul style="list-style-type: none"> Community water supplies or stocks were very low. Large west-coast cities were desperate for fresh water. | SW |
| Breakdown in civilization/social order | When Carter thinks to himself, “The idea of dropping everything to deal with the problems of some strange ship didn’t sit well with him. He wasn’t paid to help other captains out, especially Kyocera-Merck captains. Samurai Industries wasn’t fond of K-M these days. Something about Gobi reclamation contract, industrial espionage, some crap like that. Besides, he had a berg to deal with. He didn’t need any other distractions just now” (208). <ul style="list-style-type: none"> Where he had to choose between the difficult decision of helping out Calamari Maru or finishing his job to deliver this berg that was melting at a quick rate. | AA |
| | Carter says, “Who had asked for any of this, the heavy green sky, the fiery air, the daily need for Screen, the million frantic improvisations that made continued life on Earth possible? Not us. <i>Our great-great-grandparents had, maybe, but not us. Only there not here to know what it’s like, and we are</i> ” (219). <ul style="list-style-type: none"> This passage shows how the world’s climate has drastically changed over time and also what was necessary in order to adjust to the warming of the Earth. | JEC |
| Climate imbalance/disorder | The narrator writes, “Rennet was maintenance/operations, a husky, broad-shouldered little kid out of the mid-west dust-bowl” (207). <ul style="list-style-type: none"> The North American Mid-West in 2133 is suffering a dust-bowl environment reminiscent of the 1930’s | EB |
| Ecosystem imbalance – flora and fauna | The narrator writes. “The heart of the ship was a vast tank, a huge squid-peeling factory occupying the whole mid-deck” (211). <ul style="list-style-type: none"> The author is implying that all other top predators are gone – leaving only squid. | SW |

Table continues on next page

| Stress factor/impact | Example from the text -- record a brief quote, with page number, and bullet point observation(s). | Contributor (put your initials here) |
|--|--|--------------------------------------|
| Illness and disease | Silverberg writes, “It was midmorning. The shot of Screen he’d taken still simmered like gold in his arteries” (203). <ul style="list-style-type: none"> UV radiation is so intense in this climate changed world of 2133, humans must inject sun screen intravenously. | SW |
| Positive/negative feedbacks | Silverberg writes, “It was a cock-eyed place to be trawling for icebergs. But the albedo readings said there was a berg somewhere around there, and so the <i>Tonopah Maru</i> was there too” (203). <ul style="list-style-type: none"> One would not expect high albedo readings in the middle of the ocean. Low albedos would indicate ice melting conditions (a negative feedback). | SW |
| Regression (social, technological, etc.) | Silverberg writes, “This was open territory, pretty much a lawless zone where old-fashioned piracy was making a terrific comeback” (207). <ul style="list-style-type: none"> This passage clearly shows regression in the fact that they say they are going to bring piracy back which we all know was practiced very long ago. | AK |
| Resource scarcity | The narrator says, “With the one-time farming heartland of North America and temperate Europe now worthless desert, and the world dependent on the thin, rocky soil of northern Canada and Siberia for its crops, harvesting the sea was essential” (212). <ul style="list-style-type: none"> It’s clarifying that the U.S. can no longer harvest for itself, so the ocean is their only real bet for survival. | JC |
| | Silverberg writes, “Carter said, ‘Start getting the word around. That berg’s down here, south-southwest. We get it in grapple tomorrow, we can be in San Francisco with it by a week from Tuesday.’ ‘It didn’t melt between Antarctica and here, it’s not gonna melt between here and Frisco. Get a move on, man. We don’t want LA coming in and hitting it first’” (205). <ul style="list-style-type: none"> This passage emphasizes the need for icebergs to humans, particularly in San Francisco. Along with the fact that it’s a competition to the possession of them against neighboring cities. | EB |

Science-story Intersects

Once CCSI impacts have been tabulated, students are ready to dig deeper into the text using a technique we call story-science intersections: a series of probing and/or leading science questions that critically explore the science that underlies the narrative. Intersects also provide a model for the final cli-fi science project.

Intersects are essentially fact-finding/fact-checking activities that ask believability questions:

- *What is the science, if any, that underlies the fiction?*
- *Is the science used in a believable way?*
- *Does the story seem plausible?*
- *Does the story have verisimilitude?*

For example, following a reading of Paolo Bacigalupi’s story “[The People of Sand and Slag](#),” we ask students to dig deeper into the following story excerpts:

Excerpt from “The People of Sand and Slag”

We ate sand for dinner. Outside the security bunker, the mining robots tumbled back and forth, ripping deeper into the earth, turning it into a mush of tailings and acid rock that they left in exposed ponds when they hit the water table, or piled into thousand-foot mountains of waste soil. It was comforting to hear those machines cruising back and forth all day. Just you and the bots and the profits, and if nothing got bombed while you were on duty, there was always a nice bonus.

After dinner we sat around and sharpened Lisa’s skin, implanting blades along her limbs so that she was a like a razor in all directions . . . Lisa laughed and took a spoonful of tailings. “We can eat anything. We’re the top of the food chain.”

“Weird how it [the dog] can’t eat us.”

“You’ve probably got more mercury and lead running through your blood than any pre-weeviltech animal ever could have had.”

“That’s bad?”

“Used to be poison.”

“Weird.”

Intersects from “The People of Sand and Slag”:

Text: “We ate sand for dinner.”

Example questions:

- *How is it possible any living thing could “eat” sand or rock? Have you heard of lichens?*

Text: “Outside the security bunker, the mining robots tumbled back and forth, ripping deeper into the earth, turning it into a mush of tailings and acid rock that they left in exposed ponds when they hit the water table or piled into thousand-foot mountains of waste soil.”

Example questions:

- *Where does the acid come from?*
- *Can you describe the geochemistry of the tailings ponds?*
- *How would you describe the “waste soil”? Is it a soil at all? How is the presence of acid related to absence of normal vegetation?*
- *How are the soils of “The People of Sand and Slag” similar to the soils on the Moon? On Mars?*

Intersects from “The People of Sand and Slag”:

Text: “We can eat anything. We’re the top of the food chain.”

Example question:

- *But if you can eat anything, aren’t you on the bottom of the food chain?*

Text: “You’ve probably got more mercury and lead running through your blood than any pre-weeviltech animal ever could have had.”

“That’s bad?”

“Used to be poison.”

“Weird.”

Example questions:

- *What’s “weeviltech”? (A central concept in Bacigalupi’s imagined world. We generally define it as genetically modified organisms or cellular organelles designed to catalyze and metabolize inorganic, otherwise poisonous*

foodstuffs such as native metals and minerals.)

- *What other (real!) organisms may also have adapted weeviltech-like metabolisms?*
- *In what way do extremophiles have their own version of weeviltech?*
- *Where on Earth today or in the geologic past have we seen organisms that possess a kind of weeviltech referred to in “The People of Sand and Slag”?*

The Cli-fi Final Short-Story Project and End-of-Semester Celebration

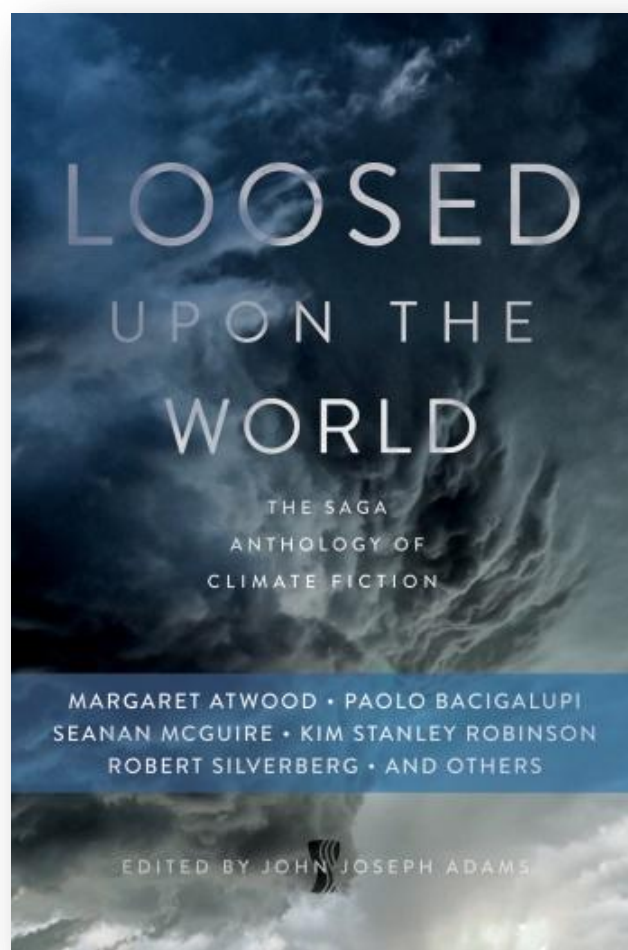
“An imaginary garden with real toads in it.”

— Marianne Moore

“Cli-fi is where art meets science, where data meets emotions, and where science meets art, too.” —

Daniel Bloom

As the culmination of the semester, we ask students to write their own cli-fi short stories. We encourage them to explore any of the ideas, themes, settings, climate/Earth science concepts that have come up in class or that they’ve generated in their imagination.



While climate change often brings visions of dystopian settings and situations, we have also read stories that offer more hopeful visions of problem-solving and adaptation. In their stories, we want students to explore how humans might adapt to a new environment, a new reality. On the final day of the semester, we celebrate each student's final cli-fi science project and short story with a reception, including refreshments and invited guests (faculty, former cli-fi students, and administrators). Our students never fail to amaze us with the stories they create out of science and imagination.

Summary/conclusion

We are fortunate at HCC to have a tradition of innovative, interdisciplinary learning that has allowed us to develop a rich climate-science curriculum centered on the popular literary sub-genre of cli-fi. It is our belief that the best science and technology are always creative, and cli-fi helps add the imagination to the geoscientist's toolkit.

Our curriculum combines the techniques of critical thinking and textual analysis from the sciences and the humanities. The fictional settings and scenarios of cli-fi expand the imagination and show geoscience principles in a fictional context, inviting students to confront the role of humanity in a climate-changed world and perhaps inspiring students to learn more about how humanity might cultivate a more cooperative relationship with the Earth.

Works Cited

- Adams, Joseph, editor. *Loosed Upon the World: the Saga Anthology of Climate Fiction*. Saga Press, 2015.
- Bacigalupi, Paolo. "The People of Sand and Slag." *Windupstories*, 15 Apr. 2017, windupstories.com/books/pump-six-and-other-stories/people-of-sand-and-slag/.
- Bacigalupi, Paolo. *The Windup Girl*. Night Shade Books, 2015.
- Martin, Mark, editor. *I'm With the Bears: Short Stories from a Damaged Planet*. Verso, 2011.
- Silverberg, Robert. "Hot Sky." *Loosed Upon the World: the Saga Anthology of Climate Fiction*, edited by Joseph Adams, Saga Press, 2015, pp. 203-228.
- Strahan, Jonathan, editor. *Drowned Worlds: Tales from the Anthropocene and Beyond*. Solaris, 2016.



Outstanding Adjunct Faculty Award Spring 2017 Honoree: Wendi J. W. Williams

By Karen M. Layout

Reynolds Community College, Richmond VA

The OAFA Committee is excited to recognize Wendi J. W. Williams of NorthWest Arkansas Community College as our Spring 2017 Honoree. Wendi teaches both General Geology and Physical Science lab courses at NWACC, in face to face and hybrid formats. She also has maintained an active role in leadership of the geoscience community, with a current appointment as the Geo2YC Division Secretary/Treasurer.



Wendi engaging elementary school pupils during a recent STEM outreach event

In a self-nomination, Wendi writes, “I have been contributing as an Adjunct Faculty for multiple 2YC and 4YC institutions for many years. I am now in my 9th year with NorthWest Arkansas Community College and University of Arkansas-Little Rock. Prior to that I have been adjunct with Austin Community College and North Harris College (now part of the Lone Star System in Houston). In addition to dedicating my time to bringing better, nationally-informed geoscience education to my community college students, I have maintained both a local and national presence through committee and board service (e.g. NAGT/Geo2YC, NWACC Faculty Senate, IAGD Executive Counselor, Triangle Coalition for STEM Education), participation in grants and fellowship reviews, and mentoring to fellow faculty (e.g. adjuncts at my current 2YC, as many are new graduates and not aware of resources for teaching or institutional processes and opportunities).”

Wendi, we are grateful for your service to the Geo2YC Division and appreciate all you do for your students! We are pleased to support Wendi with a one-year complimentary membership to the NAGT Geo2YC Division, and she will be entered into the pool of honorees under consideration for the Annual Outstanding Faculty Award, which is sponsored by a professional development stipend of up to \$750 from Pearson Publishing.

To our readership—tell us about yourself or your adjunct colleagues! What wonderful ideas and strategies are you bringing to your corners of the geoscience world? Please complete an Outstanding Adjunct Faculty Award nomination today:

http://nagt.org/nagt/divisions/2yc/oafa_nomination.html



**Nominate your Outstanding
Teaching Assistants**

<http://nagt.org/nagt/students/ta.html>

Deadline is June 15th!

2YC Faculty as Change Agents

By the SAGE 2YC Project Team

Dear Colleagues,

We are seeking geoscience educators in two-year colleges for an exciting new aspect of our project *SAGE 2YC: Faculty as Change Agents*, which is funded by a grant from the National Science Foundation. Read below for more information or jump right into the website that describes the [Cohort 2 Change Agents program](#).

Are you and your two-year college (2YC) geoscience faculty colleagues interested in **improving success of your students, enhancing your teaching, strengthening your geoscience program, and working with other geoscience educators in 2YCs**? If so, please consider applying to be a **SAGE 2YC Change Agent**.

This opportunity, funded by a grant from the National Science Foundation, will provide you with skills to implement high-impact, evidence-based instructional and co-curricular practices that will lead to improved student learning, broadened participation, and a more robust geoscience workforce.

The SAGE 2YC Faculty as Change Agent project is seeking applications for teams of 2YC geoscience faculty to become part of our **Cohort 2 of Change Agents**. Cohort teams will include 2-4 geoscience faculty from one or more schools in a single geographic region. We welcome teams that include adjunct instructors. We also welcome applications from teams with faculty in any of the geosciences including earth sciences, oceanography, meteorology, geology, environmental science, and physical geography.

The teams in Cohort 2 will receive multi-faceted virtual support to improve the success of all students, broaden participation, and facilitate students' professional pathways (careers and transfer to 4-year institutions). Change Agent teams will work at three levels: their own teaching, their

geoscience program, and their region (building a network of 2YC geoscience colleagues via annual one-day workshops).

One community college faculty member who is a Change Agent wrote *"The most valuable aspect of the virtual professional development activities is "having this new network of other great geoscience faculty. The whole experience has been invaluable with shared ideas and resources."*

Read more about the following:

- The [Cohort 2 Change Agents program](#)
- The [Cohort 1 Change Agents](#) and the work they are doing
- The [SAGE 2YC Faculty as Change Agents project](#)

The [application](#) for Cohort 2 Change Agent teams is due by **May 31, 2017**. Selected teams will be notified by June 15.

You can also contact one of the SAGE 2YC project team with questions:

- Heather Macdonald, College of William & Mary (rhmacd@wm.edu)
- Eric Baer, Highline College (ebaer@highline.edu)
- Norlene Emerson, University of Wisconsin-Richland (norlene.emerson@uwc.edu)
- Jan Hodder, Oregon Institute of Marine Biology (jhodder@uoregon.edu)
- Carol Ormand, SERC (cormand@carleton.edu)



In the realm of social media, I have found two resources that facilitate communication with and between students. While email and LMS provide mechanisms for communicating with students, these are often not the venues the students use, which renders them less useful than one would hope. Both [Remind.com](#) and [Cel.ly](#) provide a means for contacting students with notifications like texting. They do not, however, require sharing personal information and enable messaging to an entire class. Cel.ly enables faculty to establish a cell for each class. Students register in the cell and can receive or send messages to an individual or the entire class as well as create new cells for projects or study groups.



Working quantitatively, analyzing data, and using scientific reasoning to problem solve are becoming easier, but these next two resources were game-changers for me. The [National Center for Case Study Teaching for Science](#) (NCCSTS) provides a collection of over 650, peer-reviewed case studies with examples from within every science discipline with the goal of promoting active learning and problem-based learning across the country. If you are like me, I have the best of intentions to create case studies for my students, yet never get to more than perhaps one (for just one course) in a year. Having the NCCSTS as a resource to use as-is or to modify and use has been a tremendous asset.



President's Column

By Brett Dooley

Mt San Jacinto College, San Jacinto, CA

Congratulations on completing, or nearing completion of, another year! This has been the first year in over a decade I was not teaching full-time. It provided an opportunity to reflect on my practices and explore new opportunities to provide for students. I recognize this was a luxurious opportunity teaching faculty do not often have. I'd like to share a few of these resources with you, of course, for after you've had a good rest.

Another great resource for working with data is [Gapminder](#), which was created as a venue to "cure" ignorance about global trends related to Environment, Health, Energy, Gender, Economy, Demography, and Governance. While political and ecological issues comprise the bulk of the 512 datasets available, they include annual fatalities from earthquakes, tsunamis, floods, and extreme temperatures going back as far as records exist for all countries with such data. Data sets can be downloaded or instantly plotted in Gapminder. The Gapminder graphing tool allows one to select the data sets for the x- and y-axes, to present them as logarithmic or linear graphs and to play the data sets over time to analyze trends.

GAPMINDER

I am sure many are aware of many ESRI products like ArcGIS, ArcMap, and ArcGIS online. A feature that was new to me is ESRI's StoryMaps. This free resource enables students to create tours to share online. The format resembles a Google Earth Tour but has simpler processes for students to follow for creating and disseminating the tour. My students have created tours to show their understanding of and ability to recognize different [river features](#), tours to explain the [formation of oxbow lakes](#), and other similar topics.



Hopefully, you will be able to benefit from one or more of these resources. If you have found useful online resources, others can use, please share them by submitting them for the Geo2YC Division newsletter!



Invitation to Present at GSA

By **Kaatje Kraft**

Whatcom Community College, Bellingham, WA

Dear colleagues,

We hope you will consider submitting an abstract to our session at GSA (T.129), "The challenge of defining student success: broadening participation, measuring success, and preparing 2yc and 4yc students for a variety of transitions."

While "Student success" is a core principle throughout academia, there is no one-size-fits-all approach. How success is defined likely differs across populations, between faculty, administrators, politicians and students themselves. This session invites presentations from individuals, institutions, or organizations that have attempted novel approaches to ensure the success of all students. Let's start a conversation in the

geoscience community so we can learn from each other about how we have targeted student success in our classrooms, programs, and institutions. By focusing explicitly on the success of *all* students, we are poised to incorporate people from more diverse backgrounds and better prepare students to meet community, professional, and societal challenges to which the geosciences can uniquely contribute.

We look forward to hearing what you're up to and we hope you'll share this broadly with others who you think may be interested. Please don't hesitate to contact us if you have questions, Kaatje Kraft (Whatcom Community College; kkraft@whatcom.edu), Josh Villalobos (El Paso Community College; jvillal6@epcc.edu), and Pete Berquist (Thomas Nelson Community College; berquistp@tncc.edu).



Editor's Note:

NAGT Geo2YC are also sponsoring the following topical sessions at GSA's annual meeting in Seattle. Please consider submitting abstracts to these sessions before the August 1st deadline:

T112. Geoscience Education at Two-Year Colleges

Brett S. Dooley, Callan Bentley, Wendi J.W. Williams

Two-Year Colleges (2YCs) are important to diverse and inclusive geoscience workforce recruitment and retention of student populations pursuing STEM and teaching degrees. This session will showcase strategies, curriculum, and partnerships.

T127. Supporting Geoscience Student Transfer Between Institutions and Transitions into the Workforce: Pathways to Success

Norlene R. Emerson, Eric M.D. Baer, Allan Ludman

Topics might include cross-institutional collaborations including recruitment, undergraduate research, field trips, and 2YC–4YCU faculty interactions; GEOPATHS or bridge programs, advising/support strategies; career development and preparation; research on transfer; and/or impact on broadening access.

T132. Undergraduate Research Posters Showcasing Research by 2YC and 4YCU Geoscience Students (Posters)

Gretchen L. Miller, Adrienne A. Leinbach, Stephanie M. Rollins

This session is designed for two-year college (2YC) and four-year college and university (4YCU) students presenting research in any sub-discipline of geoscience. Projects supported by NSF's Improving Undergraduate STEM Education program (IUSE) are encouraged.



Readers' Geo2YC Pencil Photographs



(Above) Ammonite fossil in contact-metamorphosed Lias, from Northern Ireland (photo submitted by Callan Bentley)



Letter from the Editor

by Tom Whittaker


*Unity College, Unity, ME
thomasewhittaker@gmail.com*

Dear Colleagues,

I hope that you have a productive summer and are able to engage in some of the events taking place this summer – be it the Earth Educator's Rendezvous or otherwise. *And!* Don't forget to take your Geo2YC pencil wherever you go and snap a few pictures. We'd love to share your pencil photos in the newsletter. If you have not yet got your hands on a pencil locate the NAGT booth at the EER.

A reminder also that this summer we will be holding elections for new NAGT Geo2YC division officers. Please make sure that you head online and cast votes for vice president, newsletter editor, and archivist.

As always if you have questions or comments about the content of *FOUNDATIONS*, or have suggestions for future newsletter items please contact me (see above).

Thank you! 



**EARTH EDUCATORS'
RENDEZVOUS**
ALBUQUERQUE, NM JULY 17-21, 2017

GOING TO THE RENDEZVOUS?



*Join the Geo2YC Division
and friends for a social on
Wednesday night (7/19)*

*6-8pm, location TBD
(follows the poster session)*

*Cavorting, Collaborating,
Confabulating, and Community-
Building opportunities will abound!*

