



NOAA Climate Science Education Workshop Series Summary

During the summer of 2016, [NOAA's Climate Stewards Education Project](#) sponsored six regional one- to three-day Climate Science Education workshops in Long Beach, CA (April 22-23), Detroit, MI (May 13-14), Salt Lake City, UT (June 13-16), Boulder, CO (June 31-July 1), New Orleans, LA (July 21-22), and Charleston, NC (August 3-4). In addition, six mini-workshops were held at the National Science Teachers Association (NSTA) national conference in Nashville, TN (April 2). A total of 484 formal (K-16), informal, government, private sector, not-for-profit museum, and zoo educators participated; 168 in the regional workshops and 316 at NSTA. All participants interacted with climate science, education, and communication experts; and regional workshops attendees visited facilities to explore technologies and innovations in Earth-system science. Workshop content was specific to regional concerns and needs while being national and global in scope when discussing the impacts of climate change. The impact of the workshops is shown below by objective.

Objective One: Develop climate science understanding in formal and informal science educators through regional resources

- Educators showed a statistically significant increase in their knowledge from pre- to post- workshop participation with a pre-test mean of 79% correct and a post-test mean of 86% correct ($P < .05$) across all topics
- In each workshop, participants rated themselves significantly more knowledgeable ($p < .01$) in all areas related to the workshop presentations
- The workshops met the participants' needs (4.4/5), was of high quality (4.4/5), was well presented (4.5/5), and would be easy for participants to communicate (4.3/5)
- Most (81%) plan to address topic(s) presented in the workshop and report being confident in using that they learned (9.0/10)

Objective Two: Create or strengthen regional networks

- Participants plan to integrate the resources from the workshop in a variety of ways including into their classroom as lessons and units, as part of communication materials for the public, sharing them with upper management to help inform decisions, and sharing materials with fellow educators and administrators
- The educators plan to address climate topics within the next month (24%), the next 6 months (53%), or the next 12 months (26%)
- Educators will use the information and resources by sharing them with their colleagues (61%), engaging adults in informal settings (27%), using them to develop materials/programs (44%), engaging participants in informal settings (29%), and to inform their own work (73%)
- Educators plan to share the resources with between 5 to more than 500 people with a mode of 61-100 and a potential of well over 40,000 people reached
- Participants were highly likely to recommend this workshop to a colleague (9.1/10)

Objective Three: Make participants more aware of NOAA resources

- Participants received detailed presentations about the NOAA Climate Stewards program and how to become a part of the community.
- Participants received all of the presentations given during their workshop, were given additional materials with basic climate science information, and received links to additional NOAA resources and tools available to them.

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2016 NSTA Climate Workshop Series Feedback Summary
Saturday, April 2nd 2016
NSTA, Nashville, Tennessee
 By Bradford T. Davey, Ed.D. and Hilarie B. Davis, Ed.D.
 TLC, Inc.

Climate Change Workshop Series Program

9:00-10:30 AM	Polar Popsicles – Life in the Ice What kind of life exists in glacial environments? How can biological records from Antarctic ice cores help us better understand climate change? Polar scientists share their latest research and provide proven hands-on activities for your classroom.
10:45-11:45 AM	Bringing Climate Change Closer to Home: U.S. Forest Service Climate Change Solution! Find out how to use data about trees to quantify the services they provide. Use computer models to visualize Climate Change impacts to birds and trees. Bring climate change closer to home and answer “What does climate change mean to me?”
12:15-1:15 PM	ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Change Solution? Find out about an online treasure chest including lesson plans, videos, webinars, and more, to help you educate, inspire, and engage your students about climate change. Youth show how their classes are part of the climate solution!
1:30-2:30 PM	NOAA Climate Stewards Brining climate science into the classroom in challenging. NOAA Climate Stewards educators showcase strategies, activities, and resources you can use with your students. Learn now to join the program, receive free PD, and apply for mini-grants.
2:45-3:45 PM	Use NGSS as a Pathway to Climate Literacy The NGSS are the first science standards to include human caused climate change as a core idea for students. Hear examples of how and where climate can be integrated with the NGSS, review climate relevant performance expectations, and discuss efforts to identify NGSS aligned resources.
4:00-5:00 PM	Climate Games and Simulations Learn about climate games to develop decision making skills with students. During the workshop, make decisions as the “mayor” of a vulnerable coastal city, prepare for climate change impacts, and follow a carbon atom as it travels around the Earth.

Workshop Participation and Survey Response

	Attendance	Completed Surveys	Abbreviation in Report
Polar Popsicles – Life on the Ice	88	62	PP
Bringing Climate Change Close to Home: U.S. Forest Services Climate Change Educational Resources	58	47	BCCC
ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution!	48	31	CCL
NOAA Climate Stewards	52	22	NCS
Use NGSS as a Pathway to Climate Literacy	34	22	NGSS
Climate Games and Simulations	36	22	CGS

Have you addressed the topic(s) presented today in the past?

	PP	BCCC	CCL	NCS	NGSS	CGS
Yes	50%	72%	77%	73%	82%	64%
No	50%	23%	23%	27%	18%	36%
No Response	0	5%	0	0	0	0

What are your plans for addressing the topic(s) presented today in your work?

	PP	BCCC	CCL	NCS	NGSS	CGS
I do not plan to address it	3%	4%	0	9%	0	0
I plan to address it	66%	72%	81%	59%	64%	91%
I plan to learn more before addressing it	26%	17%	13%	23%	27%	5%
I am not sure yet whether I will address it	5%	2%	6%	5%	0	0
Other	2%	2%	0	5%	0	5%
No Response	0	3%	0	0	9%	0

Other (please elaborate):

- PP - *Assessment writer not classroom teacher*
- BCCC - *I'm retired but mentor young teachers*
- CGS - *Depends on what I'm teaching*

Please answer these questions using the scale: 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree NA=Not Applicable

	PP	BCCC	CCL	NCS	NGSS	CGS
I learned from the presentation today	4.5	4.4	4.3	4.1	4.5	4.8
I intend to use what I learned today in my work	4.4	4.4	4.4	4.1	4.5	4.9
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	4.4	4.4	4.6	4.1	4.6	4.8
It is easy to fit the topic presented today into my work/curriculum	4.2	4.2	4.1	3.6	4.5	4.4
For me to communicate the topic(s) presented today is easy	4.0	4.1	4.2	4.0	4.1	4.6

Percentage of Response By Workshop - PP

	Percent of Respondents Choosing Each Rating				
	1	2	3	4	5
I learned from the presentation today	3	0	2	30	66
I intend to use what I learned today in my work	2	3	7	31	58
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	2	2	7	33	57
It is easy to fit the topic presented today into my work/curriculum	2	8	8	29	53
For me to communicate the topic(s) presented today is easy	3	5	20	31	41

Percentage of Response By Workshop - BCCC

Percent of Respondents Choosing Each Rating

	1	2	3	4	5
I learned from the presentation today	2	0	2	40	55
I intend to use what I learned today in my work	2	0	5	43	50
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	2	2	5	29	61
It is easy to fit the topic presented today into my work/curriculum	2	2	5	50	40
For me to communicate the topic(s) presented today is easy	2	0	10	57	31

Percentage of Response By Workshop - CCL

Percent of Respondents Choosing Each Rating

	1	2	3	4	5
I learned from the presentation today	4	0	4	48	44
I intend to use what I learned today in my work	3	0	3	34	59
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	3	0	0	30	67
It is easy to fit the topic presented today into my work/curriculum	3	3	10	43	40
For me to communicate the topic(s) presented today is easy	3	0	10	48	38

Percentage of Response By Workshop - NCS

Percent of Respondents Choosing Each Rating

	1	2	3	4	5
I learned from the presentation today	9	5	5	27	55
I intend to use what I learned today in my work	10	0	5	45	40
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	10	0	5	40	45
It is easy to fit the topic presented today into my work/curriculum	10	5	30	30	25
For me to communicate the topic(s) presented today is easy	10	0	15	35	40

Percentage of Response By Workshop - NGSS

Percent of Respondents Choosing Each Rating

	1	2	3	4	5
I learned from the presentation today	0	0	6	35	59
I intend to use what I learned today in my work	0	0	6	35	59
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	0	0	12	18	71
It is easy to fit the topic presented today into my work/curriculum	0	0	13	25	63
For me to communicate the topic(s) presented today is easy	0	0	29	35	35

Percentage of Response By Workshop - CGS

Percent of Respondents Choosing Each Rating

	1	2	3	4	5
I learned from the presentation today	0	5	0	5	89
I intend to use what I learned today in my work	0	0	6	0	94
I think the topic(s) presented today will be useful in my work and/or for my students/external audiences	0	0	6	6	89
It is easy to fit the topic presented today into my work/curriculum	0	0	22	11	67
For me to communicate the topic(s) presented today is easy	0	0	11	22	67

If you are not planning to address the topic(s) presented today, why not? Choose all that apply.

	PP	BCCC	CCL	NCS	NGSS	CGS
It does not fit into my curriculum	8%	2%	0	5%	5%	9%
It is not appropriate for the age level of my students	0	0	0	5%	0	0
I do not have the technology resources	6%	0	0	0	5%	0
I do not feel confident in my knowledge of the topic	0	4%	0	0	0	0
I do not feel confident in my pedagogical skills	0	2%	0	0	0	0
It is not relevant to my work	0	0	0	0	0	0
Other	3%	0	0	5%	0	0

Other (please elaborate):

PP - *I have a fixed curriculum that has to be reviewed externally before changes are made*
 NCS; *We have a student pacing guide to prepare our students for our state end of course exam and not a lot of room for variation*

What kinds of things do you want to learn more about before addressing the topic(s) presented today in your work and/or with your students/external audiences? Choose all that apply.

	PP	BCCC	CCL	NCS	NGSS	CGS
I want to learn more about the topic(s)	52%	32%	26%	27%	32%	27%
I want to learn more about how to teach it	45%	34%	39%	32%	36%	18%
I want to learn how others have taught it	39%	38%	32%	41%	36%	27%
I want to learn about any available materials	32%	38%	42%	68%	27%	32%
I want to find out if it fits into my curriculum first	16%	9%	3%	18%	5%	9%
Other	2%	2%	0	5%	14%	0

Other (please elaborate):

PP - *Would like to see a comparison to ice core samples*

BCCC - *I want to practice and learn how to use them*

CCL - *I want to practice*

NGSS - *I want to learn how I can spread the word; I teach this topic and already use the data sets; I want to support vertical alignment from K-12 in my area on this subject*

How will you prepare for addressing the topic(s) presented today? Choose all that apply.

	PP	BCCC	CCL	NCS	NGSS	CGS
I will use existing materials I have about the topic(s)	31%	26%	35%	23%	32%	36%
I will integrate the topic(s) into existing materials	42%	53%	39%	41%	45%	55%
I will use the recommendations and resources provided by the presenters	56%	43%	55%	45%	64%	59%
I am not sure yet	13%	9%	3%	14%	0	14%
Other	0	2%	0	0	0	0

Other (please elaborate):

BCCC - *External mapping knowledge*

How do you plan to address the topic(s) presented today? Choose up to two options.

	PP	BCCC	CCL	NCS	NGSS	CGS
As an activity	53%	51%	35%	23%	32%	59%
As a lesson	55%	34%	32%	32%	36%	36%
As a project	19%	21%	26%	36%	0	5%
As a unit	16%	13%	29%	32%	36%	18%
As a course	2%	0	0	0	18%	5%
As a program	2%	0	3%	14%	0	5%
I am not sure yet	8%	8%	3%	5%	5%	5%
Other	2%	2%	6%	0	9%	0

Other (please elaborate):

PP - *Develop assessment items*

BCCC - *As available to teachers I work with*

CCL - *Homework as prep for lesson; Include in PTL Southwestern Threats and Climate Change Workshops resources*

NGSS - Share with pre-service teachers; Integrated/sprinkled throughout my chemistry class and ideally, throughout all courses

When will you address this topic?

	PP	BCCC	CCL	NCS	NGSS	CGS
Within the next month	27%	27%	32%	32%	18%	14%
Within the next 6 months	16%	15%	32%	18%	23%	23%
Within the next 12 months	39%	32%	13%	18%	32%	36%
Other	11%	32%	6%	14%	14%	9%
No Response	7%	0	17%	18%	13%	18%

Other (please elaborate):

PP – *Eventually; Unsure; Already did and will do again next year; Waiting to see*

CCL - *As requested*

NGSS - *Already address on a weekly basis; Have already taught this this year. Am planning for next year; Hoping to more thoroughly integrate for next year*

CGS - *Not sure yet; Next school year*

How many years have you been an educator?

	PP	BCCC	CCL	NCS	NGSS	CGS
1 to 5 Years	15%	13%	10%	27%	18%	32%
6 to 10 Years	13%	17%	16%	5%	9%	5%
10 to 20 Years	42%	26%	32%	27%	32%	32%
More than 20 Years	11%	26%	22%	18%	27%	14%
No Response	19%	18%	20%	23%	14%	17%

Which of the following best describes the type of education you do?

	PP	BCCC	CCL	NCS	NGSS	CGS
Elementary School Teacher	6%	6%	10%	5%	0	9%
Middle School Teacher	32%	21%	23%	27%	14%	36%
High School Teacher	47%	36%	35%	41%	45%	23%
College/University Educator	11%	36%	13%	9%	9%	0
Professional Development (pre-service)	0	2%	0	0	5%	0
Professional Development (in-service)	0	0	0	0	0	0
Informal (museums, zoos, nature centers, afterschool program, etc)	3%	4%	3%	0	9%	14%
Extension agent	0	0	0	0	0	0
Government Employee - Please Circle (local / state / Federal)	2%	0	0	0	0	0
Non-Profit Organization/NGO	0	0	0	0	0	0
Other	0	0	0	0	0	0
No Response	0	0	16%	18%	18%	18%

How many people do you expect to teach/share the information/resources from this presentation with in the next year?

	PP	BCCC	CCL	NCS	NGSS	CGS
0-5	18%	6%	3%	5%	5%	5%
6-10	3%	2%	3%	5%	5%	9%
11-15	0	2%	6%	9%	5%	0
16-30	11%	2%	0	5%	0	5%
31-60	13%	9%	23%	14%	14%	9%
61-100	16%	13%	10%	23%	18%	14%
101-150	24%	17%	26%	18%	9%	27%
151-250	6%	13%	13%	5%	18%	9%
251-500	2%	4%	0	0	0	5%
>500	3%	2%	0	0	9%	0
No Response	4%	30%	16%	16%	17%	17%

Number of People Participants Expect to Reach with What They Learned

	PP	BCCC	CCL	NCS	NGSS	CGS
0-5	11	3	1	1	1	1
6-10	2	1	1	1	1	2
11-15	0	1	2	2	1	0
16-30	7	1	0	1	0	1
31-60	8	4	7	3	3	2
61-100	10	6	3	5	4	3
101-150	15	8	8	4	2	6
151-250	4	6	4	1	4	2
251-500	1	2	0	0	0	1
>500	2	1	0	0	2	0
No Response	5	11	5	4	4	3

Total potential additional people workshop participants expect to teach/share the information/resources they learned about in their workshop with is between 14,000 and 21,000.