NOAA Climate Stewards

“You can’t make carbon go away. It just changes form, so you’d better figure out what to do with what’s already in the atmosphere. Then you’d better figure out what you want the world to be like, because it’s not going away, and it stays around for a really long time.”

6th grade student
The NOAA Climate Stewards Education Project (CSEP) is part of NOAA’s portfolio of activities designed to strengthen ocean, climate, and atmospheric science education. CSEP increases understanding of essential climate concepts, providing educators with ready access to reliable scientific information through an array of professional development (PD) opportunities. Through direct interaction with scientists and education specialists, participants receive instruction in the use of data resources, digital tools, and other innovative technologies. Educators benefit from an active online learning environment.

“You can’t make carbon go away. It just changes form, so you’d better figure out what to do with what is already in the atmosphere. Then you’d better figure out what you want the world to be like because it’s not going away and it stays around for a really long time.”

— Middle School student

eceanservice.noaa.gov/education/climate-stewards
Build Climate Literacy for educators to:

- **understand** the concepts of climate
- **assess** the scientifically credibility of information
- make **informed** and **responsible** decisions, and **initiate actions** in the community
NOAA Climate Stewards

Provides Educators:

- *Sustained* professional development
- *STEM* and geography based teaching and collaborative tools
- *Digital* content resources
- *Contextual-based* teaching applications
Leadership Team
Project Reach

200 Educators from 46 states, DC, Puerto Rico, USVI

Formal and Informal Educators – Elementary through College
NOAA Climate Stewards Process

NOAA Climate Stewards Project: Committing to developing an ongoing understanding and use of climate science

- Offers PD in climate science and NOAA resources
- Become NOAA Climate Stewards

Educators do at least 15 hours of professional development

- Apply what they learned
- Design a stewardship project with a measurable outcome

Climate Steward participants present results

- Posted for other Climate Stewards to use as ideas
- Implement stewardship project
- Demonstrate measurable results
- Participants learn climate science through action
Expectations for Participants

- Complete at least **15 hours** of Professional Development training.
- Complete at least **9 hours** of PD training for each additional year in the Project.
- Participate in **monthly** webinars and regional events.
- Develop and Implement a **climate stewardship project** in their school, community, or organization, focused on mitigating the effects of climate change.
- Use the **CSEP Wiki** to post PD reflections, classroom activities in climate change, stewardship project plans, progress updates.
- Participation in **CSEP evaluation efforts**.
Benefits for Participants

- **Mini-grant funding** to develop and implement a climate stewardship action plan.

- **Travel stipends** to attend and present at key professional development conferences.

- **Special contests** with monetary and educational resource prizes.
Organizing & Collaborating

Welcome to the NOAA Climate Stewards Workspace!

The NOAA Climate Stewards Education Project (CSEP) provides opportunities for formal and informal educators to work with NOAA in responding to environmental challenges, and inspire our youth to pursue careers in science, technology, engineering, and mathematics. CSEP brings NOAA science and education efforts together, providing educational opportunities and rewards for environmental stewardship, including Climate Stewards educating themselves and others, as well as working within their communities to reduce their carbon footprints or develop plans to “go green.”

Announcements
1. Welcome Class of 2022! This year NOAA Climate Stewards is honored to have invited 140 new educators to join the Project. With over 200 educators representing 46 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands, we look forward to strengthening our community of learning as we start the new year.
2. New Wiki Page Launched! Click here to get to a page providing important information on National and Regional meetings, a Calendar of Events/Progress for January-September 2023, and a list of CSEP contact.

Project Regions
NOAA CSEP has been organized into six regions to foster communication and collaboration among educators within those regions, as well as organizing and coordinating activities - beyond those occurring at the national project level. This may include sharing information about regional climate change, collaborating on mutual interests, or taking advantage of and sharing resources specific to the regions where participants are located. Each Region is coordinated by a Regional Leader(s) who is the lead Project participant. Links to Participants' Personal Wiki Pages are located on Regional Pages.

New England: MA, VT, NH, ME, RI, CT, NY, PA, OH
Regional Leader - Carol Tavener (Barnstable, MA)
Mid-Atlantic: NJ, DE, MD, Washington DC, VA, WV
Regional Leader - Dave Jacob (Washington, DC)
Central Region: IL, IN, IA, MO, KS, WI, CO
Regional Leader - Claire Lennov-Hall (Royal Oak, MI)
Western Region: CA, OR, WA, ID, MT, NM, AZ, NV, CO, UT, WY, NM, CO
Regional Leader - Bruce Baskin (Tucson, AZ)
Southern Region: FL, GA, NC, SC, TN, AL, MS, AR, OK, TX, NM, PR, USVI
Regional Leader - Rasha Ahmad (Tempe, AZ)
Western Pacific Region: CA, WA, OR, CA, NV, UT, AZ, HI, AK, GU
Regional Leader - Jillian Wissam (Flagstaff, AZ)

Project Documents
• Meeting Notes & Presentations
  - Monthly Instructor Survey Form
  - Professional Development Experience Review Form
  - CSEP FAQ & Answers: How to complete, upload, and post your PD Review to your wiki page
  - Stewardship Project Roadmap and Definition
  - NOAA Talent Release Form
  - Complete List of NOAA Climate Stewards Educators Action Plans
  - Climate Stewards Individual Page Template
  - Climate Stewards in the News
Professional Development: Monthly Webinars

Climate Controversy in the Classroom – Susan Buhr
Climate Change and the American Mind – Andy Leiserowitz
Tools for Investigating Estuaries – Bree Murphy
Climate Change Impacts on Human Health – Amy Work
Sea Level Change – Past, Present, Future – Stephen Gill
Ocean Acidification – Paulo Maurin
NSTA Opportunities

Symposium: NOAA Climate Data in the Classroom

Saturday Workshops

- Climate Education and NGSS
- Lessons from Antarctica: Polar Ice Cores and Climate Research
- Lunch with Climate Scientists
- ClimateChangeLIVE!: Webcasts and Education Resources
- NOAA’s Climate Stewards: Affecting Change in Your Community
- Discover Your Changing World With NOAA - New Hands-on Climate Activities!
Regional Workshops

2012

- Aldo Leopold Nature Center – Monona, WI
- New York Hall of Science – Queens, NY
- Norrie Point Environmental Center – Staatsburg, NY
- Flagstaff Festival of Science – Flagstaff, AZ

2013

- April, 2013 Traditional Environmental Knowledge
  National Museum of the American Indian
  Washington, DC
Using Virtual Platforms

- Virtual Climate Conference
  3 evenings, Fall 2012
- Introductory training: construct an avatar, how to move/communicate
- Climate content, discussion groups, exploration of NOAA island
Book Discussions/Field Trips

Eco-Village

OneClimate Island Shelter
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<th>Incomplete</th>
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<td>Clearly described issue</td>
<td>Need established through evidence</td>
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<td>Local context for a local or global issue in climate science</td>
<td>Project is put in the context of others’ efforts along the same lines (parallel projects)</td>
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<td>Hypothesis</td>
<td>Expected effect described</td>
<td>Hypothesis with expected effect and circumstances stated</td>
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<td>Hypothesis includes effect, circumstances, on whom</td>
<td>Hypothesis in if/then form</td>
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<td>Data Collection,</td>
<td>How data was used is described</td>
<td>Rationale for data collected</td>
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<td>Analysis and Results</td>
<td>Rationale for data collected and how it was used</td>
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<td>Results given in terms of how the data was collected and analyzed</td>
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<td>Stewardship Process</td>
<td>Activities listed</td>
<td>Process described with activities</td>
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<td>and Activities</td>
<td>Timeline of activities described within the process used</td>
<td>Recommendations made for how to improve the process and activities based on lessons learned</td>
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<td>Stewardship Actions</td>
<td>You educate others</td>
<td>You involve others in a short term stewardship project (&lt;2 days)</td>
</tr>
<tr>
<td></td>
<td>You involve others in a long term stewardship project (&gt;2 days)</td>
<td>You make stewardship action part of your own ongoing work, and/or the work of an institution. You document measurable results of the actions.</td>
</tr>
<tr>
<td>Use of NOAA and NOAA</td>
<td>List given</td>
<td>List with specific resources described</td>
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<td>Partner Resources</td>
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<td>Rationale for why &amp; how the resources were used to support the project</td>
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<td>Evaluation</td>
<td>Effects identified</td>
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<td>Data collected from multiple resources</td>
<td>Results put in context of goals for the project and similar efforts by others</td>
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<td>Conclusions</td>
<td>Describes what happened</td>
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<td>post to wiki)</td>
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<td>Rationale for before, during and after presentations to various audiences and stakeholders</td>
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Stewardship in Action!

- Restoration with beach grasses
- Polar Bear Challenge: Conserve energy and change habits
- Model UN Climate Change Summit
- Climate Change impacts on wetlands
- Schoolyard garden
- Effects of ocean acidification on Hawaiian ecosystems
Stewardship in Action!

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<th>(idle start time) = 15 minutes</th>
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Idle end time (when carpool started moving) 3:00, (idle start time) = 15 minutes.

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Program Evaluation

Research Questions

- What role does increased content knowledge about climate literacy have on participants? To what extent do Climate Stewards increase their content knowledge?

- How does implementation of a Stewardship Project affect participants’ attitude and behavior toward lessening the potential impacts of climate change?
Instruments

- Professional Development Reflection and log
- Needs assessment for each new class of educators
- Climate Literacy Understanding Pre and Post test
- Stewardship Project Plan
- Climate Stewardship Plan Rubric to determine stewardship plan completeness and funding
- Reflection Survey – retrospective about effects of project on knowledge, confidence, interest, strategies, resources
- Stewardship project reflection survey – effect of stewardship activities on attitudes and skills
Class of 2013 Needs Assessment

- Why they applied
  - Learn new strategies to introduce students to STEM careers
  - Increase their understanding of NOAA resources
  - Learn about new technology tools such as GIS, virtual platforms, gaming
  - Learn how misconceptions influence student learning
Class of 2013 Needs Assessment

- Topics they are interested in
  - Basic Climate Literacy
  - What people can do about climate change
  - Projections of climate change impacts
  - Human-induced changes to climate
  - Causes of climate change in the present

Other Topics of interest
- Citizen science
- Monitoring programs
- Energy reduction
- Green schools
- Local literacy
- Recycling
Class of 2013 Needs Assessment

- Teaching and Learning Strategies of Interest
  - Emphasizing critical thinking skills
  - Using field experiences for investigations
  - Infusing climate content into existing curriculum
  - Incorporating the use of real-time data
  - Building skills in problem-solving

“I am looking for resources/training for my high school teacher network to get them up-to-speed on the Next Generation Science Standards, in relation to climate science.”
“Time is key, especially with new common core standards. Resources to implement lessons and the equipment needed are sometimes inadequate or insufficient.”
Class of 2011 Evaluation Results

Climate Stewards reported strong effects on stewardship project participants in:

- Feeling they could make a difference (9.1/10)
- Increased knowledge of climate science (8.9)
- Readiness to apply what they had learned to their lives (8.7)
- Increased awareness of climate science careers (8.1)
- Meeting other people interested in climate science (7.5)
Class of 2011 Indicators of Success

- Increased confidence
- Changes in teaching practice
- Use of stewardship projects
- Interest in continuing to participate in the professional development.

“I am much more able to effectively integrate climate into the curriculum due to the resources and training in the program”
Contact

- Peg Steffen  peg.steffen@noaa.gov
- Bruce Moravchik  bruce.moravchik@noaa.gov

"It is better to teach people in advance about the environment, than to reverse the damage they do…"

6th grade student