



Howard County Legacy Leadership
Institute for the Environment
HoLLIE
*Climate Change:
Science, Policy, and Local Action*

1st Class, Thursday, February 4, 2021, 9:00 am – 12:15 pm (EST), via Webex

What Informed Citizens Need to Know about Earth Systems Science: Understanding the Tools and the State of Art in Earth Science

Introductory Remarks (9:00 – 9:15)

Monitoring the Earth’s Atmosphere, Oceans, Land, and Ice from Satellites (9:15 – 10:15)
Claire Parkinson, Ph.D., Climate Change Senior Scientist, NASA’s Goddard Space Flight
Center (GSFC)

Speaker Objectives:

- Provide an overview of Earth observations from satellites.
- Discuss how important features and components of the Earth system are being observed from space:
 - Stratospheric ozone and the ozone hole
 - Volcanic emissions
 - Atmospheric water vapor
 - Hurricanes, fires, dust storms
 - Earth’s ice cover
 - Ocean features such as sea level, sea surface temperature, and coccolithophore blooms
 - Deforestation and other human impacts

Q & A (10:15 0- 10:30)

Break (5 minutes)

Climate Change and a 40-Year Sea Ice Record (10:35 - 11:35)

Claire Parkinson, Ph.D., Climate Change Senior Scientist, NASA's GSFC

Speaker Objectives:

- Provide a brief overview of climate change and its many causes.
- Illustrate how satellite data are contributing to the information on climate change.
- Describe NASA sea ice research since the 1970s.
- Show the changes in Arctic and Antarctic sea ice since the 1970s, as revealed by satellite data.

Q &A (11:35 - 11:50)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.



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2nd Class, Thursday, February 11, 2021, 9:00 am – 12:15 pm (EST), via Webex

What Informed Citizens Need to Know about Earth Systems Science: Understanding the Science of Earth's Cycles

Introductory Remarks (9:00 – 9:15)

Observing the Living Oceans from Space (9:15 – 10:15)

Ivona Cetinic Ph.D., Senior Scientist, Universities Space Research Association, Ocean Ecology Laboratory, NASA's GSFC; ivona.cetinic@nasa.gov

Speaker objectives:

- With an integrated system perspective, examples are drawn from current ocean research, including an understanding of the ocean carbon cycle.
- The applications of satellite-derived ocean color data range from providing the information needed for a more accurate assessment of the role of the ocean in global change to providing a key parameter in a number of ecological and environmental studies.
- The color images of the Earth's changing land and ocean features will be of significant use in fisheries management, agriculture assessment and coastal zone monitoring.
- There is no question that the Earth is changing. Ocean color measurements from space have enabled us for the first time to monitor the biological consequences of that change - to see how the things we do, and how natural variability, affect the Earth's ability to support life.
- What can be learned about Chesapeake Bay from such imagery?

Q & A (10:15 – 10:30)

Break (5 minutes)

Ice Sheets: Understanding Change in the Polar Regions (10:35 – 11:35)

Kelly M. Brunt, Ph.D., Associate Research Scientist, Earth System Science Interdisciplinary Center (ESSIC), University of Maryland and NASA Cryospheric Sciences Laboratory at NASA's GSFC; kelly.m.brunt@nasa.gov

Speaker objectives: From a perspective of satellite (ICESat and ICESat-2) and aircraft observations (IceBridge):

- Explain how ice sheets change.
- Show how we measure and study that change.
- Show that recent changes of ice sheets are surprisingly large.
- Discuss what change is significant.
- Illustrate what the future ice sheets might do.

Q & A (11:35 - 11:50)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.



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3rd Class, Thursday, February 18, 2021, 9:00 am – 12:15 pm (EST), via Webex

**What Informed Citizens Need to Know about Earth Systems Science:
Understanding the Science of Earth’s Cycles, *cont.***

Introductory Remarks (9:00 – 9:15)

**How the Montreal Protocol Saved the Earth’s Ozone Layer and Is Now Helping Solve
Climate Change** (9:15 – 10:15)

Paul Newman, Ph.D., Chief Scientist for Earth Sciences, Earth Sciences Division, NASA’s
GSFC; paul.a.newman@nasa.gov

Speaker objectives: When the production of human-produced long-lived chlorine and bromine compounds threatened the Earth’s ozone layer, the Montreal Protocol was negotiated to solve this problem. This presentation will:

- Explain the basic underlying science and interactions of ozone and how human-produced chlorofluorocarbons (CFCs) impacted our ozone layer.
- Discuss outstanding issues and challenges on ozone and climate (e.g., reports on atmospheric ozone by Scientific Assessment Panel to Montreal Protocol),
- Illustrate the state of art in Earth observing technologies and strategies for atmospheric monitoring, assessment, and prediction.
- Describe how these technologies and strategies lead to continual updates on the stratospheric ozone layer and continue to inform policy makers.

Q & A (10:15 - 10:30)

Break (5 minutes)

How Human Intervention in the Carbon Cycle Caused Climate Change (10:35 – 11:35)

Sara Via, Ph.D., Professor, Dept. of Entomology, University of Maryland, and Climate Extension Specialist, University of Maryland Extension, UMD, College Park; svia@umd.edu

Speaker objectives:

- Explain the basic underlying science of the carbon cycle: i.e., that carbon dioxide moves from the atmosphere into plants, other organisms, soil, and water, then back to the atmosphere.
- Discuss how humans have altered the cycle by bringing fossil fuels back to the surface and burning them.
- Consider how these human alterations have caused climate change and discuss where the extra carbon in the atmosphere has gone, and what impacts that it has had.
- Discuss actions that can slow the increase of atmospheric carbon dioxide and reduce the atmospheric concentrations of carbon back to a more “normal” range.

Q & A (11:35 – 11:50)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.



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4th Class, Thursday, February 25, 2021, 9:00 am – 12:15 pm (EST), via Webex

**What Informed Citizens Need to Know about Earth Systems Science:
Understanding the Science of Earth's Cycles, *cont.***

Introductory Remarks (9:00 – 9:15)

Land-based Hydrological Cycle. (9:15 – 10:15)

Matthew Rodell, Ph.D., Acting Deputy Director of Hydrosphere, Biosphere, and Geophysics,
NASA's GSFC; matthew.rodell-at-NASA.gov

Speaker objectives: With an integrated system perspective, use examples drawn
from current research in the field of hydrology to:

- Explain the basic underlying science and interactions.
- Discuss outstanding issues and challenges (e.g., data gaps, groundwater depletion, etc.).
- Illustrate the state of art in earth observing technologies and strategies for environmental monitoring, assessment, and prediction.

Q & A (10:15 – 10:30)

Break (5 Minutes)

From Satellite Data to Computer Models

Virtual Visit to GSFC Scientific Visualization Studio (10:35 – 11:35)

Lori Perkins, Aerospace Technologist, Scientific Visualization Studio at NASA's GSFC

lori.k.perkins@nasa.gov

Speaker objectives:

- Illustrate how environmental observations are locally and globally acquired, processed, analyzed, and integrated with computer models.
- Illustrate how large-scale environmental observations are visualized in ways that enable new scientific insights.

Q & A (11:35 – 11:50)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.



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5th Class, Thursday, March 4, 2021, 9:00 am – 12:15 pm (EST), via Webex

Environmental Policy

Introductory Remarks (9:00 – 9:15)

Emerging Trends in International Climate Diplomacy & National Climate Policy (9:15 – 10:15)

Tim Lattimer, Senior Advisor, Office of Global Change, US Department of State;
lattimertp@gmail.com

Speaker objectives:

- Review the evolution and current state of play in international climate diplomacy, including the influence of the United States on global efforts to tackle climate change.
- Provide an overview of the new Biden Administration’s elevated focus on climate and the administration’s “whole -of-government” approach to tackling the climate crisis at the intersections of national security, environmental, economic, and social justice issues.
- Discuss the role of local, state, and private sector actors in advancing climate change.

Q & A (10:15 – 10:30)

Break (5 minutes)

Chesapeake Bay, Climate Change, and the Politics of Finance (10:35 – 11:35)

Daniel Nees, Senior Fellow at the Center for Global Sustainability, University of Maryland,
College Park; Dnees@umd.edu

Speaker objectives:

- Provide a foundational understanding of the components that are necessary to finance climate resilience and adaptation.

Q & A (11:35 – 11:50)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.



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6th Class, Thursday, March 11, 2021, 9:00 am – 12:15 pm (EST), via Webex

Howard County Government: Environmental Issues and Actions

Introductory Remarks (9:00 – 9:15)

Howard County Office of Community Sustainability (9:15 – 10:15)

Lindsay DeMarzo, Sustainability Projects Manager (Stormwater);

LDemarzo@howardcountymd.gov

Speaker's objectives:

- Introduce participants to Office of Community Sustainability (OCS)
- Describe some of the environmental issues facing our county,
- Describe what the OCS is doing to protect the environment.
- Describe the challenges faced in reaching its environmental goals.

Q & A (10:15 – 1:30)

Break (5 minutes)

Howard County Department of Planning and Zoning (DPZ) (10:35 – 11:35)

Beth Burgess, Chief, Division of Resource Conservation, DPZ;

bburgess@howardcountymd.gov

Speaker's objectives:

- Introduce participants to Department of Planning and Zoning, with emphasis on Division of Resource Conservation.
- Discuss how DPZ approaches some of the environmental issues facing our county.
- Describe what this office of government is doing to protect the environment.
- Describe the challenges faced in reaching its environmental goals.

Q & A (11:35 – 11:50)

Break (5 minutes)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.



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7th Class, Thursday, March 18, 2021, 9:00 am – 12:15 pm (EST), via Webex

Howard County Government: Environmental Issues and Actions, *cont.*

Introductory Remarks (9:00 – 9:15)

Howard County Department of Recreation and Parks (9:15 – 10:15)

Dan McNamara, Superintendent, Natural and Historic Resources Division, Howard County
Department of Recreation and Parks; dmcnamara@howardcountymd.gov

Speaker's objectives:

- Introduce participants to Howard County Department of Recreation and Parks.
- Describe what the DRP is doing to protect the local environment.
- Describe some of the environmental issues facing our community,
- Describe the challenges our community faces in reaching our environmental goals.

Q & A (10:15 – 10:30)

Break (5 minutes)

Howard County Department of Public Works (10:35 – 11:35)

Mark DeLuca, Deputy Director, Department of Public Works and Chief, Bureau of Environmental Services; mdeluca@howardcountymd.gov

Speaker's objectives:

- Introduce participants to Howard County Department of Public Works.
- Describe what the DPW is doing to protect the local environment.
- Describe the challenges our community faces in reaching our environmental goals.

Q&A (11:35 – 11:50)

Breakout Rooms and Closing Remarks (11:50 – 11:15): discussions facilitated by HoLLIE Coordinators.



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8th Class, Thursday, March 25, 2021, 9:00 am – 12:15 pm (EST), via Webex

Saving Places We Love with Actions to Make a Difference

Introductory Remarks (9:00 – 9:15)

“Saving the Places We Love: Paths to Environmental Stewardship” (9:15 – 10:15)

Ned Tillman, Author of *The Chesapeake Watershed*; *Saving the Places We Love: Paths to Environmental Stewardship* and *The Big MELT*, Sustainability Advisor, and leader of nature walks for organizations; ned@sustainable.us
www.SavingThePlaces.com

Speaker objectives:

- Discuss the Chesapeake Watershed.
- Discuss past and present human impacts on our local ecosystems and environment.
- Discuss strategies for getting back into balance with nature.

Q & A (10:15 – 10:30)

Break (5 minutes)

Amanda Gorman, first person to be named National Youth Poet Laureate:

Climate Change (2018) (5 Minutes)

<https://youtu.be/xwOvBv8RLmo>

Climate Sustainability Actions to Make a Difference (10:35 – 11:35)

Sara Via, Ph.D., Professor, Dept. of Entomology, University of Maryland, and Climate Extension Specialist, University of Maryland Extension, UMD, College Park; svia@umd.edu

Speaker objectives:

- Briefly review climate impacts on ecosystems, biodiversity, human life, and the global economy.
- Review the causes of climate change to identify and explore effective climate actions.
- Discuss strategies for reducing climate change impacts at all scales from global to personal and ask:
 - Who is responsible for action?
 - Which actions will really make a difference?
 - Which is more expensive, climate action or climate inaction?

Q & A (11:35 – 11:50)

Breakout Rooms and Closing Remarks (11:50 – 12:15): discussions facilitated by HoLLIE Coordinators.