



Annual Report 2022

Northern Institute of Applied Climate Science

A collaborative, multi-institutional partnership
led by the USDA Forest Service



Department of Forestry
MICHIGAN STATE UNIVERSITY



Michigan Tech



College of Food, Agricultural
and Natural Resource Sciences
UNIVERSITY OF MINNESOTA



The
UNIVERSITY
of **VERMONT**

Northern Institute of Applied Climate Science

The Northern Institute of Applied Climate Science (NIACS) is a collaborative, multi-institutional partnership led by the USDA Forest Service and comprised of Federal, forest industry, conservation, higher education, and tribal organizations.

NIACS develops synthesis products, fosters communication, pursues applied science, and provides technical assistance to advance ecosystem climate adaptation and carbon management.

niacs.org

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2022 at a Glance

16

NIACS team
members

6

Detailers
hosted

191

outreach items
and publications

1500+

participants in
hosted and co-
hosted adaptation
workshops

14

Adaptive Silviculture
for Climate Change
(ASCC) sites spanning
the U.S. and Canada

5

Forest Service
project planning
interdisciplinary
teams supported

3

new menus of
adaptation strategies
published

(Great Lakes coastal, fire, wildlife)

7,030

manual
measurements

of temperature, moisture, and
sunlight for the Adaptive Aspen
Management Experiment
microclimate dataset

2,200

total acres fully
implemented with
ASCC treatments

25

foresters trained
using a new *Climate
Forest Stewardship
Plan* template

145,000

users accessed
information on the
USDA Climate
Hubs website

41

adaptation projects
started at Tribal
Adaptation Menu
workshops
since the menu introduction

How NIACS Works

The Northern Institute of Applied Climate Science (NIACS) is a collaborative, multi-institutional partnership led by the USDA Forest Service and comprised of Federal ([USDA Forest Service NRS](#) and [R9](#)), forest industry ([NCASI](#)), conservation ([AF](#)), higher education ([MSU](#), [MTU](#), [UMN](#), [UVM](#)), and tribal organizations ([GLIFWC](#)). Our mission is to provide applied ecological, economic, social, and cultural information that can be used in climate adaptation and forest carbon management.

We work in collaboration with partners across all lands to ensure that the diverse values of public, private, and tribal organizations are represented in response to the immense challenges of climate change on the ecosystems and the communities that depend on them. The partnership brings people together around shared concerns and interests, engaging many different perspectives and types of knowledge to identify opportunities for collaborative action.

Our efforts are focused on the greatest good, reflecting not only our organizational partners' interests, but also the interests of the broader community of natural resources managers and stewards working to ensure the sustainability and integrity of the natural world around us in a period of immense change and uncertainty. This includes our work in support of the USDA Northern Forests Climate Hub, which has a complimentary mission and focus.

We value our role as leaders in a new, dynamic, and growing discipline to advance climate science and solutions.

This report reflects the **shared accomplishments** of our partnership.





OUR CONNECTION WITH THE USDA CLIMATE HUBS

The USDA Climate Hubs were established in 2014 and are a unique collaboration across the department's agencies. Led and hosted by the USDA Forest Service and Agricultural Research Service, a network of 10 regional Hubs gather contributions from USDA agencies and partners to develop and deliver science-based information and technologies to natural resources and agricultural managers, thereby enabling climate-informed decision making, reducing agricultural risk, and building resilience to climate change.

The USDA Northern Forests Climate Hub was designed to provide additional forestry-specific expertise to the Midwest and Northeast Climate Hubs, leveraging the Forest Service's NIACS partnership and its resources to meet the complex needs of land managers and woodland owners in the region. NIACS formed in 2003 and many of the most identifiable NIACS products developed in its early years, including the Adaptation Workbook and training curricula, are now core components of the USDA Northern Forests Climate Hub.

Now in its 20th year, NIACS partners continue to lead collaborative, cross-boundary efforts to share information and innovations in climate change adaptation and response. NIACS brings partners and diverse perspectives together in support of USDA Climate Hub goals and objectives. Collaborative efforts focus on reducing climate risks and promoting robust, healthy landscapes.

Learn more at: climatehubs.usda.gov/hubs/northern-forests

Letter from the Director

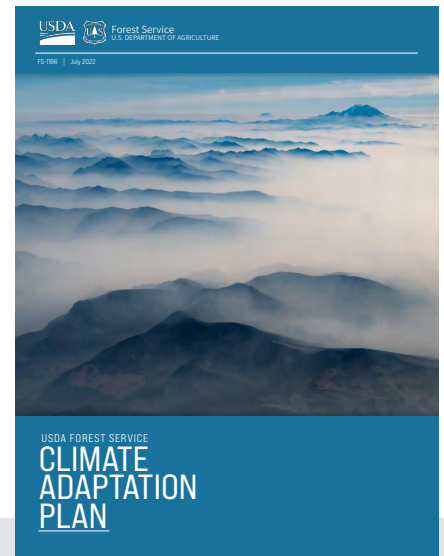
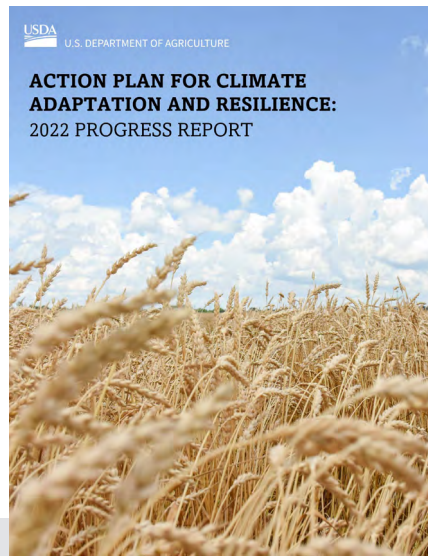
Greetings,

It's daunting to summarize "a year in the life of NIACS." This is difficult in any year, given the diversity and complexity of our collaborative projects. It feels even more challenging to give a tidy recap of our work over the past year, given the level of changes occurring among our team and across our partnerships.

Recognition of the need to adapt to changing conditions and to leverage the carbon mitigation potential of ecosystems continues to grow. The last year was notable with the release of the *USDA Action Plan for Climate Adaptation and Resilience* and the subsequent release of 17 additional USDA agency adaptation plans. Our team members were instrumental to the development of the *USDA Forest Service Climate Adaptation Plan*, convening four workshops of FS staff from across the agency to identify priorities and actions for collective response. Products of the NIACS partnership, our shared work with USDA Climate Hubs, and our support to USDA stakeholders and partners were prominent in the *USDA Forest Service Climate Adaptation Plan* and in USDA's *Action Plan for Climate Adaptation and Resilience: 2022 Progress Report*, highlighting the relevance, impact, and influence of our work. In the coming year, we will work more closely with the FS Eastern Region and Northern Research Station scientists, as well as with our many tribal, state, and private partners, to build on our successes and continue to identify and address critical needs.

It's exciting to see the expansion of climate change work at the national level, and to know that our NIACS partnership efforts are contributing to the accelerating action. Chris Swanston, Leslie Brandt, Kristen Schmitt, and Todd Ontl have moved on to new positions with the Forest Service Office of Sustainability and Climate, where they will support the agency's growing climate program. Although we certainly miss having these people—and their collective 46 years of climate adaptation experience—as part of our team, we are also excited at the opportunities to work with them in their new roles.

As we find ourselves in the midst of change and evolution, we've had many conversations among our team and with our partners about what makes the NIACS partnership unique among the growing network of organizations working in our arena. What I've taken away from these discussions is that what makes NIACS valuable has not changed.



NIACS contributed to the USDA's [*Action Plan for Climate Adaptation and Resilience*](#), the USDA's [*2022 Progress Report*](#), and the [*USDA Forest Service Climate Adaptation Plan*](#) through our accomplishments and significant staff support.



Our strength is finding innovative and effective ways to support forest and natural resources managers to respond to a changing climate.

We do that by working closely with scientists and professionals to provide a high level of service and assistance to those who most need our help. We use our creativity to explore the leading edge of our field, and we share our successes with the broader community of people working in this space. I'm grateful to our team for their dedication, ingenuity, and perseverance.

The NIACS partnership will continue to develop over the next year. We will be bringing on several new team members to support multiple new projects, as well as expand support to the USDA Northern Forests Climate Hub. New people and perspectives will enrich our team and offer up opportunities we can't yet anticipate or even imagine.

With kind regards,

Maria Janowiak
Acting Director, NIACS
Acting Director, USDA Northern Forests Climate Hub
USDA Forest Service





Highlights



Adaptation Strategies and Approaches

Adaptation Virtual Courses

Climate Forestry in Southern New England

Tribal Partnerships

Adaptation Strategies and Approaches

Menus of Adaptation Strategies and Approaches provide topical lists of adaptation actions that help managers move from broad ideas to specific actions and express their adaptation intent. Land managers can use these resources to select appropriate actions based on their unique project location and goals. The menus draw upon published research and manager input and are designed to be used with the Adaptation Workbook or other structured planning processes.

3

real-world
case studies

published with the Great
Lakes coastal menu

29

adaptation
approaches

included in the fire-prone
ecosystems menu

48

projects
launched

using the wildlife
adaptation menu



It has been a pleasure and fun to work with you the past few years on the menu. Developing and finalizing the coastal menu would not have happened without Kristen and Danielle's hard work, commitment, persistence, expertise, and leadership.

- Bob Krska, Ecological Services Program Manager, Midwest Region, U.S. Fish & Wildlife Service

forestadaptation.org/strategies



NIACS is always creating new adaptation menus to meet the interest and needs of land managers from a variety of sectors and disciplines. These are the new menus we published this year:

WILDLIFE MANAGEMENT

We published a [menu of adaptation strategies for terrestrial wildlife management](#) in the *Wildlife Society Bulletin*, in collaboration with the USGS, Michigan Department of Natural Resources, Wisconsin Initiative on Climate Change Impacts, and the University of Wisconsin-Madison. The menu covers diverse topics from wildlife population genetics to engaging human communities in wildlife conservation.

GREAT LAKES COASTAL ECOSYSTEMS

We worked with the U.S. Fish and Wildlife Service to lead a bi-national team of more than 20 regional managers and scientists to develop a [menu of adaptation strategies for Great Lakes coastal ecosystems](#), funded by the U.S. Fish and Wildlife Service as part of the Great Lakes Restoration Initiative. It has already been used to plan climate-informed tactics for several real-world projects.

FIRE-ADAPTED ECOSYSTEMS

The Southwest FireCLIME, in collaboration with NIACS and the Forest Service, developed an adaptation menu focused on [managing fire-prone ecosystems in a changing climate](#). This menu was published in the journal *Climate*, and offers a diversity of climate-informed approaches suitable for land managers seeking to support ecosystem adaptation to changing fire regimes and for fire managers who need to connect the dots between fire ecology, climate science, adaptation intent, and management implementation.

Adaptation Virtual Courses

NIACS developed a method of interactive training to help professionals prepare for and adapt to climate change in natural resources planning. This year we continued to improve on our popular online Adaptation Planning and Practices course by offering in-depth courses focused on adaptation for wildlife managers and carbon considerations. We also continued to innovate by developing a new “short course” format that is more suitable as an introduction to climate adaptation planning.

6

online adaptation
courses hosted

234

participants
in online adaptation courses

6

countries
represented
in the Latin America short course

“

I believe that the tools and information provided through NIACS represent the most field actionable resources that I have encountered.

- Kevin Podkowka, professional forester, MA DCR
(Carbon Adaptation Planning and Practices participant)

forestadaptation.org/training

forestadaptation.org/app



ONLINE TRAINING

ADAPTATION PLANNING AND PRACTICES for Wildlife Management



We hosted multiple virtual courses on climate change adaptation planning for a variety of audiences, including wildlife managers, land trusts, and Forest Service International Programs partners in Latin America. Course offerings included:

ADAPTATION PLANNING AND PRACTICES FOR WILDLIFE MANAGEMENT

We hosted an online Adaptation Planning and Practices course focused on [wildlife management](#) in partnership with the Midwest Climate Adaptation Science Center, Michigan DNR, and University of Wisconsin-Madison. Course participants covered 21 projects from around the country, representing a variety of species, habitat types, and planning scales. This was the first online course to feature the new wildlife adaptation menu.

ADAPTATION PLANNING AND PRACTICES FOR FOREST CARBON MANAGEMENT

We helped 39 participants from 12 states integrate [climate adaptation and carbon mitigation](#) into land management plans. Projects included lands under private, state, federal, and non-profit jurisdiction. Participants used the Adaptation Workbook and the forest carbon menu to develop specific actions to adapt forests to climate change and meet carbon goals.

CLIMATE ADAPTATION PLANNING SHORT COURSES FOR LAND TRUSTS

Our team members hosted multiple 4-week short courses to provide a short introduction to [adaptation planning for land management professionals](#). We partnered with the Land Trust Alliance and the USDA Climate Hubs to host a short course focused on climate adaptation and land stewardship for land trusts in the Western U.S. We hosted another short-course tailored for [southern New England land trusts](#) in partnership with Connecticut Sea Grant and the Avalonia Land Conservancy. These short courses helped us refine the new [Quick Guides](#) for adaptation planning, which were published this year by the Forest Service Northern Research Station.

Climate Forestry in Southern New England

We worked with a variety of partners to develop new programs and resources that support climate adaptation efforts in Southern New England. These successful pilot efforts can be adopted by other states to develop more climate-focused programming.

3

landowner guides
published

with the Massachusetts Department
of Conservation and Recreation

5

adaptation
practices

included in the *Forest
Climate Resilience Program*

25

foresters
trained

using the new Climate Forest
Stewardship Plan template



Just wanted to thank you for your presentation at the EEA online public meeting today. Your presentation was clear and informative, and made the complex science behind the issue easy to understand, which is an impressive feat.

- Chris Egan, Executive Director, Massachusetts Forest Alliance

mass.gov/guides/climate-forestry

forestadaptation.org/MADCR22

uvm.edu/femc/oak_resiliency



NEW CLIMATE FORESTRY PROGRAM WITH MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

We worked with Massachusetts Department of Conservation and Recreation (DCR) and many partners to develop a [Climate Forestry program](#) that encourages landowners to hire a qualified consulting forester to conduct a climate-focused forest assessment on their land. We helped develop landowner pamphlets, forester guides, logger training, and a new Forest Stewardship Plan (FSP) template with instructions for climate- and carbon-focused plans. We also co-hosted a training for 25 foresters to become certified in providing Climate Forestry services to landowners.

CLIMATE & CARBON BEST PRACTICES FOR FOREST CLIMATE RESILIENCE PROGRAM

In partnership with Mass Audubon and other regional organizations, we developed [specific forestry practices](#) for a pilot landowner incentive program in western Massachusetts. The practices are designed to increase carbon storage and forest resiliency. The suggested methods and monitoring details for each practice are described in a program handbook and will be incorporated into consulting foresters' plans for select properties in the region.

NEW ASSESSMENT TOOL FOR PROMOTING RESILIENT OAK FORESTS

We worked with the Forest Stewards Guild and the Forest Ecosystem Monitoring Cooperative to develop a new [Oak Resiliency Tool](#). This online tool enables natural resource professionals and landowners in southern New England to assess the resiliency of oak forests, explore adaptation actions, learn from real-world demonstration projects, and find resources for further learning and monitoring. The tool will help us better understand how oak forests are coping with climate change and other stressors.

Tribal Partnerships

NIACS is collaborating with multiple partners to help tribal natural resources staff and community members address tribal priorities through climate change adaptation. We're also helping non-tribal organizations work more effectively with Tribes on climate change issues.

6

TFPA projects

launched at the Tribal Forest Protection Act (TFPA) and Climate Adaptation workshop

41

adaptation projects

from around the country started at Tribal Adaptation Menu workshops since the menu introduction

267

registrations

for the Tribal Forest Protection Act (TFPA) and Climate Adaptation webinar series



The Natural Resources Department at Sault Ste. Marie Tribe of Chippewa Indians participated in all 3 NIACS Tribal Forest Protection Act webinars and the Climate Adaptation training. These webinars were extremely useful... NIACS provided experts who present concise and dense information that is directly applicable to Tribal and USFS staff... These webinars are a great training tool for entry level and experienced staff and we will continue to engage with NIACS and their excellent training resources in the future.

- Eric Clark, Lead Wildlife Biologist, Sault Ste. Marie Tribe of Chippewa Indians

forestadaptation.org/focus/tribal-perspectives

forestadaptation.org/tribal-climate-adaptation-menu



2022 MINNESOTA CLIMATE ADAPTATION PARTNERSHIP AWARD

The Tribal Adaptation Menu Team, including NIACS, received the [2022 Minnesota Climate Adaptation Partnership award](#) in the Collaboration category. The Tribal Climate Adaptation Menu is a product of many dedicated partners, including the Forest Service, Great Lakes Indian Fish and Wildlife Commission, 1854 Treaty Authority, College of Menominee Nation, Inter-Tribal Council of Michigan, and more.

CLIMATE ADAPTATION WORKSHOP TO SUPPORT MANOOMIN (WILD RICE)

The Tribal Adaptation Menu Team held an in-person workshop in Duluth, MN, to support the NOAA-funded project “Harvesting Manoomin as a Climate Adaptation and Resilience Strategy in the Lake Superior Region.” Workshop participants included staff from the 1854 Treaty Authority, GLIFWC, Fond du Lac Band of Lake Superior Chippewa, Wisconsin DNR, Midwest Climate Adaptation Science Center, TNC, University of Minnesota, as well as tribal elders.

NATIVE AMERICAN RESEARCH ASSISTANTSHIP PROJECT

We partnered with the Keweenaw Bay Indian Community to host an intern through the Native American Research Assistantship program, which is a partnership between the Forest Service and The Wildlife Society to support tribal students for 12-week paid internships. Our intern, Antoinette Shirley, was a PhD student from Michigan State University. Antoinette worked on a project called “A delicate balance: supporting white-tailed deer (waawaashkeshi) habitat and forest sustainability on Keweenaw Bay Indian Community lands.”

TRIBAL FOREST PROTECTION ACT WORKSHOPS AND WEBINAR SERIES

A new project allowed us to work with Tribal Nations and associated National Forests to identify mutual climate adaptation priorities and create project proposals to implement through the Tribal Forest Protection Act (TFPA). Forest Service funding for the Climate Hubs supported our work with GLIFWC partners to hold the first [TFPA + Climate Adaptation workshop](#) with Bay Mills Indian Community, Sault Ste. Marie Tribe of Chippewa Indians, and the Hiawatha National Forest. More workshops are planned for 2023.





Projects

Adaptation Services

Adaptive Silviculture for Climate Change

Carbon Trends and Management

Digital Science Communication

Adaptation Services



TEAM MEMBERS:

Madeline Baroli, Stephen Handler, Maria Janowiak, Adrienne Keller, Patricia Leopold, Todd Ontl, Courtney Peterson, Annamarie Rutledge, Kristen Schmitt, Danielle Shannon

Adaptation Services encompasses our work to support natural resource professionals, communities, and motivated landowners to incorporate climate change considerations into planning and on-the-ground action.

The Adaptation Services team delivers information and technical support to natural resource professionals and landowners to address climate change impacts in natural resources management. NIACS has developed a collaborative, cross-boundary approach among scientists, managers, and landowners to incorporate climate change considerations into natural resource management. Hands-on workshops, seminars, and trainings help participants identify climate vulnerabilities and adapt their management to mitigate the potential impacts of climate change. Adaptation Services activities support the USDA Northern Forests Climate Hub, part of the national network of regional USDA Climate Hubs, by providing useful resources in the Midwest and Northeast.



I continue to be impressed by NIACS' work! Your products are incredibly accessible for land managers making site-level forest management decisions.

- Emily Peters, Minnesota
Department of Natural Resources

adaptationworkbook.org

climatehubs.usda.gov/hubs/northern-forests

forestadaptation.org



28

workshops on
climate change
adaptation

3

new menus
of adaptation
strategies
published

(Great Lakes coastal,
fire, wildlife)

5

Forest Service
project planning
interdisciplinary
teams supported

SPOTLIGHT

LEADING AND FACILITATING EFFORTS TO INFORM THE FOREST SERVICE ADAPTATION PLAN

Our team of adaptation specialists helped to convene four virtual nationwide workshops and three roundtables for tribal partners, nonprofits, and state foresters to inform the development of the *USDA Forest Service Climate Adaptation Plan*. The workshops brought together over 300 Forest Service staff and numerous other partners from across the country. The *USDA Forest Service Climate Adaptation Plan* was released in July and highlighted several projects and partnerships convened by NIACS and the USDA Northern Forests Climate Hub.

SFI STATE IMPLEMENTATION COMMITTEES: REGIONAL CLIMATE CHANGE WORKSHOPS

The Sustainable Forestry Initiative (SFI) certification standard introduced new “Climate-Smart Forestry” expectations for certified organizations in 2022. We worked with SFI to demonstrate how our tools and resources can help meet these expectations and facilitated two workshops for members of the SFI State Implementation Committees in the Northeast and Lake States Regions to help identify priority climate change risks and adaptation actions. This regional information will help individual organizations move forward on addressing climate change.

INTEGRATING CLIMATE CHANGE CONSIDERATIONS INTO WILD AND SCENIC RIVER COMPREHENSIVE RIVER MANAGEMENT PLANNING

We worked with Comprehensive River Management Planning teams to evaluate the influence of climate change on seven Wild and Scenic Rivers across the country. We facilitated workshops to evaluate climate impacts on desired conditions, visitor-use strategies, and monitoring plans. Partners included the Forest Service National Wilderness and Wild Scenic Rivers program, Office of Sustainability and Climate, National Forests, and Regional Office staff (Regions 1, 3, 5, and 9).

CLIMATE ADAPTATION FOR FOREST-DEPENDENT WILDLIFE WEBINAR SERIES

We co-hosted a monthly webinar series on [Climate Adaptation for Forest-Dependent Wildlife](#) with the U.S. Fish and Wildlife Service Forest Ecology Working Group, Science Applications and Migratory Birds Programs, and the National Conservation Training Center. This year-long series explored climate change impacts on forest composition and structure, as well as the influence on wildlife populations and carbon dynamics. Over 1,300 participants registered for the webinar series, which will continue into 2023.

“ I feel like practitioners and managers know we need to incorporate climate change into our planning, but don’t necessarily know how to approach it. This was a super useful, structured way to think about climate change on our own units and I’ve already been thinking about how to use this process for some of our wetland projects.

- Whitney Kroschel, Agassiz National Wildlife Refuge, U.S. Fish & Wildlife Service





EXPANDING URBAN AND COMMUNITY FORESTRY RESOURCES

We released the [Urban Tree Canopy Assessment Toolkit](#) for the Puget Sound region this year, in collaboration with The Nature Conservancy, Davey Tree Expert Company, American Forests, and City Forest Credits. We also partnered with American Forests to develop a tree species vulnerability assessment and corresponding handouts for the Boston Region. A University of Massachusetts 'Urban Forestry Today' webinar featuring the urban forests and human health adaptation menu attracted over 1,000 participants.

COMING UP ►

Next year, our Adaptation Services work will include a variety of projects across our service area. We plan to host workshops and educational events for urban forest managers in Boston and other urban areas and release additional urban forest vulnerability assessments. We will play a leading role in education, training, and engagement with Forest Service staff across Region 9 to promote the *USDA Forest Service Climate Adaptation Plan* and meet the reporting requirements of the Climate Action Tracker. We will also continue to work with public and private certified organizations to meet new climate change expectations in the SFI and FSC certification standards.

“ I’m thrilled to be included. This has been very energizing. I’ll be going back to my forest planning work with renewed vigor because of this workshop.

- Jenny Rasmussen, USDA Forest Service participant in Climate Adaptation Plan workshop

Adaptive Silviculture for Climate Change



NETWORK LEADERS:

Maria Janowiak, Linda Nagel, Courtney Peterson, Chris Swanston

The Adaptive Silviculture for Climate Change network is a replicated, operational-scale experiment testing the effectiveness of climate adaptation strategies in a diversity of forest ecosystem types across the U.S. and Canada.

The Adaptive Silviculture for Climate Change (ASCC) Network fosters manager-scientist collaboration to co-develop and implement demonstrations of adaptation actions in a variety of forest ecosystem types. ASCC study sites are rigorously designed adaptation installations that further our understanding of potential management interventions and adaptation best practices, explicitly testing silvicultural treatments that encompass resistance, resilience, and transition related to climate change and a no-action control. ASCC Network sites complement the broader network of 500+ adaptation demonstration sites.



I just want to take a moment to express my gratitude and appreciation for the process and thoughtful coordination Courtney and Linda are stewarding for the ASCC Network. This is how conscious communities of practice are created.

- Jarel Bartig, Wayne National Forest, USDA Forest Service



14

sites spanning
the U.S.
and Canada

8

fully implemented
sites across

2,200

total acres

4

sites planted
future-adapted
seedlings

SPOTLIGHT

NETWORK GROWTH

Since its inception in 2012, the ASCC Network has grown to include 14 sites across the U.S. and Canada. Four new sites joined the Network this year: the [Driftless Area](#) series of affiliate ASCC sites located in Iowa, Minnesota, and Wisconsin; the [Ohio Hills](#) site on the Vinton Furnace Experimental Forest in an oak-dominated forest in Ohio; the [Taylor Park](#) site on the Gunnison National Forest in a lodgepole pine forest in southwest Colorado; and the Robinson Forest site with the University of Kentucky in an Appalachian mixed-mesophytic forest.

INTERPRETIVE SIGNS AT MISSISSIPPI NATIONAL RIVER AND RECREATION AREA SITE

The [Mississippi National River and Recreation Area](#) affiliate ASCC site in Saint Paul, MN, installed interpretive signs designed by a local Dakota artist and featuring Dakota and Ojibwe language that describe both the cultural significance of the trees and the scientific questions being asked as part of the experiment. These signs were made possible through a partnership with the Lower Phalen Creek Project.

THE NEXT GENERATION OF ASCC

This year, we hired our first ASCC Network Intern, Kirsten Martin. Kirsten was instrumental in updating the ASCC website, creating outreach materials for our ASCC sites and the network, and compiling the summer newsletter. Kirsten will be graduating with a B.S. in Human Dimensions of Natural Resources from Colorado State University in December 2022. Congratulations, Kirsten!



ASCC SITES



JOHN PRINCE RESEARCH FOREST (BC, CANADA)

Sub-boreal spruce forest

Point of Contact: Che Elkin,
University of Northern British Columbia

Virtual Workshop: June 2021

Harvest: Winter 2021–2022

Planting: Expected 2023

FLATHEAD NATIONAL FOREST/ CORAM EXPERIMENTAL FOREST (MT)

Western larch, mixed-conifer forest

Point of Contact: Justin Crotteau,
USFS Rocky Mountain Research Station

Workshop: June 2016

Harvest: Winter 2019–Winter 2022

Planting: Expected 2024

COLORADO STATE FOREST (CO)

High-elevation spruce-fir forest

Point of Contact: Mike Battaglia,
USFS Rocky Mountain Research Station

Virtual Workshop: December 2020

Harvest: Expected 2024

Planting: Expected 2025

TAYLOR PARK (CO)

Lodgepole pine-dominated forest

Point of Contact: Jonathan Coop,
Western Colorado University

Workshop: July 2022

Harvest: Expected 2024

Planting: Expected 2025

SAN JUAN NATIONAL FOREST (CO)

Warm dry-mixed conifer forest

Point of Contact: Mike Battaglia,
USFS Rocky Mountain Research Station

Workshop: March 2014

Harvest: Expected Summer 2023

COMING UP ►

After adding several new sites in the past year, we will shift our focus to strengthening the ASCC Network to enhance collaboration among the site scientists and managers, as well as sharing successes and lessons learned with diverse management audiences. Network leads and co-founders Linda Nagel (now at Utah State University), and Chris Swanston (now at the Forest Service Office of Sustainability and Climate), and Maria Janowiak remain committed to the success of the ASCC Network and are working with network collaborators to support robust coordination, networking, and site monitoring into the future.

ASCC is a highly collaborative network, and each site is led by a team of scientists and managers.

Core Site



Affiliate Site



**CUTFOOT EXPERIMENTAL FOREST/
CHIPPEWA NATIONAL FOREST (MN)**

Red-pine dominated, mixed species forest

Point of Contact: Brian Palik,
USFS Northern Research Station

Workshop: July 2013

Harvest: Winter 2014–2015

Planting: 2016

**PETAWAWA RESEARCH
FOREST (ON, CANADA)**

White pine-mixed wood forest

Point of Contact: Trevor Jones,
Natural Resources Canada

Workshop: July 2019

Harvest: Winter 2021–2022

Planting: Expected 2023

**MISSISSIPPI NATIONAL RIVER
AND RECREATION AREA (MN)**

*Urban ash-elm floodplain forest in
Saint Paul, MN*

Point of Contact: Marcella Windmuller-
Campione, University of Minnesota

Workshop: March 2019

Harvest: Winter 2019–2020

Planting: 2020

**SECOND COLLEGE
GRANT (NH)**

Northern hardwoods forest

Point of Contact: Tony D'Amato,
University of Vermont

Workshop: August 2016

Harvest: Fall 2017

Planting: 2018

DRIFTLESS AREA (IA, MN, WI)

Southern dry-mesic hardwood forest

Point of Contact: Miranda Curzon,
Iowa State University

Virtual Workshop: November 2021

Harvest: Expected 2023

Planting: Expected 2024

ROBINSON FOREST (KY)

Appalachian mixed-mesophytic forest

Point of Contact: Jacob Muller,
University of Kentucky

Workshop: November 2022

Harvest: Expected 2024

Planting: Expected 2025

OHIO HILLS (OH)

Dry-mesic oak-dominated forest

Point of Contact: Bryce Adams,
USFS Northern Research Station

Workshop: May 2022

Harvest: Expected 2023

Planting: Expected 2024–2025

**SOUTHERN NEW ENGLAND
EXURBAN OAK (CT, RI)**

Exurban oak-hickory forest

Point of Contact: Tom Worthley,
University of Connecticut

Virtual Workshop: October 2020

Harvest: Expected 2022 and 2023

Planting: Expected 2024

THE JONES CENTER AT ICHAUWAY (GA)

Longleaf pine-hardwood forest

Point of Contact: Joshua Puhlick,
The Jones Center at Ichauway

Workshop: January 2016

Harvest: Winter 2016–2017

Planting: 2018

Carbon Trends and Management



TEAM MEMBERS:

Maria Janowiak, Adrienne Keller, Luke Nave, Todd Ontl

The Carbon Trends and Management project creates science and tools that help partners identify carbon management opportunities and vulnerabilities as they make management decisions.

The Carbon Trends and Management theme focuses on the use of cutting-edge science, both in the field and using pre-existing public databases, to help partners consider carbon management in their work. Evidence-based ecosystem carbon management can support many goals, including climate adaptation, flood and fire mitigation, and the provisioning of ecosystem services. Carbon is critical to how ecosystems work and what they provide to people, so it is important to identify how land-use change, management decisions, and disturbances impact carbon stocks and sequestration rates.

“What I enjoy most is that I feel I can **apply what I learn in this course directly to my property and in turn **share** it with other landowners around Vermont.**

- Tim Stout, Northham Forest Carbon, participant in the Carbon Adaptation Planning and Practices online course



70
miles of hiking
to collect
7,030
manual
measurements
for the Adaptive Aspen
Management Experiment
microclimate dataset

10
peer-reviewed
journal articles
published totaling
64
coauthors

SPOTLIGHT

PACIFIC NORTHWEST AND SOUTH ATLANTIC SOIL CARBON ASSESSMENTS

We published two regional soil carbon assessments in peer-reviewed journals, featuring the [Pacific Northwest](#) and [South Atlantic](#) states. Each assessment identified the direction, magnitude, and variability in soil carbon change due to land use change, forest management, or disturbances, within the context of a unique ecoregion. These were the third and fourth in a series of similar assessments.

SOIL CARBON ASSISTANCE TO THE FOREST SERVICE

We assisted the Forest Service Washington Office and National Forest staff with monitoring in the field, implementing tools developed with the ecoregional soil carbon assessments, and creating a training module on Soil Carbon and Climate Change for a National Soils NEPA Training series.

EDUCATIONAL CONTENT FOR MSU FOREST CLIMATE & CARBON PROGRAM

We partnered with the Michigan State University Forest Carbon and Climate Program (FCCP) to develop [regionally-specific online learning modules](#) to supplement FCCP's [Understanding Forest Carbon Management course](#). Module topics include regional forest background, climate change trends and effects, carbon storage, climate impacts by forest type, and regionally appropriate carbon management adaptation strategies for the Pacific Northwest, Northeast, and Southeast.

COMING UP ►

Soil carbon assessments for the Northeast and Central Hardwoods ecoregions will be completed. A project with The Nature Conservancy in Wisconsin will be exploring carbon management tradeoffs and opportunities with ecosystem restoration in forests, woodlands, and wetlands. We're also synthesizing carbon management science into a literature database, actionable summaries, and training resources for land managers to incorporate carbon into multiple-use management objectives. We will continue to work with the MSU FCCP to create joint products.

Digital Science Communication



TEAM MEMBERS:

Hannah Abbotts, Maria Janowiak, Shawn Klomparens, Kailey Marcinkowski

Digital Science Communication efforts create and support digital media, such as websites and other web products, graphics, and educational multimedia, that clearly deliver usable, science-based information on climate change.

The Digital Science Communication team works on a growing portfolio of web-based activities that convey information, tools, and other resources regarding climate change and other land management challenges. We organize, create, manage, and maintain numerous websites to provide user-friendly online platforms for delivering climate change science information. These efforts also use graphic design as a communication tool to visually represent and clarify scientific information and ideas.



I'm getting so much positive feedback about the new newsletter design! Great work bringing your creative skills to shake that up and make it so much better!

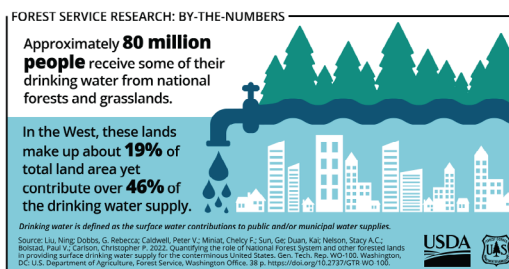
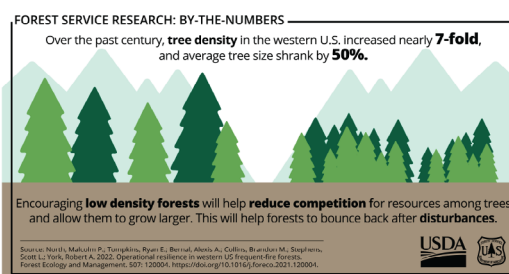
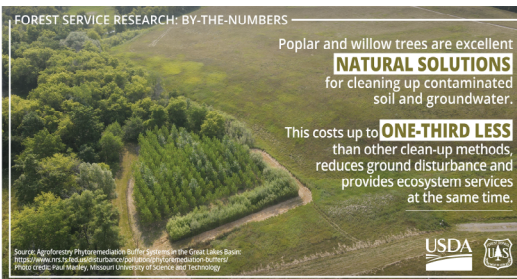
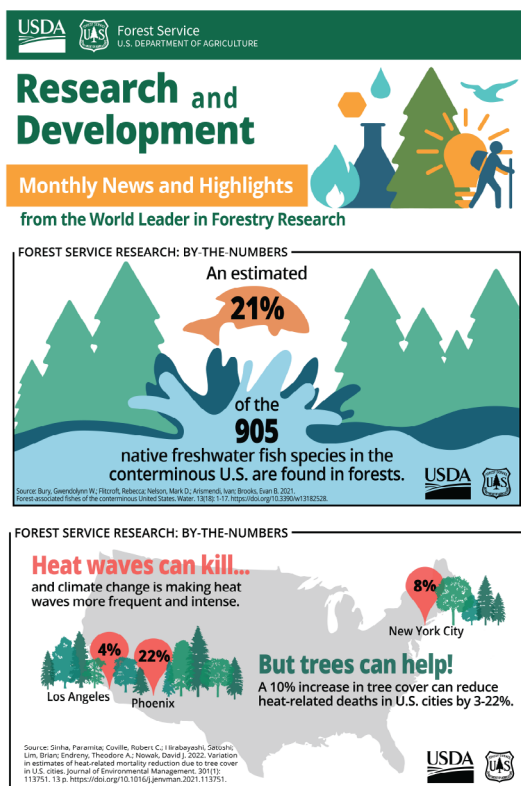
- Laurel Haavik, Research and Development, USDA Forest Service

adaptivesilviculture.org

climatehubs.usda.gov

fs.usda.gov/ccrc

niacs.org



15+
science
infographics
created for Forest
Service Research
& Development

145,000
users accessed
information on the
USDA Climate
Hubs website

SPOTLIGHT

COLLABORATING TO TRANSITION THE CLIMATE CHANGE RESOURCE CENTER

With recent structural changes to NIACS and the Forest Service's Web Modernization effort, the management of the [Climate Change Resource Center](#) (CCRC) website transitioned from NIACS to the Forest Service Office of Sustainability and Climate (OSC). We collaborated with the OSC and Forest Service Web Modernization team to create a new site within the web structure while retaining the wealth of resources currently housed in the CCRC.

VISUAL INFORMATION RESOURCES FOR NIACS AND PARTNER ORGANIZATIONS

We support Forest Service Research & Development by creating science infographics to supplement their outreach efforts. We created figures and infographics for the Forest Service [2020 Resources Planning Act Assessment](#), FS *National Report on Sustainable Forests*, and the USDA entity guidelines for greenhouse gas quantification update report. Publication layouts and digital accessibility were created for two adaptation planning Quick Guides, the Great Lakes coastal menu, and the northern Michigan field guide.

USDA CLIMATE HUBS WEBSITE

NIACS developed and implemented major changes on the administrative content management side of the national [USDA Climate Hubs](#) website this year, with the introduction of new content review tools. In the public-facing view of the website, we expanded the site to include a central location for video content.

COMING UP ►

The Digital Science Communication team will continue to lead the USDA Climate Hubs web efforts, developing more tools to improve user experience. We will explore ways to improve our delivery of digital resources and online courses to increase the effectiveness and reach of our offerings. We will lead the publication layout and design for the Spanish version of the adaptation planning Quick Guide, GLIFWC climate change vulnerability assessment, and regional tree species vulnerability assessment for several urban areas.



Outreach and Science

Fast Facts

Presentations, Press, Publications,
Trainings, Workshops

Press

Publications



Fast Facts 2022



PRESENTATIONS

96

presentations

80+

invited
presentations

17

conference
sessions

13

NIACSers
and detailers
gave presentations

PRESS

14

press
items

5

news
articles

3

podcast
episodes

1

Facebook
LIVE event
with Woodsy Owl!

PUBLICATIONS

21

publications

13

peer-reviewed
journal articles

2

peer-reviewed
white papers

1

soil organic
matter database

TRAININGS

10

trainings

12

years of
participation

in the Forest Service's
National Advanced
Silviculture Program

3

Adaptation
Planning and
Practices

2

short
courses

WORKSHOPS

50

workshops

1500+

participants

70

partner
organizations

9

adaptation
planning
consultations

PRESS

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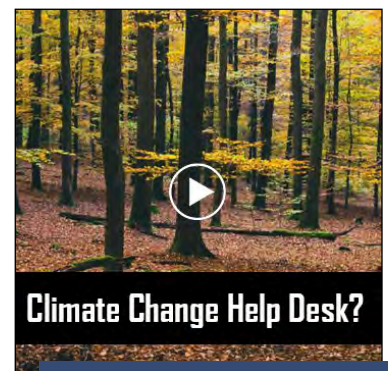
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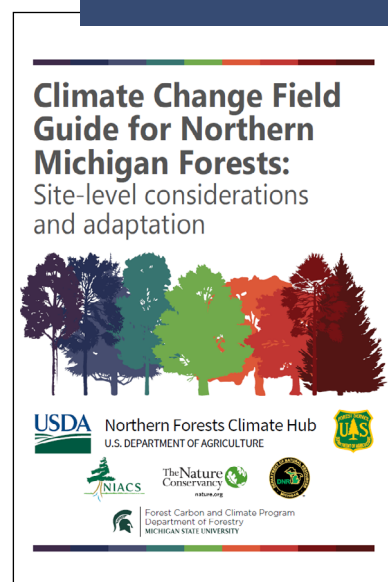


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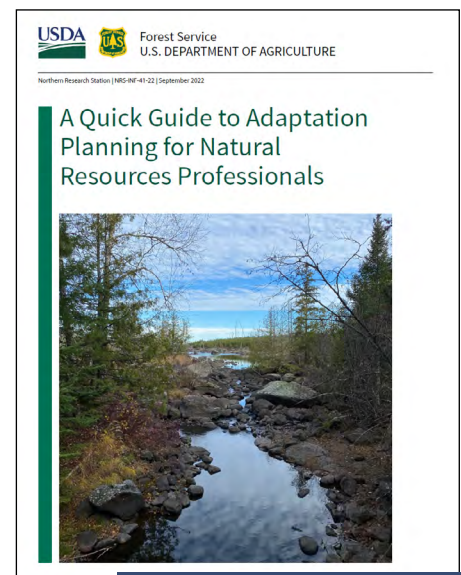
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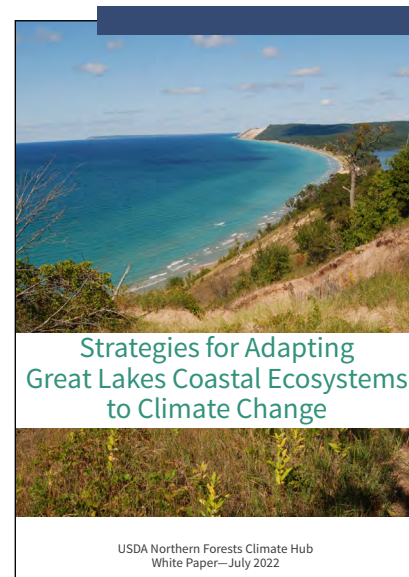
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People

Meet Our Team
FY22 Detailers
Partner Organizations



MEET OUR TEAM



HANNAH ABBOTTS ►

Product Designer and Content Delivery Specialist
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Hannah is the content manager for the Forest Service Climate Change Resource Center and USDA Climate Hubs. In addition to creating and managing web content, she plays a supporting role in site building on many projects. Hannah enjoys running and skiing and all things outside.



MADELINE BAROLI ►

Climate Adaptation Specialist
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Maddy supports partners in adaptation planning through climate science communication, resource development, and training. She also works on projects within New England and helps to manage social media. Outside of work, Maddy coordinates an assisted migration community science project and enjoys the outdoors with her partner and two pet rats.



STEPHEN HANDLER ►

Climate Change Specialist
USDA Forest Service Northern Research Station
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Stephen coordinates adaptation projects across the Northwoods. This includes preparing vulnerability assessments, working with partners, and planning real-world projects to illustrate climate-informed land management. In the past year, Stephen served in temporary assignments as the Forest Service Eastern Region Tribal Relations Program Manager and the NIACS Deputy Director.



MARIA JANOWIAK ►

Acting Director, Northern Institute of Applied Climate Science
Acting Director, USDA Northern Forests Climate Hub
USDA Forest Service Northern Research Station
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Maria has been Acting Director of NIACS and the USDA Northern Forests Climate Hub since May 2021 and has continued to expand her leadership role. This year Maria celebrated 15 years with NIACS at a surprise party hosted by co-workers. She continues to work on a few projects in New England and elsewhere. Maria enjoys riding her fat bike and growing vegetables and tree seedlings in her garden.



ADRIENNE KELLER ►

Climate Adaptation Specialist
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Adrienne works on a projects related to Midwest ecosystem adaptation and carbon mitigation. Her research background is in terrestrial carbon and nutrient cycling, spanning tropical and temperate forests, grasslands, and agroecosystems. Adrienne enjoys spending time being active outside, reading, trying to learn the banjo, and baking cupcakes with her nieces.



SHAWN KLOMPARENS ►

Full Stack Web Developer
Michigan Technological University
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Shawn is the web developer for the Climate Change Resource Center and USDA Climate Hubs. He is an advocate for Open Source software and is dedicated to the effective presentation of information online in a technically efficient way. Shawn lives in Jackson, Wyoming with his wife and two children and enjoys running, cycling, camping, and Nordic and backcountry skiing.



PATRICIA LEOPOLD ►

Climate Adaptation Specialist
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Patricia coordinates climate adaptation projects in the Mid-Atlantic and Central Appalachians, where she is expanding partnerships, creating resources, and promoting implementation of adaptation actions in inland and coastal forest ecosystems, and at scales ranging from state agency planning to on-the-ground projects. Patricia enjoys hiking, traveling, and cross-country skiing.



KAILEY MARCINKWOSKI ►

Science Visual Information Specialist
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Kailey develops graphic visualization resources and works with NIACS team members and partners to plan, design, and create graphic design products and publication layouts for digital and print materials. She enjoys turning technical and scientific concepts into fun, understandable, and pretty visuals. Kailey spends all her time outside of work chasing after her kids and hoping for a nap.

MEET OUR TEAM



LUKE NAVE ►

Research Associate Professor
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Luke conducts most of his work at a desk, seeking answers to carbon cycle science questions using pre-existing datasets. He takes periodic trips to field sites around the upper Lake States to dig holes in the ground, sling tree diameter tape, and repair research infrastructure damaged by wildlife. He also enjoys spending time in the forest with his family.



COURTNEY PETERSON ►

Climate Adaptation Specialist
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Courtney provides coordination and leadership for the Adaptive Silviculture for Climate Change Network. She is also a NIACS and USDA Southwest Climate Hub climate adaptation specialist, supporting partners in the Intermountain and Southwest with adaptation communication, planning, and training. Courtney loves playing violin, traveling, and outdoor adventures.



ANNAMARIE RUTLEDGE ►

Climate Adaptation Specialist
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Annamarie focuses on science communication, urban forestry adaptation projects, and general NIACS support. Based in Saint Paul, Minnesota, Annamarie enjoys cheering on all MN sports, visiting local restaurants and breweries, and spending time on Burntside Lake with her fiancé and three pups Jordy, Canasta, and Mr. Bates.



DANIELLE SHANNON ►

Climate Adaptation Specialist
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Danielle Shannon is a climate adaptation specialist and the coordinator of the USDA Northern Forests Climate Hub. Danielle helps land managers cope with and adapt to the challenges of climate change, particularly in the field of forest hydrology and the management of forested watersheds. After work, you can find her hanging out with her two adventurous kids, learning new recipes, completing house projects or folding laundry.

The Forest Service Office of Sustainability and Climate scored some adaptation talent this year. We'll miss having these folks on the NIACS team but will continue working with them in their new roles.



LESLIE BRANDT ►

formerly Climate Change Specialist
USDA Forest Service, Eastern Region
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Leslie led climate change vulnerability and adaptation work in urban areas for NIACS. She was away on detail for all of FY22 and accepted a position with the Forest Service's Office of Sustainability and Climate (OSC) in summer 2022. Leslie lives in St. Paul, MN, with her husband, two kids, and her two cats.



KRISTEN SCHMITT ►

formerly Climate Adaptation Specialist
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Kristen worked in support of the USDA Northern Forests Climate Hub and worked with partners to create new tools and to plan and execute trainings. After 12 years at NIACS, Kristen accepted a position with the OSC. Kristen is still located in northern Minnesota and staying busy canoeing, camping, and reluctantly running in her free time.



TODD ONTL ►

formerly Climate Adaptation Specialist
Michigan Technological University
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Todd led the coordination of the forest carbon management outreach activities. After 6 years at NIACS, Todd accepted a position with the OSC. These days, Todd enjoys exploring the coasts and mountains surrounding his new home in Maine with his wife, daughter, and two dogs.



CHRIS SWANSTON ►

formerly Director, Northern Institute of Applied Climate Science
formerly Director, USDA Northern Forests Climate Hub
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Chris Swanston served as NIACS director from 2008–2021 and directed the USDA Northern Forests Climate Hub since its inception. Chris now serves as the Forest Service's Climate Advisor and leads the OSC. Chris does not like cooked vegetables or mushrooms, because they're gross.

FY22 DETAILERS

Several Forest Service detailers provided additional support to the NIACS team this year. Ryan Toot worked with the Northern Research Station to support climate change adaptation activities, with an emphasis on forested watersheds, water resources, and Great Lakes coastal ecosystems. Andy Bower detailed as our Deputy Director, supporting NIACS organizational operations and management. Brooke Hagarty acted as the Forest Service Eastern Region (R9) Climate Change Coordinator, coordinating R9 climate work, translating the adaptation workbook for interdisciplinary team use, and compiling climate and carbon comments. Steve Harriss also joined us as the R9 Climate Change Coordinator and led regional coordinator calls and assisted with our Wildlife Adaptation Planning and Practices online course. Katie Frerker also detailed as the R9 Climate Change Coordinator, focusing on carbon and climate adaptation work and the rollout of the Forest Service Adaptation Plan.

NIACS also hosted a Native American Research Assistantship student, Antoinette Shirley. Antoinette worked as a summer intern on the project titled, “A delicate balance: supporting white-tailed deer (waawaashkeshi) habitat and forest sustainability on Keweenaw Bay Indian Community lands.”



Ryan Toot



Brooke Hagarty



Steve Harriss



Andy Bower



Katie Frerker

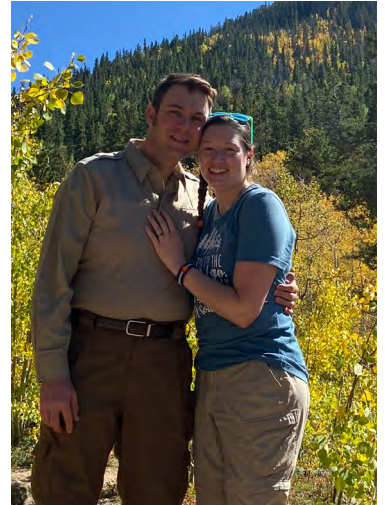


Antoinette Shirley

PARTNER ORGANIZATIONS

Partner Organization	Steering Group Member	Programmatic Contacts
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Adaptation Workbook

adaptationworkbook.org



Adaptive Silviculture for Climate Change

adaptivesilviculture.org



Climate Change Response Framework

forestadaptation.org

USDA Northern Forests Climate Hub

climatehubs.usda.gov/hubs/northern-forests

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