



ONLINE TRAINING

ADAPTATION

PLANNING AND

PRACTICES

Welcome to the course!
Here's what you need to know...

We are excited that you signed up for the Adaptation Planning and Practices online course!

This class will start on January 25 and finish March 17, 2020.

We look forward to helping you integrate climate change information into your real-world management project. Through this course, you will be able to:

- Identify locally important climate change impacts, challenges, and opportunities.
- Develop specific actions to adapt forests to changing conditions.
- Use the [Adaptation Workbook](#) to create your own “climate-informed” project.
- Better communicate with stakeholders on key climate change impacts, challenges, and opportunities.
- Access post-training support from NIACS staff during project planning and implementation.

DETAILS

DATES: January 25 – March 17, 2020

Course website:

www.forestadaptation.org/winter2021course

The course runs over eight weeks, and includes:

- Weekly lecture sessions describing resources and Adaptation Workbook (30 min-1 hour)
- Four discussion sessions focused on participant projects and questions (1 hour)
- Two optional sessions on climate impacts and adaptation strategies

Lectures and Discussion meetings

- *Weekly lectures* on Monday at 2:00-3:00pm eastern time to view live.
- *Discussion sessions* on Tuesdays and Wednesdays (see schedule for dates)
- Meeting room for all sessions

<https://michigantech.zoom.us/j/89771472093>

See page 3 for full course schedule and web/phone connection information.

Syllabus Contents

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Course Time Commitment

To get the most out of this course, we expect you to fully participate. ***All participants are expected to attend the weekly lectures and four discussion break-out group class sessions, which consists of 1-1.5 hours of instruction each week.***

We realize that things come up from time to time, and most folks are experiencing a new routine with COVID-19. If you need to miss a session, please let us know ahead of time. If you anticipate needing to miss more than two sessions, you may want to defer participation for another time. To provide participant flexibility, all lectures will be recorded and posted to YouTube, and presentation slides will be made available after each lecture.

In addition to class time, ***there will be up to three hours of homework each week.*** This is our general estimate of the amount of time needed to thoughtfully develop a climate adaptation plan, this estimate also includes the time needed to complete additional reading assignments. The amount of time you spend on homework depends on the complexity of your project and the level of detail you want to put into your adaptation plan.

Technology and Equipment Needed

Since this is a virtual training, there are some technological requirements. At minimum, you will need high-speed internet access and a phone line. We like participants to use a webcam and headset that connects directly to their computer audio if this is possible. We have found the sound quality is best if you use your computer audio rather than a phone line. If connecting by phone, a land line will offer better quality than a cell phone. You may need to disable pop-up blockers or firewalls when accessing the online workbook and webinar software. We are available to help troubleshoot potential issues prior to class.

Accessibility

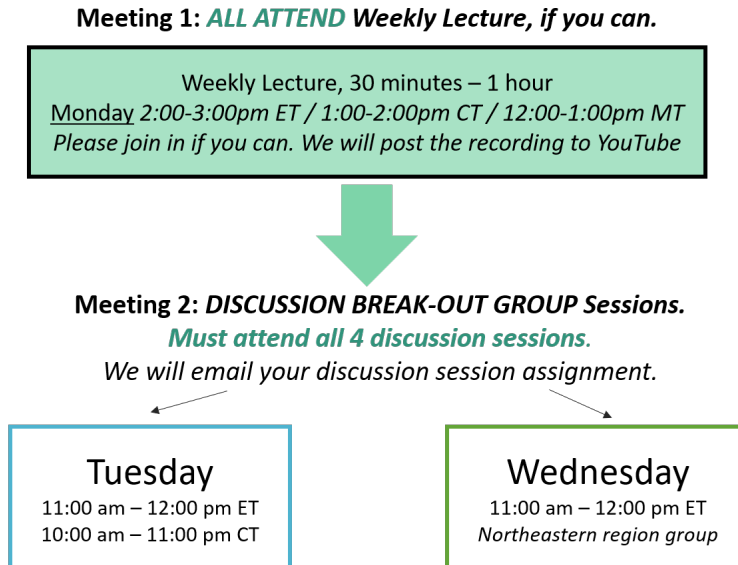
If you have a disability and require certain accommodations to fully participate, please let us know before the beginning of the course. We will work with you to ensure your needs are met.

Education credits

This course has been approved for 9 continuing forestry education credits (category 1) by the Society of American Foresters and 14 continuing education units (certified arborist, municipal specialist, management) from the International Society of Arboriculture. We will provide additional details about how to receive credits for the course during the sessions.

Course Format

This course follows a five-step process to develop climate change adaptation projects using the online Adaptation Workbook (www.adaptationworkbook.org). The course format includes a lecture and a discussion session that provides a review of each step, followed by independent work time to complete each step of the adaptation workbook. The course consists of lectures (live or recorded), discussion (live), and homework (on your own).



Lectures

We will host a weekly lecture (30-60 minutes) that covers each step of the Adaptation Workbook. We encourage you to attend the live presentation, but sessions will be also recorded and posted online on our [NIACS YouTube page](#). Lectures are on Mondays from 2:00-3:00 ET / 1:00-2:00 CT.

Discussion Sessions

We will host engaging 1-hour discussion sessions for live attendance. Participants will split up into topical break-out groups to discuss key aspects of developing your adaptation projects.

Participation in these four discussions is required. Plan to attend your group session on *Tuesday or Wednesday* at specified times (see figure above). We will email your session assignment and send calendar invitations.

- Discussion session 1 (week of January 25) – Introduce project to small group.
- Discussion session 2 (week of February 8) – Discuss project (recapping Step 2 and Step 3).
- Discussion session 3 (week of March 8) – Discuss project (recapping Step 4 and Step 5).
- Discussion session 4 (week of March 15) – Share completed product.

We will also offer two **optional** sessions to cover topics that sometimes have greater interest. These sessions will be a mix of presentation and discussion.

- Wednesday February 3, 2021 at 11:00-12:00 ET/10:00-11:00 CT: Climate impacts on tree species and the [Climate Change Tree Atlas tool](#).
- Tuesday February 23, 2021 at 11:00-12:00 ET/10:00-11:00 CT: Selecting [menus](#) of Adaptation Strategies and Approaches

Connection Details – All Lectures and Discussion Sessions

- **We will meet via Zoom:** <https://michigantech.zoom.us/j/89771472093> Please join the first session a bit early; your computer may need to install a small add-on before entering the room.
- **For audio, please choose “Join with Computer Audio” when prompted.** If it is not possible to use Computer Audio, please mute your speakers and dial the number below from a land line (preferred) or a mobile phone. (646) 876-9923; Passcode: 897-7147-2093
- **We encourage you to turn on your webcam during these sessions!**

Course Schedule

Course Preparation — Complete before the first session

To make sure you are ready to dive into the course during our first session, we would like you **to set up an account at www.adaptationworkbook.org by January 22.** Instructions for creating an account and linking it to the course are located on page 7 in this packet.

- **For group projects:** A single account should be shared among multiple users for group projects because it is not possible for multiple users to share a single project.

Session 1 — week of January 25

Lecture Topics:

- Icebreaker and introductions.
- Course objectives, instructors, and agenda.
- Introduction to the Adaptation Workbook online tool.
- Developing an adaptation project: Defining project goals and objectives.
- What you need to know for Step 1.

Assignment 1 — Due Monday at 9:00 am before the next lecture.

- Read the course syllabus.
- Create a course project in the adaptation workbook using the instructions in this document.
- Read the Adaptation Workbook Steps in Brief, which is located at the end of the syllabus.
- Complete Step 1 of the Adaptation Workbook (online at www.adaptationworkbook.org/).
- Complete the Homework section following Step 1.
- Review the Adaptation Workbook chapter of the *Forest Adaptation Resources, 2nd edition* for Step 1 and Step 2 instructions as needed.

Join Discussion Session – Introduce project to small group.

Session 2 — week of February 1

Lecture Topics:

- Considering climate change impacts and vulnerabilities in your projects.
- Resources for understanding tree species risk and climate vulnerability.
- What you need to know for Step 2.

Assignment 2 — Due Monday at 9:00 am before the next lecture.

- **Set aside 3-4 hours for completion since this is a more involved step.**
- Complete Step 2 of the Adaptation Workbook: Assess climate impacts and vulnerabilities.
- Complete Homework 2 at the end of Step 2.
- **Review regional climate impacts** by watching a recorded presentation (~25 min) and/or reading a climate report for your specific geographic area. *Choose to follow up on the resource associated to your region:*
 - All regional ecosystem vulnerability assessments authored by NIACS are [here](#).
 - **Urban** forest vulnerability ([video](#)), Chicago Wilderness Ecosystem Vulnerability ([report](#))
 - **Central Appalachians** (Maryland, Ohio, West Virginia) ([report, summaries, video](#))
 - **Central Hardwoods** (Illinois, Indiana, Missouri) ([report, summaries](#))
 - **Northwoods** (Michigan, Minnesota, Wisconsin) ([reports, video](#))
 - **New England and Northern New York** regions ([report, story map, video](#))
 - **Mid-Atlantic** (Delaware, Maryland, New Jersey, New York, Pennsylvania) ([report, video](#))
 - *Outside of the Northeast and Midwest regions* – please follow up with resources relevant to your regions such as: [California](#), [Pacific Northwest](#), [Inter-mountain West and Colorado](#), [Canada](#) (eastern provinces), [Southeast](#).
- Additional information on **tree species vulnerability**, and shifts in **heat and hardiness zones, hydrology**.
 - Find [tree species habitat suitability handouts](#) within a particular region, state, or city.
 - Explore the [Climate Change Atlas](#) for eastern trees and birds.
 - Explore Shifts in Growing Degree Days, Plant Hardiness Zones, and Heat Zones using this [interactive story map](#). Use known plant species heat/hardiness zone characteristics to evaluate how these species may cope in a changing climate.
 - Explore the effects of climate on forest hydrology ([36 min. video presentation](#))
- Find even more resources for your state at www.adaptationworkbook.org/resources.

This week, please check-in with instructors – Each project will have a meeting with course instructors (by phone, or email)

*Join **OPTIONAL Discussion Session** – Climate change impacts on tree species. This session will occur on [Wednesday February 3 between 11-12p ET](#). Attend this session using the course Zoom room URL.*

Session 3 — week of February 8

Lecture Topics:

- Identifying management challenges and opportunities for your project.
- Re-considering and revising management goals/objectives in light of climate challenges.
- What you need to know for Step 3.

Assignment 3 — Due Monday at 9:00 am before the next lecture.

- Set aside 2-4 hours for completion, as time will vary based upon your project.
- Complete Step 3 of the Adaptation Workbook: Evaluate objectives considering climate impacts.
- Complete Homework 3 at the end of Step 3.

Join Discussion Session – *Discuss projects (recapping Step 2 and Step 3)*

Break (week of February 15) — No session

- Use extra time to catch up on projects and have office hours with instructors.
- Begin reading adaptation menus at <https://adaptationworkbook.org/strategies>

Session 4 — week of February 22

Lecture Topics:

- Adaptation concepts: resisting change, enhancing resilience, and facilitating transitions.
- Developing specific actions for climate-change adaptation.
- What you need to know for Step 4.

Assignment 4 — Due Monday at 9:00 am before the next lecture.

- Set aside 3-4 hours for completion since this is a more involved step.
- View a presentation describing Adaptation Concepts, [available here \(27 minutes long\)](#). ****Required****
- Review the list of [Adaptation Strategies and Approaches](#) for your focus area (forests, urban, or forest watersheds). Details on menus for other focus areas (several are in development) are available [here](#).
- Optional videos: [Adaptation Strategies for Forested Watersheds](#), Overview of [various menus](#)
- Complete Step 4 of the Adaptation Workbook: Identify adaptation approaches and tactics.
- Complete Homework 4 at the end of Step 4.

Join **OPTIONAL Discussion Session** on *Adaptation menus*. *This session will occur on [Tuesday February 23 between 11-12p ET](#). Attend this session using the course Zoom room URL.*

Session 5 — week of March 1

Lecture Topics:

- What you need to know for Step 5.
- Tools for measuring effectiveness of implemented adaptation actions.
- Capitalizing on existing data, inventory or monitoring processes/partnerships.

Assignment 5 – Due Monday at 9:00 am before the next lecture.

- Set aside 2-3 hours for completion. Time will vary based upon your project.
- Complete Step 5 of the Adaptation Workbook: Monitor effectiveness of implemented actions.
- Complete Homework 5 at the end of Step 5.
- Optional reading on monitoring: [Janowiak et al. 2017. Assessing Stand-Level Climate Change Risk Using Forest Inventory Data and Species Distribution Models](#)

This week, please check-in with instructors – Each project will have a meeting with course instructors (by phone, or email) to discuss Step 4 adaptation actions.

Session 6 – week of March 8

Lecture Topics:

- Completing the Adaptation Workbook.
- Tips for talking about climate change with colleagues, stakeholders, and clients.

Assignment 6 – Due Monday at 9:00 am before the next lecture.

- Set aside 3-4 hours for completion of this assignment, or potentially more if you have to return to some previous steps.
- Finish up any loose ends in the Adaptation Workbook.
- Complete Homework 6 within the Adaptation Workbook.
- Summarize your project to share with the course participants as well as your colleagues and partners in a PowerPoint presentation (templates will be provided).
- Optional reading on climate change communication:
 - [Moser et al. 2017. Communicating Climate Change Adaptation and Resilience.](#)
 - [Communicating climate change adaptation: A practical guide to values-based communication](#)

Join Discussion Session – Discuss projects (recapping Step 4 and Step 5)

Session 7 – week of March 15

Lecture Topics:

- Participant adaptation project presentation.
- Next steps for moving toward implementation.
- How we can help you in the future.
- Course evaluations.

Join Discussion Session – Share projects

What if the scheduled times do not work for me?

Reach out to one of the hosts to learn more about other options. This may include attending an in-person training later in 2021 or receiving individualized technical assistance on your project. Contact us!

Instructors & Contact Information

This training will be led by a team of experienced instructors specializing in climate adaptation:



Maddy Baroli, Northern Institute of Applied Climate Science & Michigan Technological University

Maddy joined NIACS as a climate adaptation specialist in 2020. She is working on the development and implementation of various adaptation tools and trainings, with an emphasis on projects within the New England Climate Change Response Framework.



Leslie Brandt, Northern Institute of Applied Climate Science & US Forest Service

Leslie serves as coordinator for the Urban Forestry Climate Change Response Framework and is the lead author of the Chicago Wilderness region urban forest vulnerability assessment and synthesis, which served as a pilot for vulnerability assessment of urban trees and forests.



Maria Janowiak, Northern Institute of Applied Climate Science & US Forest Service

Maria Janowiak is the coordinator for the New England Climate Change Response Framework, serving the states of New York, Vermont, New Hampshire, Maine, Massachusetts, Connecticut, and Rhode Island. Maria has been working with land managers on issues related to climate change and adaptation since 2007.



Patricia Leopold, Northern Institute of Applied Climate Science & Michigan Technological University

Patricia Leopold is the coordinator for the Climate Change Response Framework in the Central Appalachians (OH, WV, MD) and the Mid-Atlantic (PA, NY, NJ, DE, MD). Patricia has been working to develop climate change tools and resources with NIACS since 2009.



Annamarie Rutledge, Northern Institute of Applied Climate Science & Michigan Technological University

Annamarie joined NIACS as a climate adaptation specialist in 2020. She is working on the development and implementation of various adaptation tools and trainings for the Urban Forestry Climate Change Response Framework.

Instructors & Contact Information

This training will be led by a team of experienced instructors specializing in climate adaptation:



Kristen Schmitt, Northern Institute of Applied Climate Science & Michigan Technological University

Kristen helps natural resource professionals integrate climate change considerations into management planning and decision-making; often working with groups outside of the Midwest and Northeast region. Kristen partners with Regional USDA Climate Hubs, agencies, universities, and other public and private organizations to hold specialized trainings on climate change adaptation and to develop resources that land managers can use.



Danielle Shannon, Northern Institute of Applied Climate Science & Michigan Technological University

Danielle Shannon is the coordinator of the USDA Northern Forests Climate Hub. Danielle connects audiences to forest adaptation resources and experts across the eastern US. Danielle is focused on working with land managers to use NIACS resources on the topic of forest hydrology and the management of forested watersheds and non-forested wetlands.

This course is developed through a collaboration among the Northern Institute of Applied Climate Science, the USDA Forest Service, and the USDA Northern Forests Climate Hub.



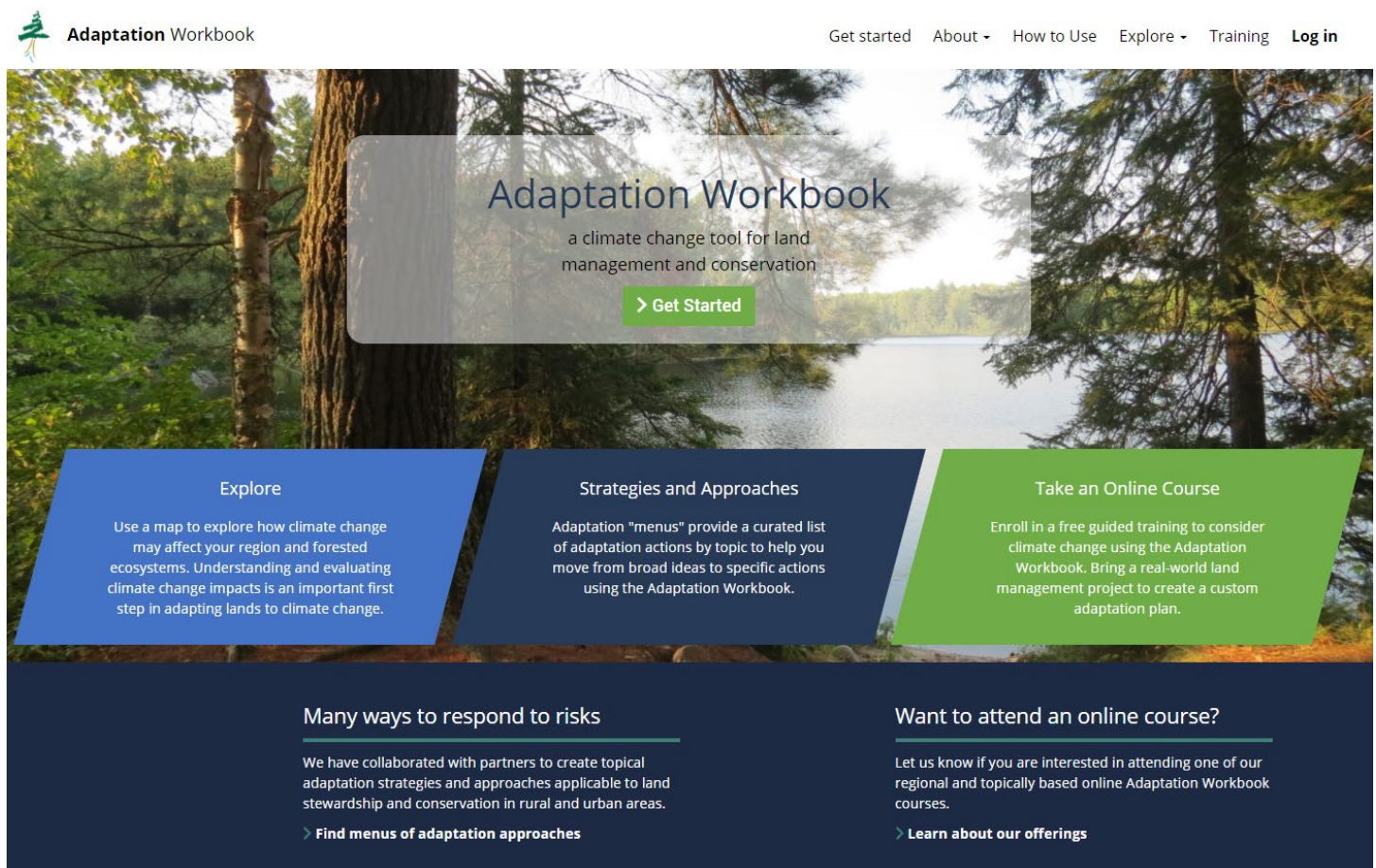
Getting Started with the Adaptation Workbook

Please set up your Adaptation Workbook account (If you have not already done so) the week before the course begins so that we can make the course features available to you before you start.

- **Just you:** Create an account using the email that you registered for the course with.
- **If you have a small team:** Choose to use one person’s email address to create an account that you can share among the group. You can then take turns working on the course project and decide how to tackle course assignments among your team.
- **If you used a different email address** to create your Adaptation Workbook account than the one that you used to register for the course, please send the correct email address to Danielle Shannon (dshannon@mtu.edu) so that your email/account can be associated with the course.

Creating an Account

- a. Navigate to www.adaptationworkbook.org. Click on “Get Started” to create an account



- b. Create a new account by entering a username, email address, and other information. Be sure to check the terms and conditions/privacy policy check box, as well as the check box allowing us to help you as you go through the workbook. When you have entered in all the information, click “Create new account.”

The screenshot shows the 'Create new account' page of the Adaptation Workbook website. The page has a dark green header with the site logo and navigation links: 'Get started', 'About', 'How to Use', 'Explore', 'Training', 'Contact', and 'Log in'. Below the header is a white navigation bar with three tabs: 'Log in', 'Create new account' (which is active), and 'Reset your password'. The main form area is white and contains the following fields and elements:

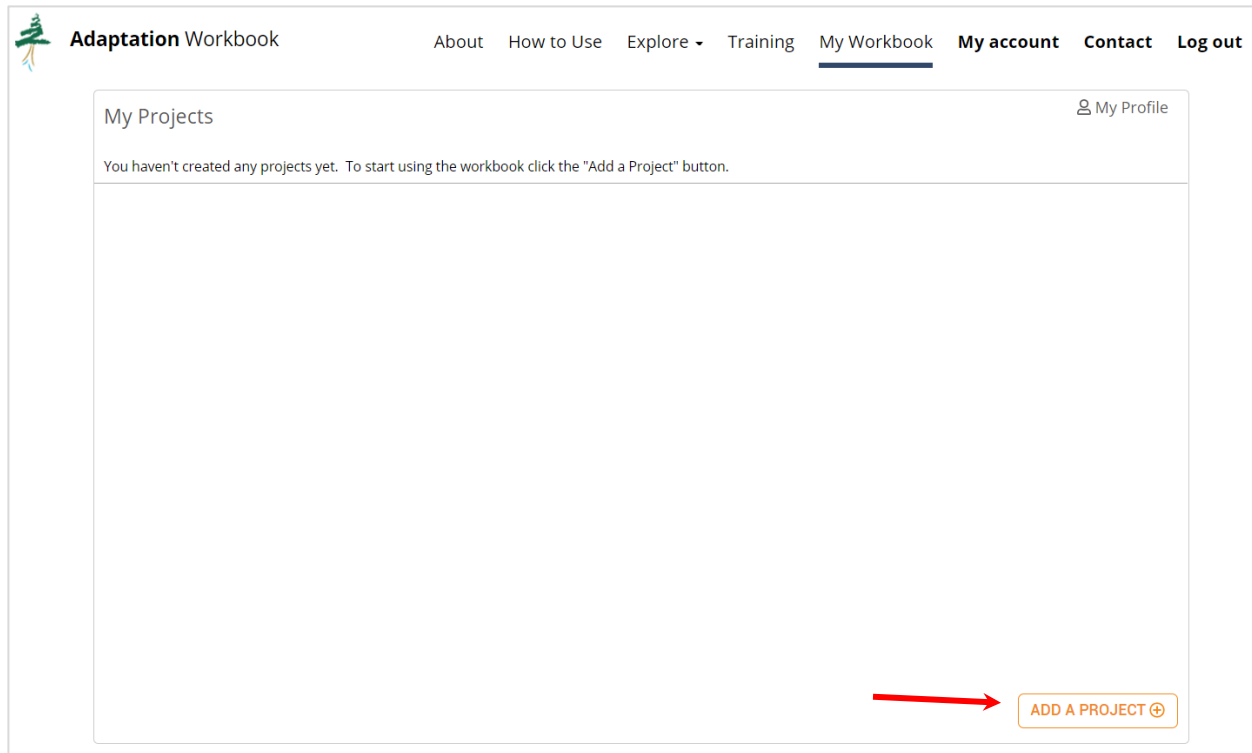
- Email address***: A text input field.
- Username***: A text input field.
- Your full name***: A text input field.
- Organization**: A text input field.
- I have read and agree to the Adaptation Workbook terms and conditions and privacy policy.*
[Terms and conditions](#) | [Privacy policy](#)
- It is OK to contact me about my Adaptation Workbook experience or to offer me assistance in my planning process
- CAPTCHA**: A section with a grey background containing the text: 'This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.'
- Math question*** 5 + 5 =
A text input field for the answer.
- Below the math question: 'Solve this simple math problem and enter the result. E.g. for 1+3, enter 4.'
- CREATE NEW ACCOUNT**: A button at the bottom of the form.

- c. The following screen will direct you to confirm your new account. You will need to check the email of the account that you have linked to the Adaptation Workbook, find a confirmation email (from info@adaptationworkbook.org), and click the confirmation link. Your confirmation email should arrive within a few hours. Check your spam folder if you do not see it in your inbox! The link will take you to a one-time login screen that will require you to create a site password. Click “Log in” and create a password on the following screen.

The screenshot shows the 'Reset your password' page of the Adaptation Workbook website. The page has a dark green header with the site logo and navigation links: 'Get started', 'About', 'How to Use', 'Explore', 'Training', 'Contact', and 'Log in'. Below the header is a white navigation bar with three tabs: 'Log in', 'Create new account', and 'Reset your password' (which is active). The main form area is white and contains the following elements:

- Username or email address***: A text input field.
- Below the input field: 'Password reset instructions will be sent to your registered email address.'
- SUBMIT**: A button at the bottom of the form.

Once logged in, you will see your Workbook dashboard. This is where you will add a project. Please note, we will create projects during the first week of the online course, please do not add a project until after the first lecture and discussion.



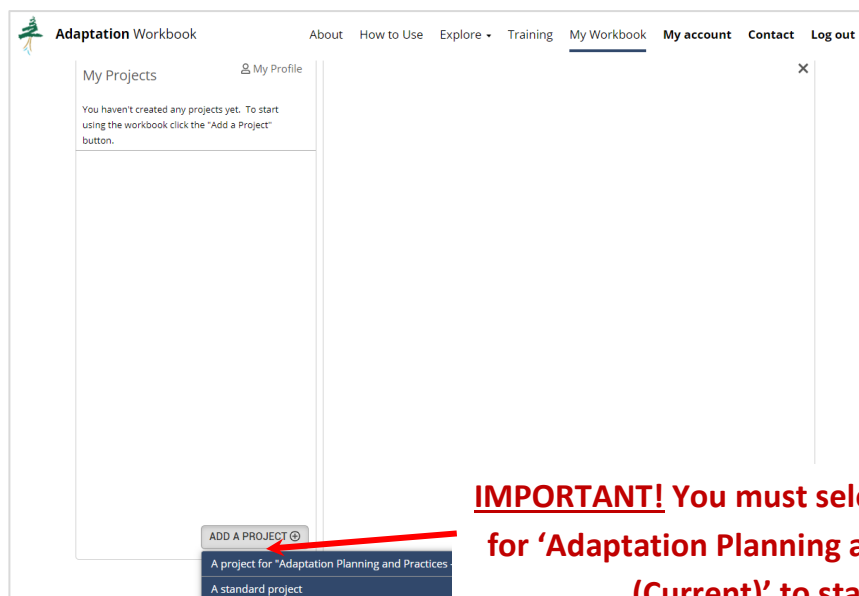
IMPORTANT! *****

Although you can use the Adaptation Workbook at any time, **you will need to create a course project** to use during the Planning and Practices course to access **course** content and additional materials. **Please wait until after Lecture 1 to create a course project.**

See next section to learn how to create a project.

Starting a Course Project – Session 1 Homework

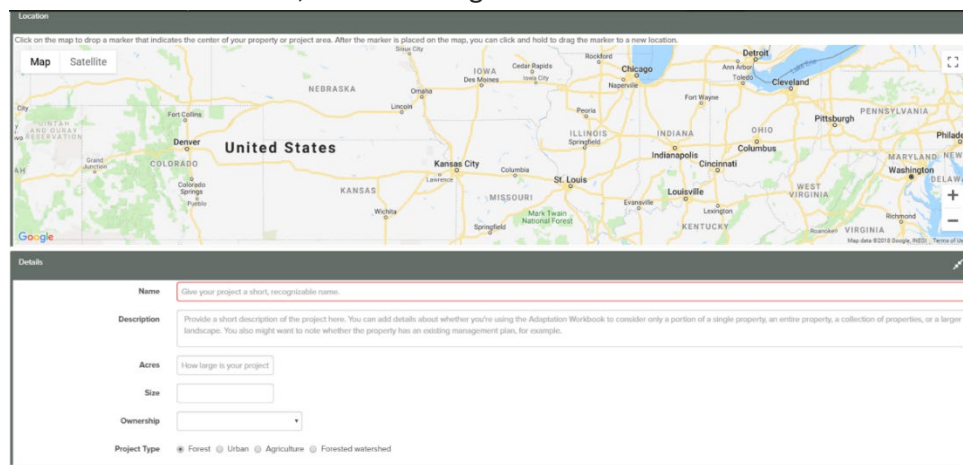
- Log into the Adaptation Workbook. You will see a screen called the project dashboard.
- Click on the orange “Add a Project” button and then select “A Project for **Adaptation Planning and Practices - Winter 2021 (Current)**”



IMPORTANT! You must select “A Project for ‘Adaptation Planning and Practices (Current)’ to start.

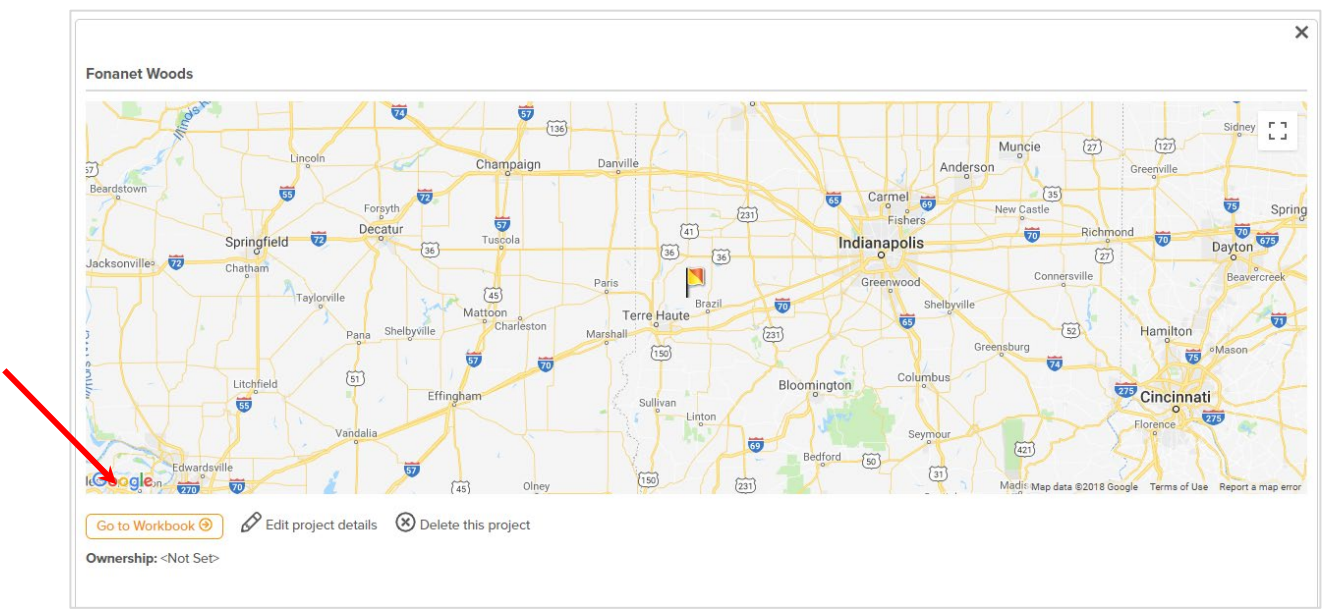
c. Start describing your project. Using the map, place a marker at the approximate location of the project. Note that if you want to maintain privacy, you can select a nearby intersection or town. Some tips for placing the marker are:

- Use the (+) and (-) buttons to zoom in and out.
- Click and hold the map to pan the view.
- A single click will place the marker on the map.
- To move the marker, click and drag it to the desired location.

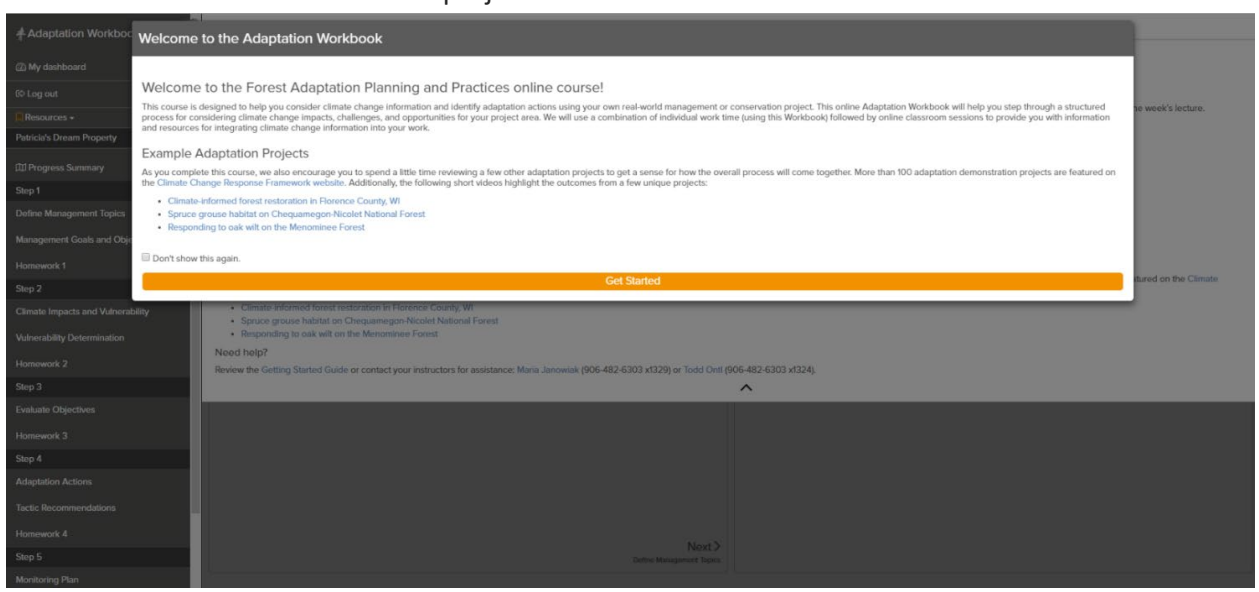


d. Enter a project name, description, acreage, and ownership. The level of detail that you provide is up to you—this information will be included in the project summary report of your adaptation plan. This information can be edited after the project is created. Select the “project type” select the theme of your project (e.g. *Forest, Urban, Forested Watershed*).

e. This project will now appear in your dashboard. To begin your project, click “Go to Workbook.”



f. Once you are in the Adaptation Workbook, a short dialog will appear with more information about the course. Read the information and click “Get Started.” Take a look at the screen and focus on the gray menu on the left side of the Adaptation Workbook. If you do not see “homework” listed in this column, please go back to the start of this tutorial and create a project that is associated to the online course.



Any questions or issues?

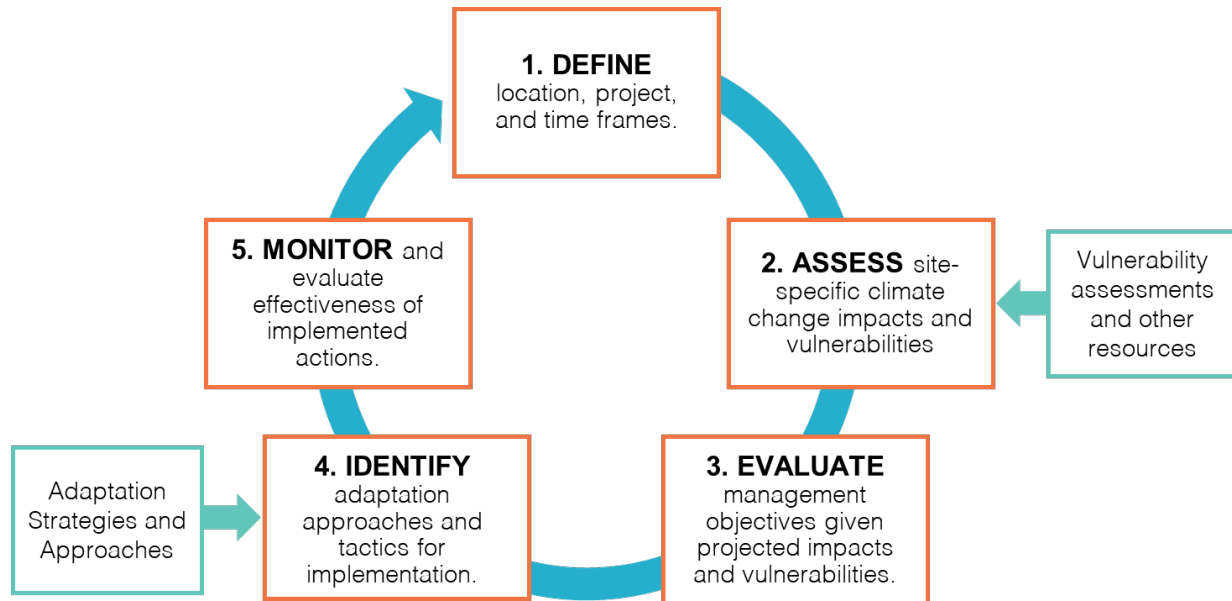
Contact...

Danielle Shannon at dshannon@mtu.edu

Maria Janowiak at maria.janowiak@usda.gov

Adaptation Workbook Steps in Brief

This is a brief outline of the Adaptation Workbook process. Find the full process in the *Forest Adaptation Resources: Climate change tools and approaches for land managers, 2nd edition* (Swanston et al. 2016) and as an online tool at www.adaptationworkbook.org.



Step 1: DEFINE location, project, and time frames.

“What are your management goals and objectives for the project area?”

The first step is to describe the project area and your management objectives before considering the potential effects of climate change. This may include identifying:

- Any ecosystem types, stands, or other distinct areas that you want to consider individually
- Any short- or long-term milestones that can be used to evaluate progress

Step 2: ASSESS site-specific climate change impacts and vulnerabilities.

“What climate change impacts and vulnerabilities are most important to this particular site?”

Climate change will have a wide variety of effects on the landscape, and not all places will respond similarly. List site-specific factors that may increase or reduce the effects of climate change in your project area, such as:

- Site conditions, such as topographic position, soils, or hydrology
- Past and current management
- Forest composition and structure
- Susceptibility to pests, diseases, or other stressors that may increase

Step 3: EVALUATE management objectives given projected impacts and vulnerabilities.

“What management challenges and opportunities may occur as a result of climate change?”

This step explores management challenges and opportunities that may arise under changing conditions. For each of your management objectives, consider:

- Management challenges and opportunities given the climate impacts you identified previously
- The feasibility of meeting each management objective under current management
- Other considerations (e.g., administrative, legal, or social considerations) beyond climate change that may affect your ability to meet your management objectives

Step 4: IDENTIFY adaptation approaches and tactics for implementation.

“What actions can enhance the ability of the ecosystem to adapt to anticipated changes and meet management goals?”

Generate a list of adaptation tactics —prescriptive actions specifically designed for your project area or property and your unique management objectives. Use the [menu of Adaptation Strategies and Approaches](#) as a starting point for identifying specific management tactics (e.g., what, how, when) that you can implement. As you develop tactics, consider the:

- Benefits, drawbacks, and barriers associated with each tactic
- Effectiveness and feasibility of each tactic

Step 5: MONITOR and evaluate effectiveness of implemented actions.

“What information can be used to evaluate whether the selected actions were effective and inform future management?”

Monitoring metrics can help you determine whether you are making progress on your management goals and evaluate the effectiveness of those actions. When identifying monitoring items, work to identify monitoring items that:

- Can tell you whether achieved your management goals and objectives
- Can tell you whether the adaptation tactics had the intended effect
- Are realistic to implement