

Delivering Climate Change Information in the Forest Service



AUDIO CONNECTION

1. **Phone:** mute your computer speakers and call 1-877-369-5243; access code: 0818071##

OR

2. **Audio through the computer:** Make sure your computer speakers are on and listen with speakers or headphones.

Note: Phone audio will allow you to both listen and speak up with questions. *If you listen through the computer, you will not be able to speak up with questions, but will be able to type questions into the Q&A pod which will be answered by the appropriate speaker.*

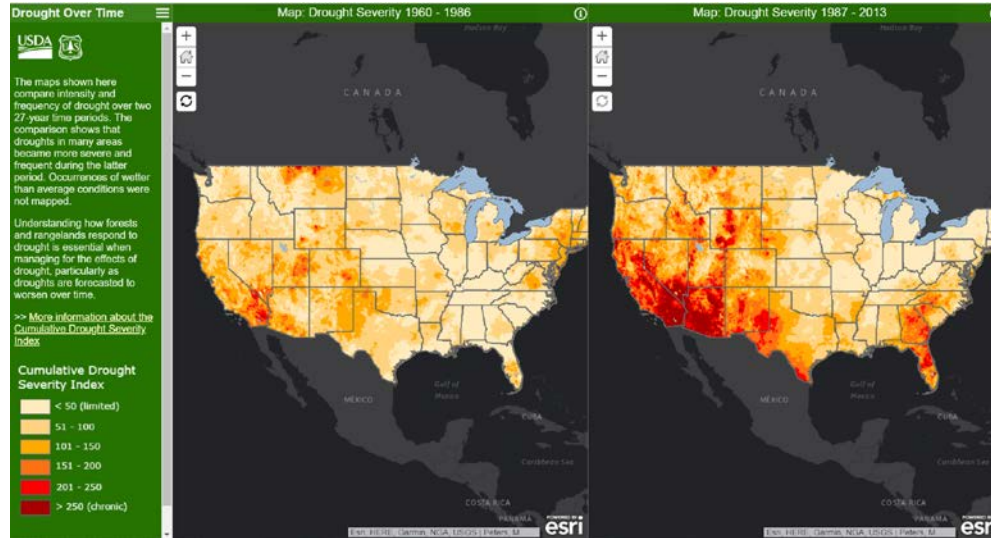




**Cynthia West,
Director**

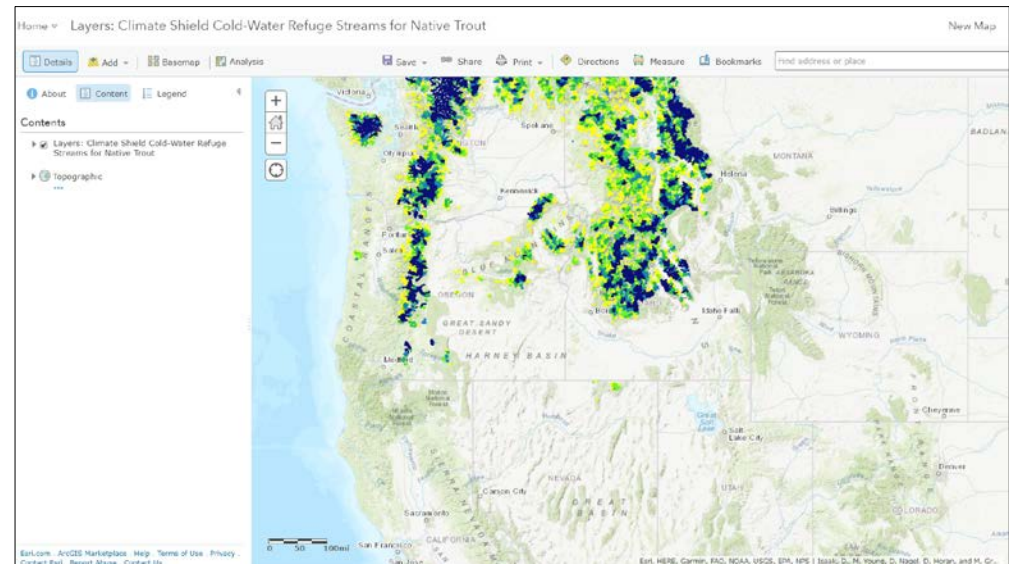
**Office of
Sustainability
and Climate**

**USDA Forest
Service**



[Drought Over Time \(app\)](#)

[Climate Shield](#)
[Cold Water](#)
[Refuge](#)
[Streams for](#)
[Native Trout](#)
(layers)





Jamie Barbour,
Acting Deputy
Director

Ecosystem
Management
and
Coordination

USDA Forest
Service

Changes in Temperature and Precipitation U.S. Forest Service - Office of Sustainability and Climate

▶ Access to Good Information Drives Good Decisions

The U.S. Forest Service has developed and published datasets about projected changes to temperature and precipitation to help managers make better informed decisions as they develop forest or regional plans. Information for national forests and grasslands in the contiguous U.S. is available at a scale relevant for decision-making. The maps below use these data to display variables related to air temperature and precipitation.

▶ Compare Historical and Projected Annual Temperatures

▶ Absolute Change in Average Annual Temperature

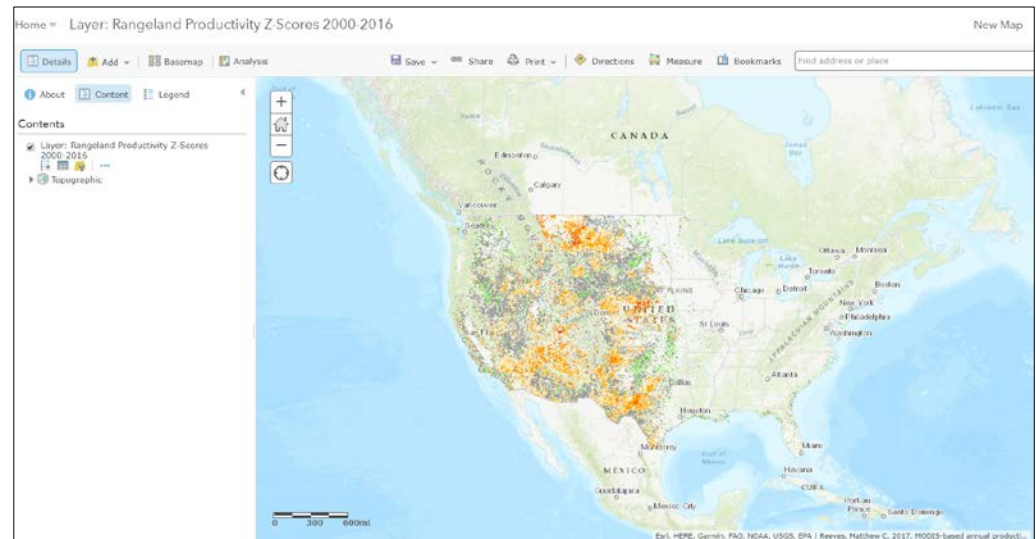
▶ Percent Change in Average Annual Precipitation

▶ More About the Data...

Ready access to information about changing temperature and precipitation helps the U.S. Forest Service prepare forest plans by characterizing the environment and risks.

Changes in
Temperature and
Precipitation
(app)

Rangeland
Productivity
Z Scores
(layers)



Webinar Overview:



- Digital Strategy
- Communication and Data Products
- [Drought](#) and [Climate](#) Galleries (live demo)
- Vulnerability Assessments in the Northeast Region
- Climate Change and Adaptation: New England and Northern New York Forests [Story Map](#) (live demo)
- Questions and Answers
- Optional [ArcGIS Online](#) tutorial

Digital Strategy

Discoverability and consistency

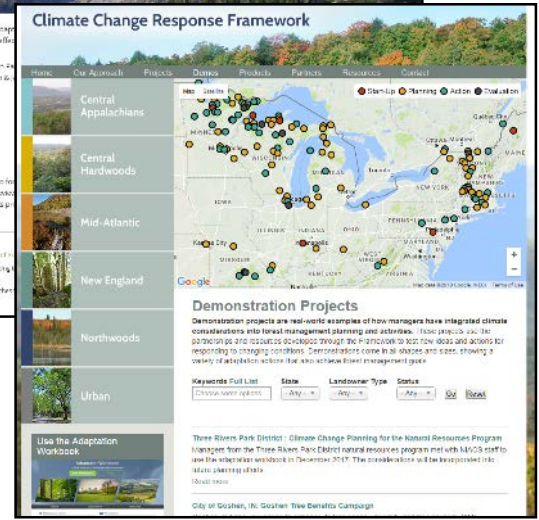
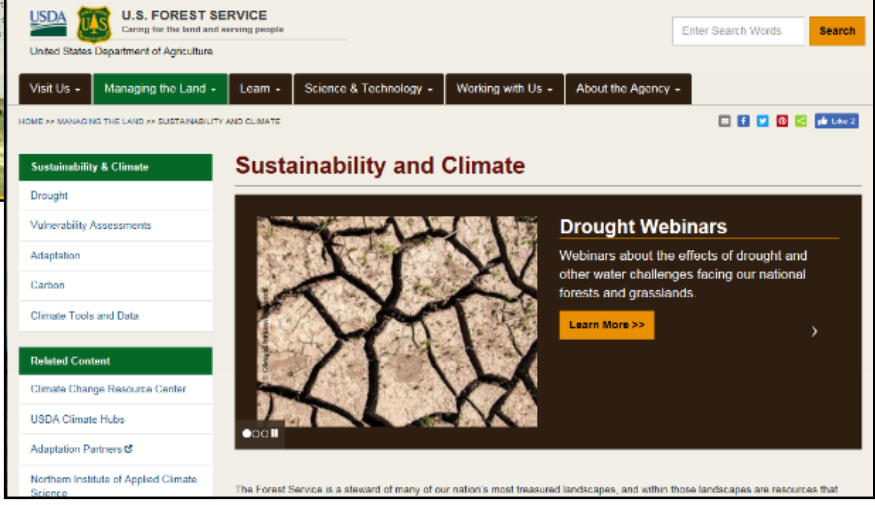
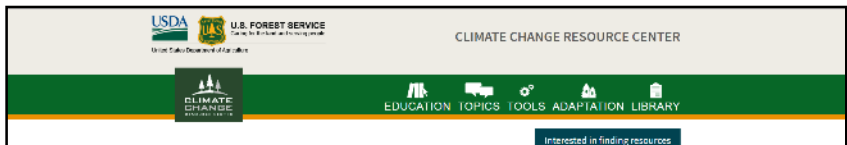
Science-based

Trusted information that is kept current and updated



Communication and Data Products

Websites



Communication and Data Products

Digital Newsletter

- Subscription based electronic newsletter and bulletins.
- Send an email to: oscc@fs.fed.us to be added to the distribution list.

USDA United States Department of Agriculture Forest Service

News & Happenings Office of Sustainability & Climate

August 2017

A Framework for Climate Action

Over the last six years each Forest Service Region has conducted climate vulnerability assessments, in partnership with Forest Service Research and Development. These assessments provide the basis for climate adaptation plans and projects, a sampling of which is featured in this issue of the Office of Sustainability and Climate's newsletter. These stories highlight our science-based framework that help us implement the results of climate vulnerability assessments, guide forest plan revisions, and develop adaptation tactics to enhance the ability of our forests to be productive and resilient.

```
graph TD; Assess[Assess: Assess vulnerabilities to changing environmental conditions.] --> Adaptation[Adaptation Planning: Science-informed climate vulnerability assessments and science-based modeling of impacts guide Forest Plan Revisions.]; Adaptation --> Implement[Implement: Develop actions to enhance the ability of our forests to adapt to a changing climate.]; Implement --> Monitor[Monitor and Learn: Learn from the monitoring of actions to help guide future assessments, adaptation plans, and tactics.]; Monitor --> Assess;
```



Communication and Data Products

Regional Drought Summaries



Communication and Data Products

Map Galleries

USDA U.S. Forest Service
Caring for the land and serving the people

Climate Gallery

A collection of maps, apps, and resources

Search maps

- Drought Gallery**
A Gallery of Drought Data and Resources
Web Mapping Application by [USFSMapsandApps](#). Last Modified 2/13/18.
Gallery of Forest Service maps, applications, data layers, and other resources related to drought.
- App: Changes in Temperature and Precipitation**
Web Mapping Application by [USFSMapsandApps](#). Last Modified 2/13/18.
Story map displaying changes in temperature and precipitation in coming decades.
- App: Climate Change Vulnerability Assessments Across the Nation**
Web Mapping Application by [USFSMapsandApps](#). Last Modified 2/13/18.
USDA Forest Service Climate Change Vulnerability Assessments across the Nation
- App: Snow Drought in the 21st Century**
Web Mapping Application by [USFSMapsandApps](#). Last Modified 2/13/18.
This story map describes the effects of snow drought, and includes projected changes.

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The maps shown here compare intensity and frequency of drought over two 27-year time periods.
- App: Forest Disturbances and Drought**
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Story map with summary of major forest disturbances, including insects and fire.

The US Forest Service - Office of Sustainability and Climate

The Forest Service is a steward of many of our nation's most treasured landscapes, and within those landscapes are resources that people need and want, such as clean air and water, recreational opportunities and forest products. Impacts from increasing climate variability, extreme weather, and other disturbances—along with changing human demands—challenge our ability to ensure that ecosystems are healthy, resilient, and thus more adaptable to changing conditions. The Office of Sustainability and Climate supports national forests and grasslands with the tools



Communication and Data Products

Story Maps

The image displays a collection of story maps from the USDA Office of Sustainability and Climate. The maps are arranged in a layered, overlapping fashion. The most prominent map is 'Forest Disturbances and Drought', which features a large aerial photograph of a forest with a mix of green and brown trees. The title 'Forest Disturbances and Drought' is overlaid in large white text. Below the title, there is an 'Introduction' section with text about disturbances and events that may result in shifts of long-term changes in an ecosystem. It mentions that droughts and extreme weather may directly or indirectly cause such disturbances to forests and rangelands in the United States. It also notes that forest fires, insect outbreaks, high winds, snow, and diseases are examples of forest disturbances triggered or caused by meteorological and climatic events. Research suggests a correlation between projected shifts in a changing climate and forest disturbance in the U.S., including the incidence and severity of wildfire, insect pests, tree diseases, and insects. Understanding these links can help resource managers better prepare for future changes. Below the text is a photograph of a forest with many dead, charred trees. A caption reads: 'Right: Dead trees caused by southern pine beetles outnumber the healthy trees in this part of Subline National Forest in Texas.' Below this is another photograph of a forest with a mix of green and brown trees. A caption reads: 'The two photos above show the effects of mountain pine beetles followed by a wildfire strike.' At the bottom of this map, there is a list of links: 'Forest Insect and Disease Damage 2000-2016', 'Future Insect and Disease Risk to Forests', and 'Wildfire Locations 2000-2015'. Other maps visible include 'Stream Temperature and Native Trout', 'Changes in Temperature and Precipitation', 'Snow Drought in the 21st Century', 'Yellow-cedar Decline in Southeast Alaska', and 'Rangelands and Drought'. Each map has a similar layout with a title, introductory text, and a large background image. The USDA logo is visible in the top right corner of each map's header.



Managed Data Services

DATA TOPICS + IMPACT APPLICATIONS DEVELOPERS CONTACT

The home of the U.S. Government's open data

Here you will find data, tools, and resources to conduct research, develop web and mobile applications, design data visualizations, and more.

Health Care Provider Charge Data

BROWSE TOPICS

- Agriculture
- Climate
- Health
- Local Government

USDA U.S. Forest Service

FSGeodata Clearinghouse

Enterprise Data

- Downloadable Data
- Data Extract Tool
- Map Services

Maps

- FSTopo
- Standard Map Products
- Other Map Products

Master Lists

- Caribbean Island Land Cover
- Chugach Updates
- National Forest Type
- Forest Biomass
- IS4000

Special Purpose FS Data

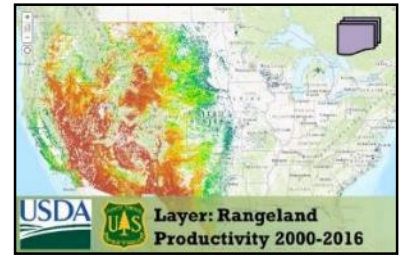
- State and Private Land Inventory
- Wilderness & WSR & WSA
- Research and Development
- Suqarto Rico Gap Analysis Project

Site maintained by: Geospatial Technology and Applications Center

2372 W 20th S
Salt Lake City, UT 84143

Need help?

Enterprise Data



Data Extract Tool

Extract U.S. Forest Service Enterprise Data

IMPORTANT NOTICE: Results of FSTopo data

The apps.fs.fed.us

All Forest Service metadata is available through the apps.fs.fed.us domain prefix (https://apps.fs.fed.us) domain prefix (https://apps.fs.fed.us).

ONLY the apps.fs.fed.us

Please update your browser to the latest version of the data/apps.fs.fed.us.

The USDA Forest Service provides a clearinghouse for the discovery of geospatial data. Through the Clearinghouse, you can discover natural resources, roads, disease threat and surface water, and other sources of forest data.

What's new?

- FSTopo data is now live! About raster map imagery confirms data for the new National Monuments Service lands. Boundaries titled "National Forest" obtain that data is found.

Enterprise Data

Geospatial Data Discovery

for the greatest good...

Search for Data

The U.S. Forest Service has configured this open data site to help our partners and the public discover geospatial data published by the Agency. Use it together with your data to create maps, apps and other information products.

- Land & Woody
- Wilderness & WSR
- Administrative Boundaries
- Wildlife
- Vegetation
- Wilderness & Climate
- Fire & Aviation
- Forest Management
- Ecosystems
- Vegetation
- Hydrography



Live Demo

USDA U.S. Forest Service
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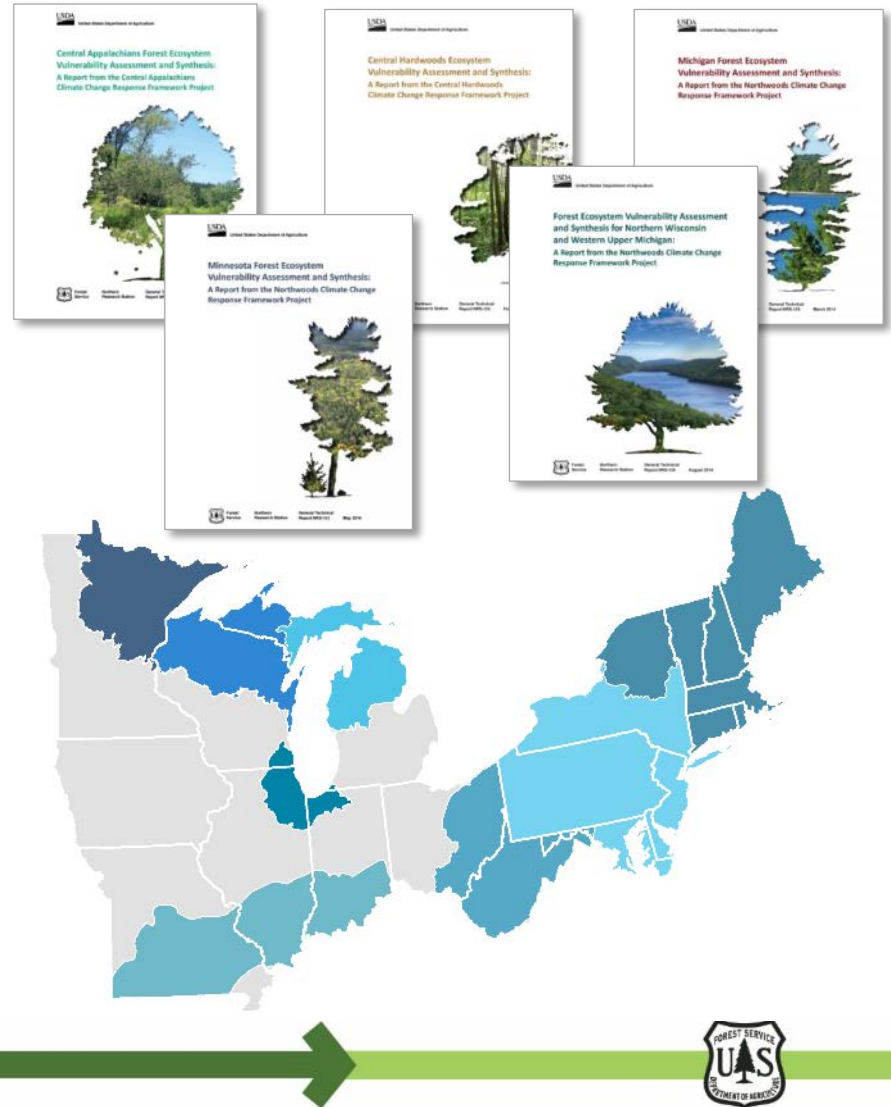
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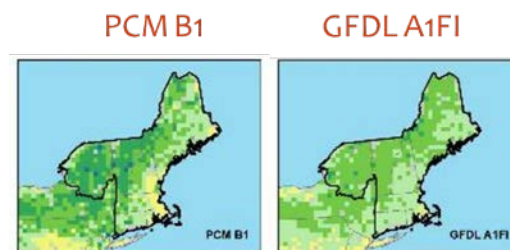
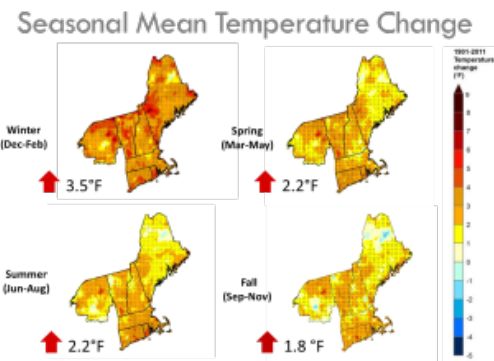
Vulnerability Assessments (R9)

- Series of reports for **natural resource professionals**
- Focus on **tree species and forest ecosystems**
- Examine a **range** of future climates
- Evaluate **key ecosystem vulnerabilities** to climate change
- **Does not make recommendations** or assess vulnerability to changes in mgmt., land use, policy



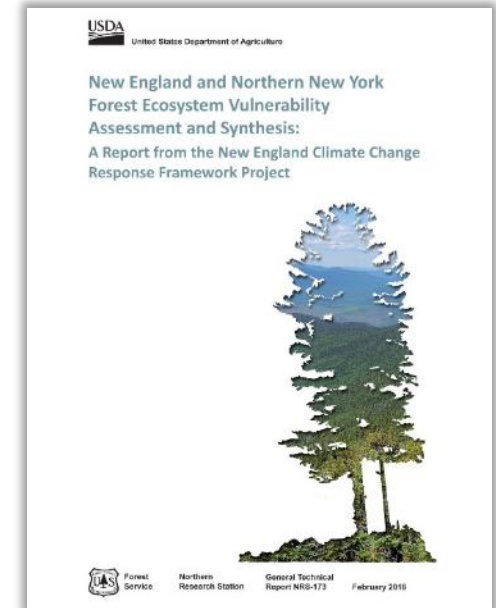
Assessment Features

- Synthesize state/regional assessments and scientific literature
 - Identify areas of agreement regarding ecosystems and species at greatest risk
 - Describe state-of-knowledge for anticipated changes in climate and response of forest ecosystems
- Incorporate new results from forest impact models: **Climate Change Tree Atlas, LINKAGES, LANDIS**
- Draw on local expertise of **scientists and land managers**



Report Contents

- Current Forest Conditions
- Observed Climate Change
- Future Climate Change
- Climate Change Impacts on Forests
- Forest Ecosystem Vulnerability
- Implications for Forest Management



34 authors – General Technical Report – 234 pages

Live Demo

Climate Change and Adaptation: New England and Northern New York Forests

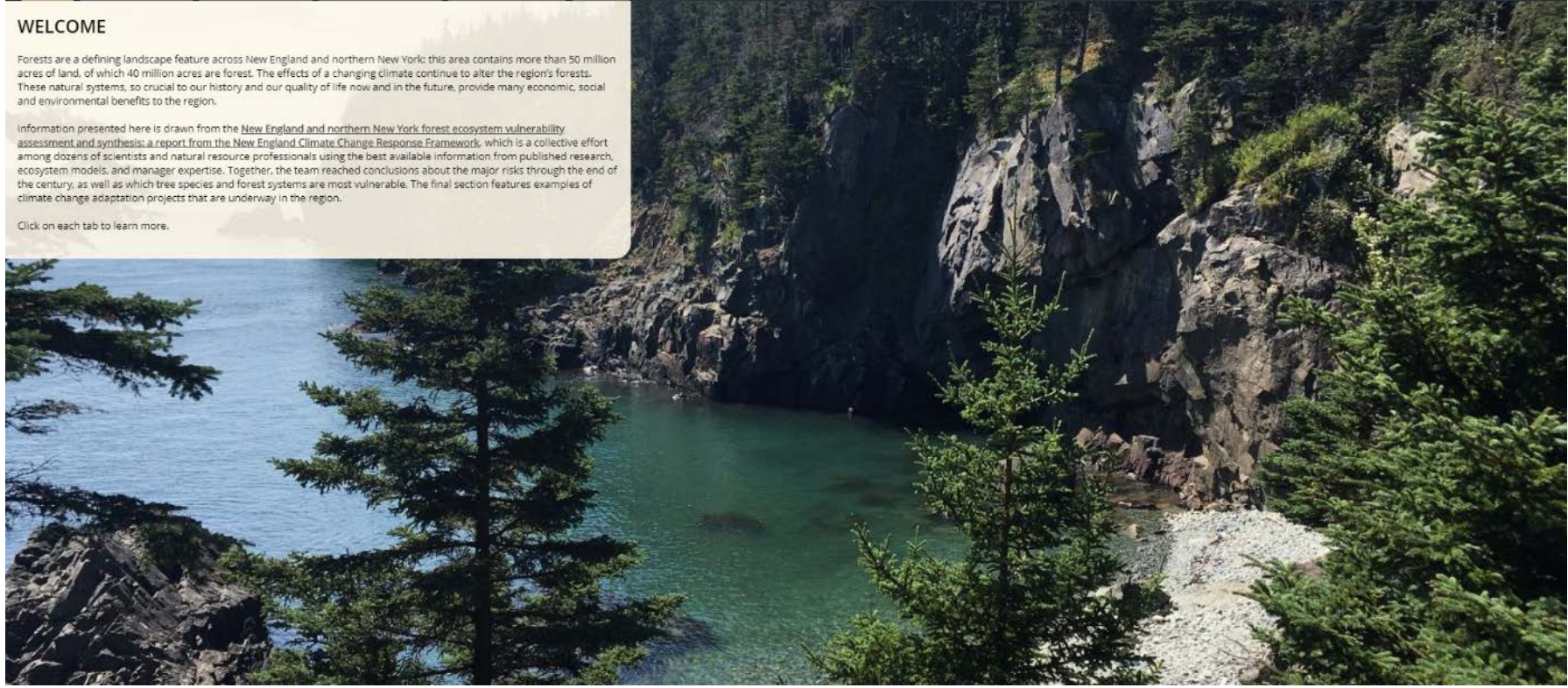
Home Changing Climate Effects on Forests Forest Vulnerability Adaptation Stories Credits

WELCOME

Forests are a defining landscape feature across New England and northern New York: this area contains more than 50 million acres of land, of which 40 million acres are forest. The effects of a changing climate continue to alter the region's forests. These natural systems, so crucial to our history and our quality of life now and in the future, provide many economic, social and environmental benefits to the region.

Information presented here is drawn from the New England and northern New York forest ecosystem vulnerability assessment and synthesis, a report from the New England Climate Change Response Framework, which is a collective effort among dozens of scientists and natural resource professionals using the best available information from published research, ecosystem models, and manager expertise. Together, the team reached conclusions about the major risks through the end of the century, as well as which tree species and forest systems are most vulnerable. The final section features examples of climate change adaptation projects that are underway in the region.

Click on each tab to learn more.



Questions & Answers

- **By phone:** Dial #2 to enter the queue.
- **On your computer:** Type your question into the Q & A pod on the left side of your screen.



Maria Janowiak (mjanowiak02@fs.fed.us)
Erik Johnson (ejohnson02@fs.fed.us)
Nathan Walker (nathanwalker@fs.fed.us)

Drought Gallery: <https://tinyurl.com/y973s6rn>

Climate Gallery: <https://tinyurl.com/y7makrbm>

New England Forest Vulnerability Story Map: <https://tinyurl.com/ydy7gj9m>



Live Demo: Working with AGOL

- How to request an ArcGIS Online (AGOL) account
- Exploring AGOL
- Creating and sharing maps
- Additional resources

U.S. FOREST SERVICE
Caring for the land and serving people

Conozca los programas de incentivos del USDA en el Story Map

A Gallery of Chapters from Blue Mountains Climate

Scroll through the 27 Profiled Fires in the 2017 Wildfire Map Tour - Wildfires Region 8 - Pacific Northwest

Chetco Bar Fire - Swipe Web App

Welcome to the U.S. Forest Service ArcGIS Online organization

The U.S. Forest Service is using ArcGIS Online & **ArcGIS Open Data** to share maps, data, and applications for use by other federal agencies, partners, and the public. Users can find and use map services published by the Agency, together with their own data, to create web maps and web mapping applications.

To request an Organizational account, please [fill out a request form here](#) (USFS Employees only)

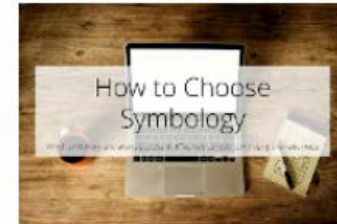
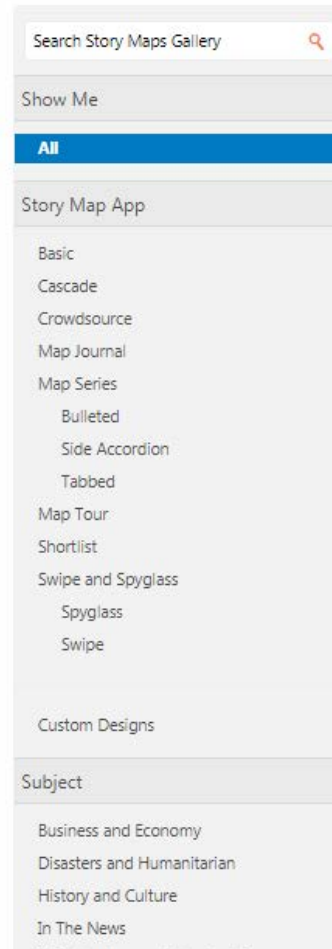
For additional information, please explore the resources below.

- Explore agency training gallery [Story Map Delivered Training](#)
- Explore agency training opportunities [GTAC Developed Training](#)
- Check out the Esri [Help Documentation](#)
- Get the latest information about [ArcGIS Online](#)
- Contact [Agency Support Staff](#)

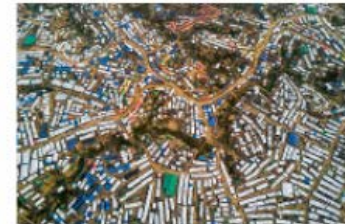


Live Demo: Story Maps

- Exploring the Story Map Gallery
- Creating a Story Map
- Additional Resources



How to Choose Symbology
By alison.davisholland



Rohingya Refugee Emergency at a Glance
By vidonne_unhcr



2018 Report to the Community
By St. Louis Park, MN



Flying the Atlantic
By Andrew Skinner, Esri



A Tale of Traveling Trash
By Blue Ocean Society for Marine Conservation



Invasive animals in U.S. forests
By U.S. Endowment for Forestry & Communities



Resources

- [Enterprise Data Warehouse](#)
- [ArcGIS Online](#)
- [AGOL Training Gallery](#)
- [Open Data](#)
- [SharePoint Site](#)
- [Content Creation Guide](#)
- [Story Maps](#)



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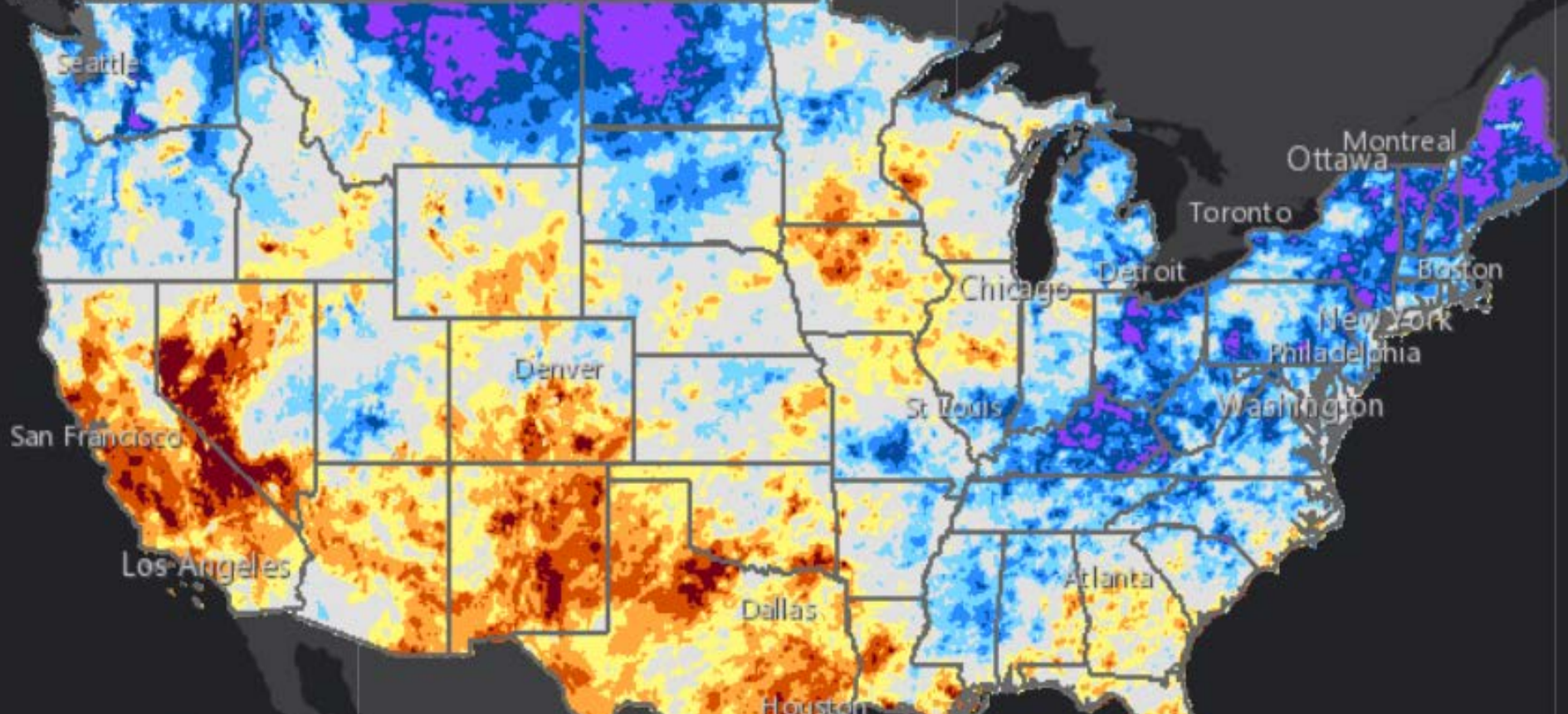
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Vancouver



Thank you for attending today's webinar!

A recording of this session will be available shortly at the
Climate Science Webinar Portal:

<http://www.climatewebinars.net/webinars/drought-gallery>

