

USDA Climate Hubs:

A red tractor with a large implement is shown in a field of yellow flowers. The tractor is in the foreground, and the implement is in the background. The scene is bright and sunny.

NOAA Eastern Region
Climate Services Webinar

1. Overview of USDA Climate Hubs
2. Focus on NE Climate Hub
3. Northeast Impacts, Adaptation & Mitigation

Lindsey Rustad, PhD
Director, USDA Northeast Climate Hub



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Translating Climate Science Into Action

Mission

To develop and deliver science-based, region-specific information and technologies to enable climate-informed *decision-making*...

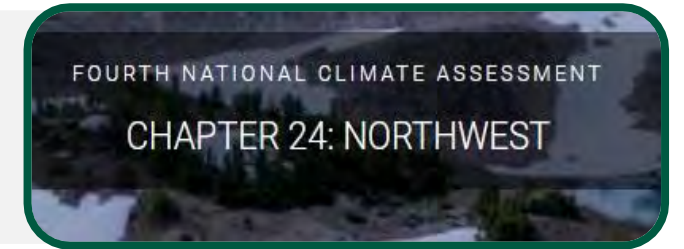


How We Work: Workstreams



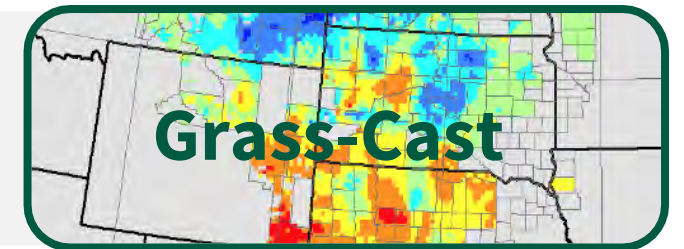
Science and data syntheses

Translating and delivering relevant information



Tool/technology development and support

Supporting climate-informed planning and decision-making



Outreach, convening, and training

Facilitating engagement, discovery, and exchange




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How We Work: Priority Areas



**ADAPTATION
RESOURCES
FOR AGRICULTURE**
Responding to Climate Variability and Change
In the Midwest and Northeast

**Adaptation/
Resilience**



Mitigation



**CLIMATE
ADAPTATION
FELLOWSHIP**

**Adaptation Plan
Implementation**



**WILDFIRE IMPACTS
ON THE SOUTHERN PLAINS**
Assessment Report
April 2019

**Wildland Fire/
Forest Restoration**




**USDA's Climate,
Agriculture, and
Forest Science
Webinar Series**

Climate Literacy



**Climate Smart
Ag + Forestry**



**Environmental
Justice**



DAPTA
agricultura y cambio climático

International



Who We Are

Force Multiplier for USDA service providers, leveraging the Department's joint capacity to have greater impact.

Model for developing and delivering climate information and services to agricultural and natural resource managers for USDA and its partners.



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Northeast Climate Hub

- 12 Northeast States + DC
- 16 Land Grant Universities
- Home to most densely populated and forested states
- Partnerships with FS, ARS, NRCS, LGUs, NGOs and others



Northeast Climate Hub – By the Numbers

Priority Areas



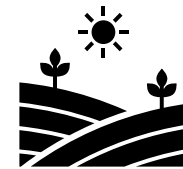
- 18 adaptation and resilience projects
- 13 mitigation focused projects
- 12 climate literacy projects
- 8 climate smart ag and forestry projects
- 2 environmental justice projects



5 Co-leads from NRCS, ARS, and FS; 4 Fellows conducting research and implementing programs



20 projects currently underway



14 Agriculture focused projects
7 Forestry focused projects
5 Weather/climate projects
2 Agroforestry projects



Northeast Climate Hub – Projects



- Climate Learning Forum
- Graduate Climate Adaptation and Mitigation Program
- Dairy Climate Adaptation and Mitigation Fellowship
- The Meteorological Drivers of Drought and Flash Drought in the Northeast
- Climate-smart Tools for Soil Climate and Analysis Network and engage with Tribal SCAN
- Understanding Forest Carbon Offsets
- Sightline – a quarterly report on ESG
- The Pulse: Forests and Carbon in the News Long-term Economics of Soil Health
- Assessing Wood Vaults for Carbon Mitigation
- Sharing our feature length film, Delmarva and the Ground for Change



- Publishing our quarterly newsletter, The Quarterly Harvest
- Supporting an ARS Fellow
- Assessing performance of a Novel Shallow Well for Agricultural Use in Maine
- Working with a recent college graduate to develop scientific communication skills
- Mapping Saltwater Intrusion in Forests in the Mid-Atlantic
- Creating connections with the Northeast region NRCS staff
- Facilitating a meeting for all NRCS Climate Hub co-leads
- Contributing to the 5th National Climate Assessment
- Climate science, synthesis, outreach service, and education

Climate-Smart Agriculture and Forestry (CSAF)



Emerging Issue:

Drought in Unexpected Places and Unusual Times

Drought in New England

Drought in Alaska

Flash Droughts

Snow Droughts

Mega-drought in the
Colorado River Basin



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Science Synthesis - Example

Flash Drought in the Northeast

- ✓ Determine how the causes of drought have changed and are likely to continue to change in the Northeast
- ✓ Provide a regional synthesis of results in a format that can be utilized by key stakeholders
- ✓ Communicate results to researchers, decision-makers, extension personnel and producers via factsheets, webinars, and other outreach activities



Tools and New Technology - Example

Shallow Wells (with USGS, UMaine)

- ✓ Diversify access to water
- ✓ Capable of storing more water than a traditional dug well
- ✓ Possible addition to NRCS climate smart strategies
- ✓ May be cost-effective

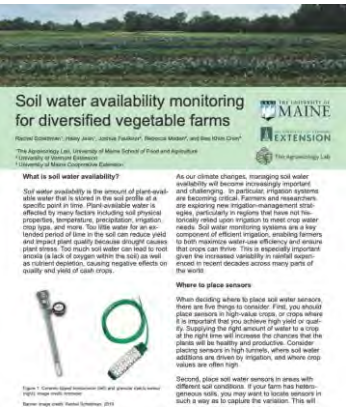


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Outreach, Convening and Training - Examples

Factsheets and summaries of scientific studies



Quarterly e-newsletters



Workshops and proceedings



Archived webinars



Economic case studies



360 virtual tours demonstrating climate adaptation practices



Northeast Climate Hub - advancing climate equity

A focus on facts, understanding, empathy, and action



[Climate Equity Fellow \(ORISE\)](#)

[Tribal Climate Equity Fellow \(NRS\)](#)

[Climate Equity Webinars](#)

[Art + Climate Equity](#)

Our goal is to integrate climate equity into all our projects as part of “This is who we are.”

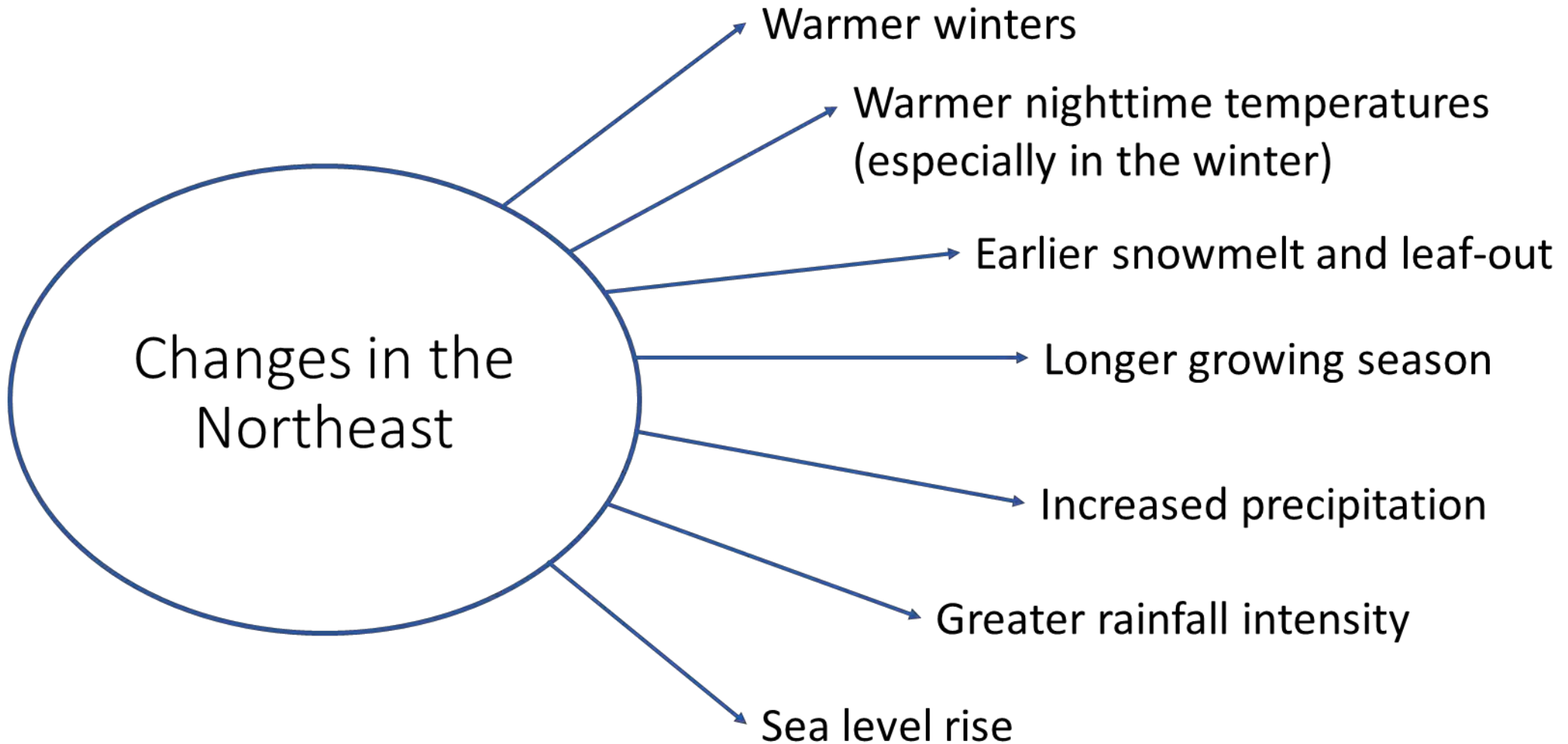


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The background of the slide is a photograph of a forest. Several tree trunks are visible, with various scientific instruments attached to them. In the foreground, a tree trunk has a silver metal band around it, and a small electronic device with wires is attached. In the background, another tree has a similar band, and a person wearing a white hard hat is partially visible, working on the tree. The scene is brightly lit, suggesting a sunny day in a forest.

Application of Climate Science to Agriculture and Forestry

-
- ✓ Changes of Concern
 - ✓ Impacts
 - ✓ Opportunities
 - ✓ Adaptation
 - ✓ Mitigation



Agricultural Impacts



← damaged infrastructure after a wind event

↓ spring flooding



Increased rainfall & precipitation intensity

- + Erosion
- + Compaction
- + Loss of nutrients
- + Delayed planting/harvesting
- + Crop loss

Increased temperature

- + “False Springs”
- + Less snow = more runoff and erosion in winter
- + Pests and invasive species
- + Need for irrigation
- + Yield loss due to heat stress

Sea level rise

- + Soil and well salinization
- + Farm/forest land loss

Agricultural Opportunities

- Double cropping
- New varieties
- Longer growing season
- More growing degree days



Agricultural Adaptation Strategies



← alley cropping system

↓ cover crops



Promote soil health & reduce soil erosion

- Cover crops
- Reduce tillage

Decision support: better information faster

- Integrate pest management
- Shift planting dates
- Adjust feeding management
- Identify and select better adapted varieties, breeds and cultivars

These are just some examples!

Protect from extremes

- High tunnel houses
- Ventilation systems
- Riparian buffers
- Expanded irrigation
- Shift production zones away from flood- and frost-prone areas

Agricultural Mitigation Strategies



← Cover cropping to increase carbon inputs

Installing solar panels on a barn roof →



Increase on-farm carbon sequestration

- Add cover crops
- Reduce tillage
- Add organic matter
- Replace annual crops with perennial crops
- Add, protect, and grow trees

Practices that increase soil carbon are also climate adaptive!

Reduce on-farm emissions

- Practice energy conservation and efficiency
- Conduct energy audits
- Implement efficiency updates and utilize efficiency strategies
- Integrate renewable energy including wind, solar, or bioenergy

Forestry Impacts



M. J. Raupp

← Insect Damage

↓ Ghost Forests



Increased rainfall & precipitation intensity

- + Erosion
- + Compaction
- + Flooding
- + Loss of nutrients

Increased temperature

- + Increased fire danger
- + “False springs”
- + Less snow = more runoff and erosion in winter
- + Pests and invasive species
- + Productivity loss due to heat stress

Sea level rise

- + Soil salinization
- + Ghost forests

Forestry Opportunities

- Longer growing seasons
- More growing degree days
- New species and varieties
- Increased carbon sequestration

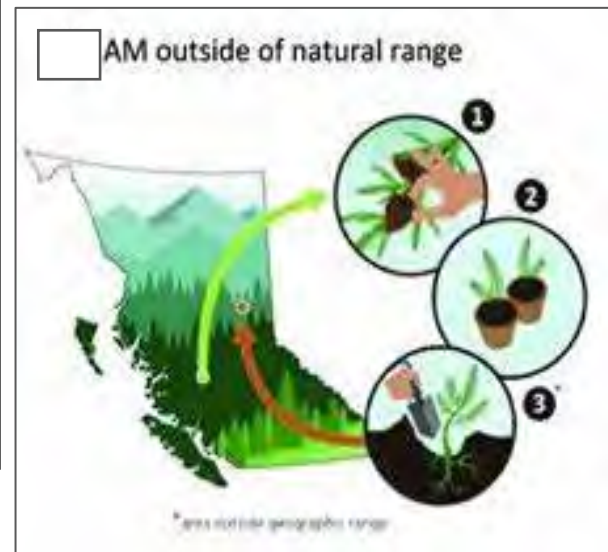


Forestry Adaptation Strategies



← Keep forests as forests

↓ Assisted Migration



Avoid Forest Loss

- Keep forests as forests
- Plant forests
- Plan forest buffers, corridors, reserves

Reduce Stressors

- Reduce pollution
- Control invasives, pests & pathogens
- Manage for fire
- Manage for resilience

Assisted Migration

- More southerly species
- More southerly cultivars

Forestry Mitigation Strategies



← Plant trees

↓ Manage soil carbon



Sequester carbon in plants

- Keep forests as forests
- Plant more forests
- Maximize species selection for old growth + fast-growing species
- Extend rotations

Sequester carbon in soils

- Avoid compaction
- Avoid carbon loss by fire
- Manage for long-term soil health

Avoid loss of carbon

- Improve ability to withstand pests and pathogens
- Reduce impacts from invasive species

USDA Climate Hubs

resources

Website: [Welcome to the USDA Northeast Climate Hub | USDA Climate Hubs](#)

Newsletter: Quarterly Harvest

Twitter: @USDAClimateHubs

Forest Pulse: [The Pulse: Forests and Climate in the News | USDA Climate Hubs](#)

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Questions?



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