



RESOURCES FOR HELPING LAND MANAGERS ADAPT TO A CHANGING CLIMATE

January 17th, 2017



**Climate Hubs
Northeast, Midwest, Northern Forests
Natural Resources Conservation Service
Agriculture Research Service
U.S. Forest Service**

**Dan Dostie, State Resource Conservationist,
NRCS Pennsylvania**

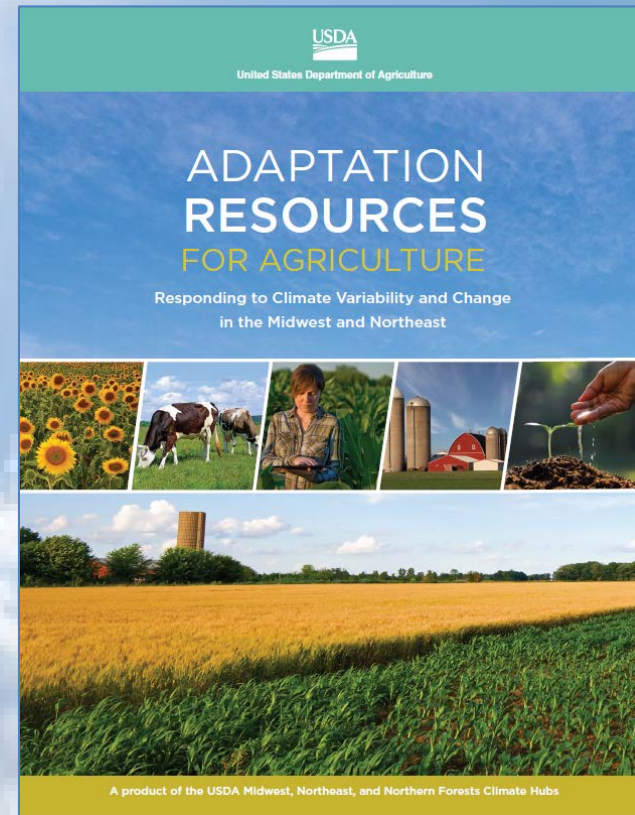
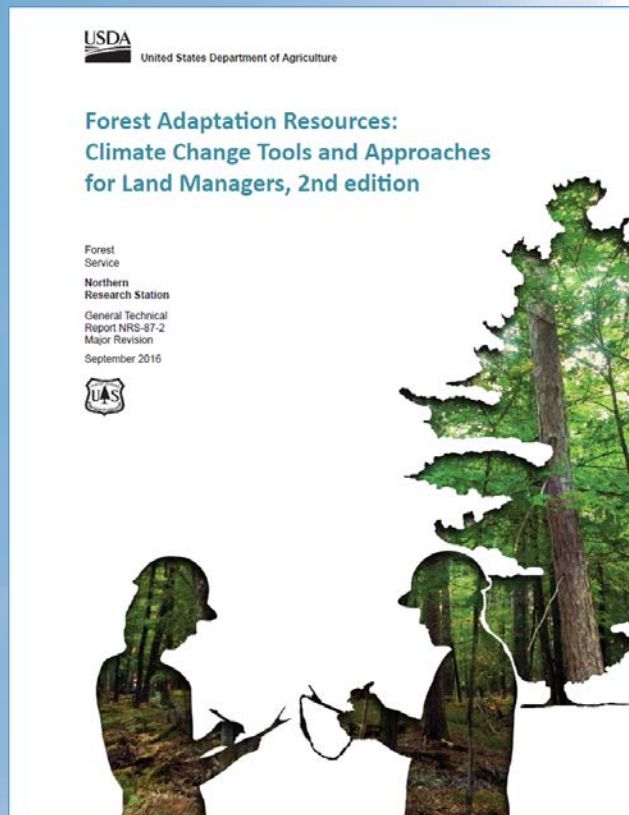
**Maria Janowiak, Deputy Director,
NIACS, U.S. Forest Service**



Resources for Helping Land Managers Adapt to a Changing Climate

1. Regional Adaptation Responses
2. Adaptation Workbook
3. Adaptation Workbook Examples

New Adaptation Resources in 2016:



Visit www.climatehubs.oce.usda.gov and look for “Adaptation Assistance”



United States Department of Agriculture

Climate Hubs

Adaptation Workbook

[About](#) [How to Use](#) [Resources](#) [Training](#) [Get started](#) [Log in](#) [Contact us](#)

Adaptation Workbook

a climate change tool for land management and conservation

[Get Started](#)

[About](#)



FORESTS



URBAN FORESTS



AGRICULTURE



Tailored to your location

Relevant resources and information for your location, giving you complete flexibility to build a custom adaptation plan based on your unique management goals, values, and experience.



Structured process

A logical, step-by-step process to help you consider climate change information for your location. The process helps you capture your thinking and align your goals to adaptation actions.



Peer-reviewed

Based on the best available science on climate change impacts and adaptation. You can access a library of information to learn more.



Take it with you

Create a custom adaptation plan for your property. Save this plan to combine with other management documents and share with your colleagues.



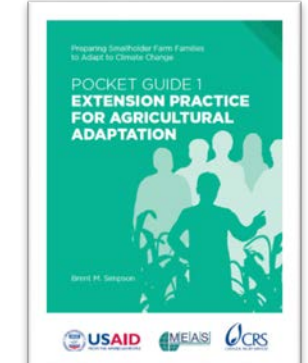
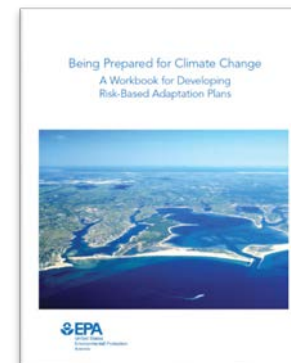
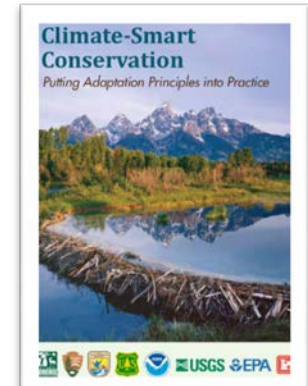
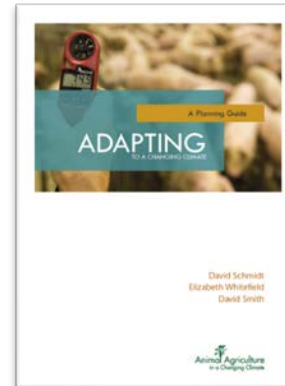
Northern Institute of Applied Climate Science

[Terms and Conditions](#) | [Privacy Policy](#) | [Contact](#)



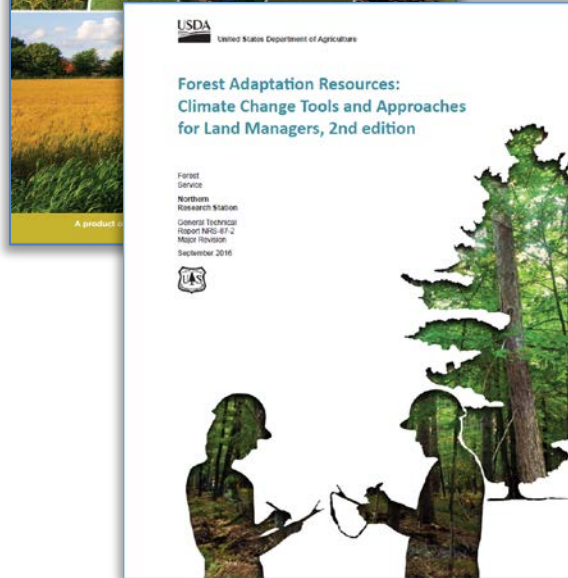
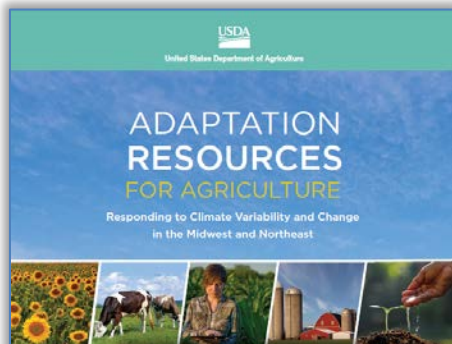
Other Adaptation Resources:

- Offer different perspectives
- Animal Ag, Wildlife, Estuaries, & International Development Smallholders
- Consider the variety of land managers with diverse goals
- Everyone needs information and help accessing decision tools





USDA Adaptation Resources



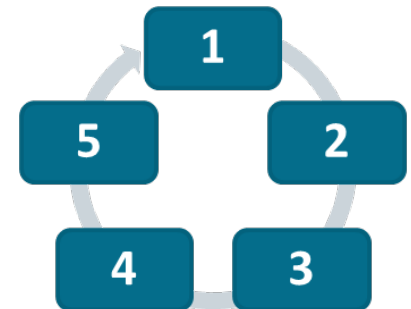
Strategies & Approaches

Menu of adaptation actions



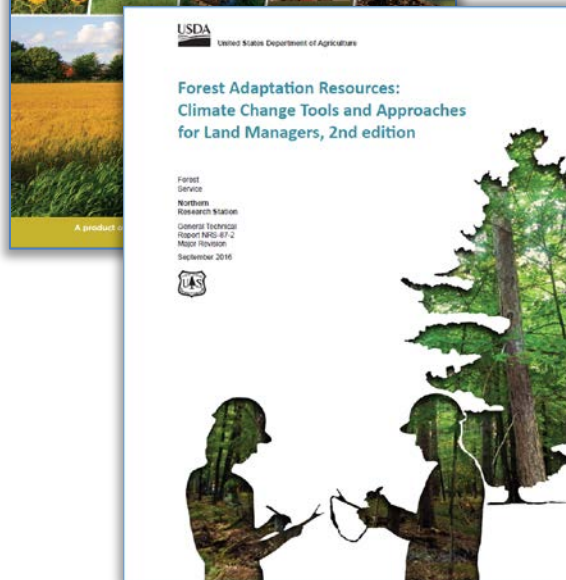
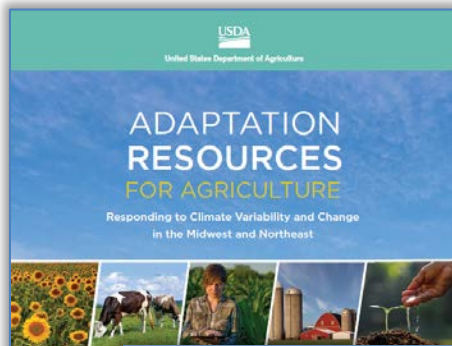
Adaptation Workbook

- Structured process to integrate climate change considerations into management
- Workbook approach





USDA Adaptation Resources



Do NOT provide specifications.

Do provide:

- Considerations for production and conservation
- A flexible model useful in any location
- Menus of regionally-relevant adaptation strategies and approaches
- Real-world examples : 180+ forest demonstrations; tested for agriculture



Regions: Midwest & Northeast





United States Department of Agriculture
Climate Hubs

Adaptation Resources for Agriculture:

Responding to Climate Variability and Change in the Midwest and Northeast

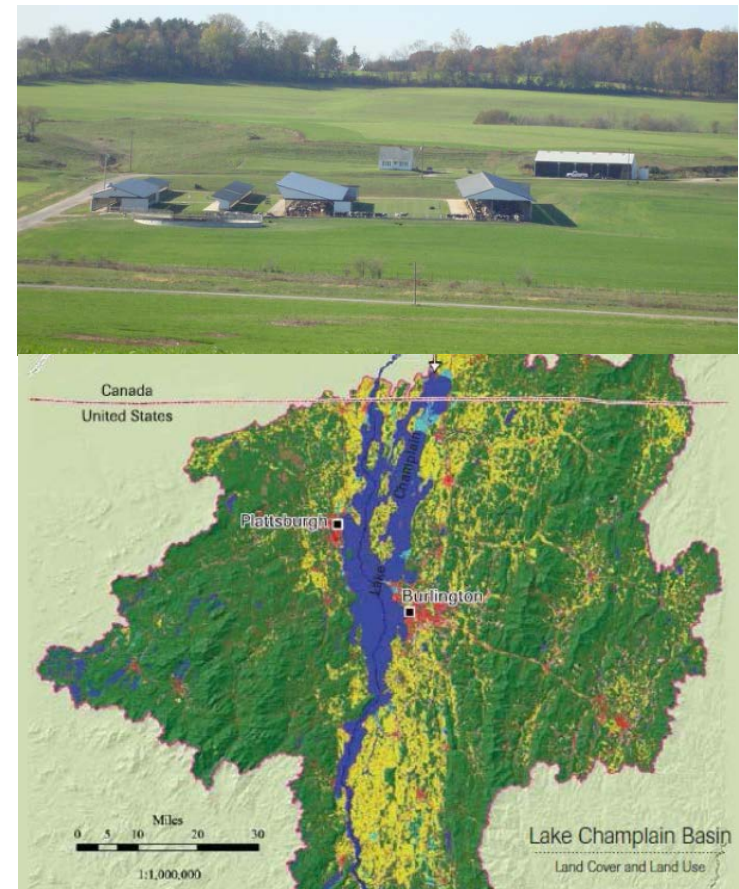
U.S. Department of Agriculture, Washington, DC, Technical Bulletin 1944, October 2016





About Adaptation Resources for Agriculture:

- For **educators**, conservationists, advisors, farm owners, **operators**
- **Farm** or **Area** wide scale, **NOT** state or national policy scale
- Broad ecological site and planning **considerations**
- **NOT** financial, legal, market, human resource considerations





About Adaptation Resources for Agriculture:

Contents:

1. Regional Climate Change Effects
2. Adaptation Concepts
3. Regional Adaptation Responses
4. Adaptation Workbook
5. Adaptation Workbook Examples
6. Glossary
7. Literature cited
8. Methods used
9. Worksheets



What is changing in the Midwest and Northeast?



- **Annual average** temperatures will continue to warm
The annual average temperature may be 3 – 6 °F higher by mid-century (2041-2070) than it was in the late 20th century (1971-2000).
- **Heat waves** and intensity will continue to increase
especially in summer.
- **Annual precipitation** amounts will continue to increase
especially in winter and spring.
- **Precipitation events** will be heavier with **longer dry spells**
- **The growing season will be longer . . .**



Key Principles of Adaptation

Setting priorities for the most vulnerable
Considering the co-benefits of planned actions
Being flexible and creative
Taking precautionary actions
Monitoring & adaptive management

**Keys to sustaining farms, ranches, and forests
under extreme, variable and uncertain climate**



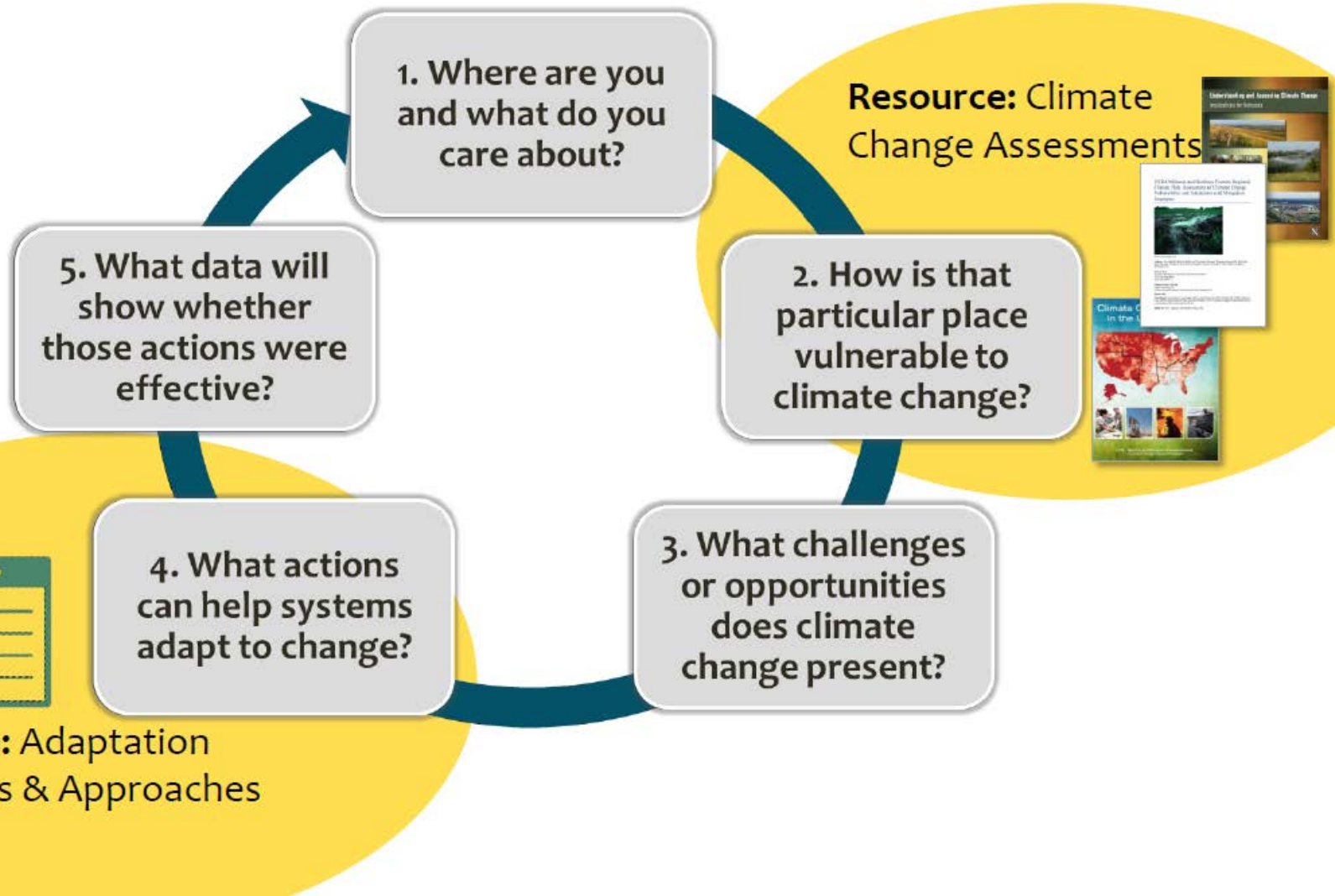
About the Adaptation Strategies and Approaches Menu

- Translates broad **concepts** into specific **actions**
- A full spectrum of possible adaptation **responses**:
 - Adaptation **strategies**
 - Adaptation **approaches**
 - Adaptation **tactics**
- Provides the **rationale** for making decisions





Adaptation Workbook





Four Workbook Examples





Adaptation Workbook Worksheets

ADAPTATION WORKBOOK WORKSHEETS

Worksheet #1: Define management goals and objectives.

Farm or Project Area:	
Location:	

Worksheet #2: Assess site-specific climate change impacts and vulnerabilities.

Management Unit (from Step #1)	Regional Climate Change (from Step #1)	Climate Change Impacts and Vulnerabilities (from Step #1)
--------------------------------	--	---

Worksheet #3: Evaluate management objectives given projected impacts and vulnerabilities.

Management Unit (from Step #1)	Management Objectives	Challenges To Meeting Objectives	Opportunities for Meeting Objectives	Feasibility of Objectives	
--------------------------------	-----------------------	----------------------------------	--------------------------------------	---------------------------	--

Worksheet #4: Identify adaptation approaches and tactics for implementation.

Management Unit (from Step #1)	Adaptation Actions		Time-frames	Benefits	Drawbacks & Barriers	Effectiveness and Feasibility of Tactic	Recommend Tactic?
	Approach	Tactic					

Worksheet #5: Monitor and evaluate effectiveness of implemented actions.

Management Unit (from Step #1)	Adaptation Monitoring Variable	Criteria for Evaluation	Monitoring Implementation
--------------------------------	--------------------------------	-------------------------	---------------------------



Why the Workbook?

Management Goals
& Objectives

Climate Change
Impacts

Challenges &
Opportunities

Intent of Adaptation
(Option)

Make Idea Specific
(Strategy, Approach)

Action to Implement
(Tactic)

**Why it's important:
Helps connect the dots
from broad concepts
to specific actions for
implementation.**



United States Department of Agriculture
Climate Hubs

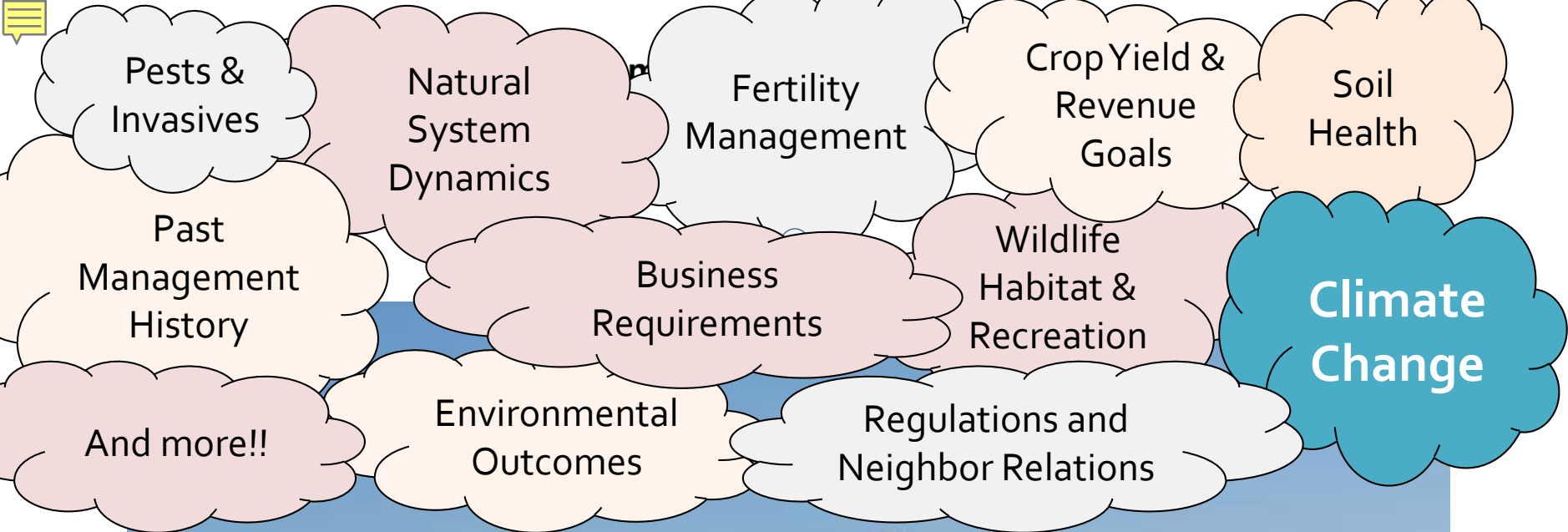
Planning Adaptive Management Contingencies for Climate Change

Each decision is unique and will vary based upon:

- **Place:** Location & Site Conditions
- **Purpose:** Goals & Objectives
- **People:** Values, Culture, & Resources
- **Level of Uncertainty:** Learn as you go!

There isn't a single answer.

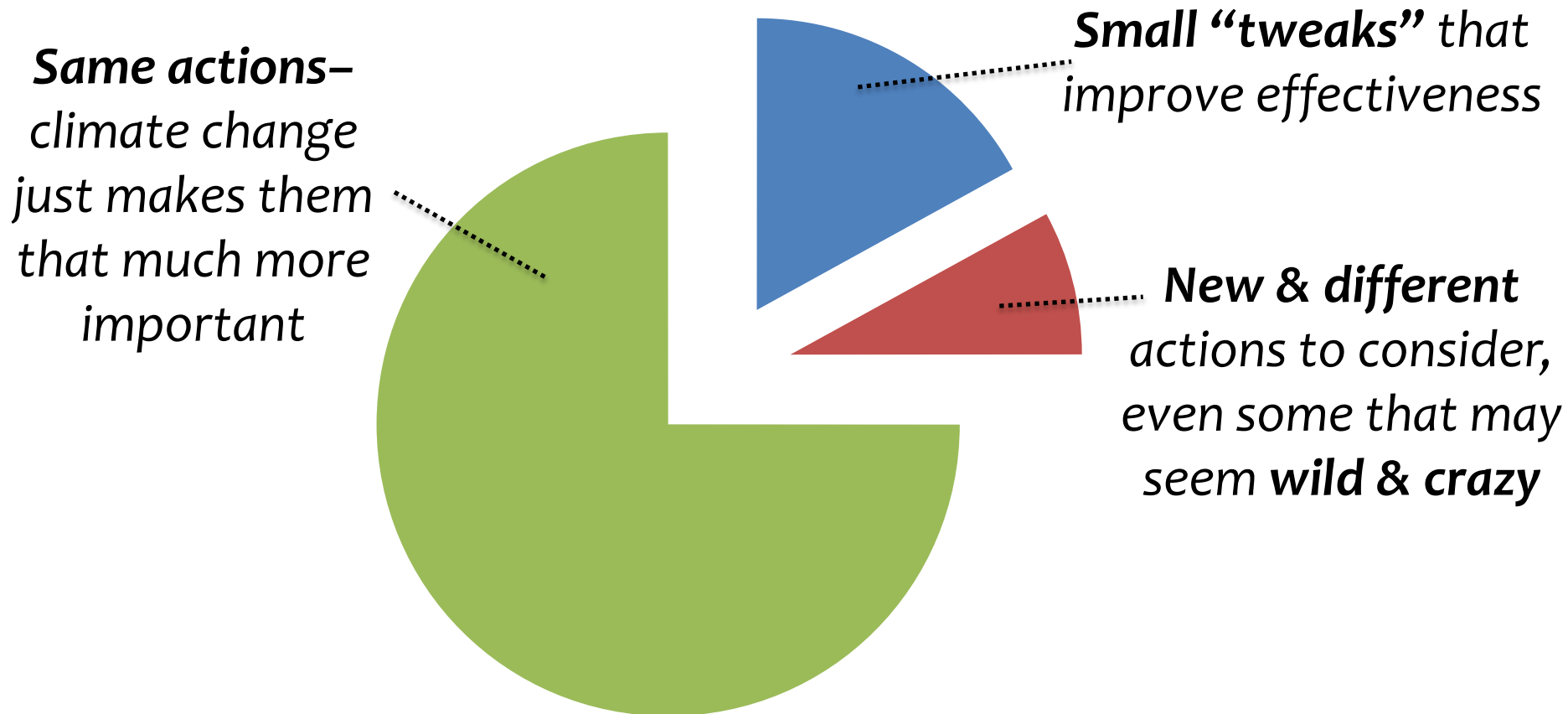




So Many Considerations !



Current management may be fine



**individual results will vary*



United States Department of Agriculture
Climate Hubs

Consider mitigation opportunities

Adaptation and Mitigation are connected . . .



Adapting today without mitigating impacts on tomorrow increases the future cost of adaptation



CSF Water Deficit Calculator

CSF Water Deficit Calculator

Climate

Tools

Team

Resources

Forum

Videos


Location

City: Ithaca, NY


Lat: 42.443300

Lon: -76.449170

Soil Water Capacity

High (Clay, fine texture) 

Crop Type

Grass Reference 

Plant/Greenup Date

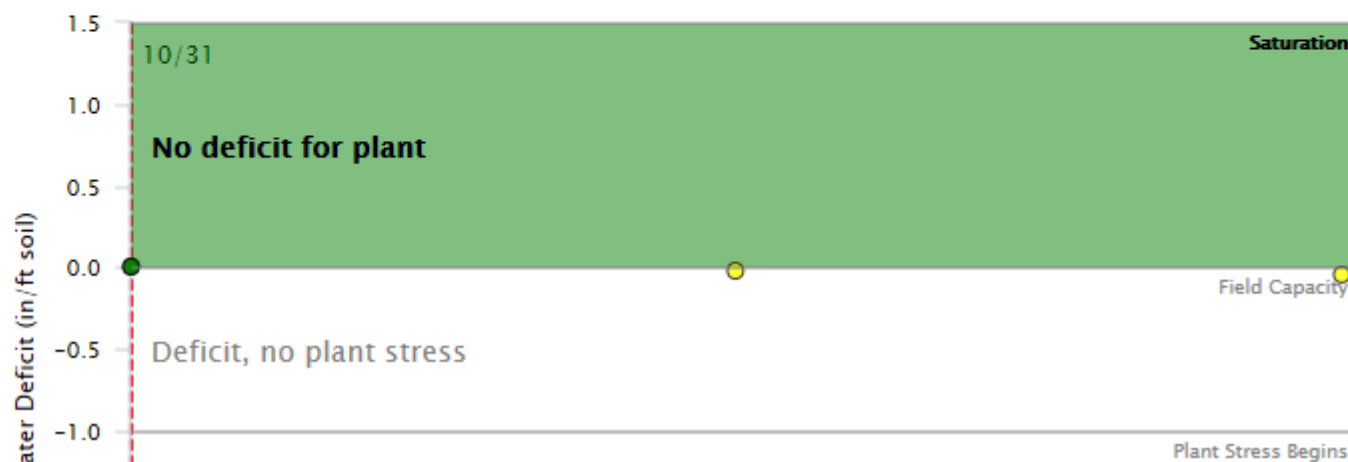
05/01/2016 

Water Deficit Results

Next 30 days

Climate Change Projections

Water deficit since last recharge to field capacity



<http://climatesmartfarming.org/tools/>



Irrigation Investment^{DST}

Explore the profitability of investing in irrigation equipment within the Corn Belt





United States Department of Agriculture
Climate Hubs

NRCS Climate Connections Tool (Beta)

Climate Connections

Broad categories of climate variability and change with definitions and links to supporting scientific literature.

Climate Adaptation Practices

Find conservation practices that are most frequently used to address concerns that are climate related.

Practice Details and Trade-offs

A complete inventory of NRCS practices with interaction summaries and links to primary documentation.



United States Department of Agriculture
Southeast Regional Climate Hub

[Accessibility](#)

[Privacy Policy](#)

[Important Notices](#)

Beta v0.080916

Step by Step Instruction Video

<https://www.youtube.com/watch?v=5QFjga1pwso&feature=youtu.be>



Conclusion

- Use the Adaptation Workbook as a climate change response framework
- Use decision support tools to adaptively manage practices
- Current management may be fine, need small tweaks or large transformations
- Engage trusted advisors to develop win-win-win solutions!



United States Department of Agriculture
Climate Hubs

Questions ?



Maria Janowiak mjanowiak02@fs.fed.us for Online Workbooks
<https://adaptationworkbook.org/>
Dan Dostie daniel.dostie@pa.usda.gov for NRCS questions