## Climate Adaptation Planning for Farms



Start planning for climate adaptation and farm resilience based on the unique variables of your land and operation.

## Five steps for farmland climate adaptation planning:

- 1. Define your farm goals and priorities
- 2. Identify specific, observed climate impacts
- **3.** Conduct a risk & vulnerabilities assessment based on your climate impacts and farm goals
  - 4. Develop a set of adaptation practices
- **5.** Evaluate the effectiveness of those adaptations practices and update your plan accordingly



1. Goals What are the overall or immediate goals of your farm operation?

**Articulate one to three goals that inform your choices and priorities.** Consider foundational values, financial requirements, organizational strengths, farm resources, aspirations, challenges, etc.

Version 4. This approach was adapted by Julie Fine from <u>Adaptation Resources for Agriculture: Responding to Climate Variability and Change in the Midwest and Northeast</u>. USDA Midwest, Northeast, and Northern Forests Climate Hubs, 2016. Updated versions and fillable pdf available at <a href="https://farmland.org/climate-adaptation-worksheet/">https://farmland.org/climate-adaptation-worksheet/</a>

## 2. Climate Impacts What impacts of climate change have you observed and experienced on your farm? Check all that apply. Circle the most concerning impacts.

## **Changing precipitation patterns** ☐ Wetter springs or falls ☐ More frequent extreme precipitation ☐ Saturated soils affecting planting, weeding, and/or harvest □ Seasonal drought □ Increased need for irrigation □ Decreased pasture/forage yield

ш	Decreased pasture/forage yield
	Extreme weather
	Flooding and/or ponding
	Increased erosion
	Nutrient leaching
	High wind effects
	Infrastructure damage due to wind, snow, rain,
	or temperatures
П	Wildfire & smake impacts

	Increased temperatures
П	Increased seasonal temperatures
	More extreme temperatures
	Changing pest or disease patterns
	Increased weed vigor
	Increased cooling needs
	Heat stress
	Animal health declines

Seasonal shifts				
	Wetter, cooler spring Longer fall Unpredictable frosts, fruit loss Warmer winter/summer Changes in timing of planting/harvest Crop or variety not adapted Pest or pollinator shifts			

## Other (write in)

or temperatures ☐ Wildfire & smoke impacts

## Projected Changes in Weather in the Northeast for mid-century (2041-2070 average)

ANNUAL TEMP	ANNUAL PRECIPITATION	GROWING SEASON	HOT DAYS	HOT SPELLS	COLD DAYS	EXTREME PRECIPITATION
+ 4 to 8 F	<b>+ 1</b> to <b>7 inches</b>	+ 19 to 27 days	+ 3 to 21 days	<b>+ 1</b> to <b>7 days</b>	- 6 to 24 days	+ 2 to 4 days
Avg temp increases, and increases in each season.  Milder winters	Seasonal increase greatest in winter Decrease in sum- mer	Warmer, wetter springs	Least change in northernmost areas	Increase in consecutive days over 95	Greatest decrease in the north	More days of precipitation exceeding 1"

This table is adapted from the USDA Regional Climate Hubs' Regional Agricultural Vulnerability Assessment and the National Climate Assessment NESDIS reports using the A2 climate scenario. Growing season=the period between the last occurrence of 32° in the spring and first occurrence of 32° in the fall; hot days=annual average of days with max temp exceeding 95°; hot spells=max number of consecutive days with max temps over 95°; cold days=average annual number of days with min temp below 10°; freeze days=days with a min temp below 32°; extreme precipitation=number of days with precipitation over 1 inch.

3. Risks Assessment Based on your observations of climate impacts, and taking into account projected changes in climate, what are 4 major vulnerabilities of your farm operation? What areas of land, important crops, animals, or essential infrastructure are a priority to protect? What is at most risk? Where do the identified climate impacts directly impact your top farm goals?
$\sum$
$\sum$
$\sum$
$\sum$

Mind map Use this space to map out critical areas of the farm, or brainstorm the issues.



Now choose which vulnerabilities are the priority. Priority should be given to large financial risks, preventable losses, and long-term priorities that meet the goals of your farm.

Circle your top priority.

# Consider Adaptation Strategies and Possible Practices:

Review these strategies, and specific potential practices, for adapting to climate change. Which one(s) would help address the risks and vulnerabilities that you've prioritized above? Circle the most relevant ones (or develop your own).

# Soil resilience

# Prioritize soil health

 Reducetillageto aggregation improve soil

Slow & catch water

Plan ahead for

Reduce severity of

flooding

 Permanent beds or repeatedflooding

drive lanes

- Maximizedays in cover crop
- Increase soil organic matter

## ncrease water nfiltration

 Reduce compaction aggregation Address ponding Improve soil

## Increase water retention

- Increase soil organic matter
- tarp or keep surface Mulch, cover crop, residue

Improve infiltration in

Anticipate flooding

•Channel water away Have dry storage for

from critical areas

# Nutrient management

- nutrient runoff during Anticipate potential heawrains
  - · Use slower release fertilizer

Develop additional

water sources

Prepare for drought

in response to precip Supplement fertility

# Diversification

management

Water

## Crop production

Maintain livestock

- betweenhightunnel Split production and field
- diversity & rotations Increasecrop

Reduce heat stress (in & outdoors)

Improve pasture

performance health and

- farm revenue streams Diversify markets & Trial heat & disease
- Evaluate crops that resistant varieties might succeed in current or future

conditions

Understand contours

 Create swalesor Prevent erosion

grassy strips

Manage water flow

## Livestock & dairy

from fields, pasture,

Grade farm roads

Improve drainage

- Increase haylage or balage production Diversify feed
- Select for climate resilient genetics Custom grazing opportunities

Succession plantings

forage or feed plans

Make alternative

(predictive models

Scout for pests

may be outdated)

varieties and breeds

Manage impacts of

pests & pathogens Disease resistant

# Adjust for crop loss

Plan for lower yields

equipment & inputs

- lower milk production animal growth or Plan for slower
- Increase or stagger crop successions

## Diverse habitat

- delivery systems

Improve water

Store water

efficient irrigation Use sensors for

# Pollinator habitat

- Create riparian buffer
- Convert marginal land wetland or habitat to permanent

seasonal changes in

temp, precip, frost

grazing or cropping Consider predicted

Consider custom

## Crop & anima strategies

# nfrastructure

## Prevent manure Livestock & dairy

- for liquid manure mgt Upgrade equipment nutrient loss
- Mitigate silage leachate

## Protected crop

Prepare for disease

mud or heat testing & vet emergencies

disesserelated to Prevent emergent

High & low tunnels

marketing and sales

Direct community

- Wind breaks Shadecloth
- Installdrainage for greenhousesor

# Manage temperature

- Optimize postventilation
  - harvest cooling

Assess farm resources

and systems as a

whole

Whole farm planning

Climatecontrolled storage

- Prevent farm runoff
- Improve irrigation infrastructure (equipment &

## nfrastructure nvisible

# Social & community

- Maintain personal support network

Find peer learning

health

opportunities

awareness of risk

Build community connections and Prioritize mental

- production

Establish dry lots

Back up water

tunnels

Analyzeviability of

farm enterprises

·Financial cushion

Crop insurance

Financial planning

# Barn and greenhouse

Grant opportunities

- Shade/cooling for employees

•Manage farm as part

of landscape

## Manage water

 Shift planting dates Perennial plantings

Adjust crop plan

- Develop ponds or wells

Take at risk landout

of production

Lessrisky crops

Plant valuable crops in safer fields

redundancy)

## Labor

- Sources of labor
- Add specialized expertise Housing

 Secure new fields or Revaluate land relocatefarm Move infrastructure

Risk:	4. Adaptation
Strategy:	Practices
Practice:	1: Write down what you identified as your most significant risks to climate impacts.
	2: Using ideas on the previous page, note what strategies might be used to mitigate these risks?
:	3: Consider what specific practices could serve to increase the resilience of your farm?
Risk:	Remember that adaptive practices should include:
Strategy:	<ul> <li>Considerations of feasibility and potential effectiveness</li> </ul>
Practice:	<ul> <li>Flexible management that can adapt with new information</li> <li>"No regrets" decisions that will create broad benefits with little risk</li> </ul>
	<ul> <li>Resources that are available and supported in your network</li> <li>A specific, practical timeline</li> </ul>
Timeline and Considerations	

- ⇒ What is a realistic time frame for developing these practices? How could they fit into your current systems?
- ⇒ What are possible funding sources, technical services, or community support?
- ⇒ Have other people been successful with these practices? Who can you consult about their experience?

## 5. Evaluate

Choose one or two criteria to measure the effectiveness of your climate adaptation practices.

What will indicate success? How often will you take that measurement?



## In Summary:

This climate adaptation planning cycle should be repeated over time as new practices yield results, information is gathered, and new challenges emerge. Congratulations on getting started, and good luck with your climate resilience planning!

## **Climate Adaptation Planning**

Adaptation Resources for Agriculture https://www.climatehubs.usda.gov/sites/default/files/adaptation\_resources\_workbook\_ne\_mw.pdf

<u>Climate Adaptation & Mitigation Planning</u> <u>Tool</u> https://www.adaptationfellows.net/ planningtool

<u>Cultivating Climate Resilience on Farms</u> <u>and Ranches</u> https://www.sare.org/ content/download/80674/1415715/file/ Cultivating Climate Resilience on Farms and Ranches.pdf

Webinar: Climate Adaptation for Vegetable and Flower Farms https://www.johnnyseeds.com/growers-library/webinar/webinar-series-climate-adaptation-for-vegetable-and-flower-farms.html

<u>Five Step Guide to Farm Resilience</u> https:// regenerativefarmresilienceguide.org/ New England Adaptation Survey for Fruit and Vegetable Growers https://adaptationsurvey.files.wordpress.com/

The Adaptation Workbook https://adaptationworkbook.org/

### **Practice Resources**

<u>Building Soils for Better Crops</u> www.sare.org/resources/building-soilsfor-better-crops/

<u>Managing Cover Crops Profitably</u> https:// www.sare.org/resources/managing-cover -crops-profitably-3rd-edition/

Northeast Cover Crops Decision Tool https://northeastcovercrops.com/decision-tool/

NRCS Climate Smart Conservation Practices https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/climatechange/?cid=nrcseprd1881023

<u>Climate Adaptation Resource Database</u> https://www.uvm.edu/climatefarming/ High Tunnels and Extreme Weather https://blog.uvm.edu/cwcallah/2024/08/13/a-guide-to-preparing-high-tunnels-for-extremeweather/

Use tools like the NRCS In-Field Soil Health Assess-

ment, financial analysis, soil health tests, forage yields, or other data to measure success.

<u>Cornell Climate Smart Farming Program</u> http://climatesmartfarming.org/

<u>Real World Resilience Stories</u> https://cultivatingresilience.com/real-world-resilience/

### **Funding & Social Resources**

<u>Find local NRCS office</u> https:// offices.sc.egov.usda.gov/locator/app? agency=nrcs

Ambrook Funding Resource Library https://ambrook.com/funding

<u>Farm Resource Network</u> https://farmaid.my.site.com/