RESOURCES TO SUPPORT PLACE- AND COMMUNITY-BASED CLIMATE ADAPTATION

Caiti Steele

USDA Southwest Climate Hub Coordinator

USDA United States Department of Agriculture
Southwest Climate Hub

USDA Climate Hubs

Translating climate science into action

Mission: Develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers to support climate-informed decision making, reduce agricultural risk, and build resilience.

Agricultural Research Service

NRCS Natural Resources Conservation Service

Forest Service, U.S. Department of Agriculture

APHIS

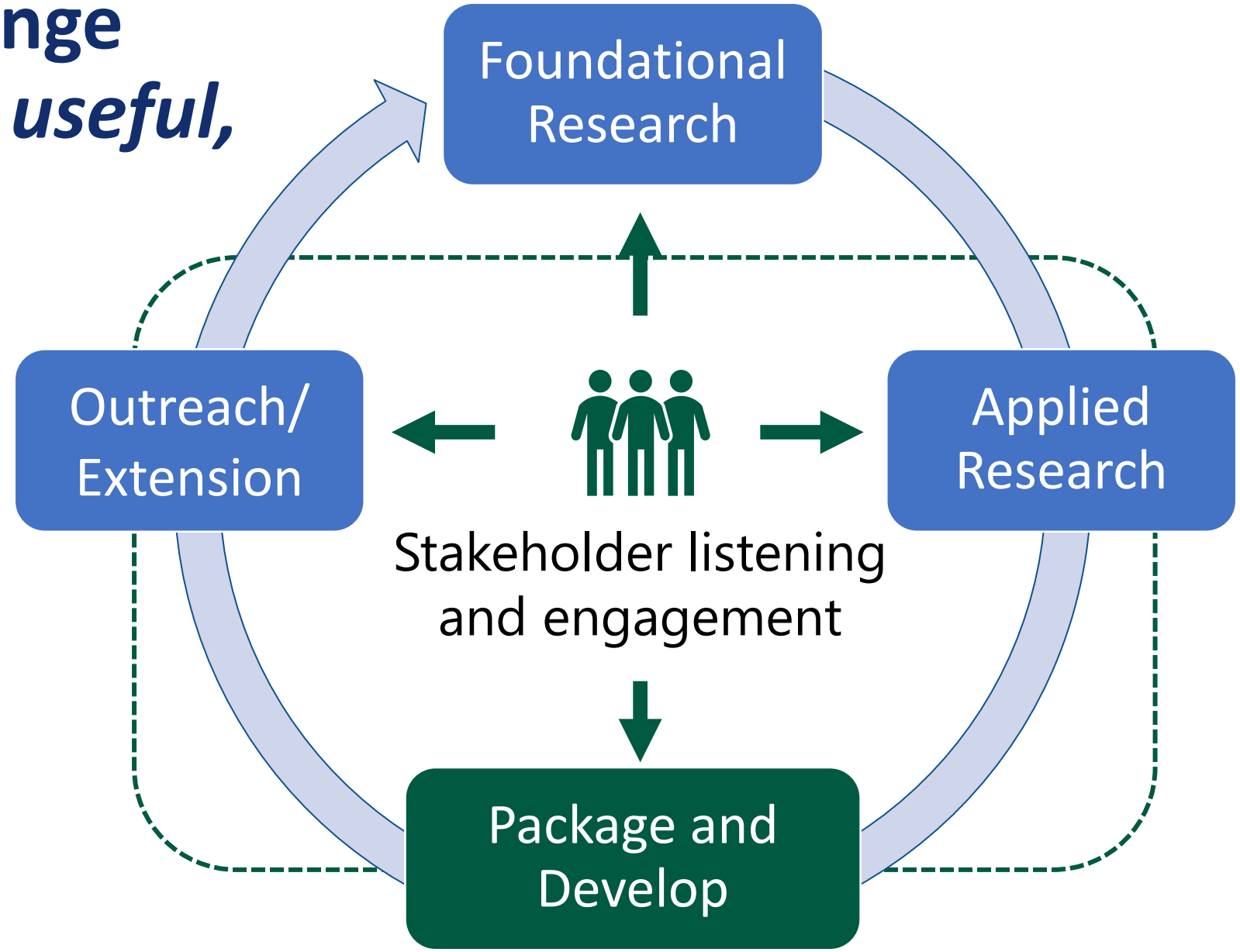
FSA Farm Service Agency

RMA

Making climate change science + resources *useful, usable, and used*

Partners/Stakeholders

- USDA Service Agencies
- Federal Agencies
- Cooperative Extension
- Land Grant Universities
- Farmers
- Ranchers
- Foresters
- Rural communities



USDA

Hub resources to support adaptation

- Adaptation Workbook: Adaptation Menus of Strategies and Approaches relevant to agriculture: https://adaptationworkbook.org/
- The AgRisk Viewer: https://www.climatehubs.usda.gov/hubs/southwest/tools/agrisk-viewer

- Please visit https://www.climatehubs.usda.gov/

Northern Institute of Applied Climate Science / Northern Forests Climate Hub

Climate

Carbon

The Northern Institute of Applied Climate Science (NIACS) develops synthesis products, fosters communication, pursues science, and provides technical assistance in climate change adaptation and carbon management. NIACS leads the Northern Forests Climate Hub (NFCH)

NIACS
Northern Institute of Applied Climate Science

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

American Forests™

Great Lakes Indian Fish & Wildlife Commission

NCASI

1885 Michigan Technological University

The UNIVERSITY of VERMONT

UNIVERSITY OF MINNESOTA

MICHIGAN STATE UNIVERSITY

The NFCH helps natural resource managers, woodland owners, and others working in forested ecosystems to integrate climate change information into planning, decision making, and management activities.

Challenge: putting climate science into management practice

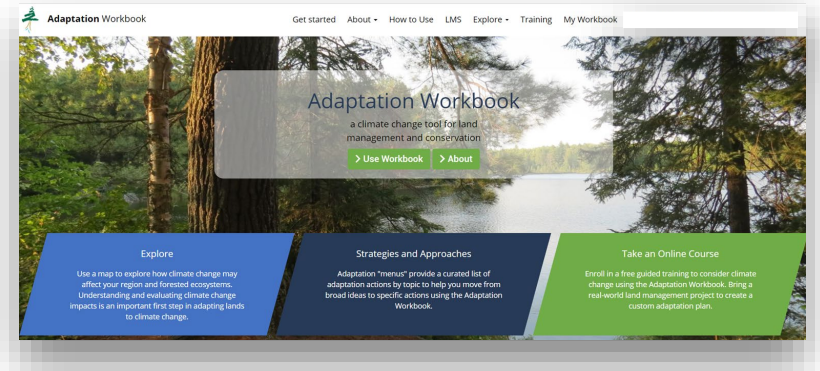
- Climate change science is not being widely used to inform land management
  - Mismatches in the scale and scope of the science
  - Science doesn’t always reflect the needs and decision-space of the managers

Challenge: putting climate science into management practice

- When it comes to agriculture…
  - Farmers are "*influenced by historical intergenerational narratives of family farm management practices*" (Wilke, 2016)
  - "Every farmer remembers three things: their best year, their worst year, and last year."

Adaptation Workbook & Adaptation Resources

- Flexible 5-step workbook designed for a variety of landowners with diverse goals
- Works at project level
- Centers around manager's expertise, and judgement
- Creates **clear rationale** for actions by connecting them to **broader adaptation ideas**
- **Does not make recommendations**
- **Includes:**
  - Adaptation workbook
  - Adaptation strategies for different resource areas (menus)



Download at: www.fs.usda.gov/research/treesearch/52760 or use online at www.AdaptationWorkbook.org

Adaptation Menus of Strategies and Approaches

OPTION

STRATEGIES

APPROACHES

TACTICS

ACTION

A "menu" of **possible actions** that allows you to decide what is ***most relevant for a particular location and set of conditions.***

Brunch

Classics

Lemon Ricotta Pancakes Whipped Mascarpone Maple, Berries	15	AJ's Omelet Fontal Cheese, Spinach, Mushrooms	14
Cornflake Crusted French Toast Berries, Maple Syrup	15	Eggs Florentine Spicy Capicola, House-Made Cheddar Biscuit, Spinach	15
Bacon, Egg & Cheese Bacon, Two Eggs, Taleggio Cheese, Ciabatta	14	Porchetta Hash Poached Egg, Calabrian Chili Hollandaise	16
Avocado Toast Poached Eggs, Tomatoes, Chili Flakes, Sea Salt	15	Chia Pudding Chia Seeds, Toasted Coconut, Banana, Strawberry	14
Chicken Parmigiana Spicy Marinara, Fresh Mozzarella	22	Farmhouse Breakfast Two Eggs, House-Made Cheddar Biscuit, Chicken Sausage	14
Squid Ink fettuccine Vongole Little Neck Clams, Garlic, White Wine, Butter, Chili	22	Chicken Kale Caesar Chicken, Kale, Croutons	16

Create Your Own Pasta

Shapes		Sauces	
Rigatoni Semolina, All-Purpose Flour, Olive Oil	14	Marinara San Marzano tomatoes, Garlic, White Wine, Basil, Chili	
Cavatelli All-Purpose Flour, Durum Flour, Eggs, Ricotta	15	Arrabiata All-Purpose Flour, Durum Flour, Eggs, Ricotta	+1
Tagliatelle All-Purpose Flour, Durum Flour, Eggs	15	Broken Meatball House Tomato Sauce with the Addition of Broken Meatballs	+4
Gluten-Free Rigatoni Gluten-Free All-Purpose Flour, Olive Oil, Eggs	16	Sunday Sauce House Tomato Sauce with Short Rib, Sausage, Veal	+4
Spaghetti Semolina, Durum Flour, Olive Oil	15	Roasted Garlic Pecorino Semolina, Durum Flour, Olive Oil	+2
			+3

Cocktails

10/45

Juice, Horseradish

12/55

e Peche, Sparkling Wine

12/55

12/55

ot Juice

10/45

ne de Peche

12/55

Lime, Grenadine

12/55

imosa Juice, Sparkling Wine

Adaptation menus available at: www.forestadaptation.org/strategies

Adaptation Workbook

1. DEFINE
location and management objectives.

Vulnerability assessments, scientific literature, TEK, etc.

2. ASSESS
climate impacts and vulnerabilities.

3. EVALUATE
management objectives.

4. IDENTIFY
and implement adaptation tactics.

Adaptation Strategies and Approaches

5. MONITOR
and evaluate effectiveness.

MENUS!

Menu of Adaptation Strategies and Approaches

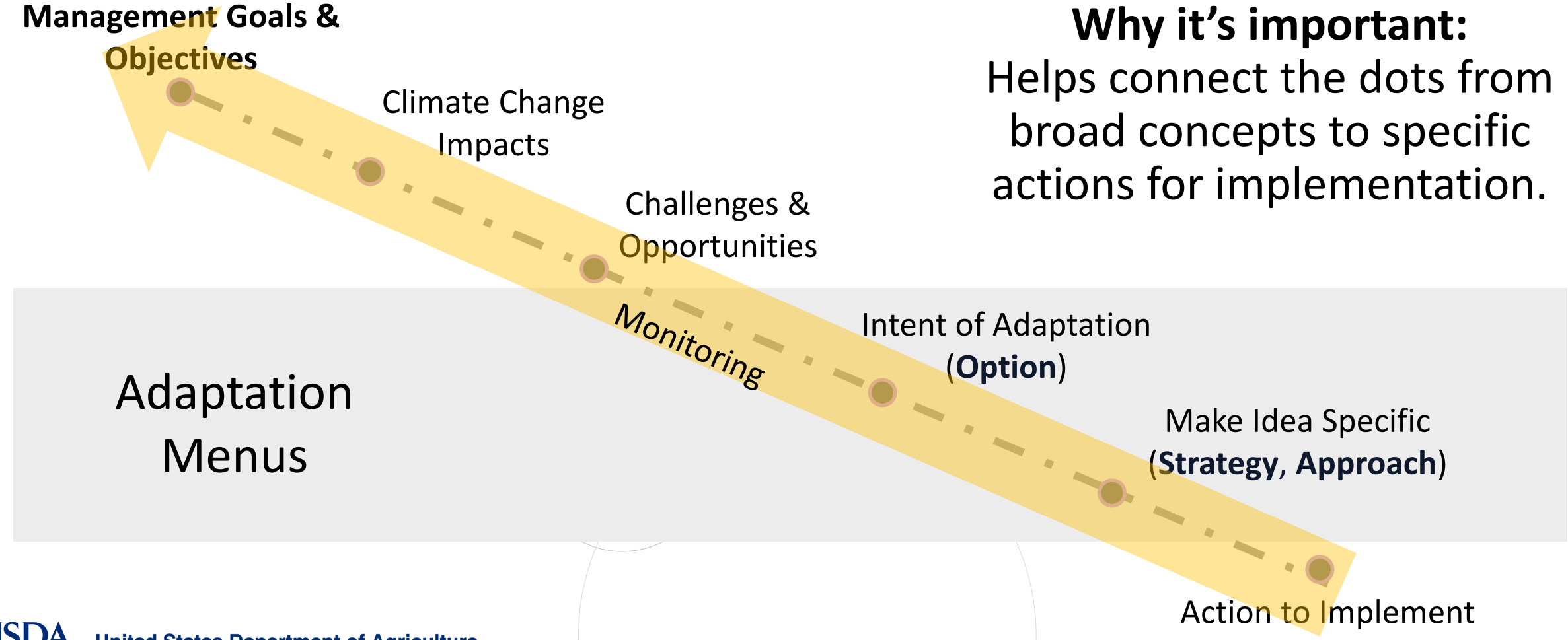
Developed for forests

NIACS

NIACS
Northern Institute of Applied Climate Science

Download at: www.fs.usda.gov/research/treesearch/52760 or use online at www.AdaptationWorkbook.org

Connecting the Dots



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

Adaptation Menus of Strategies and Approaches

Published:

2012: **Forestry**

2016: **Urban Forestry**

2016: **Agriculture**

2019: **Forested Watersheds**

2019: **Recreation**

2019: **Non-Forested Wetlands**

2019: **Inland Glacial Lake Fisheries**

2019: **Tribal Perspectives**

2020: **Forest Carbon Management**

2022: **Fire-Adapted Ecosystems**

2022: **Wildlife Management**

2022: **Great Lakes Coastal Ecosystems**

In Preparation:

- **Grasslands**
- Ocean Coastal Ecosystems
- **Arid Grassland Ecosystems**

Menu of Adaptation Strategies and Approaches

Developed for forests

Strategy 1: Sustain fundamental ecological functions.
1.1. Reduce impacts to soils and nutrient cycling.
1.2. Maintain or restore hydrology.
1.3. Maintain or restore riparian areas.
1.4. Reduce competition for moisture, nutrients, and light.
1.5. Restore or maintain fire in fire-adapted ecosystems.

Strategy 2: Reduce the impact of biological stressors.
2.1. Maintain or improve the ability of forests to resist pests and pathogens.
2.2. Prevent the introduction and establishment of invasive plant species and remove existing invasive species.
2.3. Manage herbivory to promote regeneration of desired species.

Strategy 3: Reduce the risk and long-term impacts of severe disturbances.
3.1. Alter forest structure or composition to reduce risk or severity of wildfire.
3.2. Establish fuelbreaks to slow the spread of catastrophic fire.
3.3. Alter forest structure to reduce severity or extent of wind and ice damage.
3.4. Promptly revegetate sites after disturbance.

Strategy 4: Maintain or create refugia.
4.1. Prioritize and maintain unique sites.
4.2. Prioritize and maintain sensitive or at-risk species or communities.
4.3. Establish artificial reserves for at-risk and displaced species.

Strategy 5: Maintain and enhance species and structural diversity.
5.1. Promote diverse age classes.
5.2. Maintain and restore diversity of native species.
5.3. Retain biological legacies.
5.4. Establish reserves to maintain ecosystem diversity.

Strategy 6: Increase ecosystem redundancy across the landscape.
6.1. Manage habitats over a range of sites and conditions.
6.2. Expand the boundaries of reserves to increase diversity.

Strategy 7: Promote landscape connectivity.
7.1. Reduce landscape fragmentation.
7.2. Maintain and create habitat corridors through reforestation or restoration.

Strategy 8: Maintain and enhance genetic diversity.
8.1. Use seeds, germplasm, and other genetic material from across a greater geographic range.
8.2. Favor existing genotypes that are better adapted to future conditions.

Strategy 9: Facilitate community adjustments through species transitions.
9.1. Favor or restore native species that are expected to be adapted to future conditions.
9.2. Establish or encourage new mixes of native species.
9.3. Guide changes in species composition at early stages of stand development.
9.4. Protect future-adapted seedlings and saplings.
9.5. Disfavor species that are distinctly maladapted.
9.6. Manage for species and genotypes with wide moisture and temperature tolerances.
9.7. Introduce species that are expected to be adapted to future conditions.
9.8. Move at-risk species to locations that are expected to provide habitat.

Strategy 10: Realign ecosystems after disturbance.
10.1 Promptly revegetate sites after disturbance.
10.2. Allow for areas of natural regeneration to test for future-adapted species.
10.3. Realign significantly disrupted ecosystems to meet expected future conditions.

NIACS

To be used in the Adaptation Workbook decision-support framework – Swanston et al, 2016. Forest Adaptation Resources: climate change tools and approaches for land managers, 2nd edition http://www.treesearch.fs.fed.us/pubs/52760 ***More information can be found at*** *www.forestadaptation.org/strategies*

Adaptation menus available at: www.forestadaptation.org/strategies

Adaptation Resources for Agriculture: Case Studies using the Adaptation Workbook

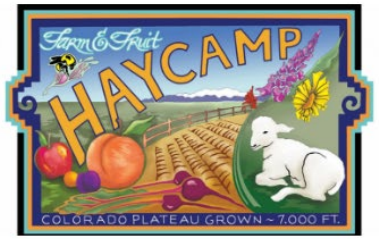
Artisan Cider Apple Orchard in Wisconsin Case Study

R&G Miller and Sons Organic Dairy Farm, WI Case Study

Kelly and Deborah Kettner Farm, TX Case Study

Ridgeway Farms, AK Case Study

Small Acres Family Farm, SE Indiana Case Study



Haycamp Farm, CO Case Study

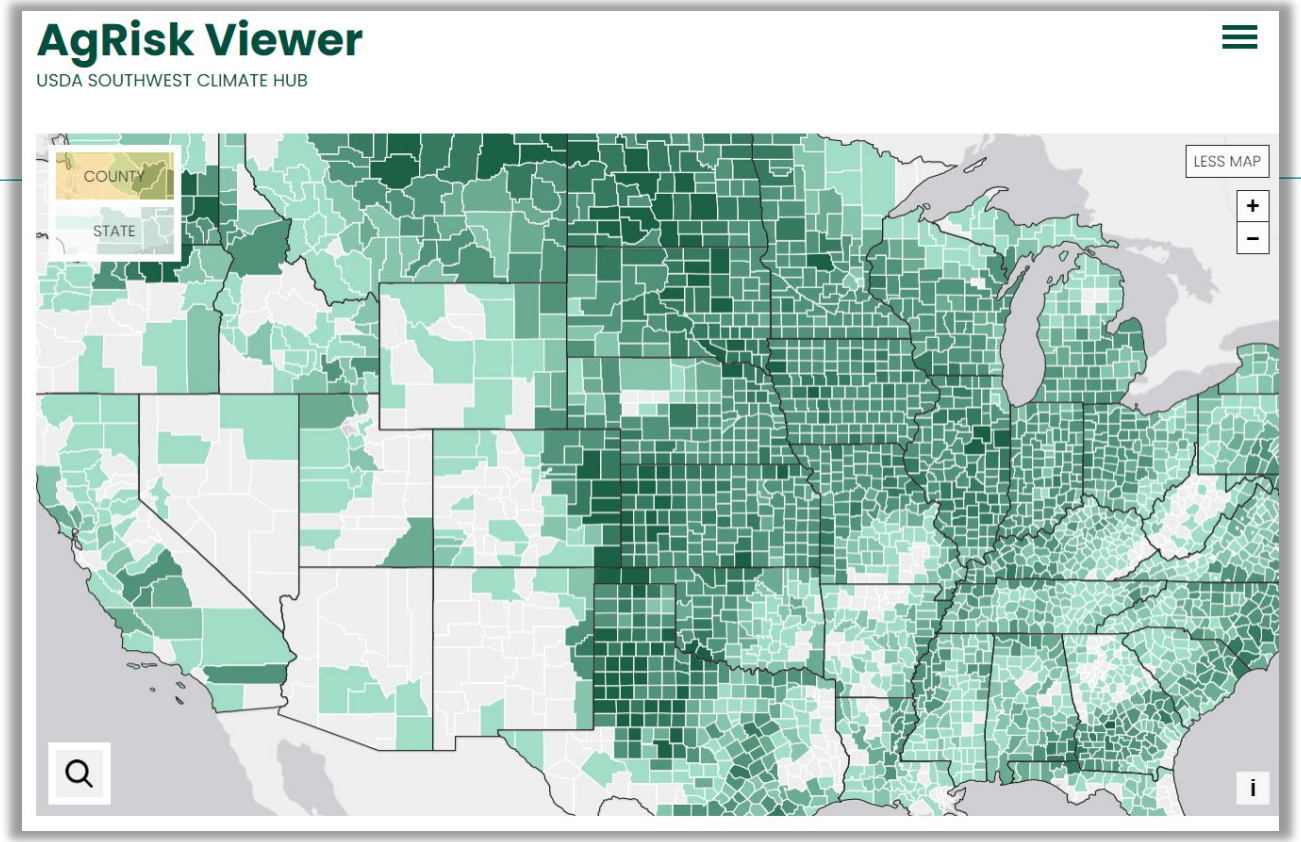
Bushes Bunches Produce Stand, AK Case Study

J Alvin Lee Farm, LLC, Arkansas Case Study

https://www.climatehubs.usda.gov/hubs/topic/adaptation-resources-agriculture-case-studies-using-adaptation-workbook

AgRisk Viewer

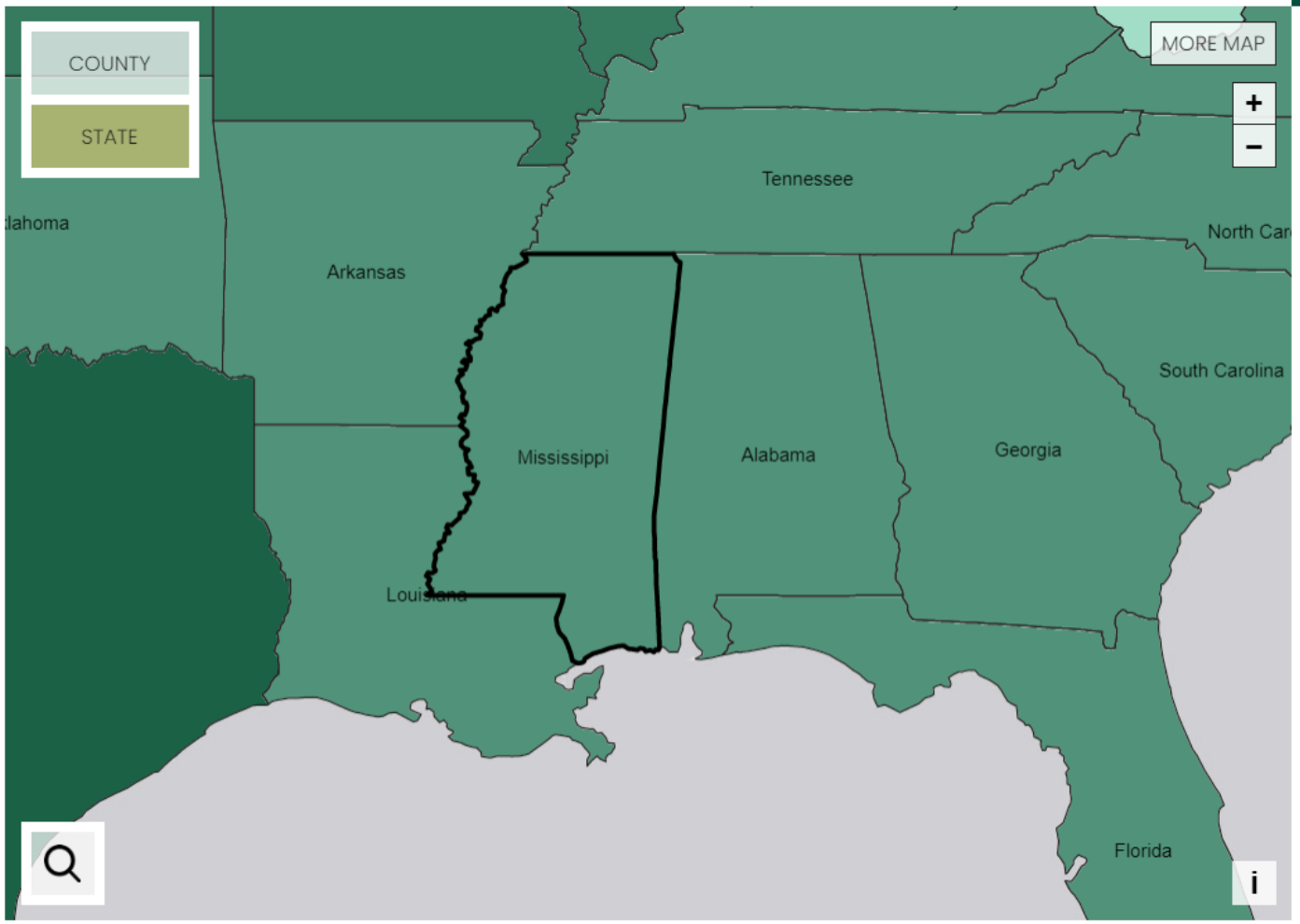
- Publicly-available cause of loss data from the USDA Risk Management Agency in a map-based viewer
- Metrics: Payment indemnity ($), acreage, count, liability ($), subsidy ($)
- Dates: 1989 – 2021
- Commodity
- Cause of Loss
- County or state footprint



https://swclimatehub.info/rma/rma-data-viewer.html

AgRisk Viewer

USDA SOUTHWEST CLIMATE HUB



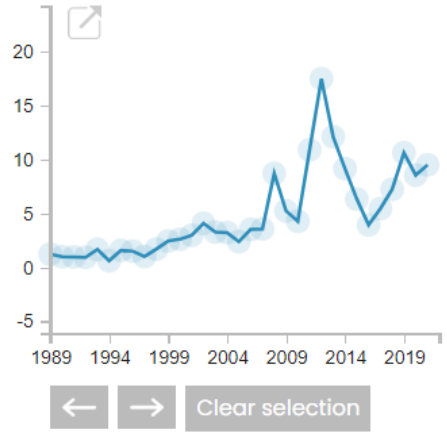
Now Viewing
Risk Management Agency Payments

Mississippi: 2,190,160,009

Click on line chart points or bar chart bars or labels to narrow data

Payment indemnity by commodity

Annual totals, all commodities
(x 1,000,000,000)



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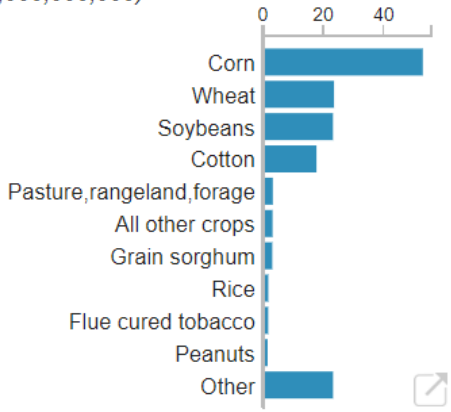
1989–2021 totals by commodity
(x 1,000,000,000)



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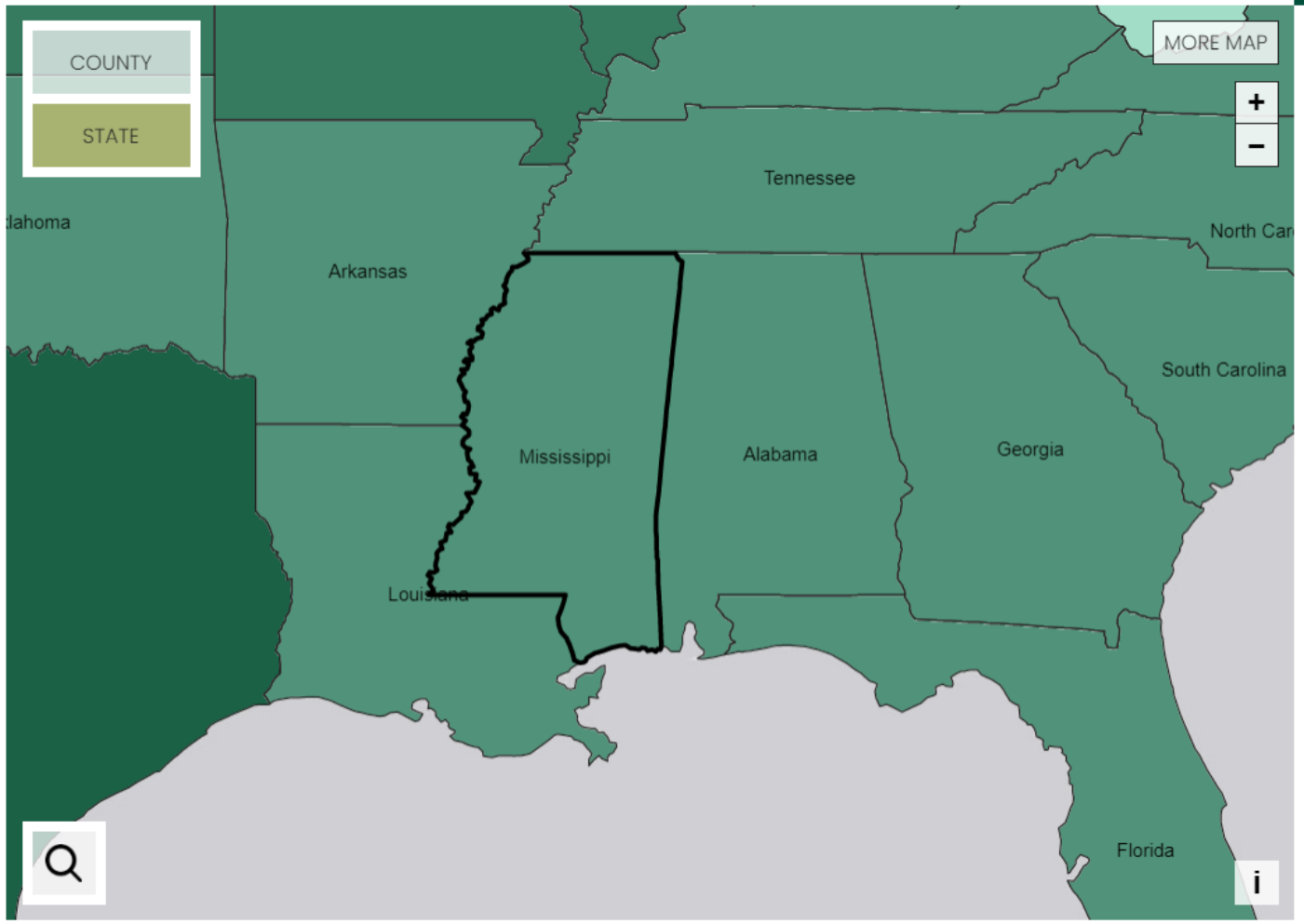
AgRisk Viewer

USDA SOUTHWEST CLIMATE HUB



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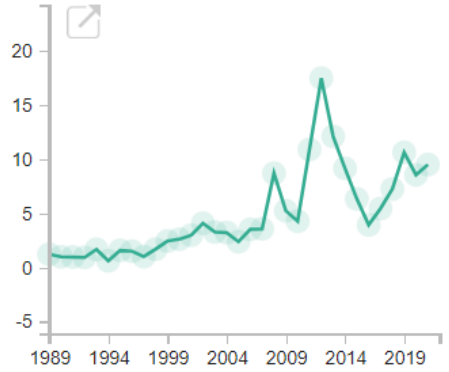
Risk Management Agency Payments

Payment indemnity by cause of loss

Annual totals, all causes of loss
(x 1,000,000,000)



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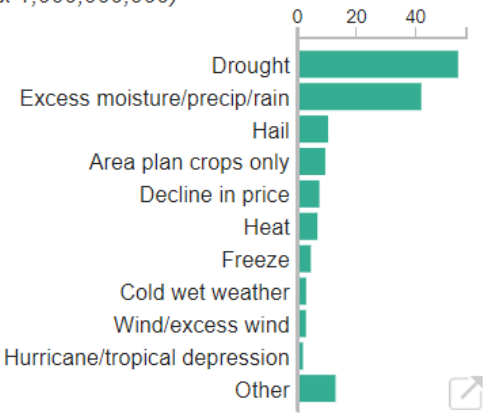

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AgRisk Viewer

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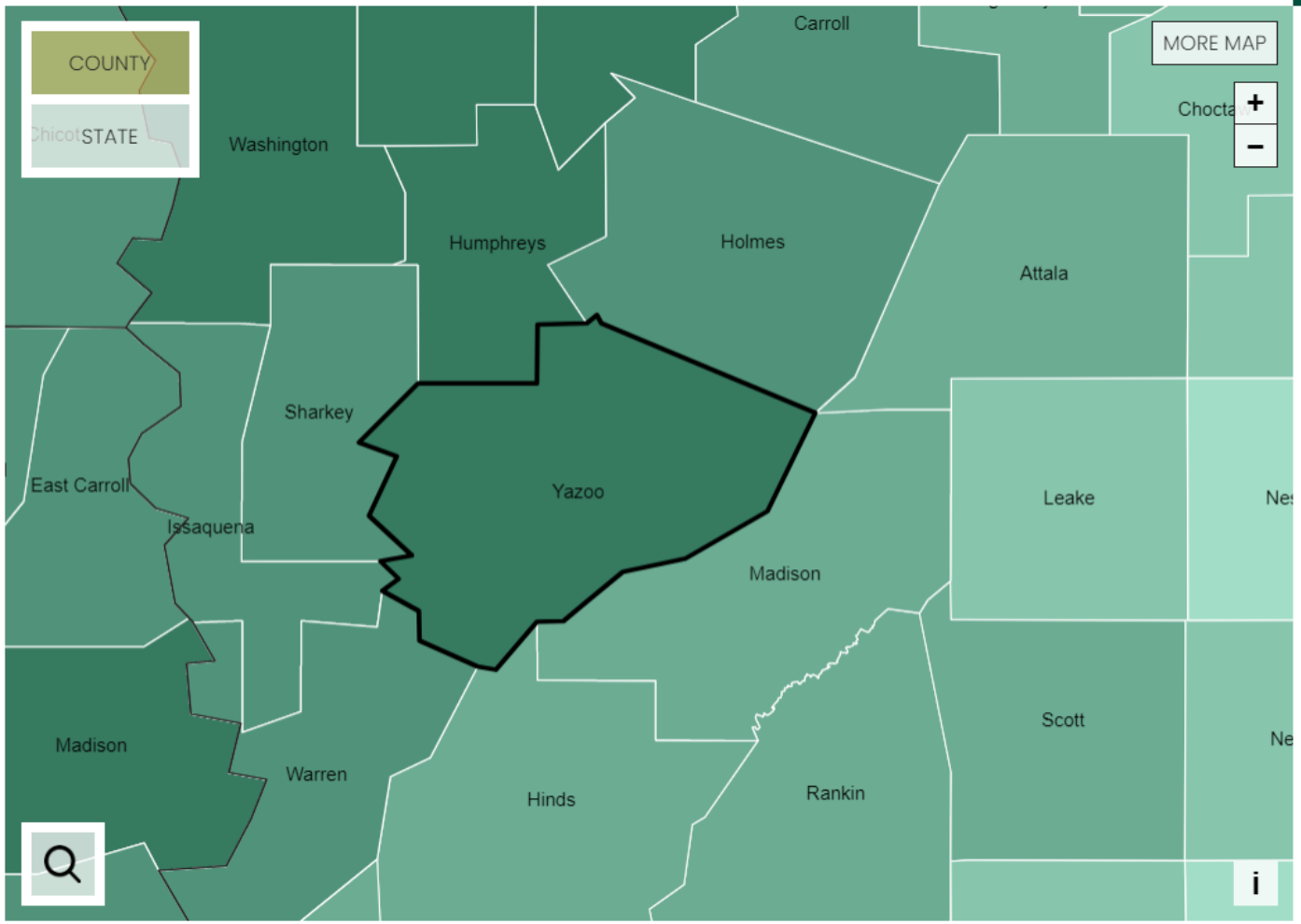


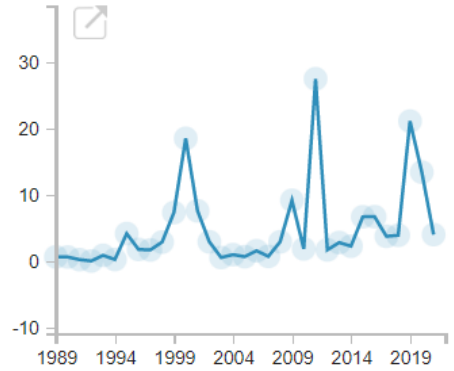
Now Viewing
Risk Management Agency Payments

Yazoo County, MS: 161,627,957

Click on line chart points or bar chart bars or labels to narrow data

Payment indemnity by commodity

Annual totals, all commodities
(x 1,000,000)



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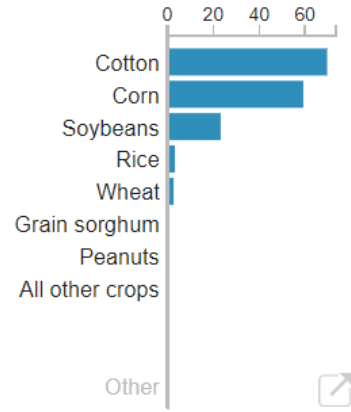
1989–2021 totals by commodity
(x 1,000,000)



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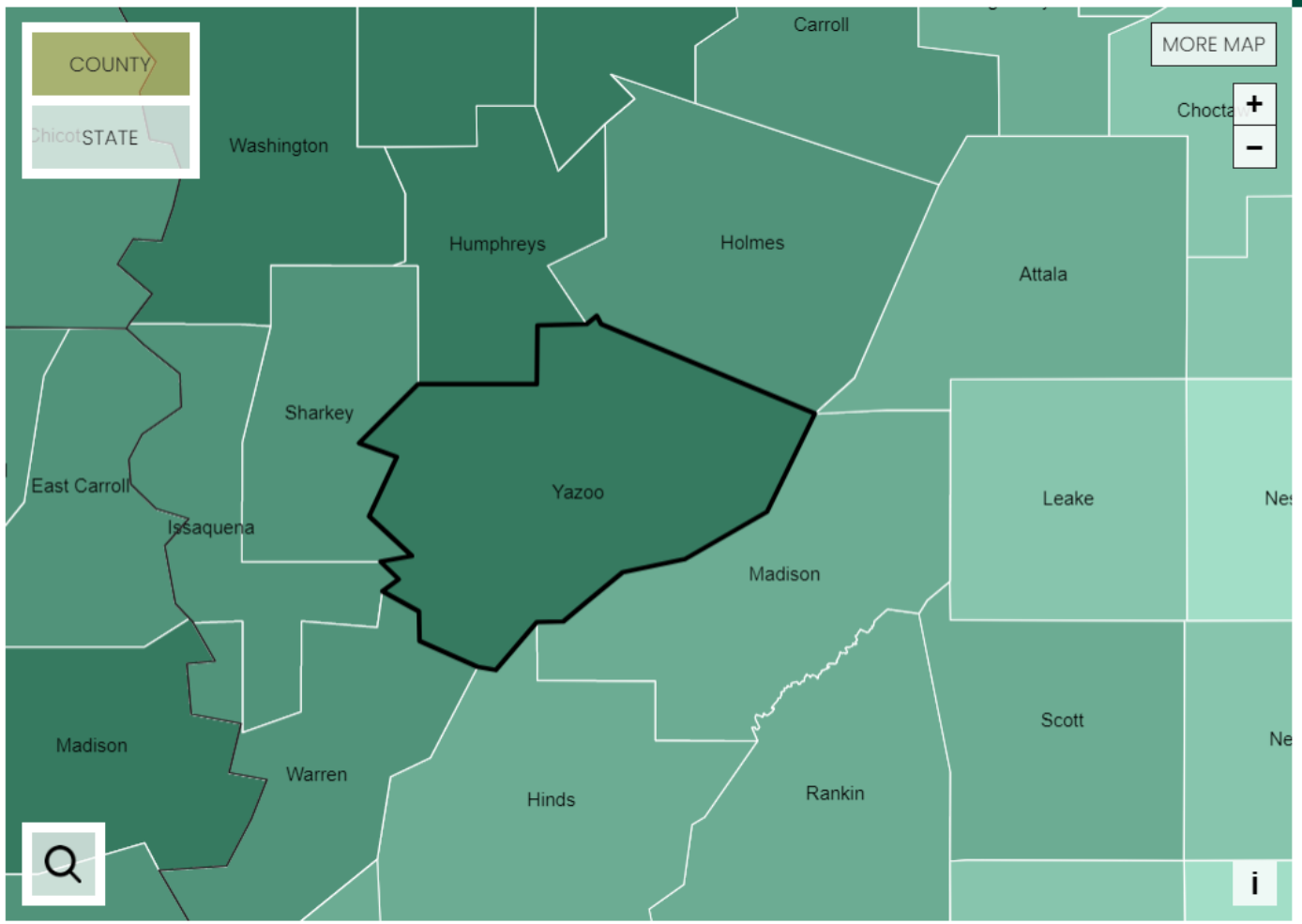
AgRisk Viewer

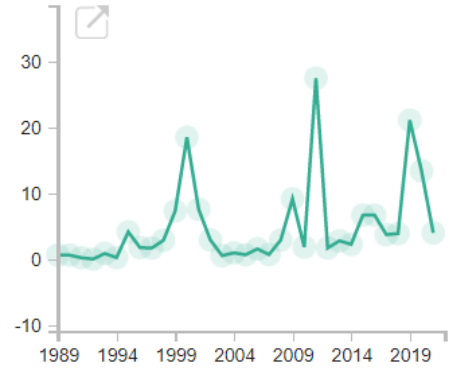
USDA SOUTHWEST CLIMATE HUB



Now Viewing
Risk Management Agency Payments

Payment indemnity by cause of loss

Annual totals, all causes of loss
(x 1,000,000)



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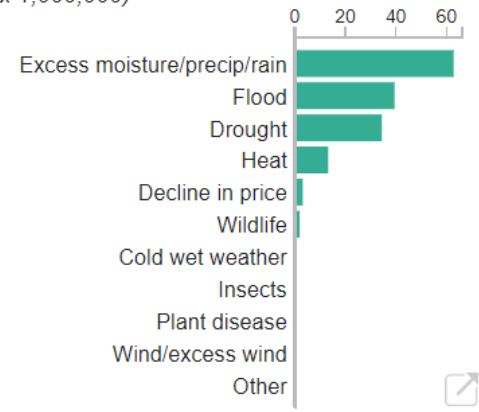

Clear selection

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