



Southeast  
Climate Consortium

UNIVERSITY  
OF MIAMI  
ROSENSTIEL  
SCHOOL of MARINE &  
ATMOSPHERIC SCIENCE



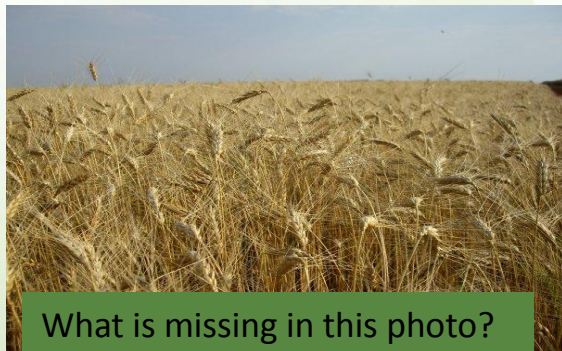
UF UNIVERSITY of  
FLORIDA  
IFAS

# Co-development of a decision support system for risk reduction in agriculture

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Florida



What is missing in this photo?

*Climate Change, Agricultural Production, and  
Water Resources – Frederick, MD June 23, 2010*

# People: Human Dimensions





# Outline

- Who we are
- Objectives
- Decision Support tools: Co-development
- Next Steps



# The Southeast Climate Consortium

- A Regional Integrated Science and Assessment Center
- Five States and their State Climatologists
- Miami, UF, FSU, UGA, Auburn, NCSU, Clemson, UAH
- 50+ scientists
- Funding: NOAA, USDA-RMA, NIFA, NASA, NSF, and other
- Partners: Cooperative Extension Services, NGOs (underserved farmers, organics), growers associations



# The Southeast Climate Consortium: goal

To develop a climate-risk decision support system for the Southeastern USA that will contribute to an improved quality of life, increased profitability, decreased economic risks, and more ecologically sustainable management of agriculture, forestry, and water resources.



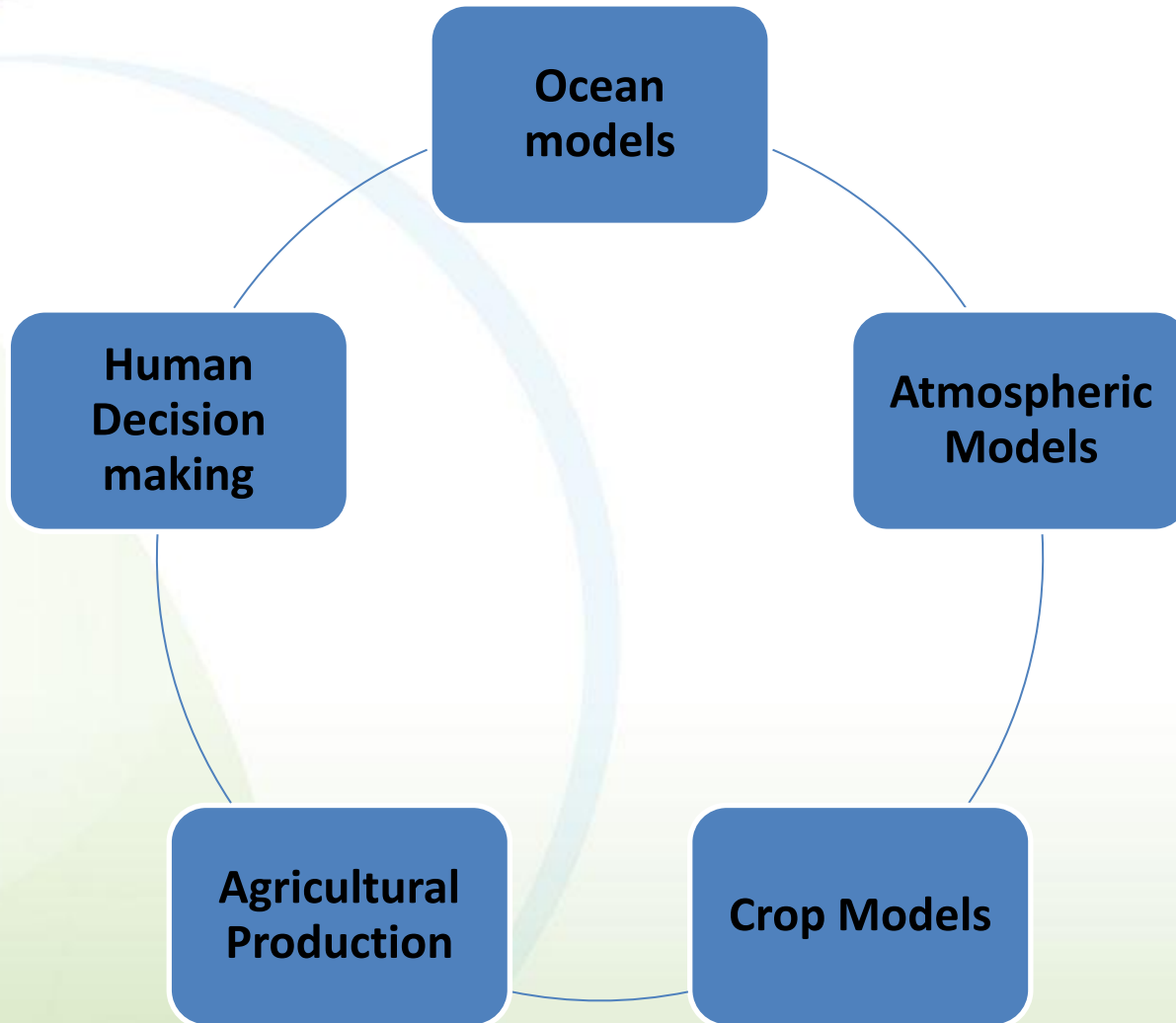
## The DSS “Enigma”\*

Problem with DSSs:

- non adoption
- short-term use
- deterministic nature
- exaggerated expectations
- lack of user friendliness

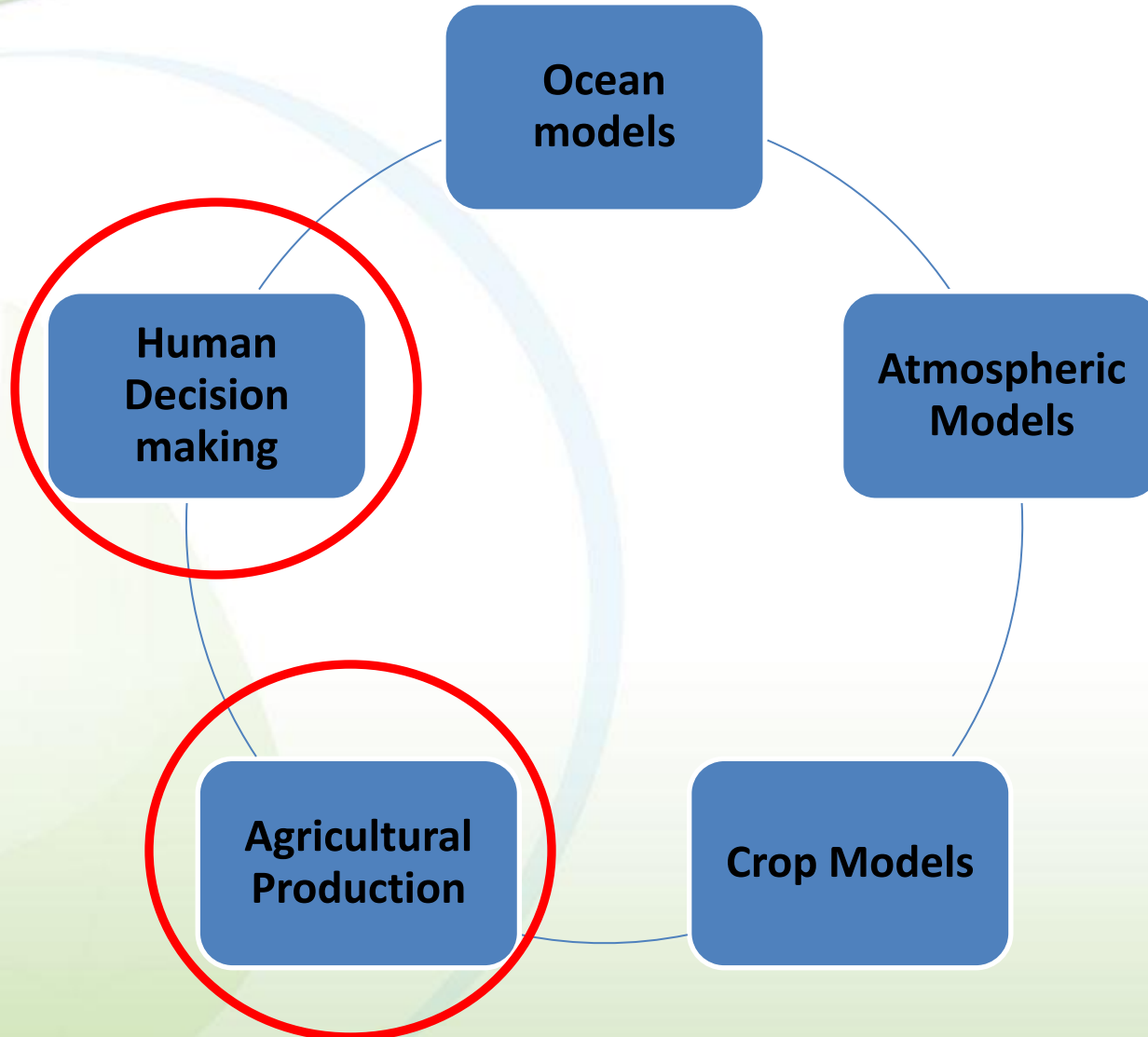


# Sources of Uncertainty



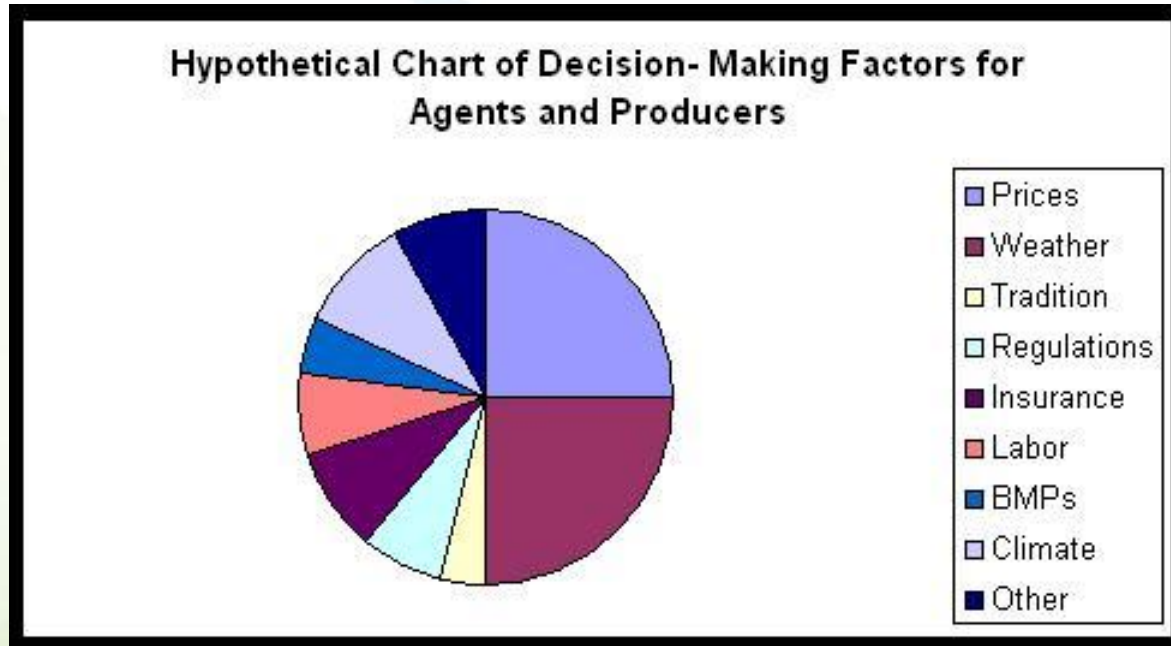


# Human Dimensions Research focuses on the human sources of Uncertainty





## Information Processing Theory: The conscious mind can only deal with a limited number of problems at one time





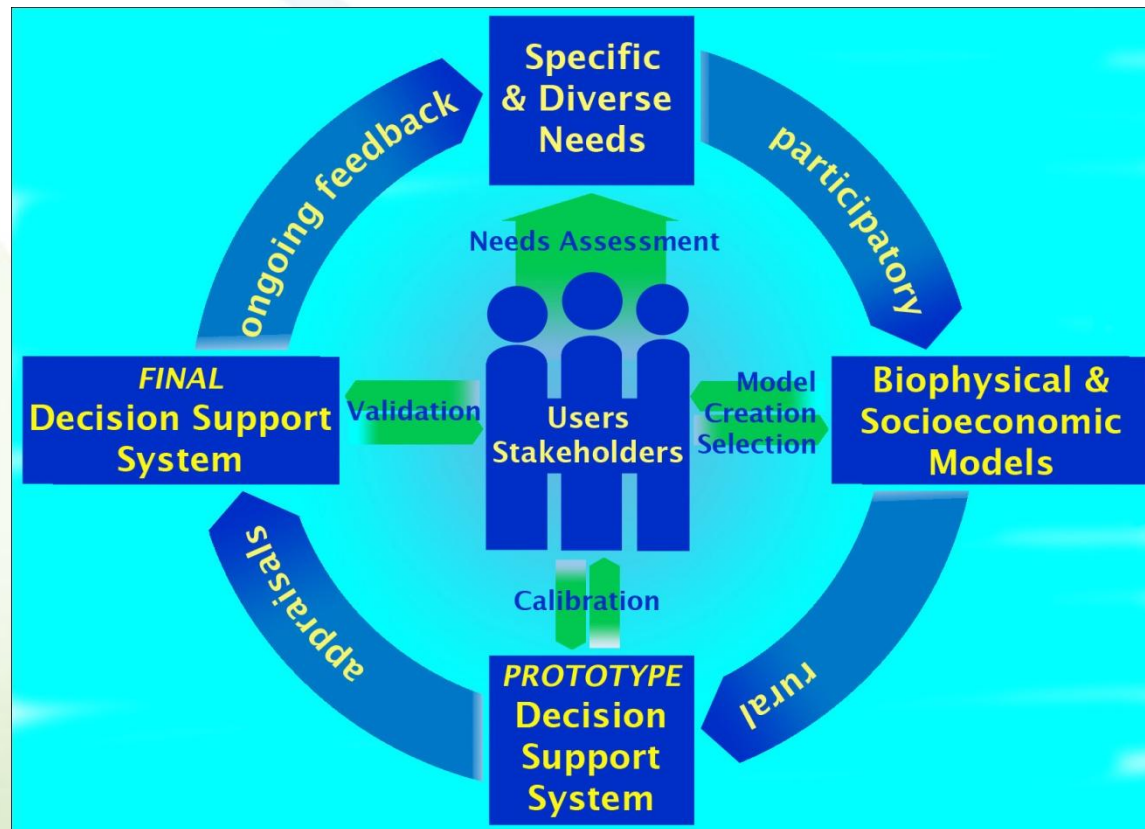
## Co-development with boundary organizations and end users reduces uncertainty

- Needs assessment
- Cultural milieu: values and belief system
- Feedback and input on prototypes: participatory modeling
- Trial and error) of prototypes
- Training

### METHODS

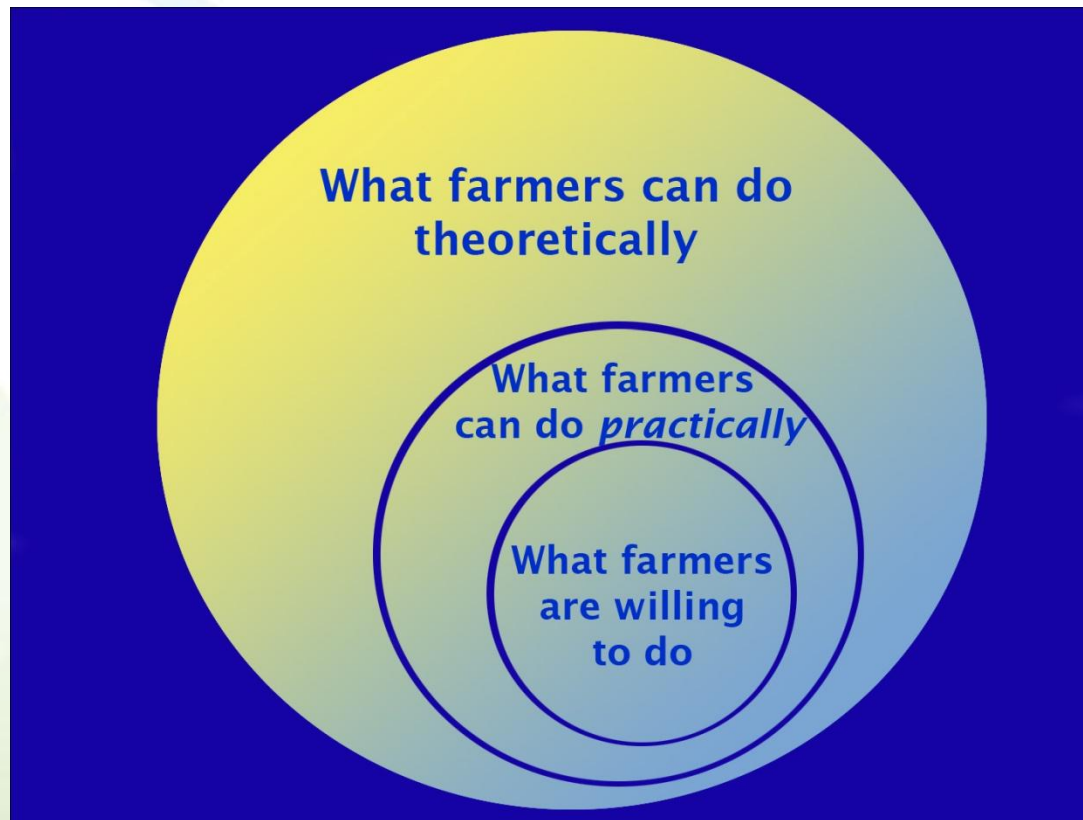
- Surveys and interviews
- Focus groups
- Workshops
- Participation, process, participation

# The Participatory Co-development Process





# We need to understand





Pre-season, strategic decision-making processes can be improved by considering seasonal forecasting: “Tweaking the system”





## Different tools for different decisions

- Pre-season decisions (Yield Risk)
- Pre and In-season (Chill Hours)
- Daily (Strawberry Disease)



# ARID: Agricultural Reference Index for Drought

## Drought Index Tool

[Back to Tools](#)

Select the station/county:

SEBRING/HIGHLANDS

Draw the limits of County

News: 2009-07-15 22:26:59

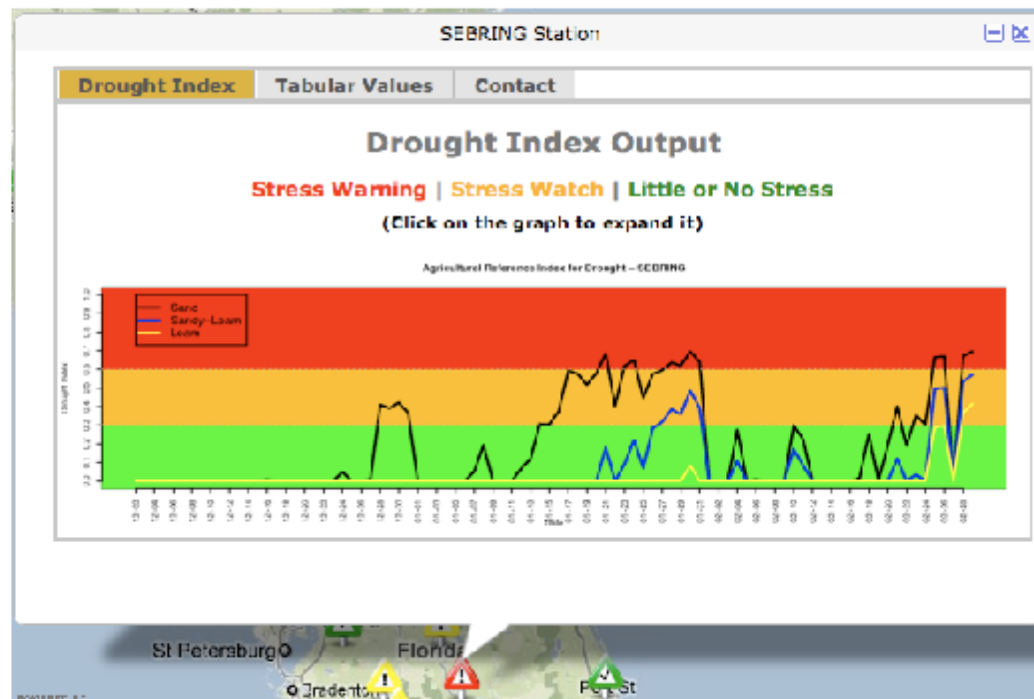
### ARID - Agricultural Reference Index for Drought

Drought is the shortage of water with respect to a specified need. An agricultural drought occurs when the amount of water in the root zone is not sufficient to meet the need of a crop at a particular time. Generally, agricultural drought indices are developed to monitor crop water stress. However, ARID has been designed not merely to quantify crop water stress at a particular time or period but to estimate yield loss due to drought, in which farmers are ultimately interested...

[more details](#)

Can't you see the map?

Use Firefox Browser



# ARID: Agricultural Reference Index for Drought

Drought Stage	Characteristics	Tactical decision
Early	<ul style="list-style-type: none"> <li>Daily evapotranspiration has exceeded precipitation for several days</li> <li>Forage growth has begun to slow</li> <li>Blades of grass curl during the mid-day heat and the swards begin to have more of a blue-gray tint rather than the bright green color of non-stressed stands</li> </ul>	<ul style="list-style-type: none"> <li>Lower the stocking rate on each pasture</li> <li>Investigate the prices of supplemental feedstocks</li> <li>Maintain cows in a body condition score of at least five</li> </ul>
Advanced	<ul style="list-style-type: none"> <li>Daily evapotranspiration has exceeded precipitation for several days</li> <li>Blades of grass remain curled throughout the day and the blue-gray tint of the sward is peppered with tan-colored leaf tips and new growth that has withered at the soil surface</li> </ul>	<ul style="list-style-type: none"> <li>Maintain a stubble height of 2' of bermudagrass, 1½' of bahiagrass, and 2½-3' of tall fescue</li> <li>Limit the grazing pressure on current pasture supplies by allowing animals to access hay or creep rations containing soybean hulls, corn gluten, cottonseed, or other such supplements</li> </ul>
Severe or extreme	<ul style="list-style-type: none"> <li>Daily evapotranspiration has exceeded precipitation for several weeks</li> <li>Forage growth has stopped and most, if not all, grazed pastures are down to the minimal stubble height.</li> <li>Remaining blades of grass stay tightly curled throughout the day and are almost completely tan-colored and withered</li> </ul>	<ul style="list-style-type: none"> <li>Continue to confine sacrifice animals in paddocks and limit the access of grazing animals to current pasture supplies (if any) by allowing them to graze for brief periods during the morning or evening</li> <li>If the leaves and/or stems of warm-season grasses in the Sorghum family (sorghum, sudangrass, sorghum x sudan hybrids, and johnsongrass) are wilted and tan-colored, avoid feeding this forage as it may contain toxic levels of prussic acid.</li> </ul>



# Next Steps

1. Open Source DSS
2. Climate Risk tools embedded in temporally and spatially downscaled climate change scenarios
  - 5 – 15 – 30 years (coupled models)
  - Southeast United States
  - Emphasis on thresholds and triggers for adaptive management

# Open-source AgroClimate

## open.agroclimate.org

HOME | DOCS | FORUMS | CONTACT | DOWNLOADS | Wiki



**Open-AgroClimate**  
An Open-Source Initiative for AgroClimate.org

20 Posts 0 Comments



### Open-AC

- Home
- Docs
- Creating a plugin
- Forums
- Contact
- Wiki

### Communication

- Google groups

### Posts

- Brochures (1)
- FAQ (3)
- First Workshop (5)
- Second Workshop (2)

March 2010

M	T	W	T	F	S	S
1	2	3	4	5	6	7
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« Jan

## Home

Welcome to *Open-AgroClimate*. This is an Open-Source initiative for AgroClimate.org, a climate information and decision support system for managing agricultural and natural resources in the Southeast USA.

The main objective of *Open-AgroClimate* is to help ensure that AgroClimate continues to evolve to address a wide range of climate-based crop risk management issues after the original implementation project ends. It will also ensure that that codes are fully documented and follows the best programming standards and database design, facilitating its transfer to other states, countries, and organizations with a minimum effort and at a reduced cost.

**Open-AgroClimate Brochure:** [click here to download it.](#)

## 2nd Open-AgroClimate Workshop

[Click here for more information.](#)



### Recent Posts

- Location: 2nd Open-AgroClimate Workshop
- Lodging: 2nd Open-AgroClimate Workshop
- Agenda: 2nd Open-AgroClimate Workshop

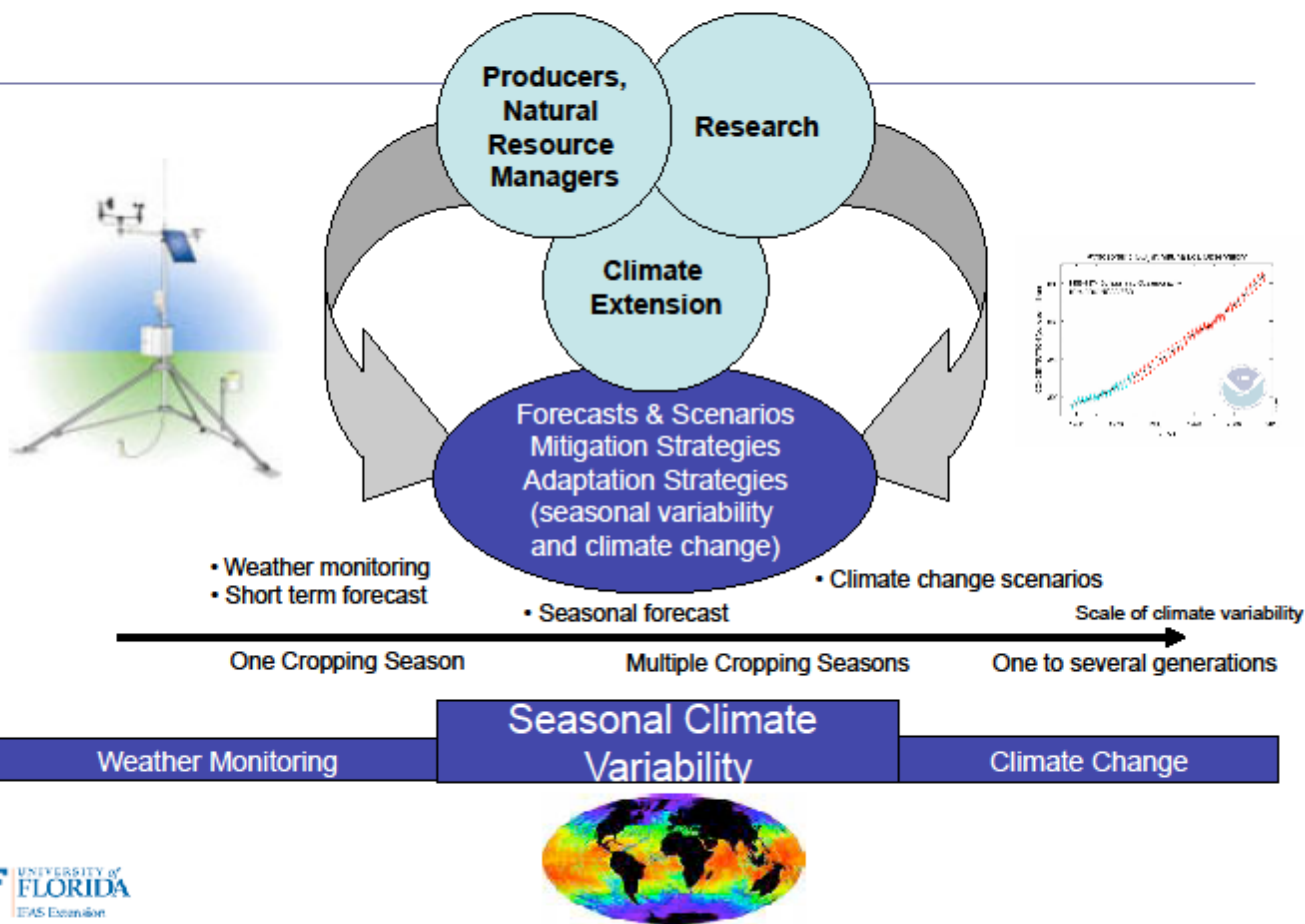
### Climate & Weather Links

- AgroClimate.org
- Florida Automated Weather Network
- Google: Automated Environmental Monitoring Network
- National Climate Data Center
- NOAA Climate Prediction Center

### Southeast Climate Consortium

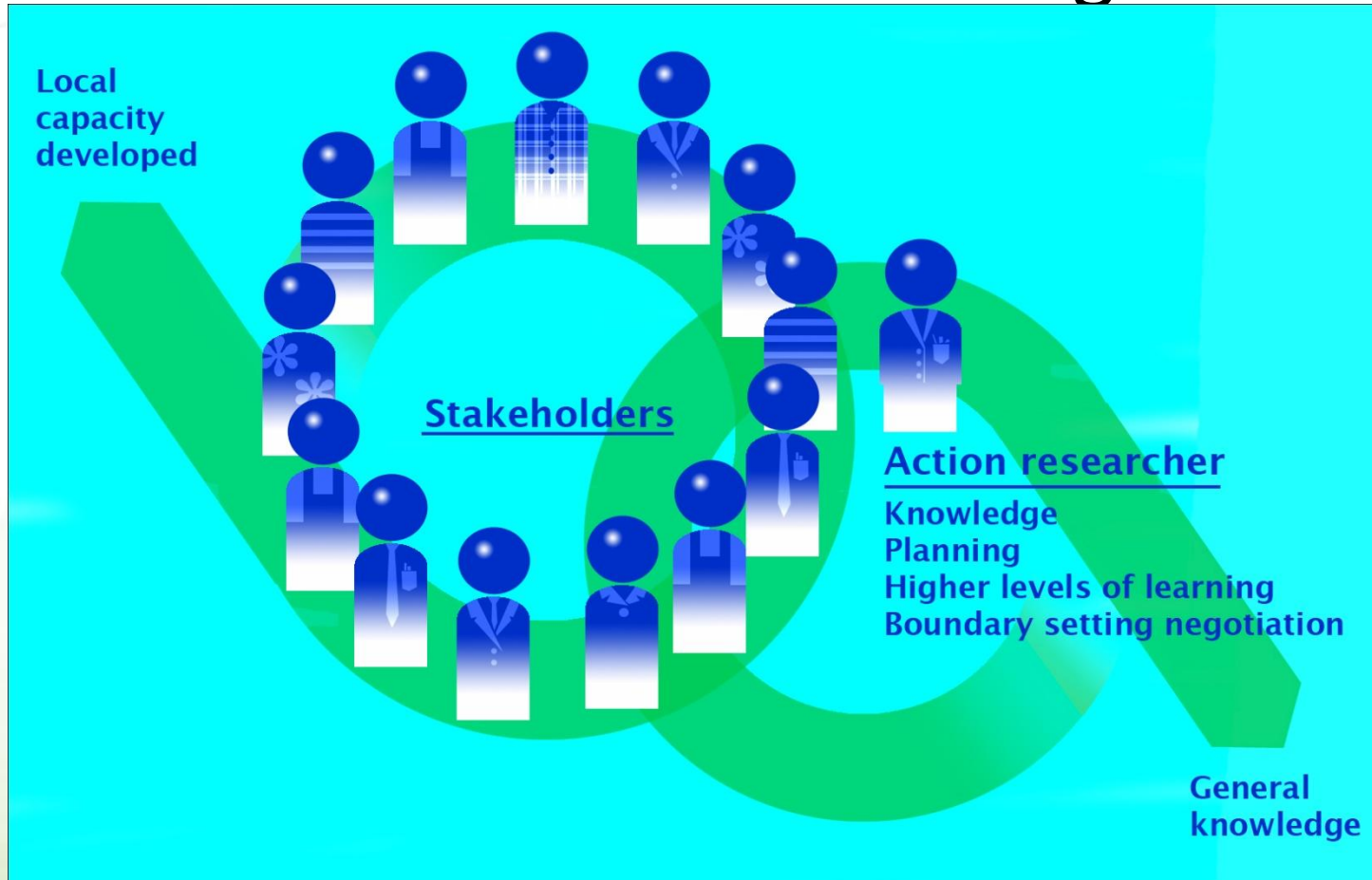
- Auburn University
- Florida State University
- North Carolina State University
- Southeast Climate

# Agricultural Climate Extension Program





# Framework for Social Learning Process





## Glimpses of Success

- Strawberry: saving fungicide
- Agricultural Water Enhancement Program
- Blueberries: saving growth regulator
- Winter Forage
- Peanut: selecting variety more tolerant to drought
- Corn: when to plant Bt varieties
- Pasture, Rangeland and Forage Pilot Insurance Program
- Forest Fire planning



# Questions?

Thank you

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