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The International Research Institute for Climate and Society

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Development and Adaptation to Climate Change (DACC) in the Agricultural Sector of Uruguay:

The National Agricultural Information System (SNIA)

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Motivation for Establishing the SNIA in Uruguay

1. Need a new approach for Adaptation to Climate Change

Planning, Decision Making, Policy Making

Adaptation to What?
What Can We Expect?

What Mitigation options are likely to succeed?
(REDD+, NAMAs, CDM)

Information on Future Climate

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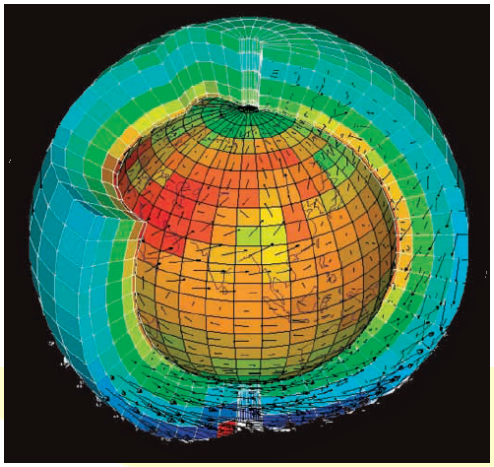
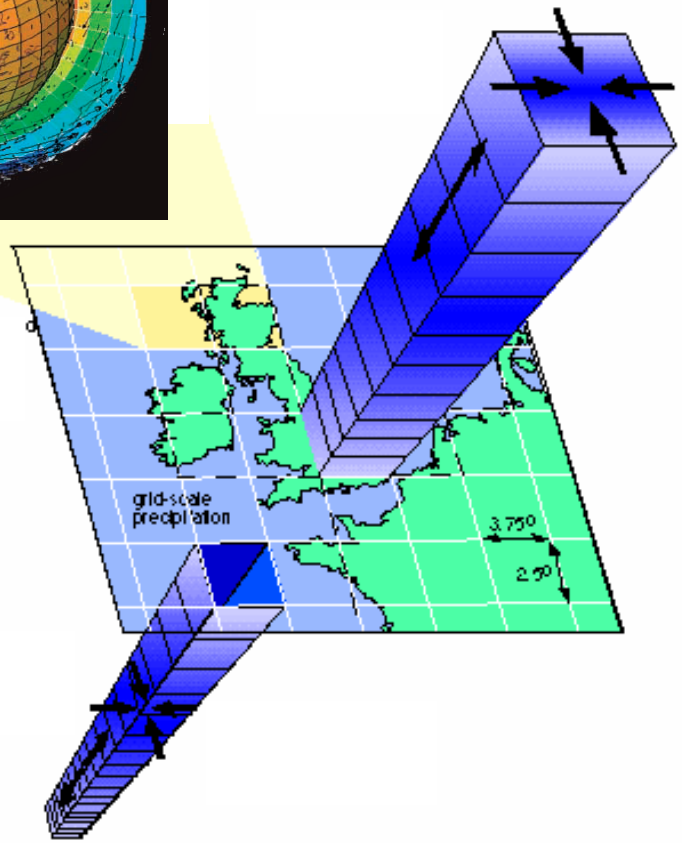
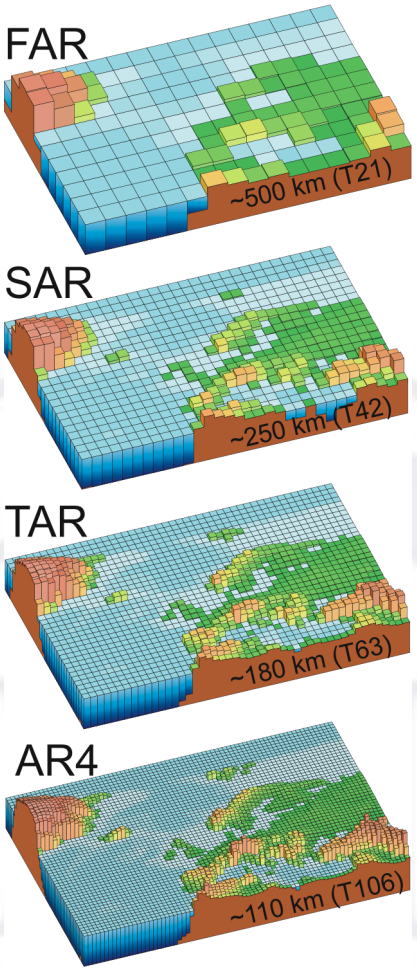
Future Climate Scenarios: Using Climate Models (GCMs)

Complex models that simulate physical processes in the atmosphere, oceans and land





Models are getting better



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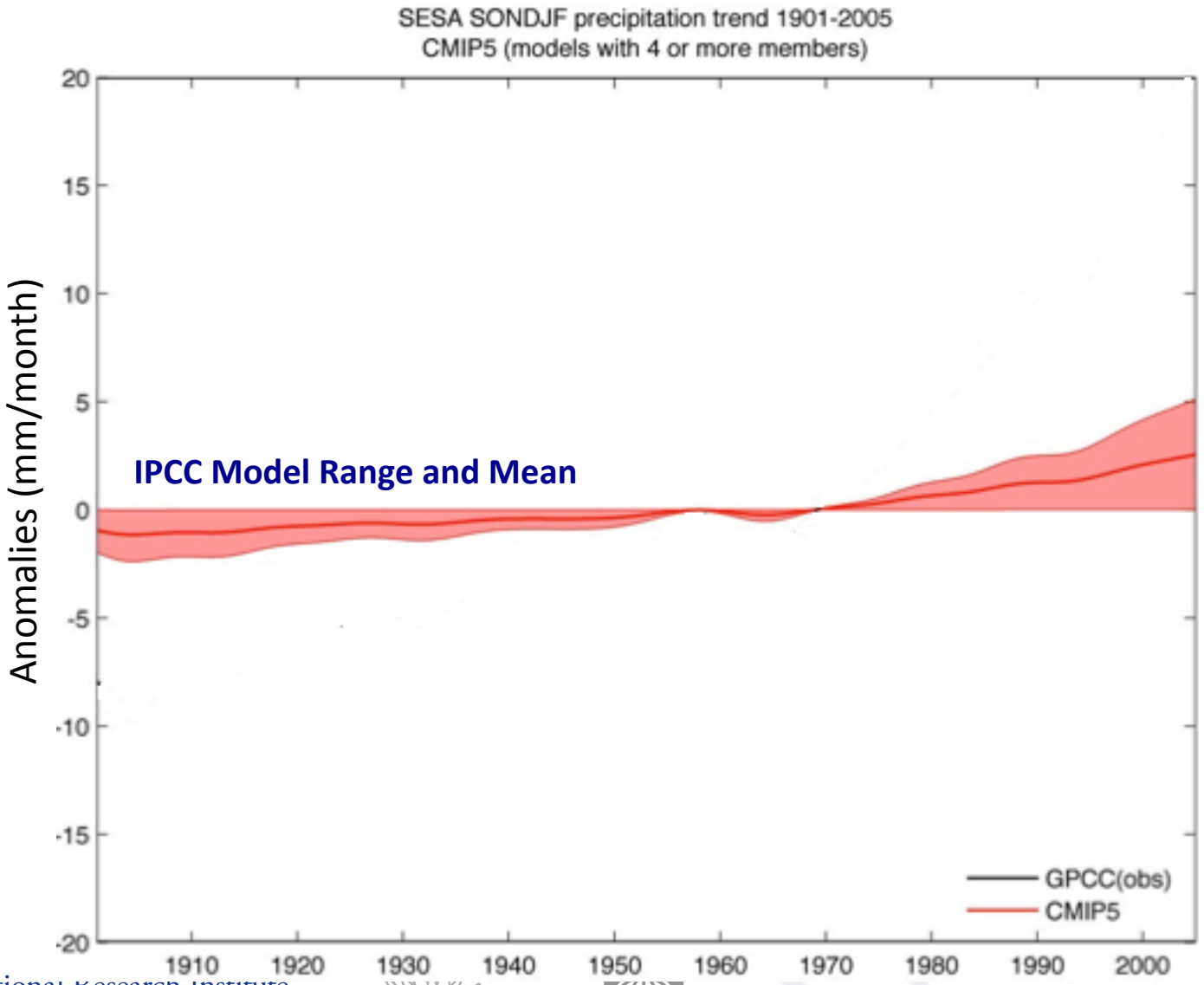
Climate Models: Simulating Past Observed Climate
Example: SE South America SONDJF



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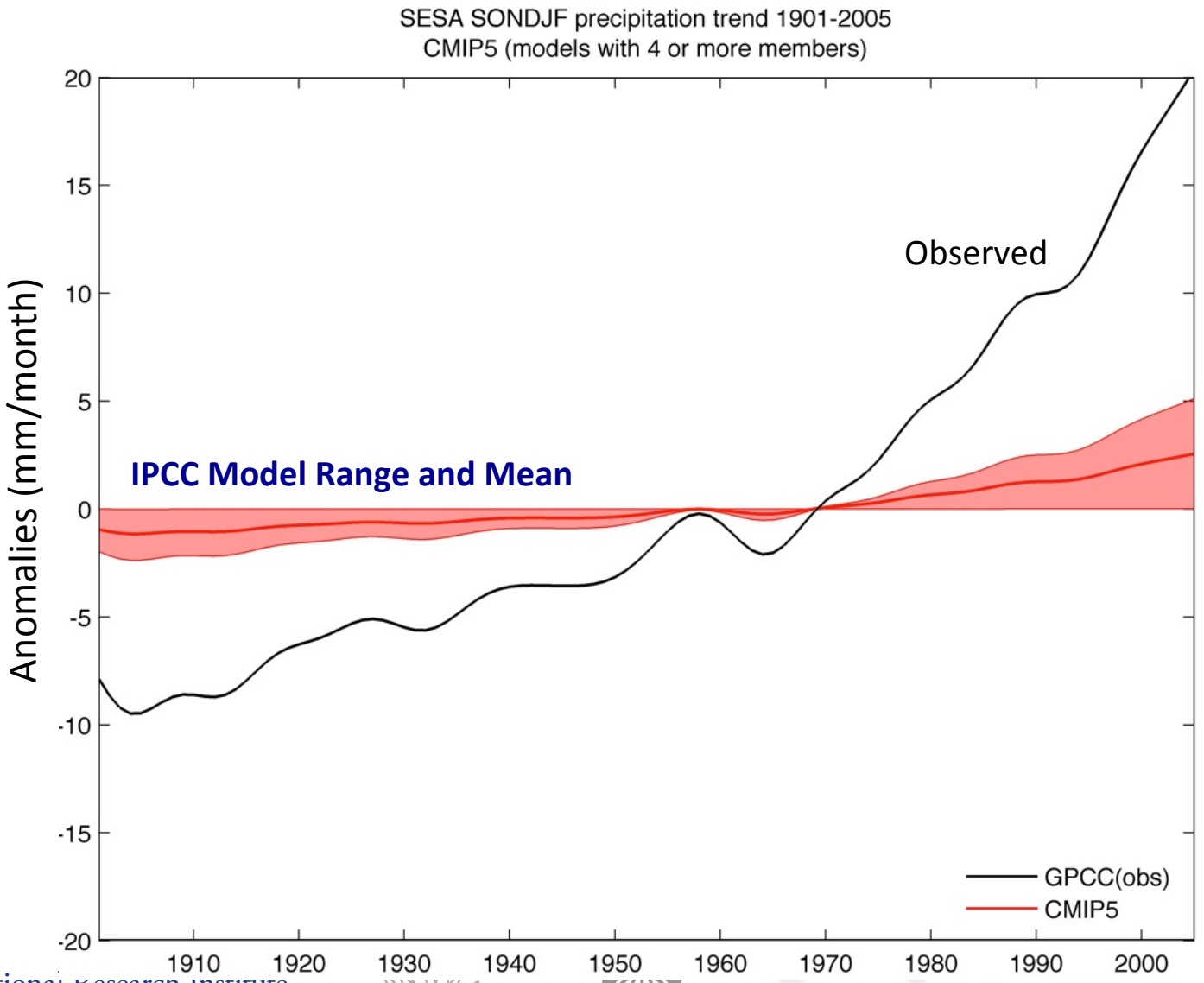


Future Climate Scenarios: Using Climate Models (GCMs)

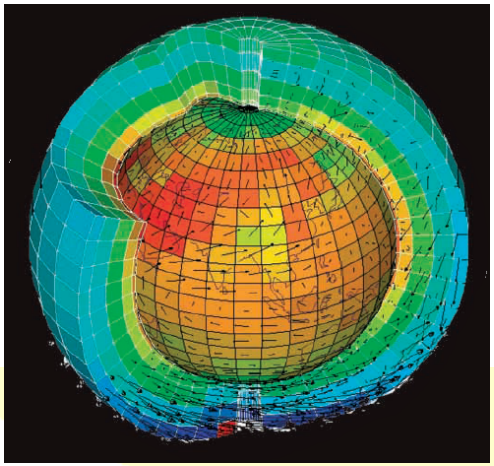
1. **Great advances in science, but still lots to understand: Uncertainties due to Models**

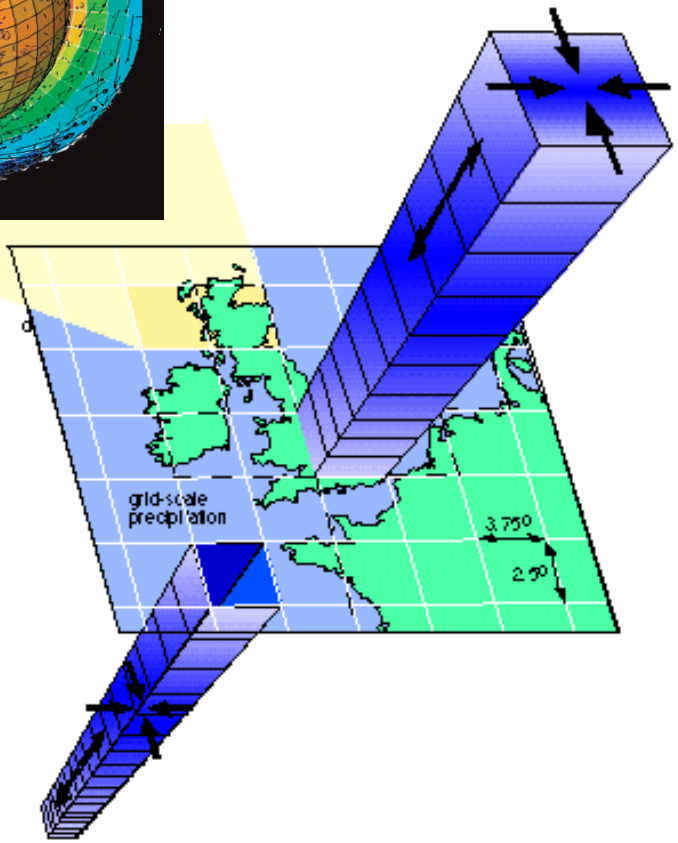
2. **Key Input: GHG Emissions**

Assumptions:
(e.g., in 2080-2100)

Technologies?
Energy Sources?
Deforestation rates?
Population?

Uncertainties
(IPCC Scenarios)





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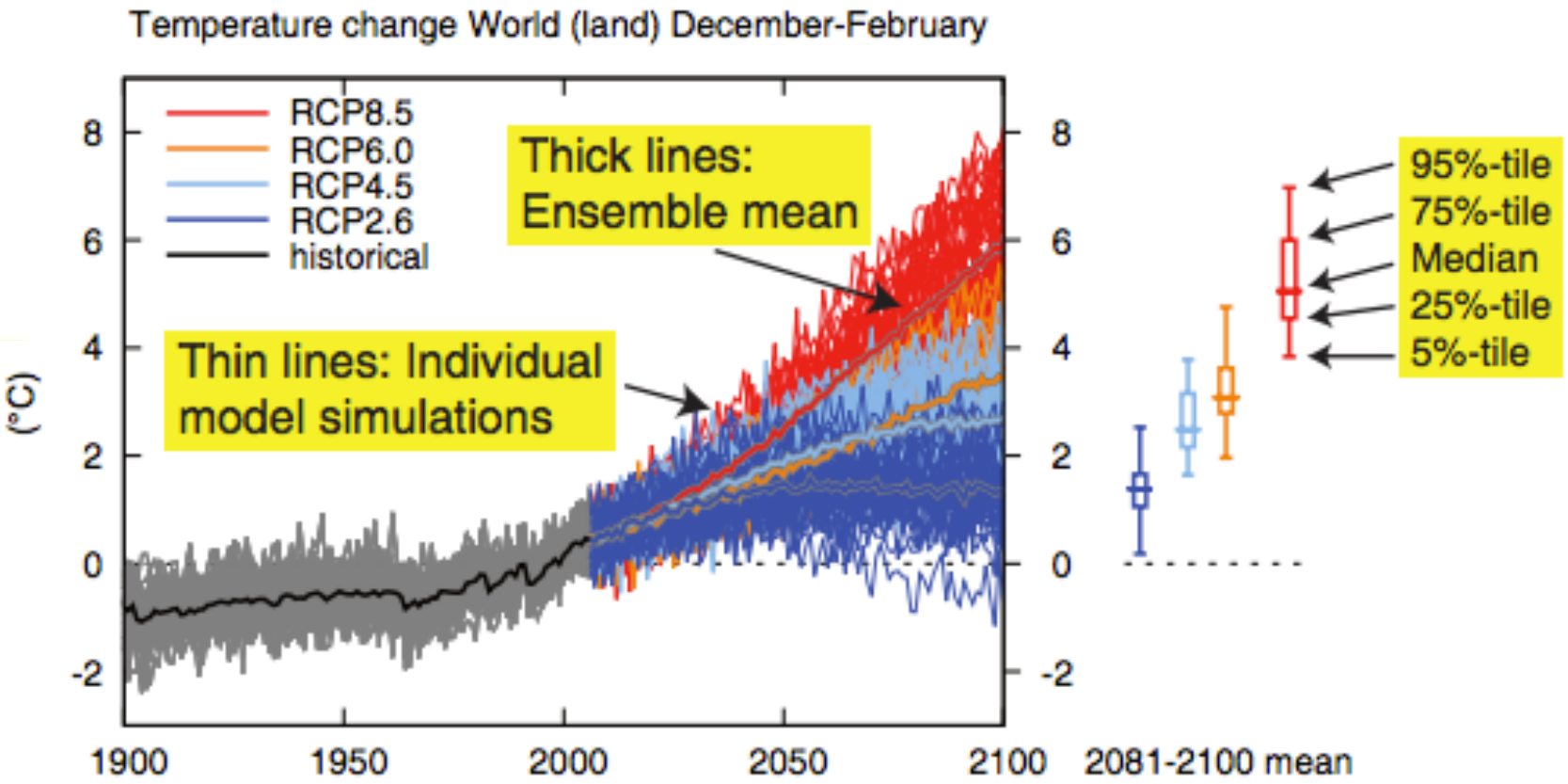
Establish Ranges of Socioeconomic Scenarios and Connect with Climate Models:

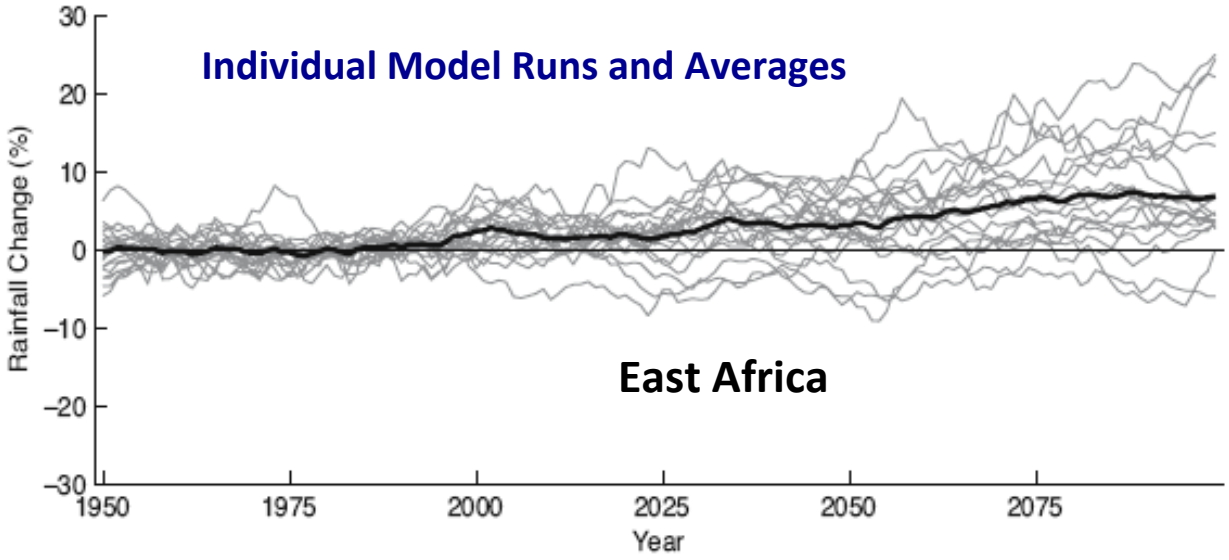
IPCC Scenarios

(Global, The Whole World)



For Precipitation Uncertainties are Much Larger

Example in East Africa: 90% of the Climate Models agree it will become wetter



+25%

-10%

All scenarios have equal chances

This is for large "Windows"
At Local level Uncertainties are much larger

Giannini et al., 2007

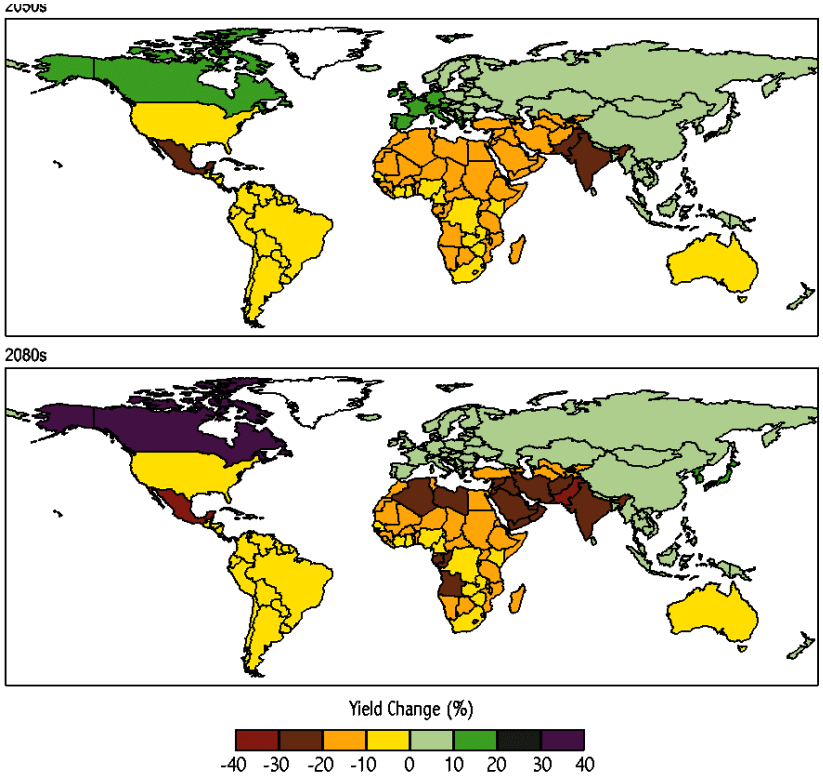
Conclusion: Climate Change Scenarios are Uncertain
IPCC's objective was not to create scenarios for impact assessment

However: Published articles with Crop Yield Projections

Percent change in Crop Yields for one climate change scenario

2050

2080



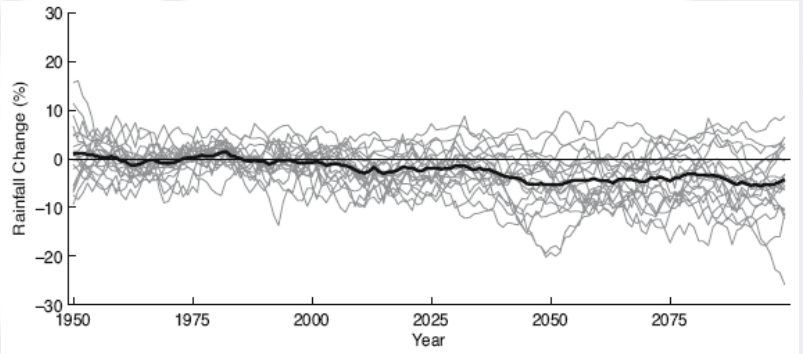
This is Wrong!

EXTRA PROBLEM:

This is easily understood

Can be "erroneously" believed

Maladaptation / "Malmitigation"



Uncertainty?

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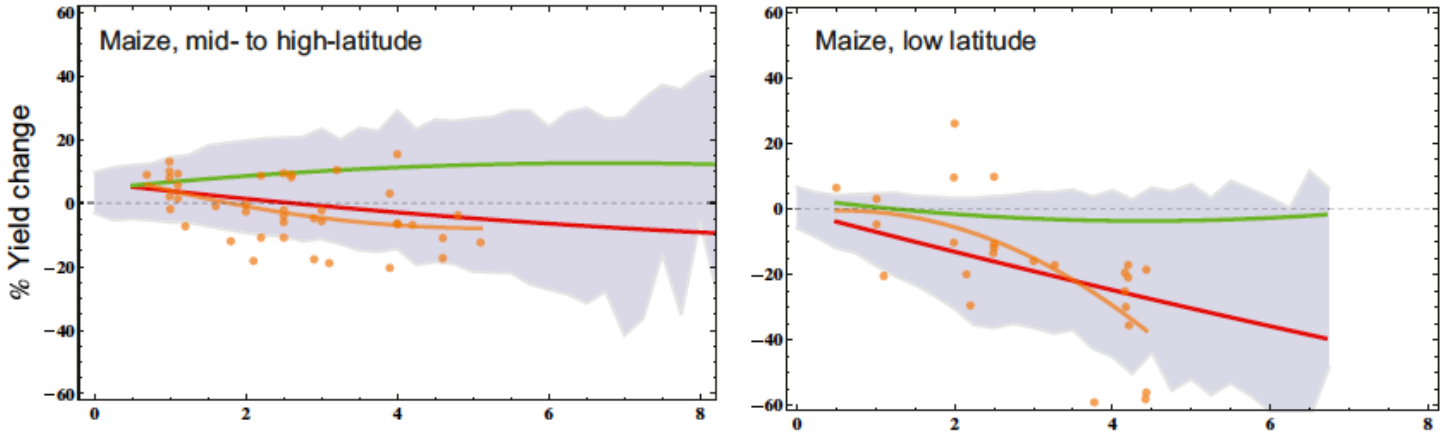
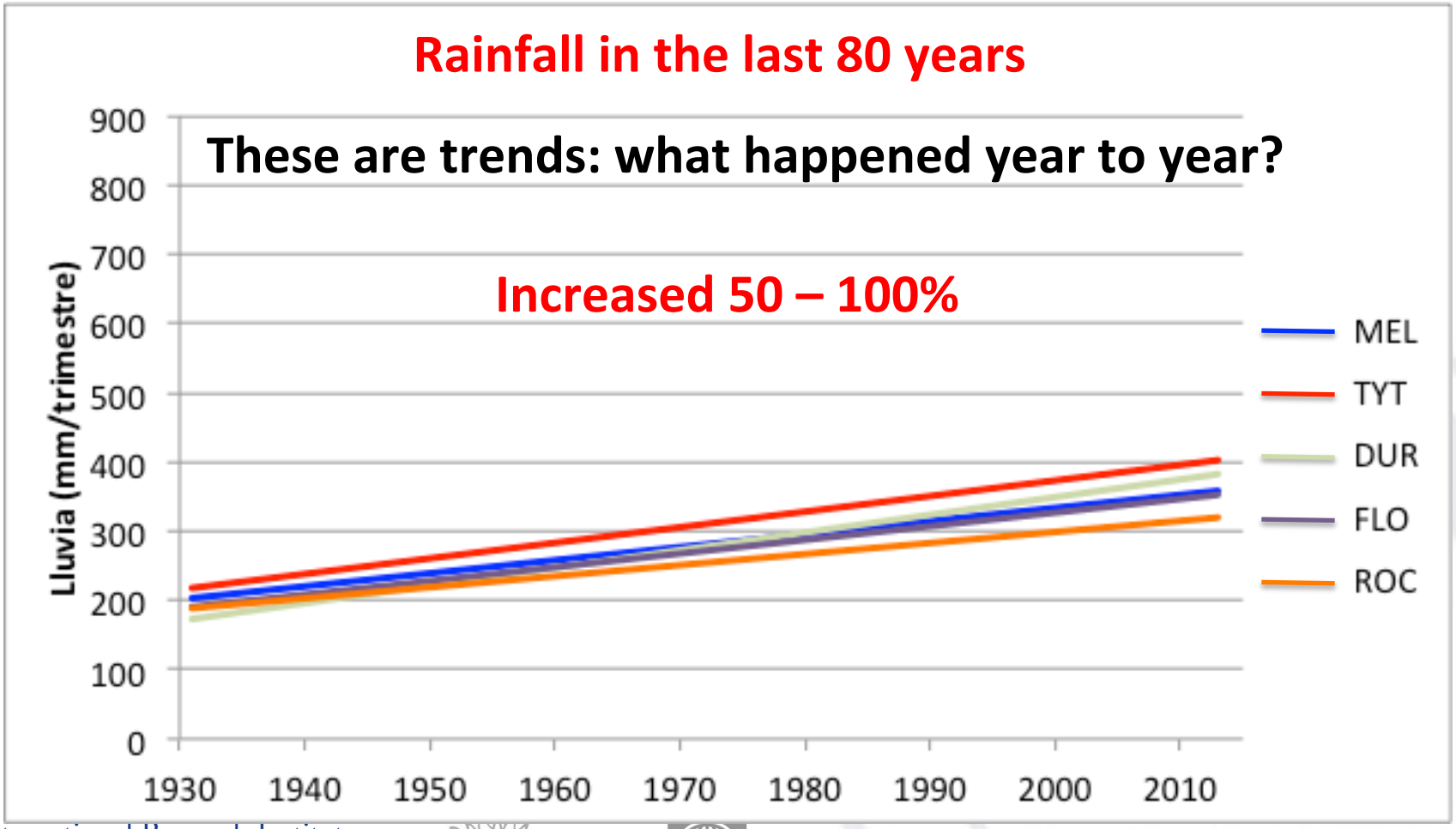
A More Resonable Approach: AGMIP 2013



Establish a range of plausible Climate Scenarios: Identify interventions with highest chance of success given that range

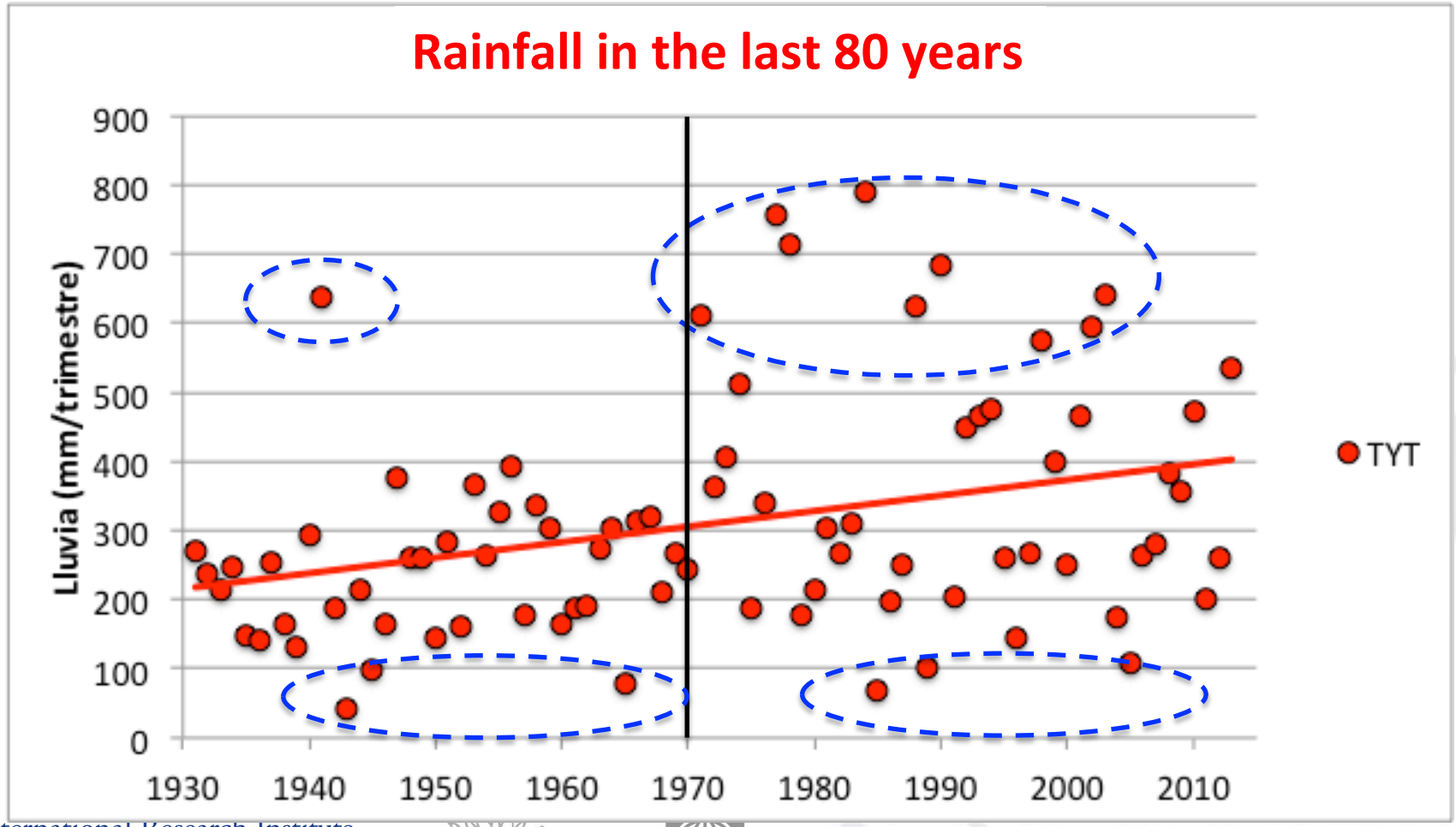
Rosenzweig et al, 2013 (PNAS) from AgMIP Work

What can we learn from historical records
Did rainfall Increase in the Uruguayan Summer?



Rainfall Increase in Uruguayan Summer?

Treinta y Tres: Total Rainfall in Dec – Jan - Feb



DACC

Development and Adaptation to Climate Change

First project that links Development and Adaptation starting by Improving Adaptation to Current Climate

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IRI The International Research Institute for Climate and Society

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Motivation for Establishing the SNIA in Uruguay

1. **Need a new approach for Adaptation to Climate Change**
   (Uruguay / World Bank: Leaders in new approach)

2. **Need to Assist / Inform Decisions and planning in Private Sector, elaborate Policy in the Ministry of Agriculture**

Motivation SNIA: Informing Decisions

Premise: Decisions, Planning, Policies will be better if they are better informed

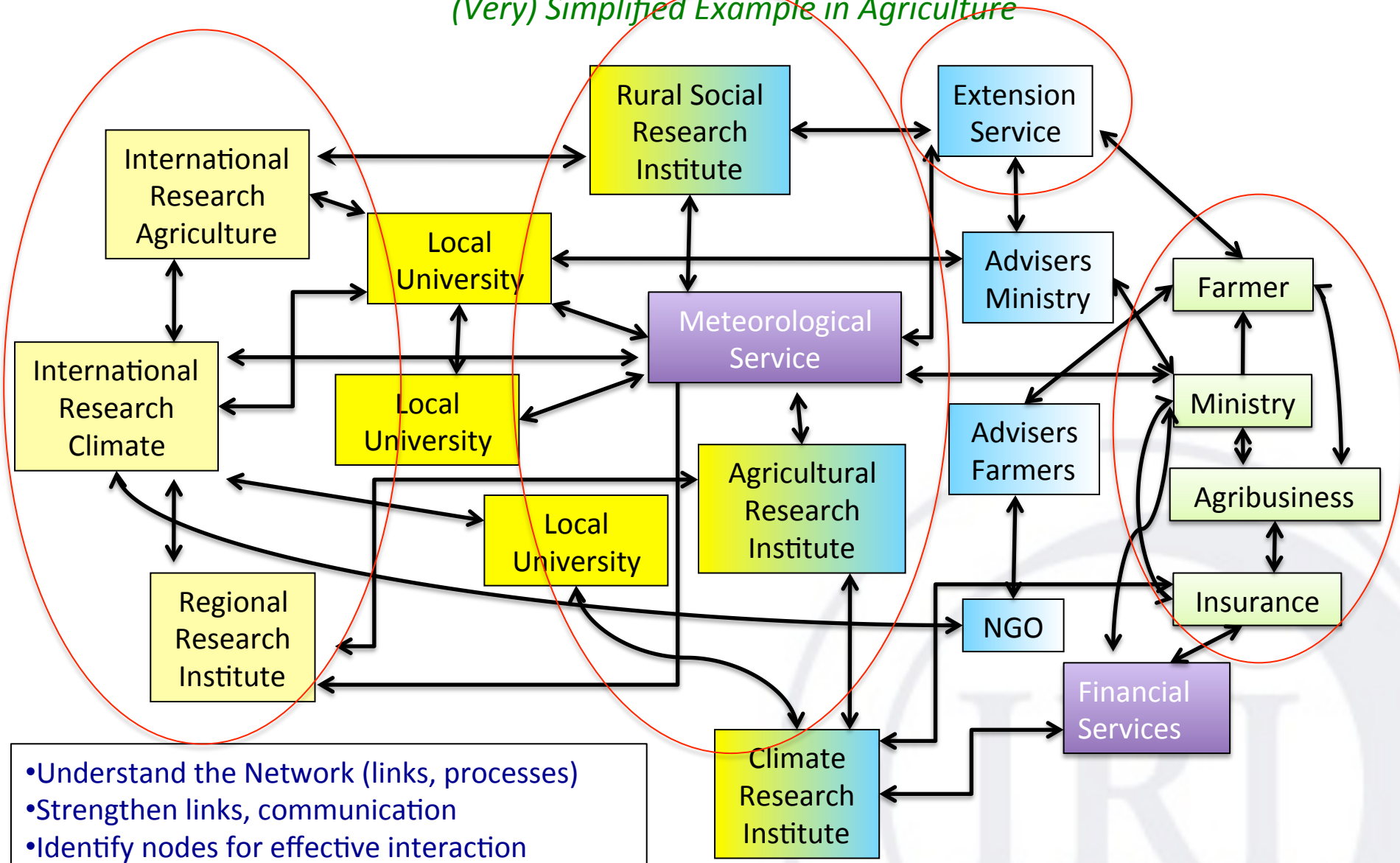
Information (1):
Generally available (in excess?), but Prioritize? Translate? Integrate?

Information (2):
Often exists but not readily available, not processed, not analyzed ("data" vs "information")

SNIA: Organize, Prioritize, "Filter", Connect, Analyze/Process, "Translate", Improve Availability

Interaction with Stakeholders: Information Networks

(Very) Simplified Example in Agriculture



- Understand the Network (links, processes)
- Strengthen links, communication
- Identify nodes for effective interaction

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Gap between Science and Applications / Society

1. Decision-makers approach problems holistically and often intuitively

2. Science traditional reductionist approach:
   Create 'islands of knowledge in a sea of ignorance'

(Meinke et al., 2007; 2009)

Need Tools/Approaches to Integrate Knowledge (Decision Support Systems)

URUGUAY: DACC, SNIA = Climate Risk Management Approach and Tools

(Applied Systems Analysis Approach)

Information and DECISION SUPPORT SYSTEMS

URUGUAY: DACC, SNIA = Climate Risk Management Approach and Tools

(Applied Systems Analysis Approach)

Information and DISCUSSION SUPPORT SYSTEMS

IRI CCAFS NASA APSRU DPI INIA INTA Embrapa IAPAR Colorado State University Knowledge to Go Places

CLIMATE INFORMATION

REMOTE SENSING

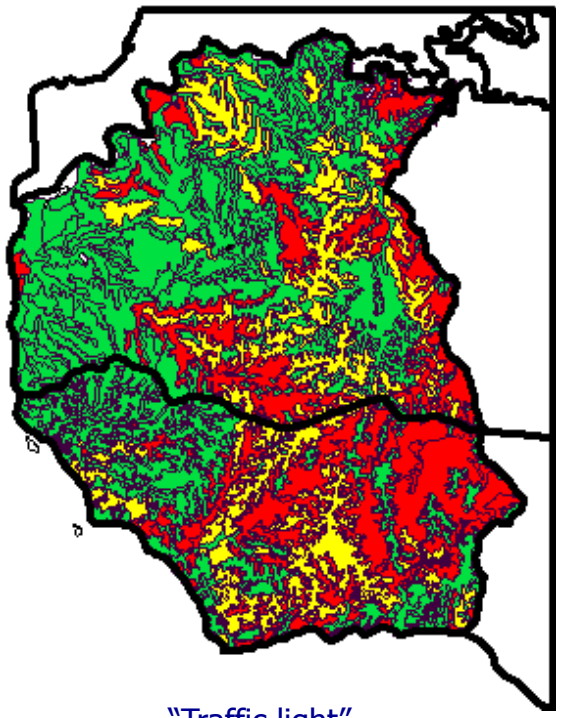
PRICES

EXISTING DATABASES

INFRASTRUCTURE

SIMULATION MODELS

GIS



"Traffic light" colors

Examples "IDSS Approach"

- Early Warning Systems
- Early Response to Emergencies
- Reservoir Optimization
- Crop Forecasts / Food Avail.
- Crop Disease/Pest Outlooks
- Climate Index Insurance
- Feasibility of Technologies
- Energy Generation (Biomass)

Different Spatial Resolutions: Region → Country → Provinces → Farm

Different Temporal Resolutions: Seasons → Decades → Climate Change

Easily Understandable / **Actionable**: Inform Decisions, Planning

(IRI's Maprooms, SNIA)

SNIA: Different Users, Different Demmands, Scales

Users

Government

Development Agencies

Agri-Businesses

Cooperatives, NGOs

Advisers

Farmers

Research Institutes

Universities

Media

Objectives

Public Policy
Planning
Insurance Programs
Emergency Funds
Credit

Technology Assessment

Sustainability

Strategic Decisions

“Tactical” Decisions

Research

Scales

- Country
- Agro-ecological Zone
- Department (Province)
- County
- Farm

Motivation for a SNIA:

(1) Adaptation: a new approach is needed

Start by improving adaptation to current climate
Connect to development efforts

(2) Information

Establish a System to:
Organize, Prioritize, "Filter", Connect,
Analyze/Process, Make Available

(3) Knowledge Networks

Understand (research), identify key nodes

(4) Integrate Information

Decision / Discussion Support System
Understandable, actionable information

National Agricultural Information System (SNIA)