

USING CLIMATE INFORMATION

1. END-TO-END FORECASTING

- ▶ CLIMATE INFORMATION**
- ▶ IMPACTS**
- ▶ APPLICATIONS**

2. OBSTACLES TO END-TO-END FORECASTING

3. INSTITUTIONS FOR END-TO-END FORECASTING

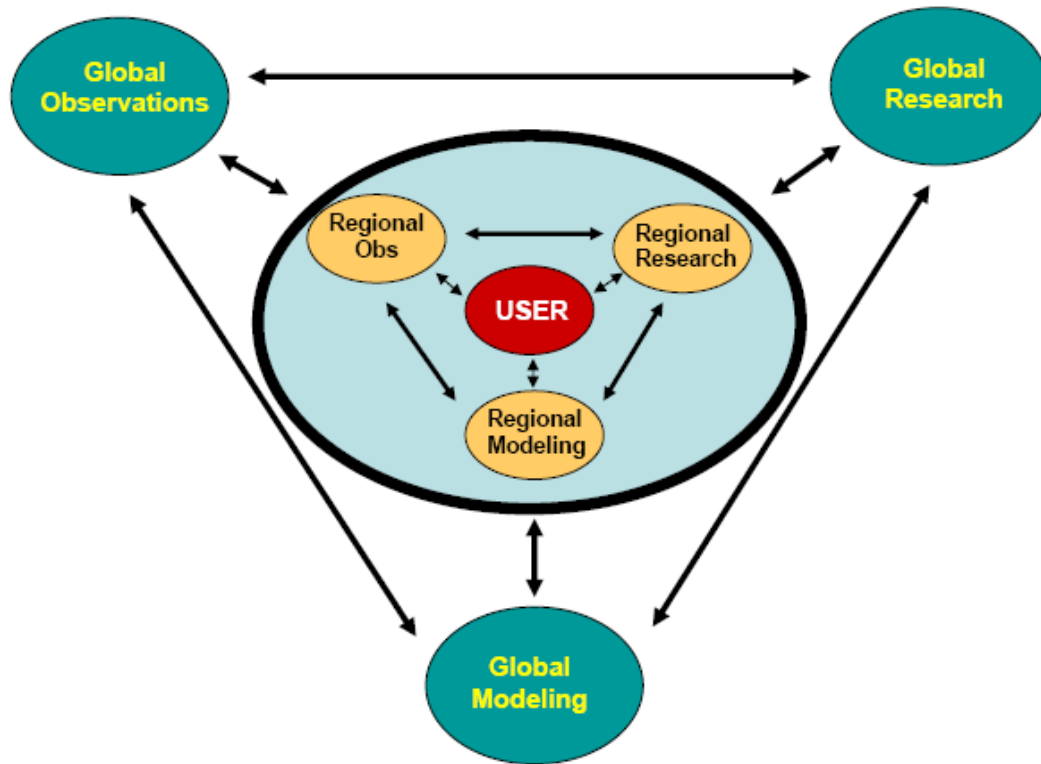
- ▶ A NATIONAL CLIMATE SERVICE**
- ▶ REGIONAL CLIMATE CENTERS**
- ▶ IRI**
- ▶ ALL THE ABOVE**

4. RESEARCH FOR END-TO-END FORECASTING

GENERAL PRINCIPLES:

- ▶ **ANY KNOWLEDGE ABOUT THE FUTURE SHOULD BE BETTER THAN NO KNOWLEDGE ABOUT THE FUTURE**
- ▶ **CLIMATE INFORMATION IS ANY INFORMATION (PAST, PRESENT, AND FUTURE) THAT GIVES US INFORMATION ABOUT THE FUTURE.**
- ▶ **THE FORECAST MUST COME WITH MEASURES OF UNCERTAINTY**
- ▶ **UNCERTAIN FORECASTS IMPLY INCREMENTAL RESPONSES**
- ▶ **THE FORECAST HAS TO BE RELEVANT, UNDERSTANDABLE, AND ACTIONABLE**
- ▶ **DEFINITION: AN APPLICATION OF A FORECAST IS AN INFLUENCE ON A DECISION.**
- ▶ **THE APPLICATION OF THE FORECAST MUST BE DEMONSTRABLY BENEFICIAL.**
- ▶ **THEREFORE WE HAVE TO UNDERSTAND HOW DECISIONS ARE MADE.**

1. END-TO-END FORECASTING



► CLIMATE INFORMATION

➔ PAST CLIMATE INFORMATION

INSTRUMENTAL
PALEO

➔ NOWCASTS

➔ FORECASTS

▶ CLIMATE IMPACTS

→ THE NORMAL WORKINGS OF THE SYSTEM

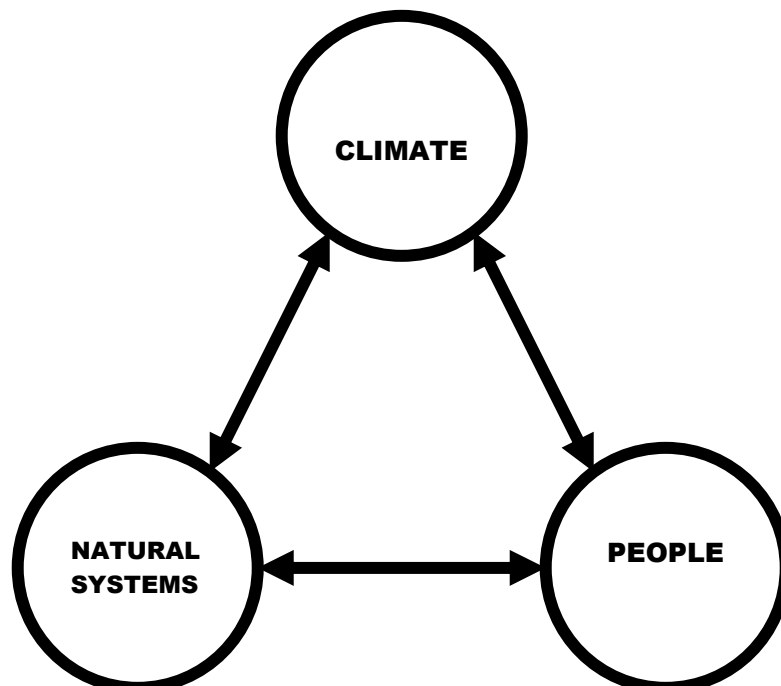
VULNERABILITY

EXPOSURE
SENSITIVITY
RESILIENCE

COPING: INFRASTRUCTURE
HEDGING
RESPONSE

OPPORTUNITY

→ INTEGRATED IMPACTS



▶ **APPLICATIONS**

- IDENTIFY APPLICATION**
- UNDERSTAND NORMAL DECISION PROCESS**
- IDENTIFY USEFUL CLIMATE INFORMATION**
- CONVEY CLIMATE INFORMATION**
- RECEIVE THE SAME CLIMATE INFORMATION CONVEYED**
- MAKE APPROPRIATE DECISION**
- EVALUATE DECISION**
- ITERATE**

2. OBSTACLES TO END-TO-END FORECASTING

- ▶ INAPPROPRIATE INFORMATION**
- ▶ INFORMATION MISCONVEYED**
- ▶ INFORMATION MISUNDERSTOOD**
- ▶ INFORMATION IGNORED**
- ▶ DECISION INAPPROPRIATE**
- ▶ BAD LUCK--FIRST APPLICATION BLOWN**
- ▶ LOCALIZED (NOT DIFFUSED)**
- ▶ DISTRIBUTIONAL INEQUITIES**
- ▶ LEGAL ISSUES**

3. INSTITUTIONS FOR END-TO-END FORECASTING

▶ A NATIONAL CLIMATE SERVICE

THE CLIMATE SERVICE IDENTIFIES, DESIGNS, AND PRODUCES AUTHORITATIVE AND TIMELY CLIMATE INFORMATION FOR USE IN SUPPORTING POLICY AND MANAGEMENT DECISIONS IN THE PUBLIC AND PRIVATE SECTORS, ON REGIONAL, NATIONAL, AND INTERNATIONAL SPACE SCALES.

→ DESIGNS, ESTABLISHES, AND MAINTAINS U.S. COMPONENT OF A GLOBAL CLIMATE OBSERVING SYSTEM

→ MAKES GLOBAL ANALYSES AND FORECASTS

→ ARCHIVES INSTRUMENTAL, PALEO, AND MODEL DATA

→ SHAPES, DOWNSCALES, AND DELIVERS **TIMELY AND **AUTHORITATIVE** INFORMATION TO REGIONAL CLIMATE CENTERS**

→ PERFORMS THE RESEARCH NEEDED TO SUSTAIN ABOVE

▶ REGIONAL CLIMATE CENTERS

→ KNOWS THE CUSTOMER

→ MAINTAINS REGIONAL OBSERVATIONS

→ DISTRIBUTES CLIMATE INFORMATION

→ PRODS THE NATIONAL CLIMATE CENTER

→ INTERFACES WITH SECONDARY DISTRIBUTORS (PRIVATE SECTOR)

→ IDENTIFIES RESEARCH NEEDED IN THE REGION

**▶ THE IRI: A PILOT INSTITUTION TO
DEMONSTRATE END-TO-END
FORECASTING**

**4. RESEARCH FOR END-TO-END
FORECASTING**

**→ PRODUCTION AND DISTRIBUTION OF
CLIMATE INFORMATION**

→ CLIMATE IMPACTS

U.S. REGIONS

INTERNATIONAL REGIONS

→ PUBLIC PERCEPTIONS OF CLIMATE

**→ DECISIONMAKING IN ORGANIZATIONS AND
PUBLIC BUREAUCRACIES**

DESCRIPTIVE

NORMATIVE

PRESCRIPTIVE

→ EVALUATION OF APPLICATIONS

**→ BOUNDARIES BETWEEN PHYSICAL SCIENCES,
SOCIAL SCIENCES, AND POLICYMAKING**

DIFFUSION OF INNOVATIONS

DEFINITION: AN INNOVATION IS ANY IDEA OR TECHNOLOGY **PERCEIVED** TO BE NEW.

DEFINITION: DIFFUSION IS THE PROCESS BY WHICH AN **INNOVATION** IS **COMMUNICATED** **OVER TIME** AMONG THE MEMBERS OF A **SOCIAL SYSTEM**.

▶ **DIFFUSION IS A COMMUNICATION PROCESS.**

▶ **IT IS A SOCIAL PROCESS.**

▶ **DIFFUSION SUCCEEDS OR FAILS BY COMMUNICATION WITHIN SOCIAL PROCESSES.**

IN TIME, THE INNOVATION IS EITHER ADOPTED OR REJECTED BY SOCIETY.

WHAT LEADS TO SUCCESSFUL DIFFUSION AND THEN ADOPTION?

1. INNOVATIONS

A. RELATIVE ADVANTAGE

B. COMPATIBILITY

C. COMPLEXITY

D. TRIALABILITY

E. OBSERVABILITY

2. THE DECISION IN TIME

THE S CURVE

3. COMMUNICATIONS

A. HOMOPHILY OF COMMUNICATORS

B. SUITABLE COMMUNICATION CHANNELS

NETWORKS

MEDIA

C. CHANGE AGENTS

4. THE DECISION IN A SOCIAL SYSTEM

CHARACTERISTICS OF INNOVATORS

**CHARACTERISTICS OF
ORGANIZATIONS**

CHARACTERISTICS OF CHANGE AGENT

CONSEQUENCES OF DIFFUSION

WHAT'S NOT COVERED?

**OBSTACLES TO DIFFUSION AND HOW TO
OVERCOME THEM**