Changing the Climate on Climate

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http://www.changingtheclimate.com/

Role of Science in Policy and Decision-Making

- Science provides one aspect of knowledge that forms basis for action
- Science identifies potential societal impacts that stimulates public debate
- Science process monitors impacts and effectiveness of policy decisions already made
- Science policy (CCSP)

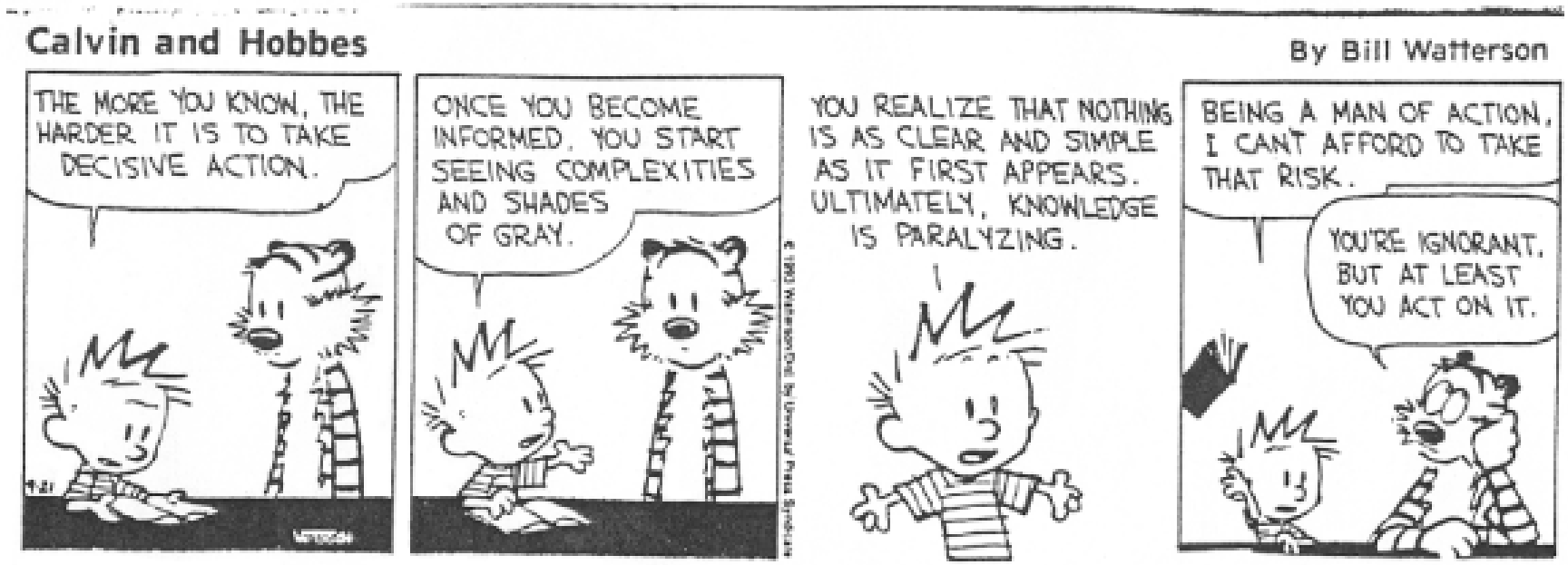
Decisions about Climate Science: U.S. Climate Change Science Program

Vision: A nation and the global community empowered with the science-based knowledge to manage the risks and opportunities of change in the climate and related environmental systems

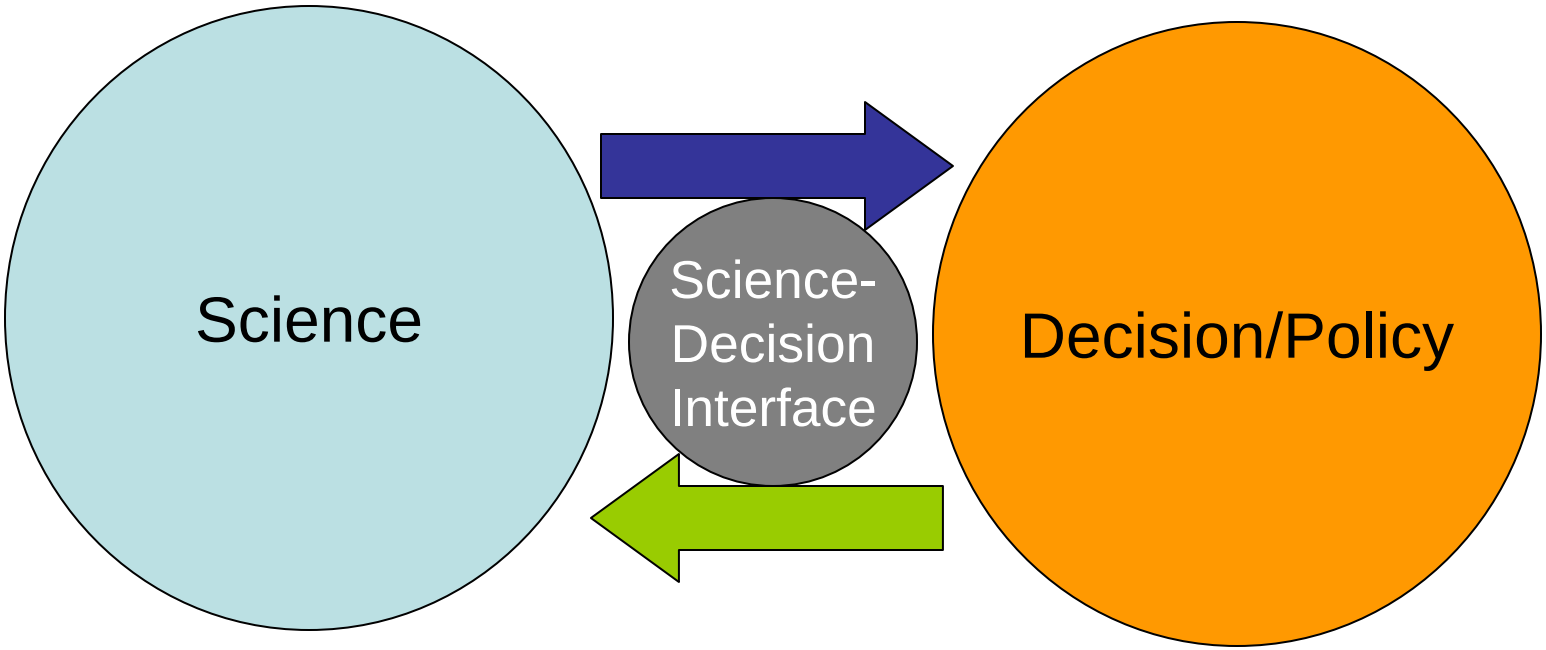
Mission: Facilitate the creation and application of knowledge of the Earth's global environment through research, observations, decision support and communication

http://www.climatescience.gov

Decisions using Climate Science



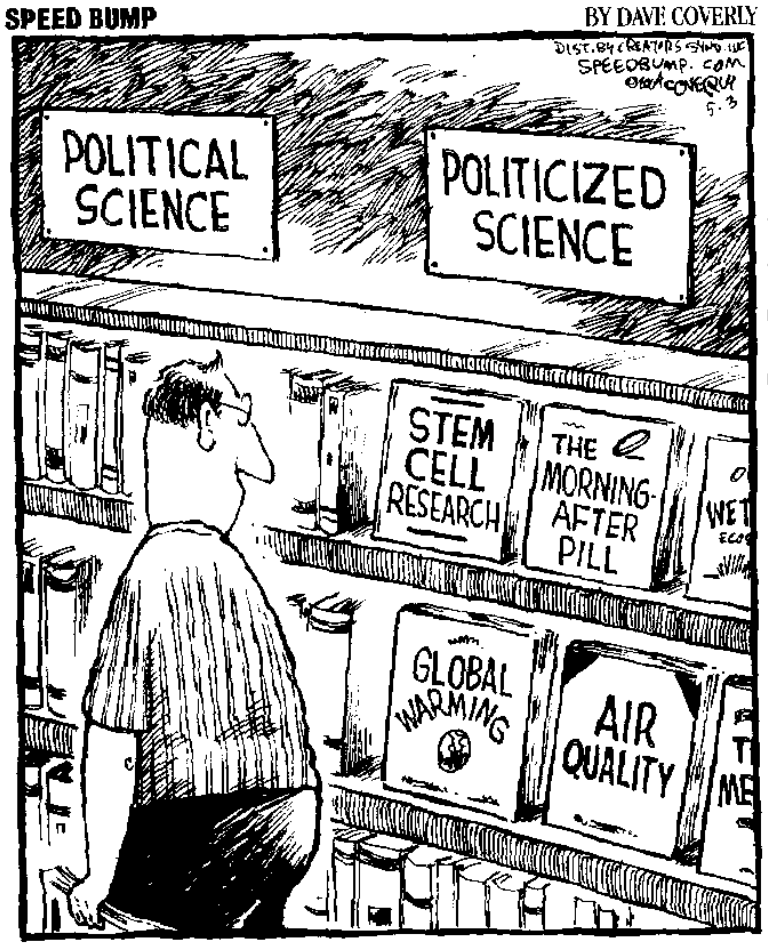
Creating New Linkages
Expanding options



Requires the development of effective partnerships

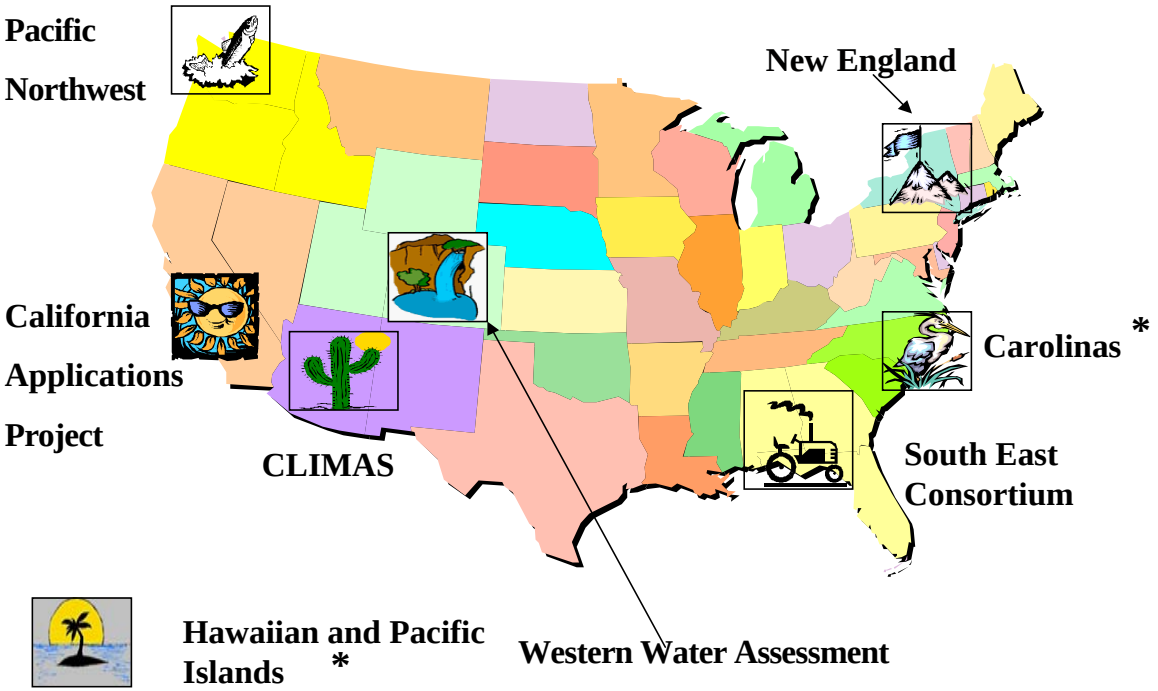
Politization of Science

- Focus science agenda on one path when science could be consistent with wider set of options
- Predetermine action and selectively use science to support that decision



Regional Integrated Science and Assessments

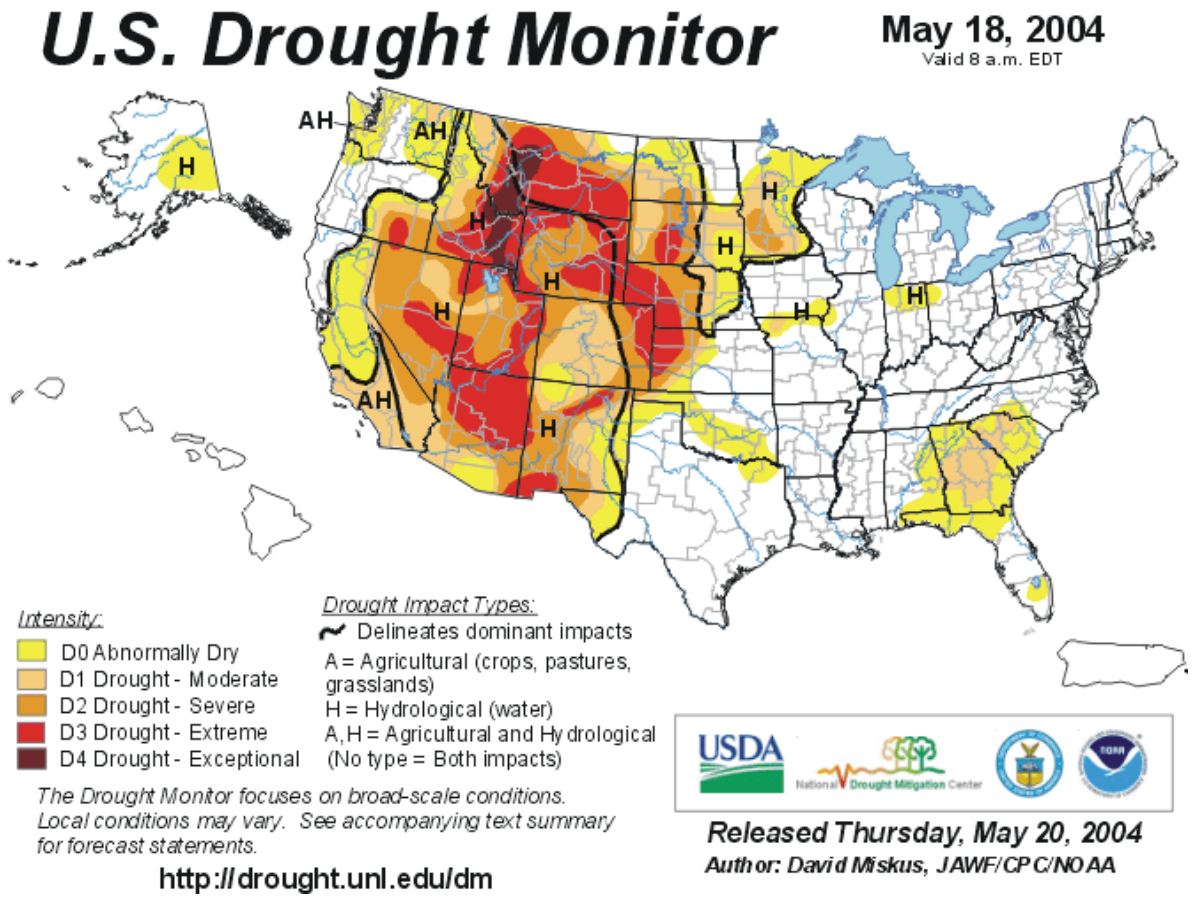
- provide a direct connection between research and end user
- strong focus on water issues
- how current climate products are used and interpreted
- needs for next generation regional climate information products and climate science



Responding to diverse interests for sharing limited resources…

U.S. Drought Monitor

Derived by synthesizing various information sources



Agricultural (A), hydrological (H) designate primary impacts (drought types). There are manifold indirect impacts as well, e.g., on recreation, energy production, water quality, fire risk, air quality, ecosystems, endangered species.

Planning Example: Drought Problem Focus

- United States does not have a national drought policy
- Approach droughts in an ad hoc, response-oriented manner
- Drought conditions and forecasts have not been readily available or reliable
- Seek further refined tools beyond Drought Monitor product

National Integrated Drought Information System: Vision

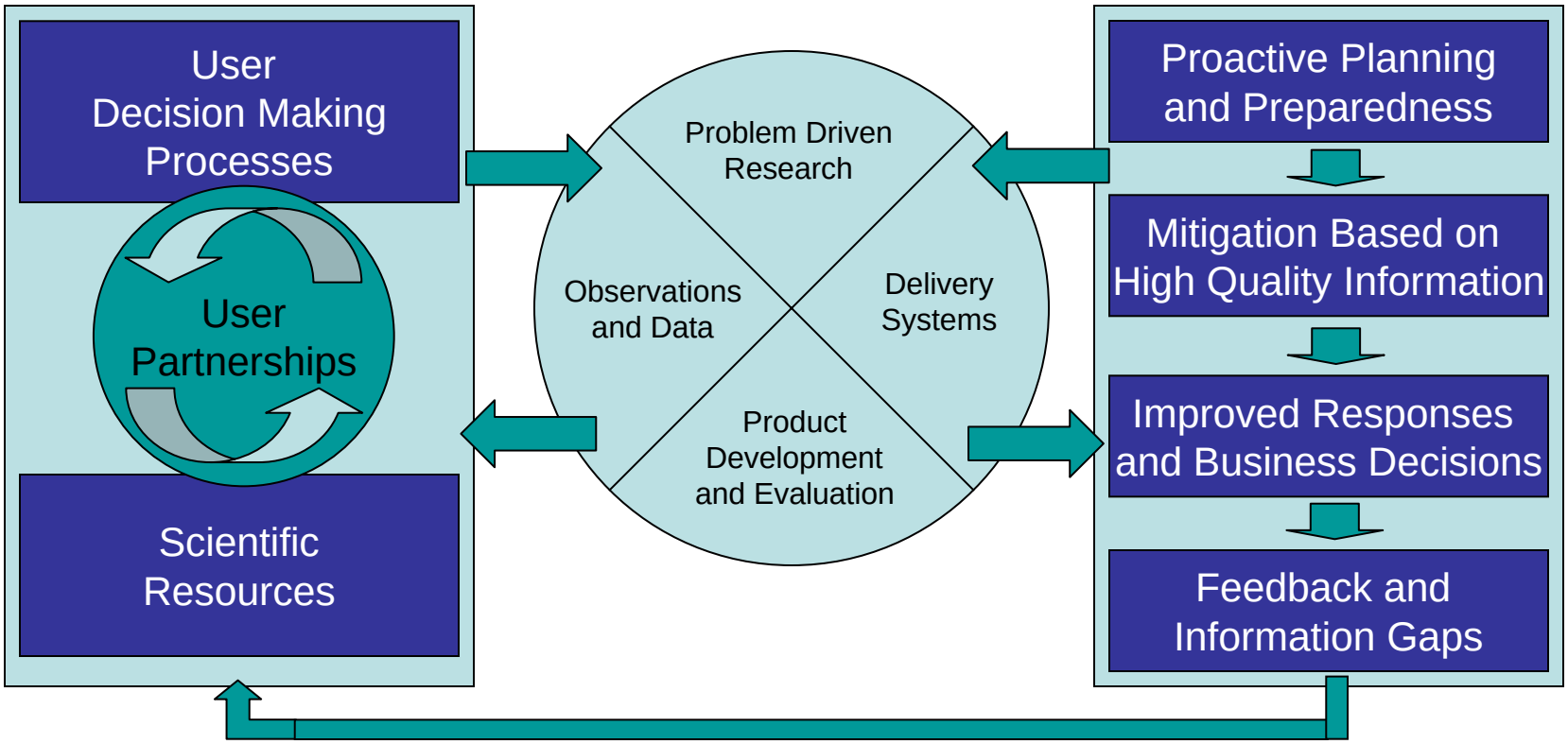
A dynamic and accessible drought information system that empowers all users with the ability to determine their own level of drought risk and vulnerability needed for preparing for and mitigating the impacts of drought.

It is envisioned that a user will be able to interactively query drought information products in order to analyze their decision options for proactively responding to drought.

NIDIS Elements

- National Drought Preparedness Act of 2004
  - Establishes a permanent Drought Council
  - Authorizes a Drought Fund
  - Gives the lead for implementing the NIDIS to DOC/NOAA
- NIDIS Recommendations
  - Establish NIDIS
  - Establish data needs and integration tools - integrate existing networks, determine gaps …
  - Research needs …. to improve the forecasting of short- and long-term drought conditions, to make the forecasts more useful and timely, and to establish priorities based on the potential to reduce drought impacts.
  - Facilitate drought preparedness programs
  - Interaction and education

National Integrated Drought Information System Framework



Water Resources - Agriculture - Wildfire – Energy – Ecosystems - Human Health - Tourism

Reservoir Management Decision Calendar

Water Year Planning → **Next Water Year Planning**

Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct

Provide for late Summer/early Fall irrigation while maintaining target flows

Next water year runoff unknown, reserve water until February snowpack data

Winter season precipitation forecast for Fall release decisions

Winter releases based on Jan/Feb snowpack data

Winter/Spring forecast for Winter release decisions

Peak Flow Augmentation — fill curve

Summer season forecast for Peak Augmentation planning

Week 2 forecasts for Peak Augmentation

Peak Flow Augmentation releases

Plan releases for Summer irrigation & hydropower

Week 2 forecasts for Summer irrigation & hydropower release decisions

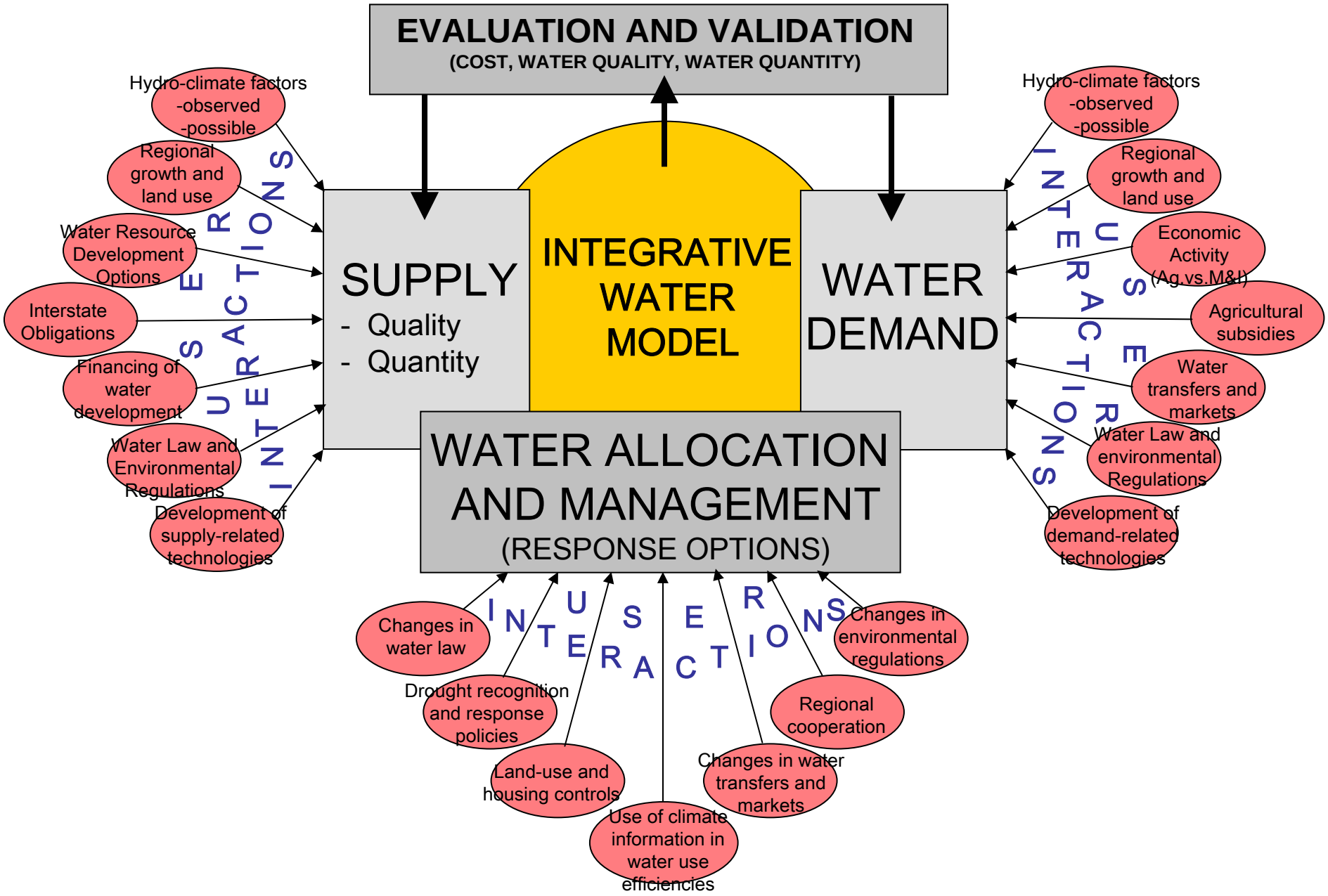
Provide for Summer irrigation & hydropower needs while maintaining target flows

Planning processes | Operational issues | Climate & weather forecasts

Andrea J. Ray, Robert S. Webb, John D. Wiener, 2001

Photos: US Bureau of Reclamation, NOAA-CIRES Western Water Assessment

VULNERABILITY, POLICY, AND PLANNING



Science Gaps

- Climate Variability
  - PDO
  - Improvements in regional forecasting (monsoon dynamics; local to regional scale climate variability and change, particularly in topographically complex terrain)
  - Predictability of drought
  - Regional climate change impacts on water (plus confidence)
- Water Management
  - Improved stream flow forecasting
  - Greater understanding of water management processes, institutions, options and the role of climate (climate/snow/hydrology linkages)
- Climate variability in context of multiple stressors (e.g., ecosystems, land-use, health)
- Vulnerability (including thresholds of change), adaptation, resilience
- Communicating scientific information

Realities of Developing Partnerships

- ***Requires a large investment*** of time and effort
- ***Commitment to sustained communication*** and follow-up to meet user expectations
- ***Need to plan for transition to operational products*** and educated users, operational information brokers (whether NOAA or another distributor of climate information)
- ***Transition to operational distribution of climate products allows researchers to move on*** to developing new projects and partnerships.

The End