Panel Discussion on User Needs & Perspectives on CPC products

James Partain
NOAA/NCEI Regional Climate Services Director, Alaska Region

Rick Thoman
NOAA/ NWS Alaska Region, Environmental & Scientific Services Services Division

Bruce Rittenhouse
US Bureau of Land Management –Colorado, Natural Resources Branch

Bob Peters, PE
Water Resource Engineer, Denver Water

Alan Haynes, *Service Coordination Hydrologist*
NOAA/NWS California Nevada River Forecast Center

Jeff Lukas, *Western Water Assessment RISA, Univ of Colorado*

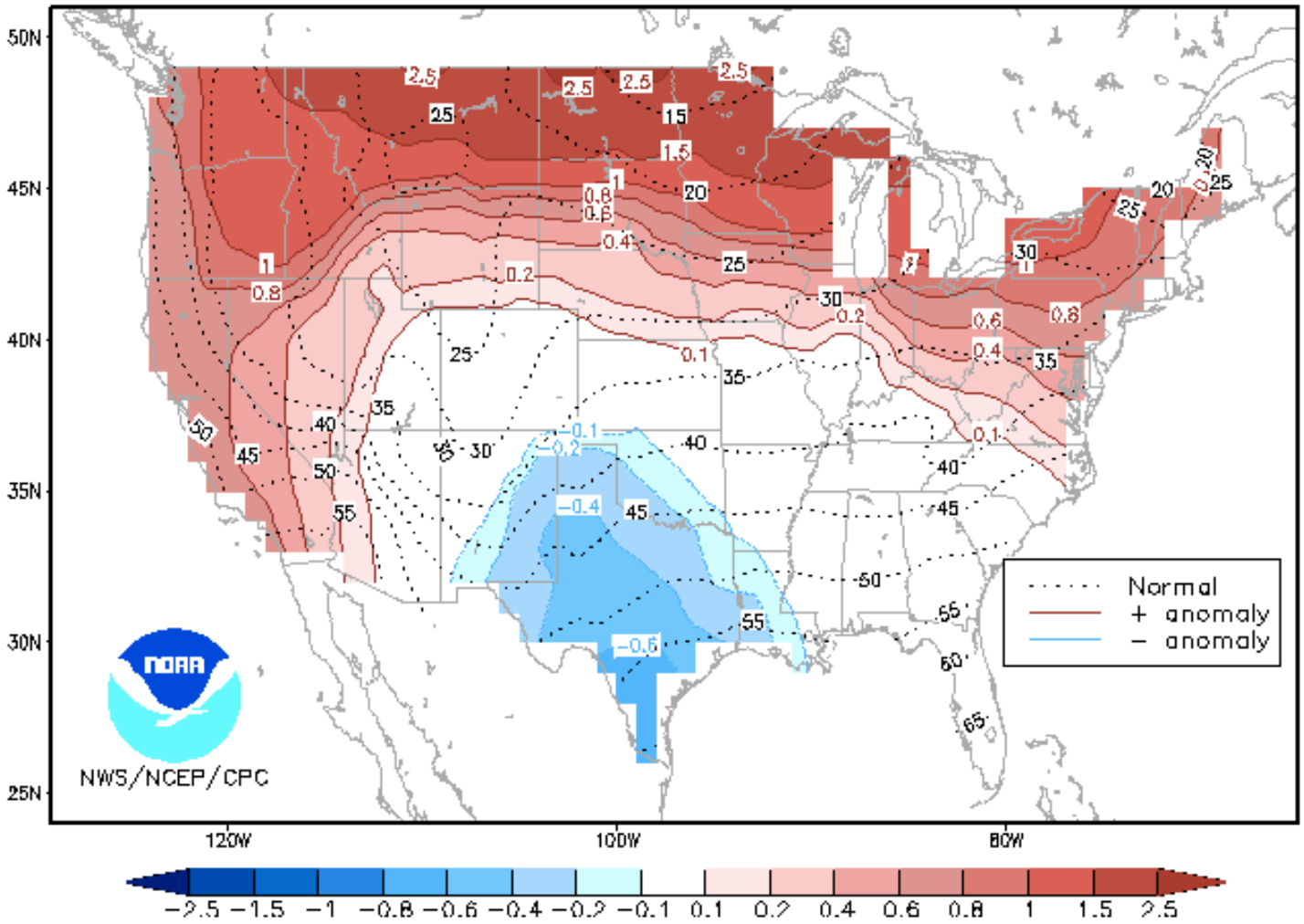
Panel Organizer: Andrea Ray *NOAA/Earth System Research Lab*

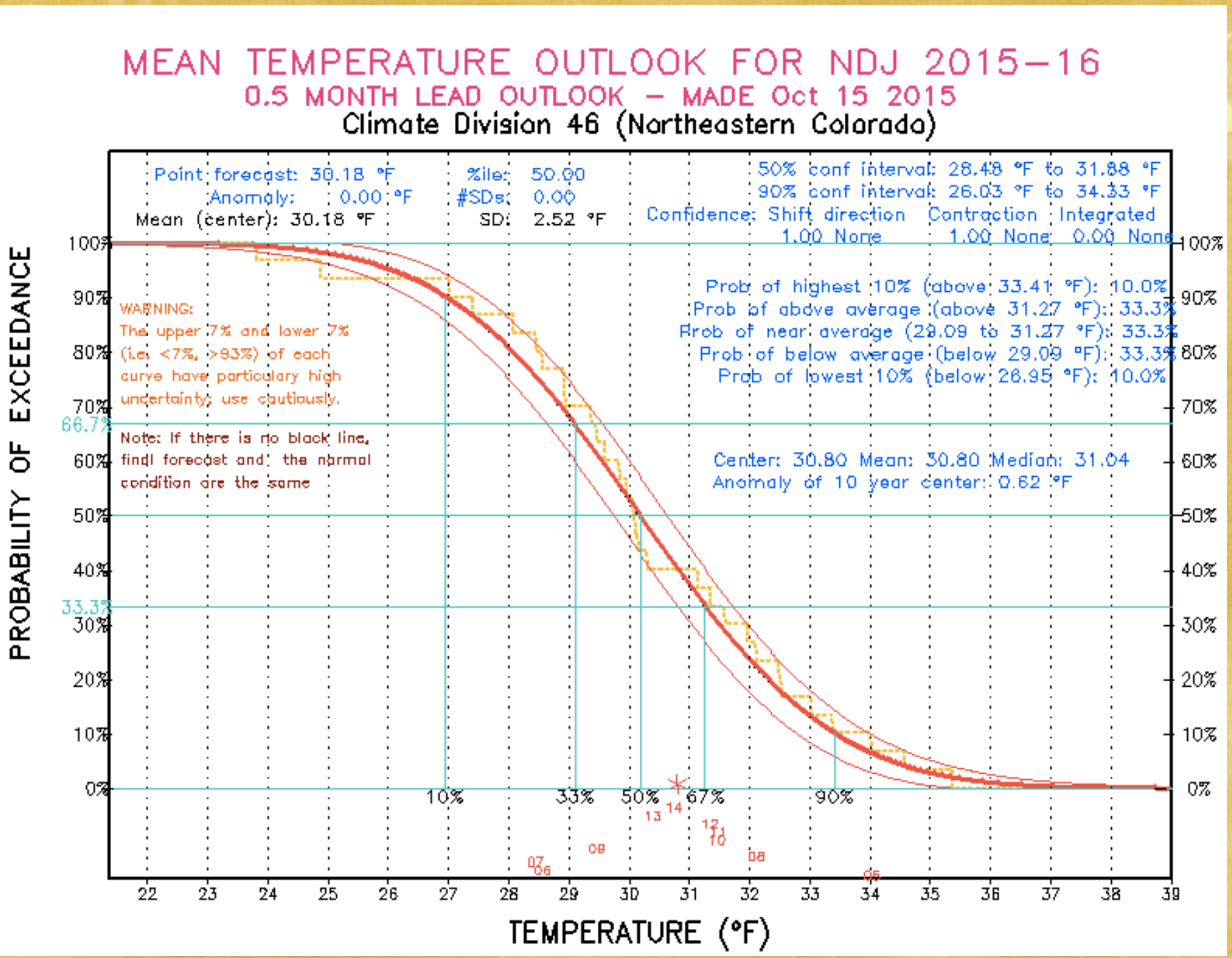
WHO are users of intraseasonal-to-interannual information?

- Major are *intermediaries* who do something with the information to manage the risks for the public
  - often with a preparedness or "ready-set-go" mindset, situational awareness, actions/decisions adjustable thru a season
- Within NWS: Warning Coord. Mets, River Forecast Centers, other NOAA environmental and climate information providers
- Regional institutions: NOAA RISAs, Dept of Ag Climate Hubs, USDA Climate Science Centers
- Reservoir and water supply managers (e.g. Denver Water), wildfire managers, public land managers (grazing, controlling invasive grasses, e.g. DOI bureaus including BLM, Forest Service); agriculture; public health
- Private sector: tailor products for specific users, may be proprietary
- Many of these *already work with* a variety of uncertain and often probabilistic information
- Different challenges for different user groups
  - For example, skill needed varies, depends on decision context & the confidence in other parameters related to the decision. Perception of skill needed often changes as the user understands the products & science behind them

Anomaly (deg F) of the Mid-value of the 3-Month Temperature Outlook Distribution for NDJ 2015-16

Dashed lines are the median 3-month temperature (degrees F) based on observations from 1981-2010. Shaded areas indicate whether the anomaly of the mid-value is positive (red) or negative (blue) compared to the 1981-2010 average. Non-shaded regions indicate that the absolute value of the anomaly of the mid-value is less than 0.1. For a given location, the mid-value of the outlook may be found by adding the anomaly value to the 1981-2010 average. There is an equal 50-50 chance that actual conditions will be above or below the mid-value. Please note that this product is a limited representation of the official forecast, showing the anomaly of the mid-value, but not the width of the range of possibilities. For more comprehensive forecast information, please see our additional forecast products.




MEAN TEMPERATURE OUTLOOK FOR NDJ 2015–16
0.5 MONTH LEAD OUTLOOK – MADE Oct 15 2015
Climate Division 46 (Northeastern Colorado)
Point forecast: 30.18 °F
Anomaly: 0.00 °F
Mean (center): 30.18 °F
%ile: 50.00
#SDs: 0.00
SD: 2.52 °F
50% conf interval: 28.48 °F to 31.88 °F
90% conf interval: 26.03 °F to 34.33 °F
Confidence: Shift direction Contraction Integrated
1.00 None 1.00 None 0.00 None
WARNING:
The upper 7% and lower 7% (i.e. <7%, >93%) of each curve have particulary high uncertainty; use cautiously.
Note: If there is no black line, findl forecast and the normal condition are the same
Prob of highest 10% (above 33.41 °F): 10.0%
Prob of above average (above 31.27 °F): 33.3%
Prob of near average (29.09 to 31.27 °F): 33.3%
Prob of below average (below 29.09 °F): 33.3%
Prob of lowest 10% (below 26.95 °F): 10.0%
Center: 30.80 Mean: 30.80 Median: 31.04
Anomaly of 10 year center: 0.62 °F
PROBABILITY OF EXCEEDANCE
100%
90%
80%
70%
66.7%
60%
50%
40%
33.3%
30%
20%
10%
0%
10%
33%
50%
67%
90%
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TEMPERATURE (°F)

Overview

Current interest in "bringing in social science"– how?

- Social science approaches that are informing our user assessments of "stakeholder" needs, subseasonal-seasonal ("S2S") time horizon
- *Lens* thru which we analyze and assess data gathered through standard methodologies (interviews, doc review, surveys)
- Move beyond ID of constraints and barriers to the use of forecasts
  - understand why barriers exist, and to move on to entry points and opportunities, To be effective, the regional decision support systems must understand/acknowledge:
  - what problems and questions are important and critical, to focus our work
  - Understand how they perceive uncertainty/confidence
- Describe approaches
- Example

What do we need to know about them?

*Power, $$

*Values/Concerns/Critical

*Social Organization

*Institutional analysis

Culture (various kinds

Space/Place

Race/Ethnicity/Gende

Bottom line: contex

Diffusion of innovations

- Describes innovations as an idea or practice that serves to reduce the uncertainty in outcomes
  - conceptual stages in deciding whether to adopt an innovation
  - idea of early adopters, those who adopt an innovation ahead of others.

- Contributions: By pinpointing the stage of adoption and use, informs next steps in engagement activities and informs product development and efforts; also who are potential partners for collaborative projects

Rogers, 1995

Environmental Anthropology

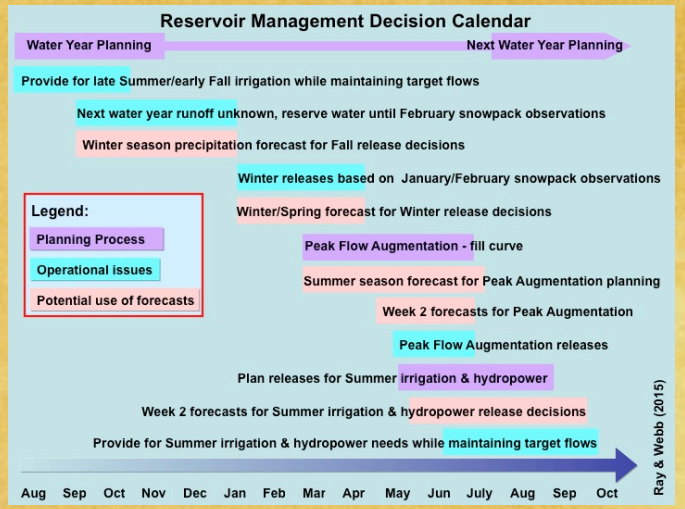
- Ways of knowing and valuing the environment
- Emic and etic (insider/outsider) perspectives
- Interrogates the politics of knowledge production and how different actors engage with it
- Process(es) through which climate knowledge(s) are produced and accessed
- Politics of resource management (political ecology)

- Contributions:
  - How uncertainty is conceptualized across different academic disciplines and in scientific and American political culture
    - E.g. conservative political culture makes it difficult to use climate to justify decisions
  - Uncertainty vs confidence

USBR Aspinall Unit, Gunnison Basin, Colorado

Context for Aspinall Unit Case

- Critical problem sensitive to climate
  - Evolving reservoir management w/ demands closely balanced with supply but new uses legally proscribed
  - More intensely managed water system is more sensitive to shortage
- Stakeholders who may be willing partners & early adopters
  - Deadlines for ESA recovery plans & federal reserve water right for a national park are requiring USBR to include these in their operations (release & reorganization stage)
  - 2002 drought as a climate event (not forecasted) also resulted in finding flexibility and new ways of operating
- Decisionmakers and their key stakeholders
  - USBR has authority to manage, but USFWS, NPS, have interacting legal authorities, other stakeholders (policy sciences)
- How climate variability interacts w/ the critical problem
  - Decision calendar for annual operating plan helped organize recurring decisions and ID potential climate



Ray 2004, Ray & Webb 2015

Thank you!

Ray & Webb, 2015, chapter in forthcoming book, Climate in Context: Lessons learned from the RISA program, Parris et al, eds.

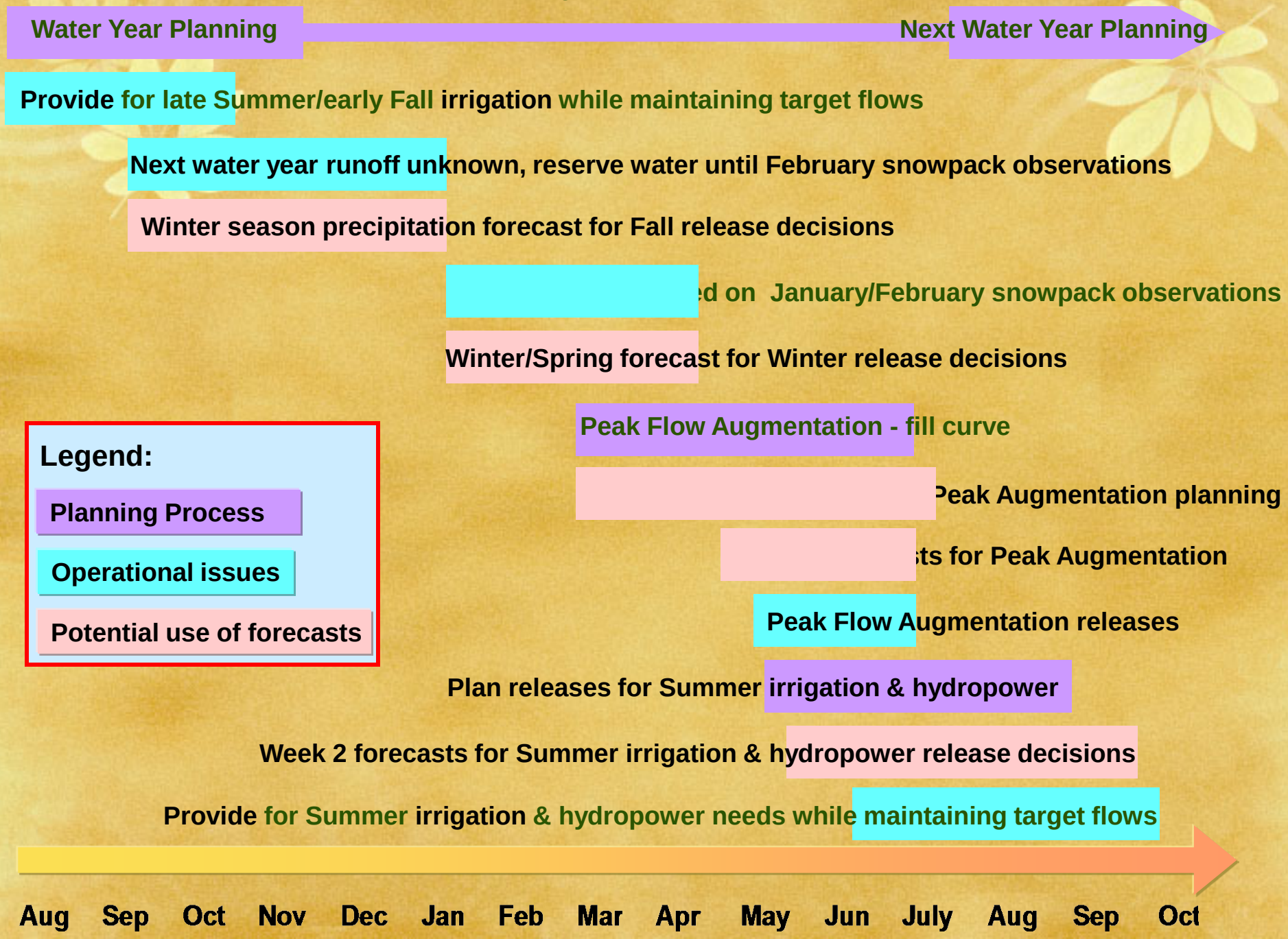
Andrea J Ray
Andrea.ray@noaa.gov
NOAA/Earth System Research Lab
Boulder, CO

Heather M. Yocum
NOAA-Univ. of Colorado Cooperative Institute for Research in Environmental Sciences

Earth System Research Laboratory
Science, Service & Stewardship

Extras

Reservoir Management Decision Calendar



How S2S climate/drought information might be used

- "Conversation" within water management groups and with their stakeholders, and with scientists -- dialogue about risks, e.g. drought/flood
- Mental models of managers for their systems are important as well as hydrologic and management models
- Relationship of climate information to their triggers & thresholds for action
- As interested in the information behind the Drought Monitor as the DM itself, in order to make their own assessments
- Major need for synthesis of research into products & analysis that connect climate impacts to water management impacts:
  - Temperature --> evaporation, rain/snow mix, urban demand, length of growing season
  - Timing of spring runoff --> water rights, reservoir reliability

Monsoon applications case

Add monsoon decision calendar

Notes on steps.

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Types of Use

- Describes innovations as an idea or practice that serves to reduce the uncertainty in outcomes; conceptual stages in deciding whether to adopt an innovation
  - Stages
  - idea of early adopters, those who adopt an innovation ahead of others.
- Contrib of this approach: Awareness of these stages of adoption and use that stakeholders and potential users are in, are valuable for the potential to inform product development and efforts to develop user-centric products

Ray and Webb, 2015; Ray 2004

Who am I now?

- Committed to connecting science to applications to benefit society
  - Dynamical ENSO forecasts to seasonal-interannual in water & natural resources management; hazards/extremes
  - Climate information, climate projections, changes in extremes -> adaptation to climate change
- "Physical Scientist," NOAA Earth Systems Research Lab, Physical Sciences Division, Climate Analysis Branch
  - Environment and society interactions, policy sciences, social science methodologies
  - Uses of climate information in natural resource management, especially public land management
  - Connecting specific research to applications (climate projections, attribution, monsoon)
- Ph.D. Geography, environment & society interactions

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