



What happens when the driver turns the steering wheel?

**Initial Panel
Findings /
Recommendations**

LOBO 2015

Hydrologic Water Year Review:

- Opportunity for analysis and refinement of landscape-level climate patterns that might affect management strategies.
 - A time-series analysis of historical records [carefully chosen] allows the “gaming” of flow reductions of 30%, 45% or 60% flow reductions - [including reservoirs]
 - Will create some very different estimates of long-term water availability - e.g., end of year storage as a target for in-season mgmt

Changes in Effects of Climatic Oscillations

- ▶ AMO, PDO, ENSO still occurring and not dampened by increasing oceanic temperatures
- ▶ Are we “stuck” in current climatic pattern ? - alteration in Jet Stream / Siberian Express forcing changes in distribution of rainfall
- ▶ WHAT IF THIS IS THE NEW “NORMAL”?

April 1 Snow Water Equivalents San Joaquin, Sacramento, Trinity

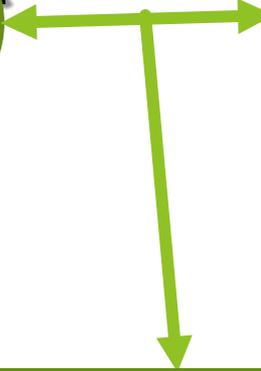
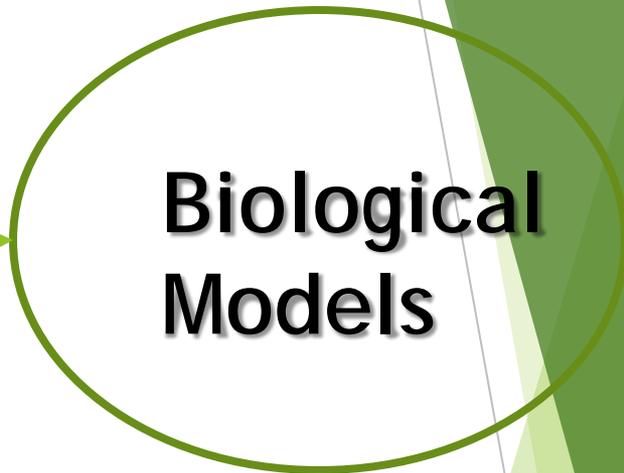
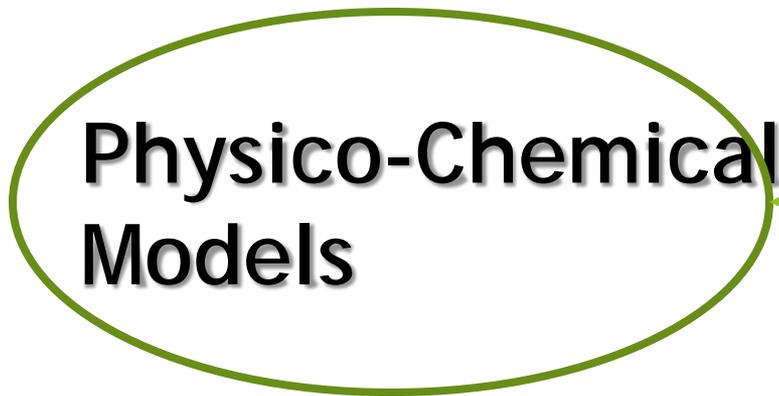
Elevation	2005-2034	2035-2064	2070-2099
1000-2000m	-13 to -48 %	-26 to -68 %	-60 to -93%
2000-3000m	+12 to -33 %	-08 to -36 %	-25 to -79 %
3000-4000m	+19 to -13 %	-02 to -16 %	-02 to -55 %
All Elevations	+06 to -29 %	+.12 to -42 %	-32 to -79 %

GENERAL OBSERVATIONS



GENERAL OBSERVATION:

- Drought conditions might mean that reconsideration of rule curve is necessary under extreme drought conditions - including flood storage
- Kudos for contemplating the linkage between physical models and biological response
- “Habitat” is not as simple as river miles at a desirable temperature



STRONG



**Needs
Enhancement**

GENERAL OBSERVATION:

- Continue to connect hydrologic conditions to fish and macroinvertebrate survival . Assess adequacy of current models.
- More time on biological models and begin assessing “value” of further alterations of apparently adequate physical models
- The ultimate decision is only as good as it’s weakest estimate



Progress on Shasta Reservoir and Sacramento River temperature monitoring, modeling, and management

- Why all of these different models - concordance - Can they talk to each other?
- ENSO will deliver water to basins - won't help cold-water storage - Do we need a different cold-water strategy?
- More monitoring within Shasta required
- Modeling stratification as a means to do some earlier forecasting for availability of cold-water releases

- Redundancy (probes) needed for monitoring - failure prevention - always a fail-safe - Tolerances should be within 0.1 degrees
- Available habitat - how measured? Temperature but not DO or velocities / sediment deposition?
- Modeling stratification as a means to do some earlier forecasting for availability of cold-water releases

- Fish life-stage should determine compliance points
- Have done a good job at managing for temperature compliance points but need to understand where fish habitat use is greatest and then manage flows to enhance other physical habitat conditions (velocity, flow, substrate combination)
- That is, incorporate survival / temperature information to determine compliance points, then, survival related to other physical and biological conditions

RAFT decision support tool

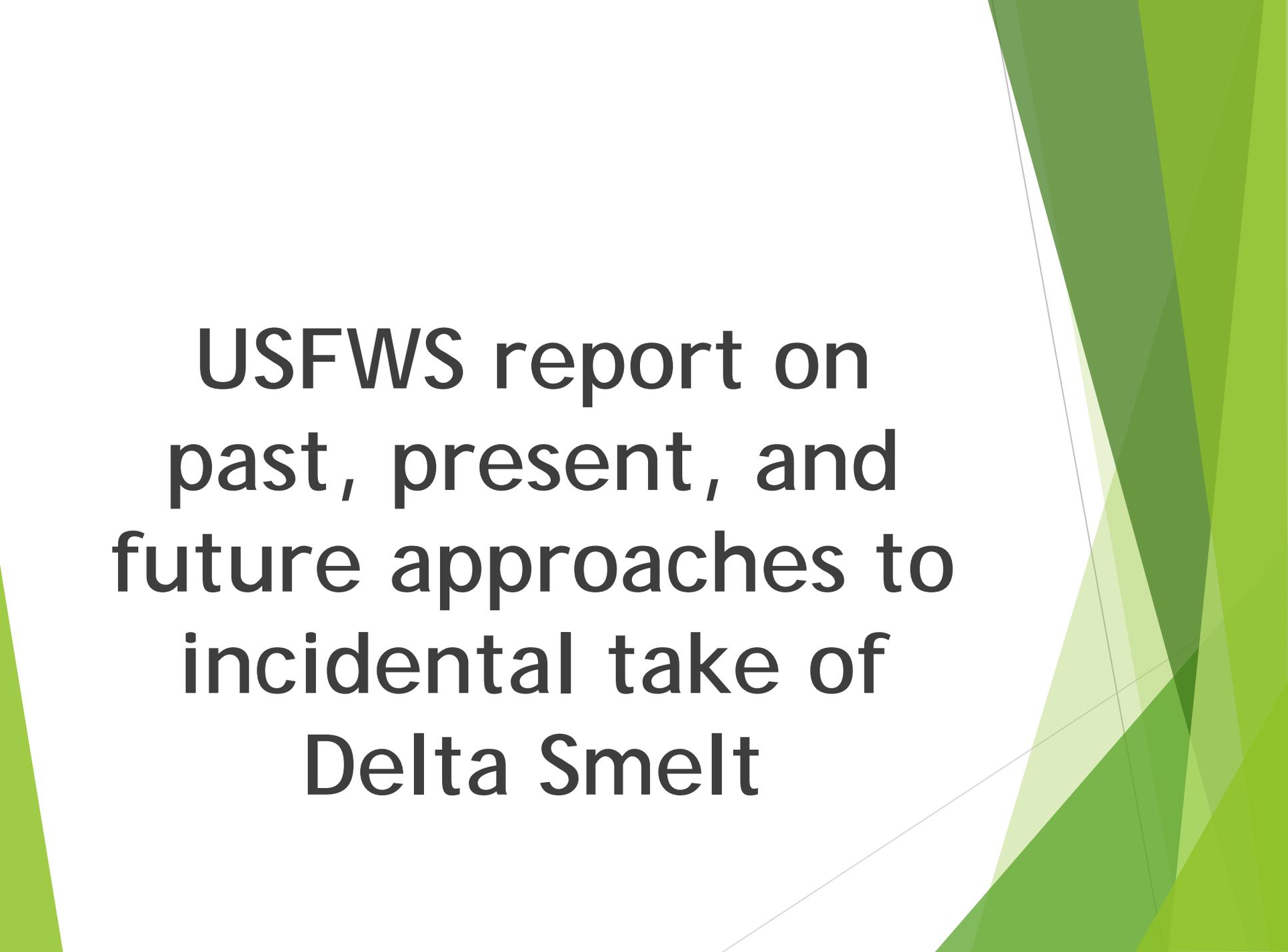
- 25-year historical record as calibration and prediction check - superimpose large-scale climate patterns PDO / ENSO
- “HABITAT” when they really mean “thermal conditions”
- Amount of coldwater habitat - river miles of a certain temperature of water - need more physical habitat / life stage / discharge correlations

- Extending QUAL-2E downstream or RAFT upstream?
Two-dimensional models such as QUAL-2E are appropriate
- Groundwater and hyporheic flow contributions to the system? Unknown - Water balance needs to be created along with assessment of biological need

The background features abstract, overlapping green geometric shapes in various shades of green, ranging from light to dark, creating a modern and dynamic look. The shapes are primarily located on the right and bottom edges of the slide.

Report on enhanced particle tracking modeling

- Validation needed – not convinced that it makes a good prediction
- Although we applaud this first attempt at biological components, do we need to make some different assumptions?
 - Generic predator assumes that predator “pressure” is constant.
 - Fish are not likely to be passively acting particles (but be unrealistic movement speeds).
- Is this model (or any model) fine-grained without making any difference in the management decision or the actual outcome? That is, are the decisions too coarse to reflect the subtleties of the changes in the model?



**USFWS report on
past, present, and
future approaches to
incidental take of
Delta Smelt**

- Problem of sampling marginal areas?
- N=11 Pretty small set of values
 - Propagation of regression error
- Is relationship between Secchi Disc readings (turbidity) and Delta Smelt populations a spurious correlation?



► Implementation of the RPA Actions under dry year conditions based on prior science reviews' questions about RPA implementation

- Adequate for short-term decision making

- Need to address long-range changes to management decisions if the drought-pattern becomes cyclical and predictable ---- The New Normal
 - Well-developed behavioral models incorporated into current models
 - development of water balance
 - compliance that are determined by biota
 - focus on coldwater resources separate from water resources - more rain, less snow
 - Better monitoring of water quality parameters in Shasta

SCHEDULE

- ▶ Finish drafting and send lead author (16 Nov)
- ▶ Lead author incorporates comments and sends first draft to panel (20 Nov)
- ▶ Panel sends comments back to Lead Author (25 Nov)
- ▶ Teleconference? (27 Nov)
- ▶ Lead Author revises, and sends second draft (30 Nov)
- ▶ Panel sends final comments back to Lead Author (4 Dec)
- ▶ Final Panel report sent to Delta Science Program (7 Dec)

QUESTIONS?

