

# Regulatory Perspectives on Modeling Protocols

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# Overview

- State Water Board and Water Resource Modeling
- Case Studies
  - Water Quality Control Planning
    - Sacramento Water Allocation Model (SacWAM)
  - Water Right Curtailments
    - 2012-2016 Water Rights Drought Effort Review (WARDER)
    - 2021-2023 Water Unavailability Methodology
- Reflections and Closing Thoughts

# State Water Board and Water Resource Modeling

- User and Consumer of Models and Model Studies
  - Develop and apply models for planning and implementation
    - Water Quality Control Planning
    - Compliance methods for flow objectives
    - Total Maximum Daily Loads
  - Interpret model studies by others
    - Water right permitting, petitions
    - Water quality certifications
    - CEQA/NEPA document review and comment
    - Implementation of water right terms (e.g., Water Right Order 90-5)
  - Administer water rights in times of shortage
    - Term 91
    - Water right curtailments pursuant to emergency regulations

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# Sacramento Water Allocation Model (SacWAM)

- Hydrology and operations model developed for Sacramento/Delta Bay-Delta Plan Update
  - Model domain: Sacramento River Watershed, Delta Eastside Tributaries, and Delta
  - Represents major Central Valley Project and State Water Project tributaries and infrastructure, and **non-Project tributaries**
- Extension of Central Valley WEAP Model
- Developed in collaboration with Stockholm Environment Institute and Stantec

# SacWAM Development Timeline

- Initiated development: 2013
- Beta release and peer review: Fall, 2016
- Peer review response and version 1.0 release: Fall, 2017
- Scenario development: Fall, 2017 – Fall 2019
- Release version 1.2, including proposed Voluntary Agreement and percent unimpaired scenarios: Fall, 2019
- Next release to accompany Staff Report for the Sacramento/Delta Bay-Delta Plan Update, later this year

# SacWAM Stakeholder Engagement

- Fall 2016
  - **Documentation**
  - Workshop and training accompanying beta release
  - Peer review public workshop
- Fall 2017
  - Peer review response
  - Revised **documentation**
- Fall 2019
  - Meetings with stakeholder staff and consultants, before and after release
  - **Documentation**
  - Public webinar
  - Release of postprocessing spreadsheet tool
    - CalSim II scenario results
    - Historical data
    - Performance metrics

# Water Right Curtailments

- Water Rights Drought Effort Review (WARDER)
  - Initiated June, 2020 by Division of Water Rights and Office of Public Participation
  - Reviewed performance of Division of Water Rights during 2012-2016 drought
  - Solicited input in 23 interviews of diverse stakeholders
  - Draft report and Board meeting presentation February, 2021
  - Major relevant messages:
    - Improve communication
    - Improve data reliability
    - Improve collaboration



# Water Unavailability Methodology for the Sacramento-San Joaquin Delta Watershed

- Built on WARDER recommendations
  - Prioritized QA/QC of reported diversion data
    - SB-88 compliance insufficient
    - Had to rely on user-submitted reporting data
  - Used hydrologic forecast products from Department of Water Resources and California Nevada River Forecast Center
    - Consulted with staff to understand appropriate use of forecast data
    - Supplemented with analysis of historical data to address 2012-2016 lessons learned
  - Web resources for visualization and curtailment status
  - Frequent engagement with stakeholders:
    - Draft methodology revisions
    - Public meetings (Nine public workshops, April 2021 – March 2023)
    - Public archive of curtailment analyses
    - Individual meetings
    - Telephone and email inquiries

# Reflections and Closing Thoughts

- Regulatory decisions affect public resources, communities, and livelihoods
  - Robust public processes improves transparency and credibility
  - Public process does improve reliability
  - Decisions must be made in light of imperfect information
- Future revisions to protocols
  - Greater emphasis of software engineering principles, including **version control** and **testing**

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[https://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/sacwam/](https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/sacwam/)

[https://www.waterboards.ca.gov/drought/drought\\_tools\\_methods/delta\\_method.html](https://www.waterboards.ca.gov/drought/drought_tools_methods/delta_method.html)