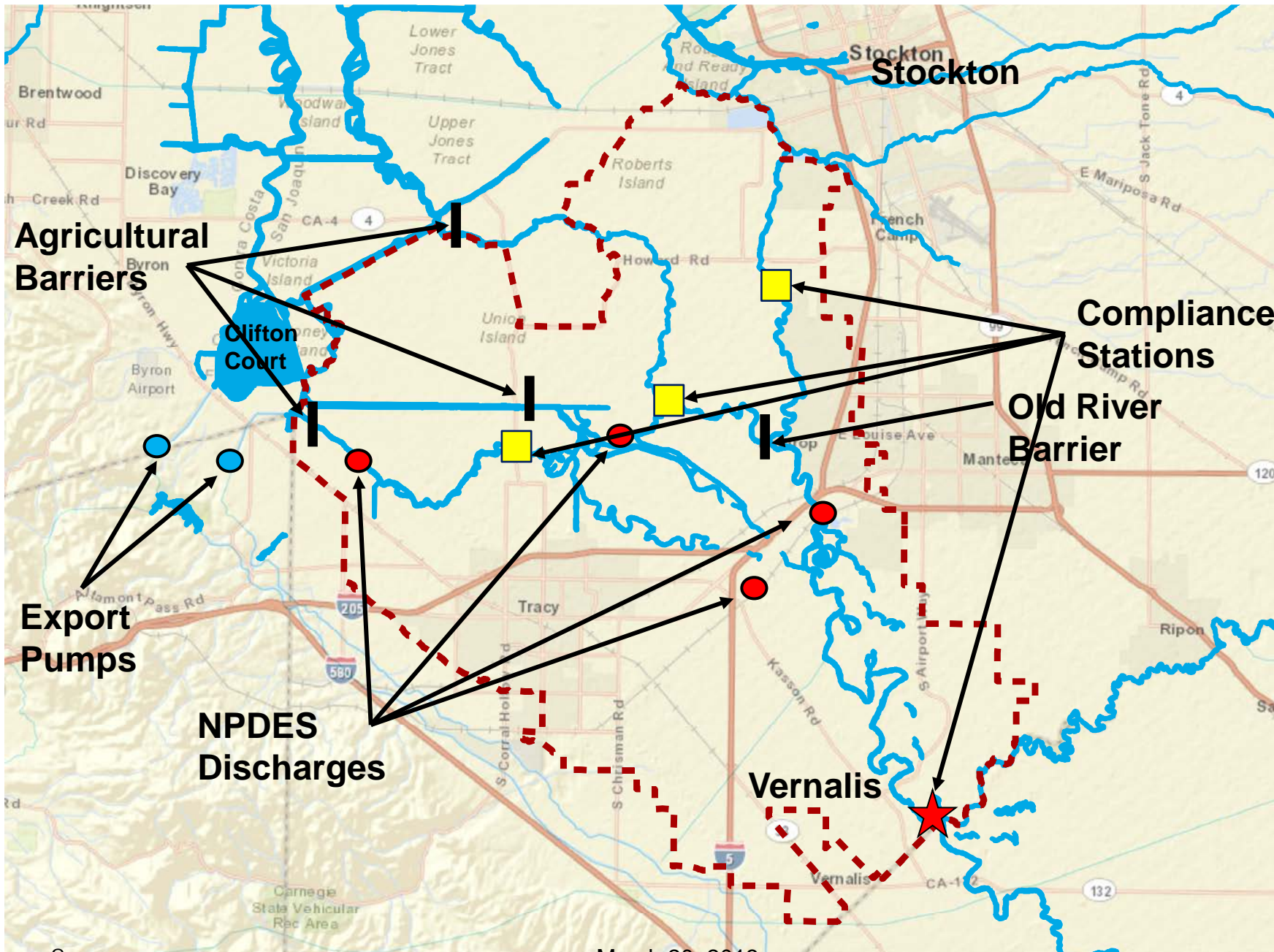


Southern Delta Water Quality (SDWQ) Objectives and Program of Implementation

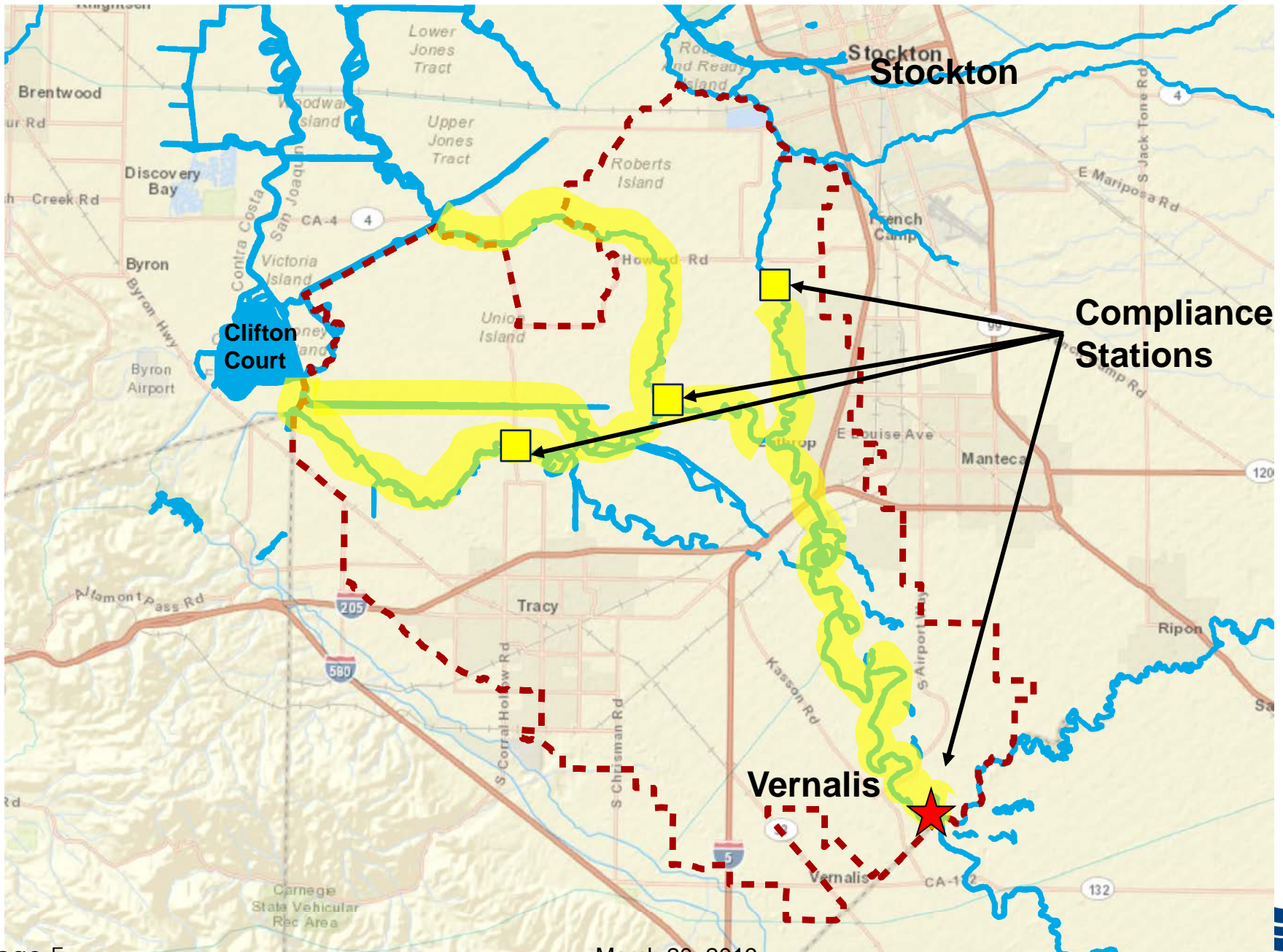


Soil Water Salinity and Crop Yields

- Study performed by Dr. Glenn Hoffman
 - Current salinity levels suitable for all crops
 - Existing leaching between 0.21 and 0.27
 - Steady-state modeling approach
 - Dry bean yields:
 - no impacts at $EC=1.0$ dS/m with leaching > 0.20
 - 5% yield loss with low rainfall at leaching = 0.15
 - Suggested additional studies

SDWQ Alternatives

- Alternative #1 – No Project
- Alternative #2 – 1.0 dS/m as 30-day average of daily maximum EC in all months
- Alternative #3 – 1.4 dS/m as 30-day average of daily maximum EC in all months



SDWQ Objectives – Program of Implementation

- USBR: compliance with 0.7 dS/m (April -August) and 1.0 dS/m (September – March)
- USBR and DWR:
 - comprehensive operations plan
 - field and modeling studies
 - monitoring and reporting protocol
 - continued temporary barrier operation
- Consideration of future CV-SALTS findings
- Continued implementation of salinity programs from Central Valley Water Board and other agencies

Draft Substitute Environmental Document (SED)

Environmental and Economic Impact Analysis

Impact Evaluation in SED

■ Environmental Impacts

- Water supply/quality & hydrology
- Flooding, sediment and erosion
- Aquatic resources
- Terrestrial biological resources
- Groundwater
- Recreational
- Agricultural
- Cultural
- Service providers
- Energy resources and climate change

■ Economic Impacts

■ Other Analysis

Flow Objective and Program of Implementation (POI) Impacts

■ River Flow

Aquatic, Terrestrial, Water Quality, Flooding & Erosion

■ Surface Water Diversions

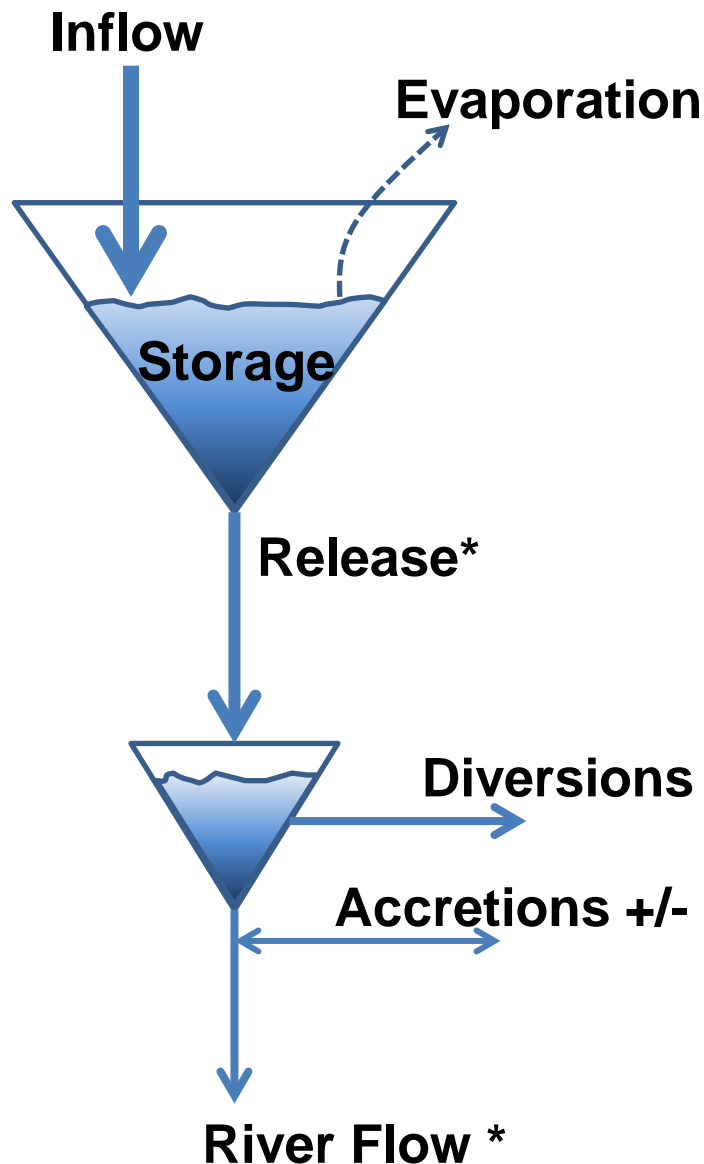
Direct: Agriculture, Service Providers

Indirect: Groundwater, Energy, Greenhouse Gases

■ Reservoir Storage

Hydropower, Water Quality, Recreation, and Cultural

Water Supply Effects Model



Inflow, Evaporation, Accretions +/-
= same as CALSIM across 82 years

River Flow
= % unimpaired flow requirements
(within min. & max. limits)

Storage and Divisions
= adjusted to meet % unimpaired
flow requirements plus accretions

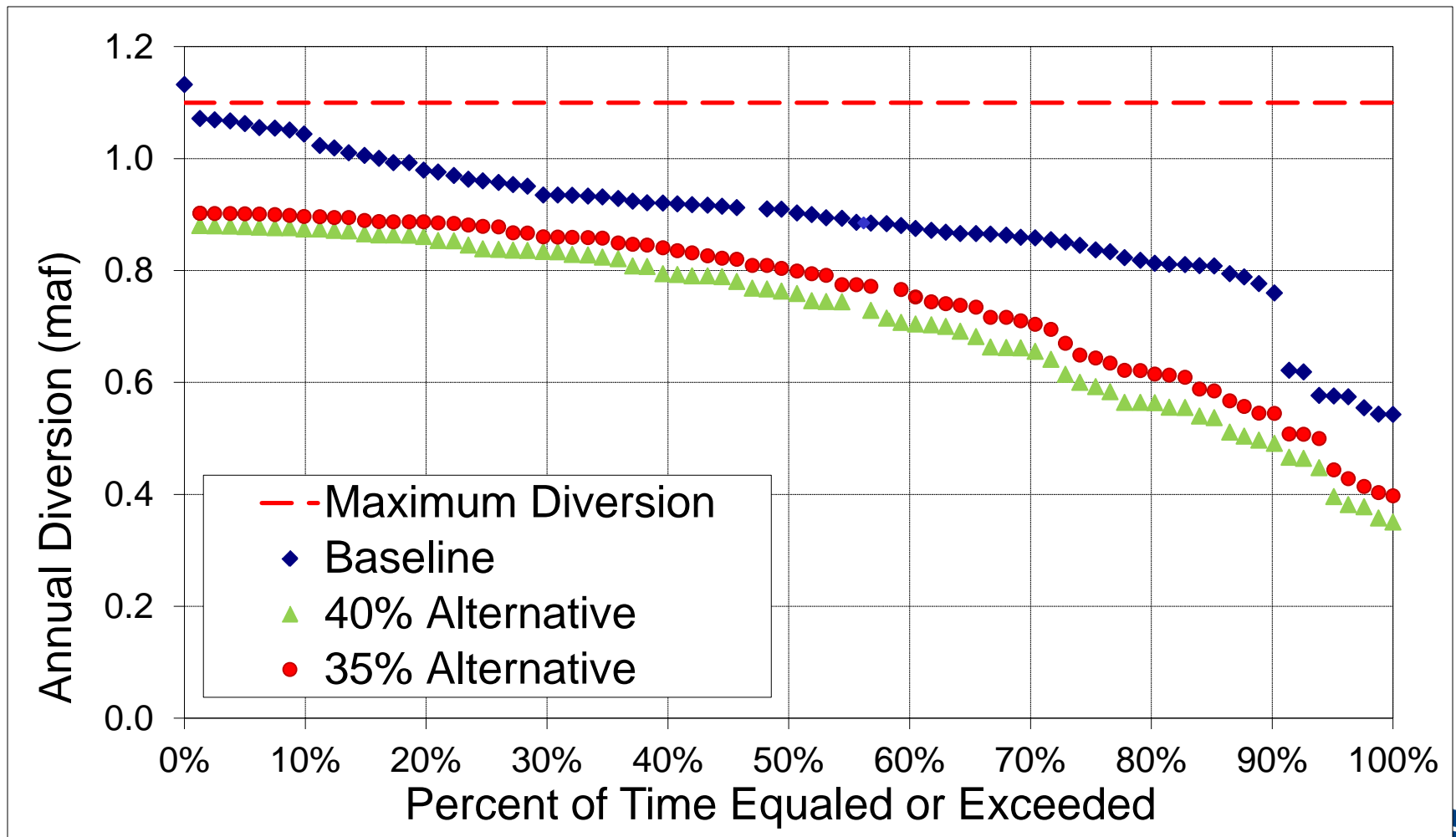
Release
= difference between Inflow and
change in Storage, less Evaporation

** Includes any additional reservoir releases
needed to evacuate flood control space*

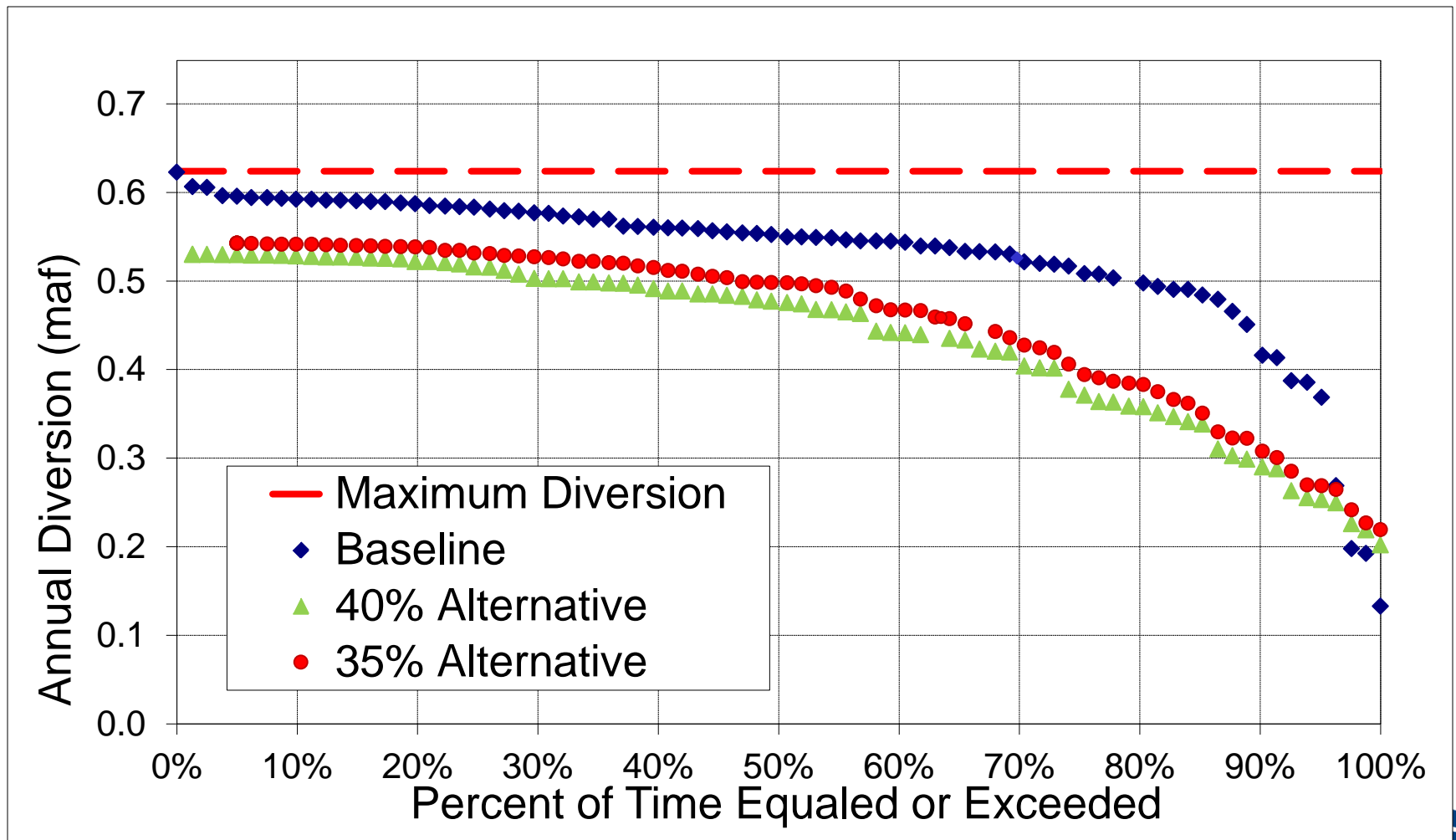
Agricultural Resource and Economic Impacts

1. Surface water diversion reduction estimates from WSE model.
2. Cropping patterns and acreage/revenue reduction estimates from SWAP model.
3. Indirect impacts on regional economy from the IMPLAN model.

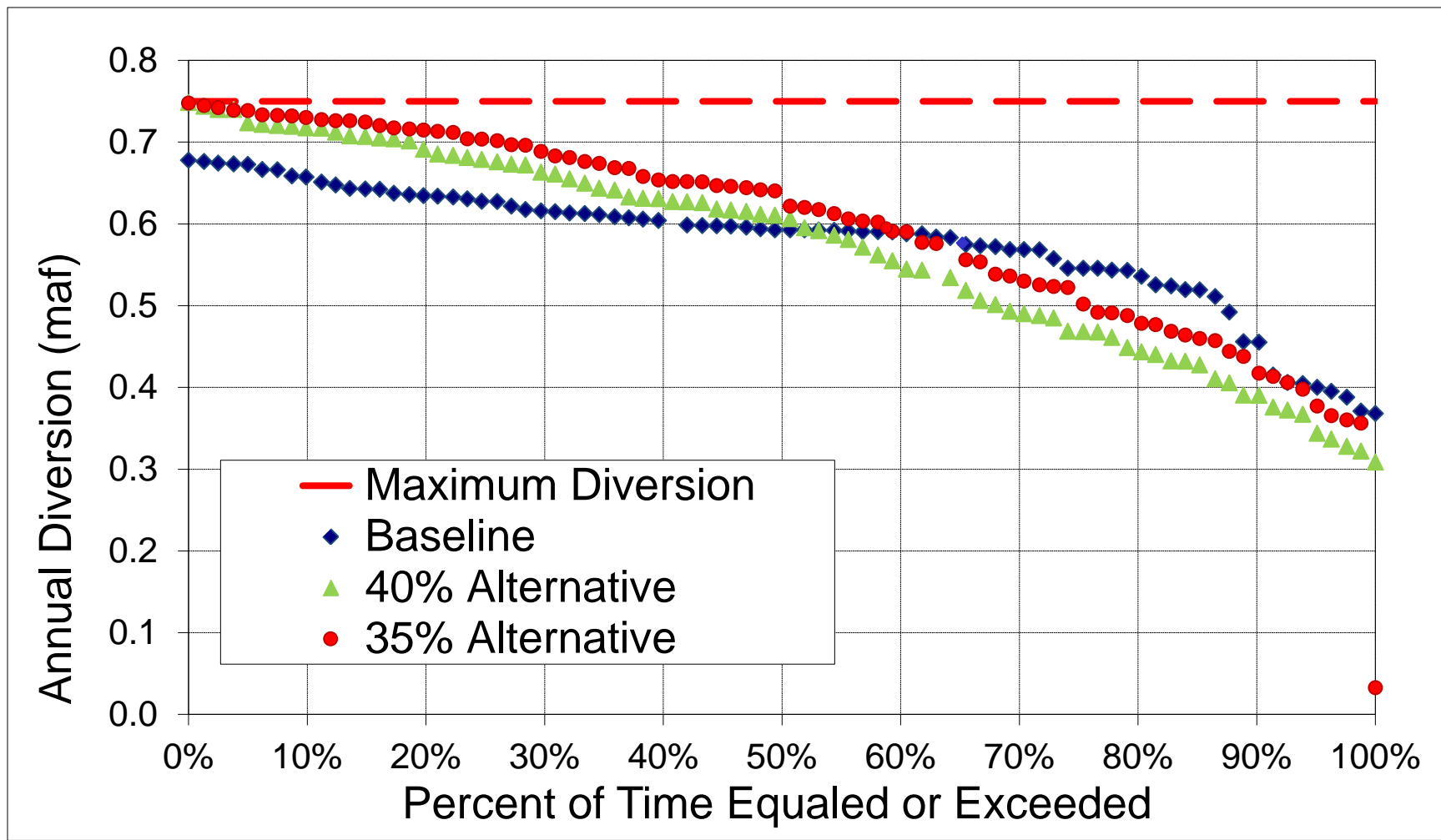
Tuolumne River Surface Water Diversion Reductions



Merced River Surface Water Diversion Reductions



Stanislaus River Surface Water Diversion Reductions



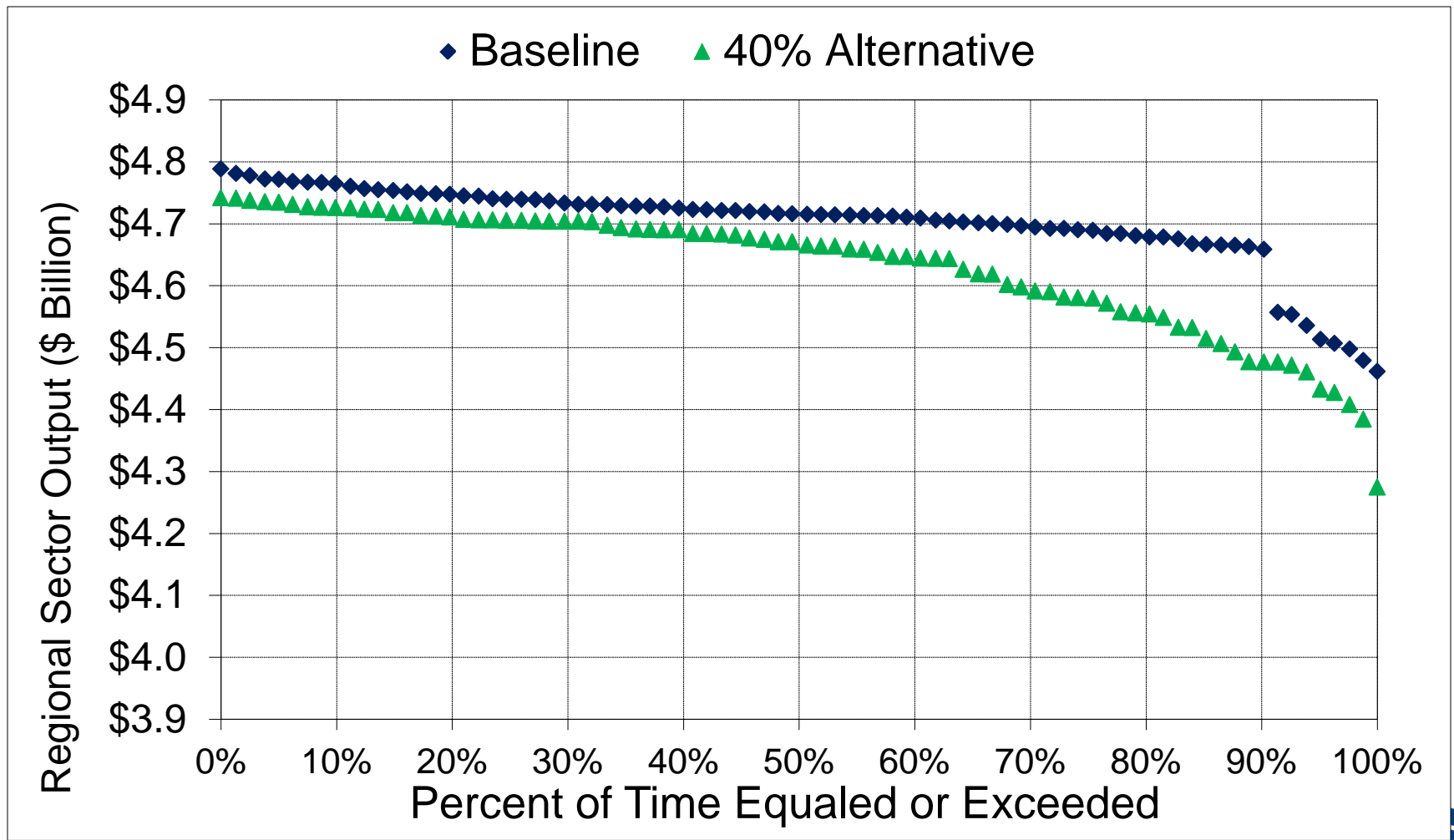
2. Statewide Agricultural Production (SWAP) Model

- Simulates decisions of farmers at regional level based on maximizing profit
- Developed at UC Davis, and used in several policy analysis projects
- Estimates shift in crop acreages and revenue
- *Assumes no increase in groundwater pumping to replace reduced diversions*

3. Regional Economic Impacts – IMPLAN Modeling

- Impact Analysis for Planning (IMPLAN) model version 3.0 (2009)
- Indirect and induced effects including jobs
- Widely used for economic analysis by government agencies (including D-1641)

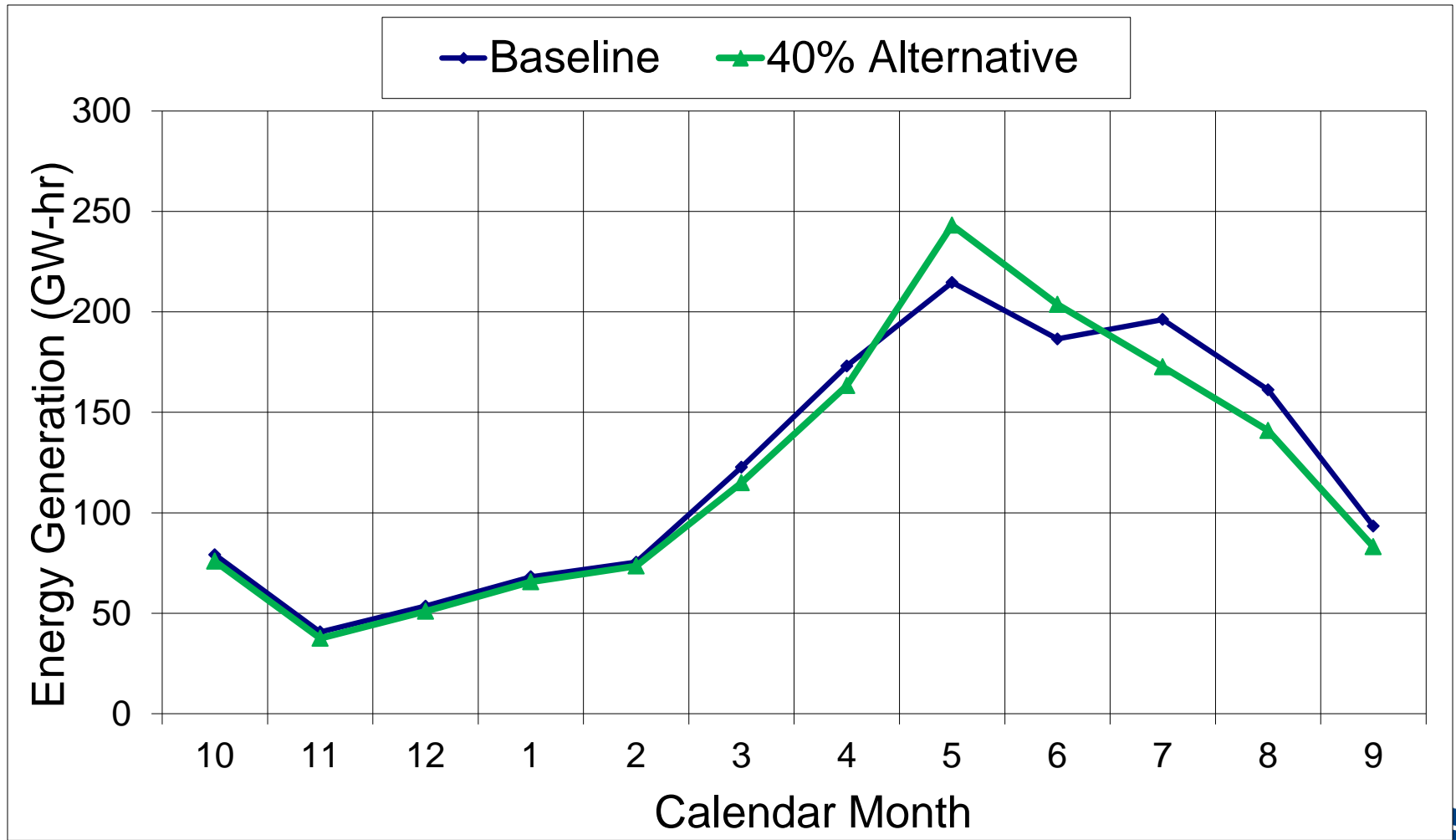
Total Agriculture Related Economic Activity



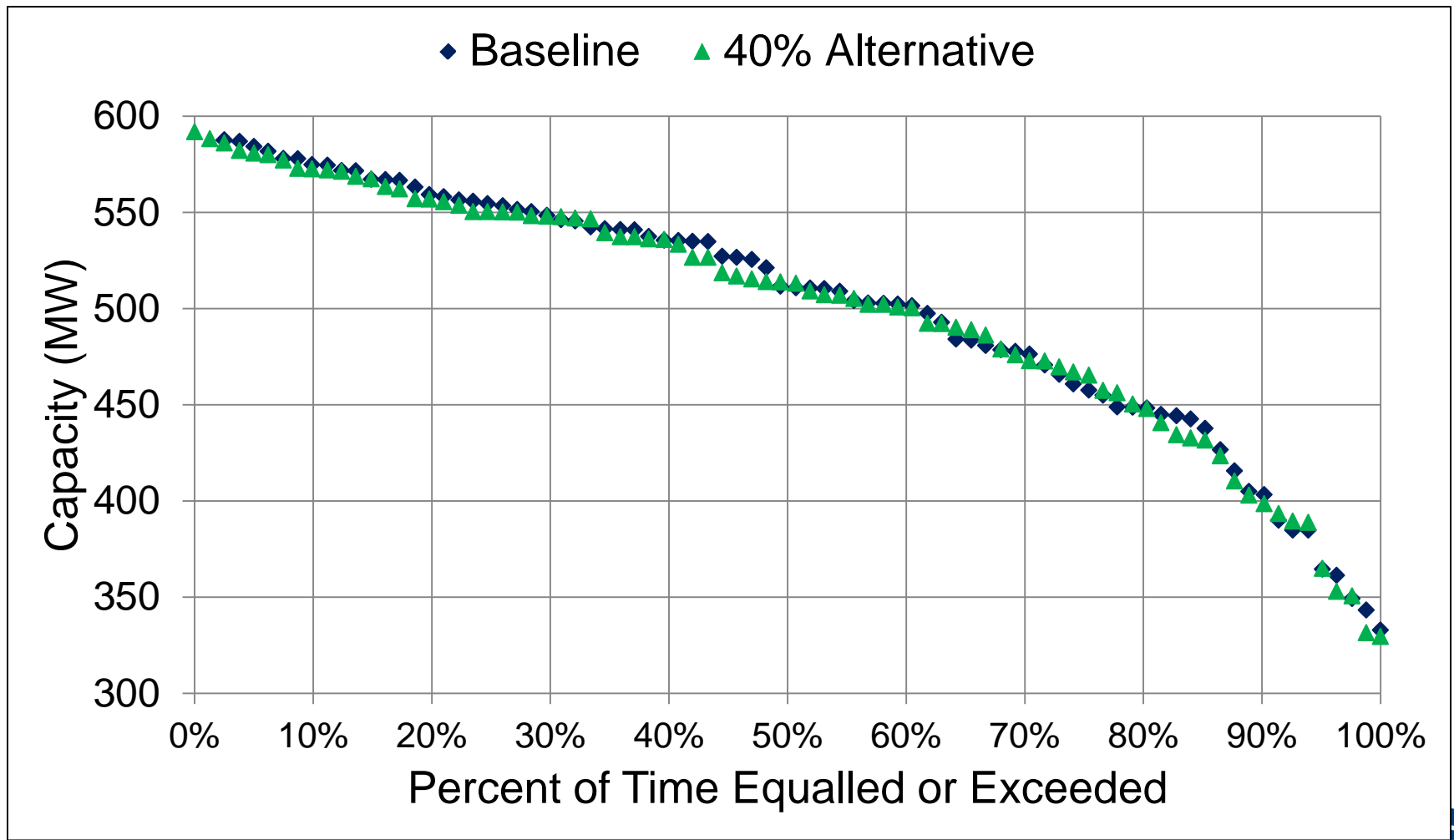
Hydropower Impacts

- Flow objectives have potential to:
 - Shift of more flow from summer to spring
 - Change reservoir elevations
- Potentially impacting:
 - Shift in timing and amount of hydropower
 - Hydropower revenues
 - Greenhouse gas emissions
 - Generating capacity and grid reliability

Monthly Hydropower Generation



Hydropower Generating Capacity In July



Groundwater Impacts

- Assumes groundwater pumping will make up for surface water diversion reductions
- Potential impacts on:
 - Groundwater aquifer
 - Greenhouse gas emissions

Service Provider Impacts

- Due to potential reductions in available surface water diversions
- Impact to local municipal and agricultural suppliers on Tuolumne and Merced Rivers
- Less than significant impact to:
 - City and County of San Francisco diversion
 - CVP and SWP exports

SDWQ Impacts Analysis

- Environment generally not impacted
 - No change in USBR requirements at Vernalis
 - Reduced municipal salinity loading
 - Various upstream salinity reduction efforts
- Significant impact on local municipal WWTP dischargers

Final SED

- Formal written comments due March 29th
- Recirculation if/as necessary
- Draft Final SED later in 2013
- Board consideration