Drought Impacts on Surface Waters and POTWs

Ken Landau

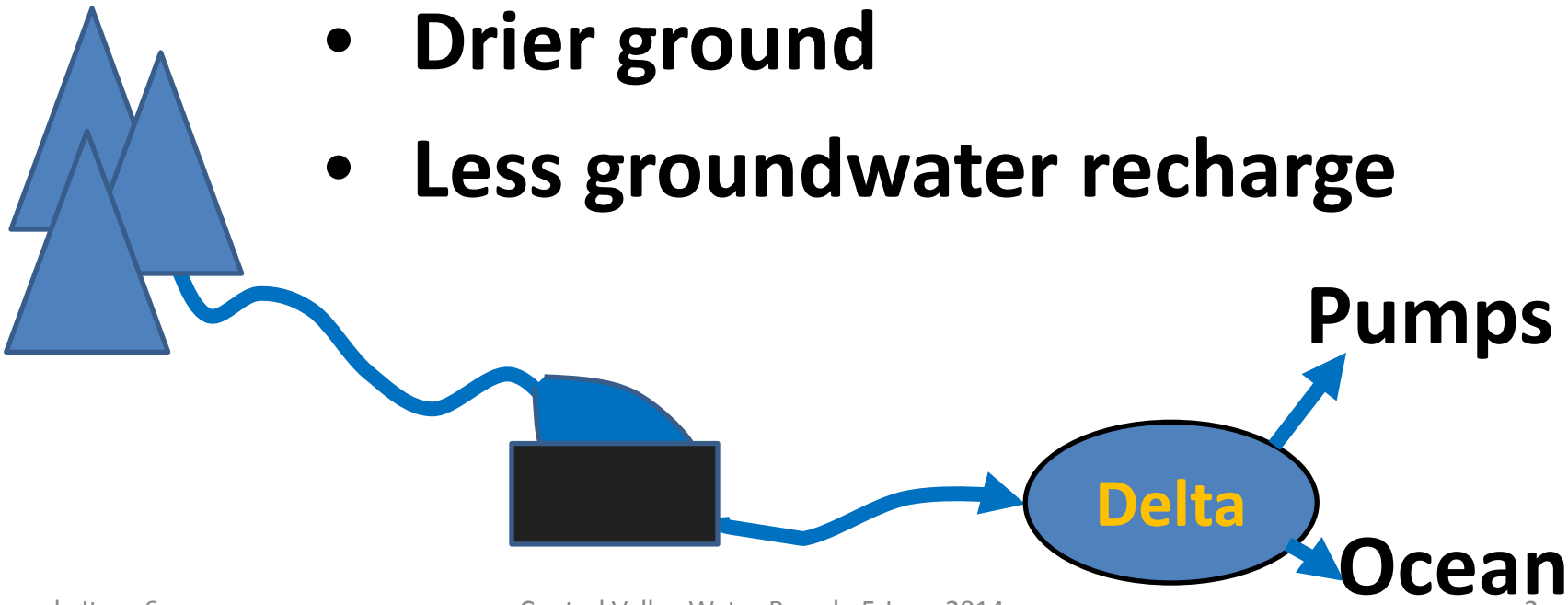
Assistant Executive Officer

Rancho Cordova Office

Surface Water Impacts

Less Precipitation

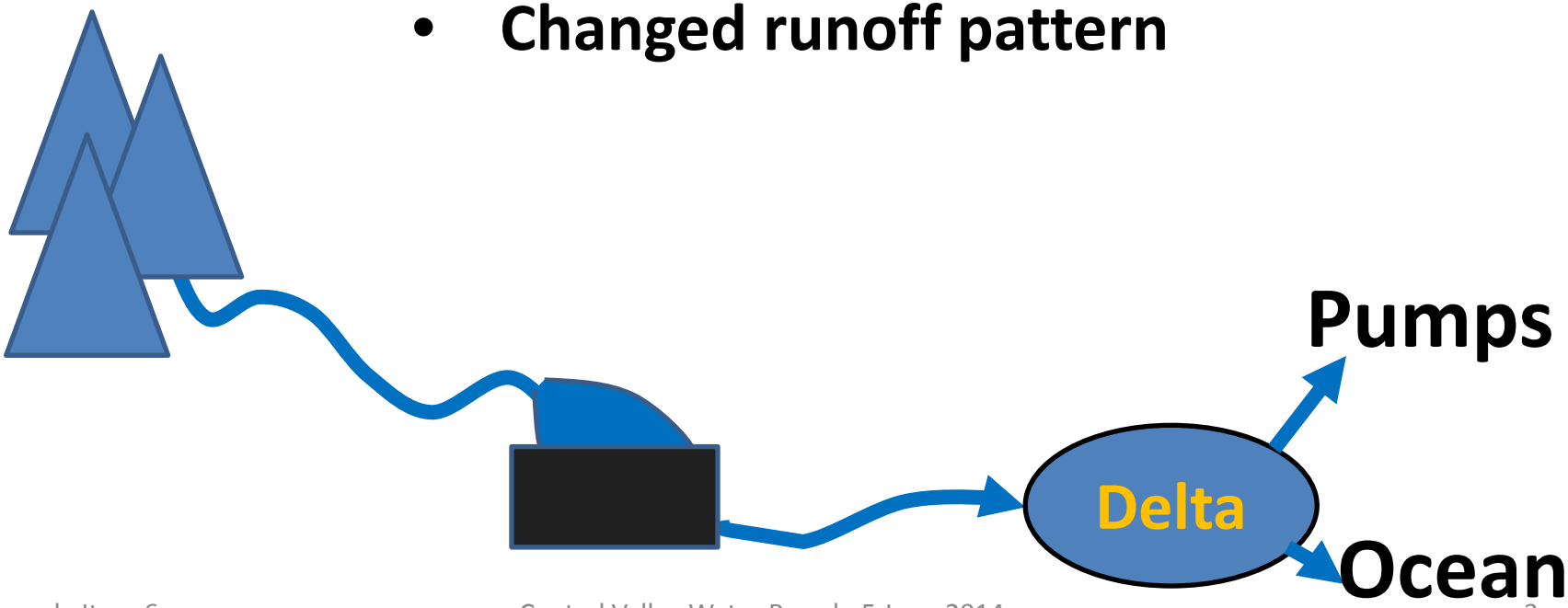
- **Lower river flows**
- **Lower lake/reservoir levels**
- **Drier ground**
- **Less groundwater recharge**



Surface Water Impacts

Less snow

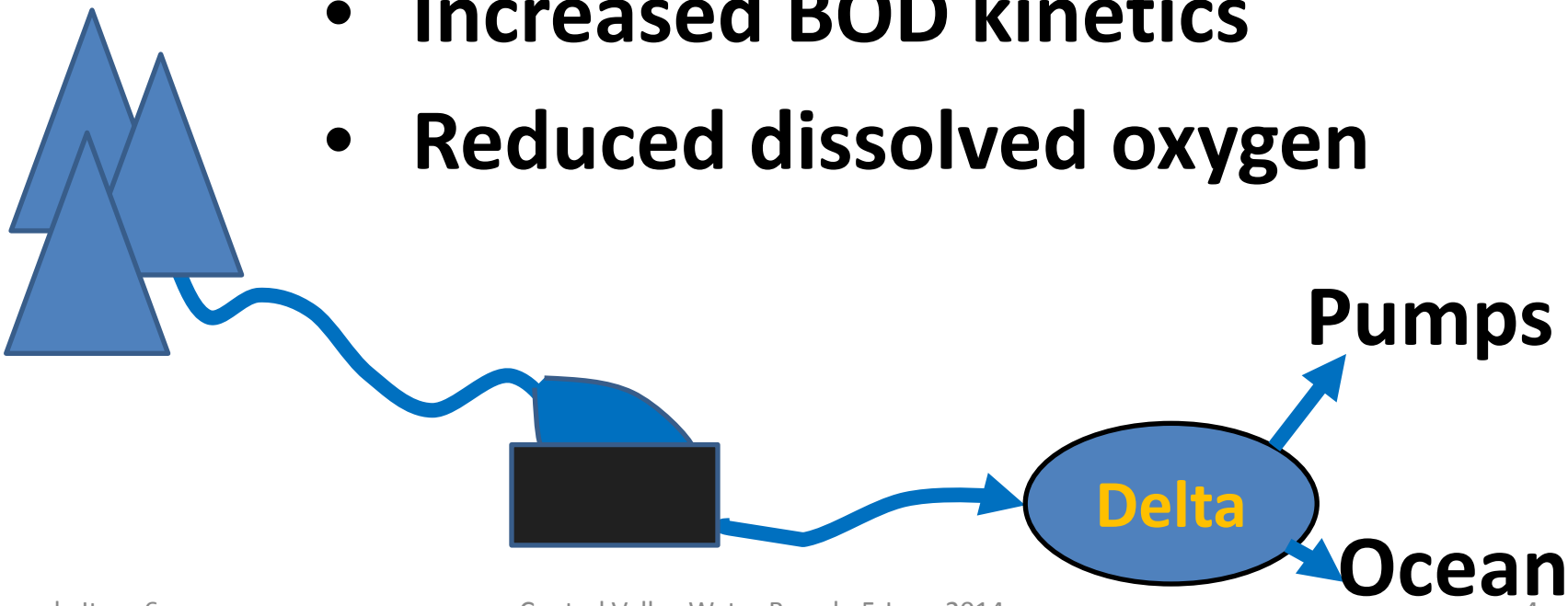
- **Warmer rivers / lakes**
- **Loss of seasonal storage**
  - **Changed runoff pattern**



Surface Water Impacts

Warmer waters

- **Hard on cold-water fish**
- **Reduced DO saturation**
- **Increased BOD kinetics**
- **Reduced dissolved oxygen**

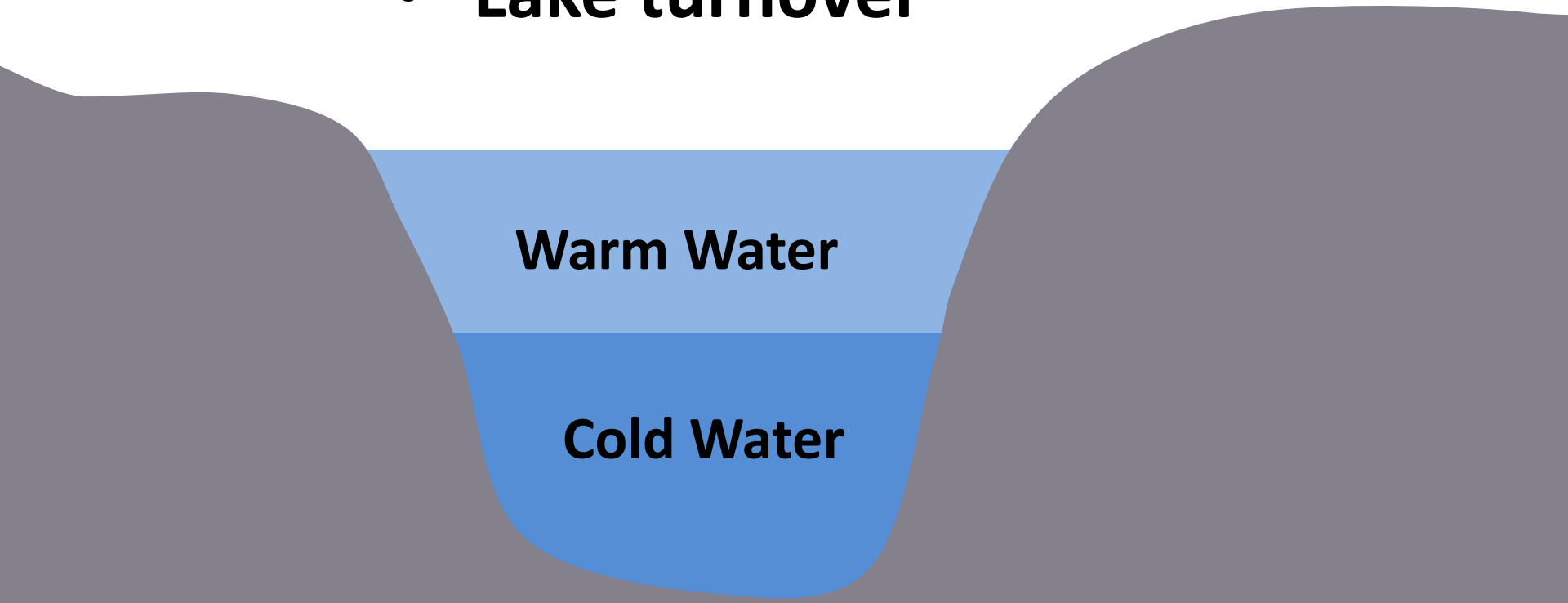


Lower lakes / reservoirs

- **Bath tub ring**
  - **Increased erosion**
  - **Increased mercury methylation when refilled**

Lower lakes / reservoirs

- **Cold water pool**
- **Lake turnover**



Lower lakes / reservoirs

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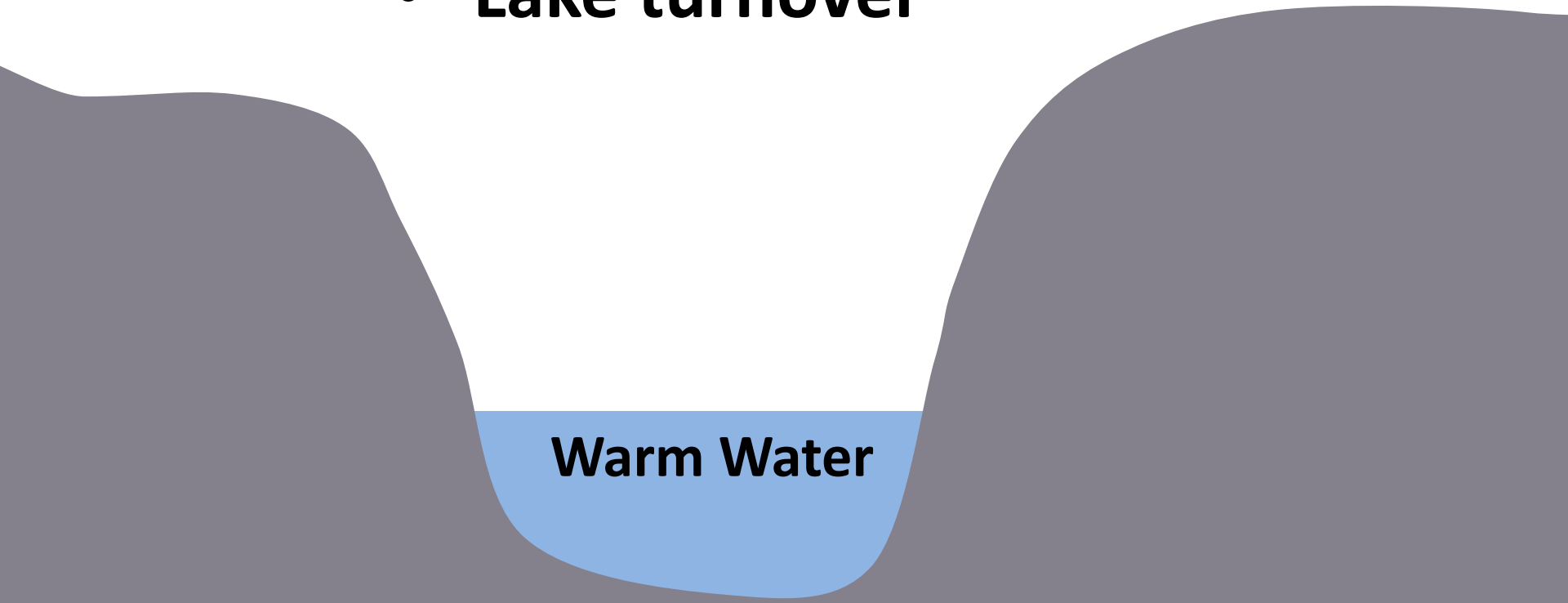

Lower lakes / reservoirs

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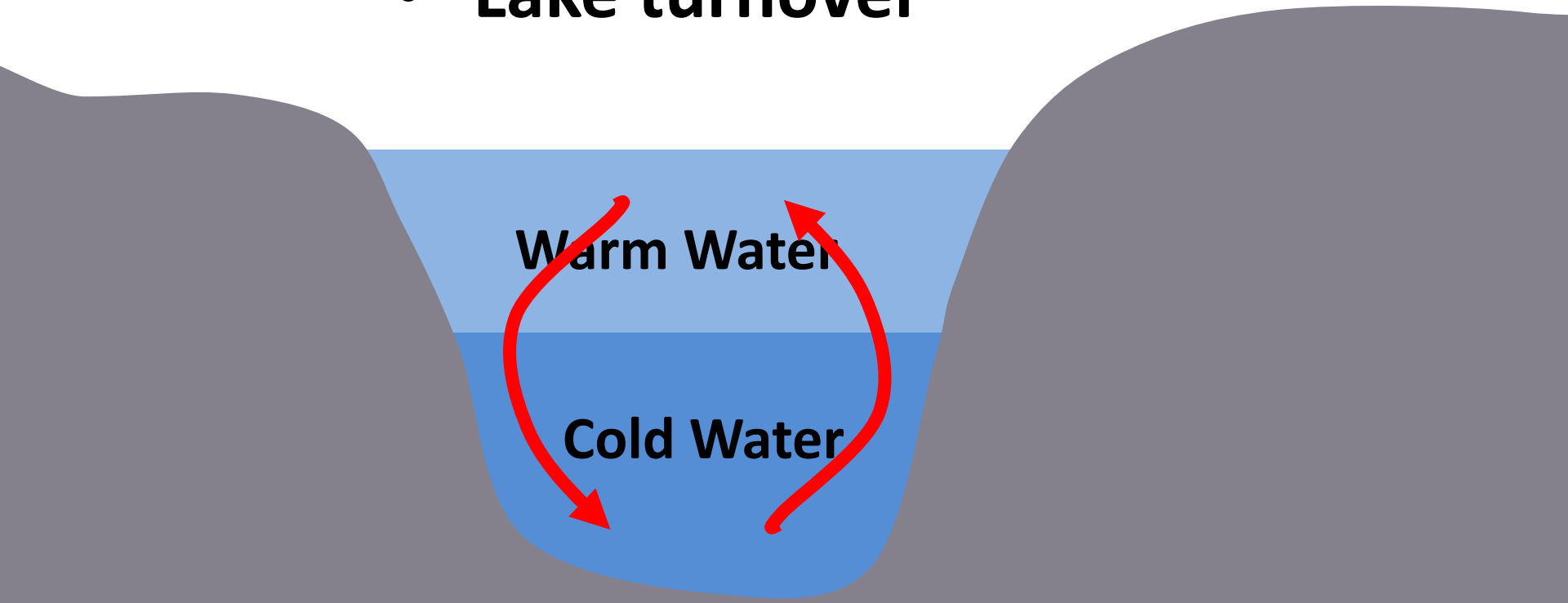


Why are we worried about erosion?

- Sediment deposits
  - Change stream bottoms
  - Increase stream turbidity
  - Carry pollutants – metals, pesticides, nutrients
- Harder for vegetation to grow

Surface Water Impacts

Economic Impacts

- **Less / poorer water supply**
  - **Fallow land, jobs**
- **Less hydropower production**
- **Reduced recreation**
  - **Fishing, skiing, boating, hiking**
  - **Motels, grocers, rentals, jobs**

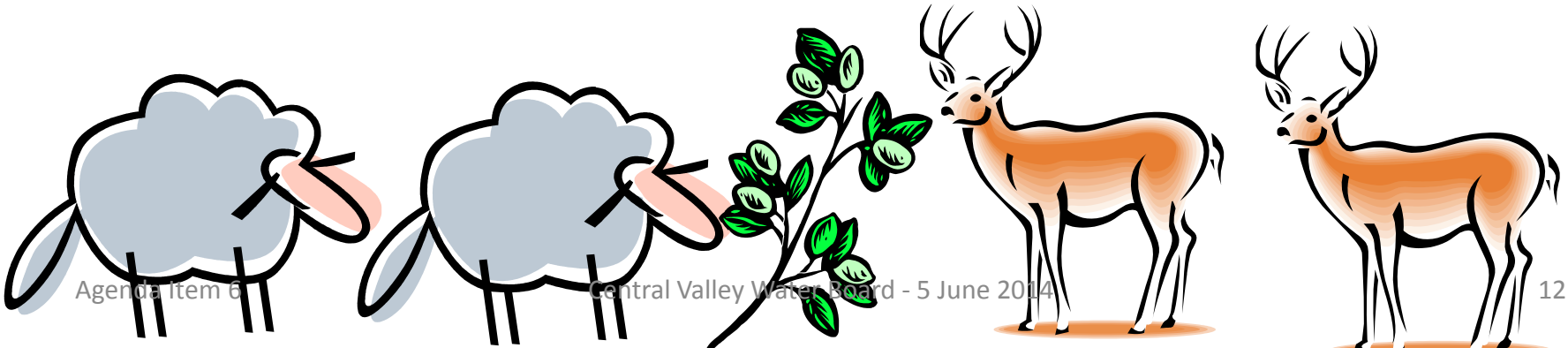
Timber

Increased wild fires

- **Reduced vegetation**
  - **May destroy top soil**
- **Erosion**
- **Toxic runoff**
- **Staff response to fires**

Reduced vegetation

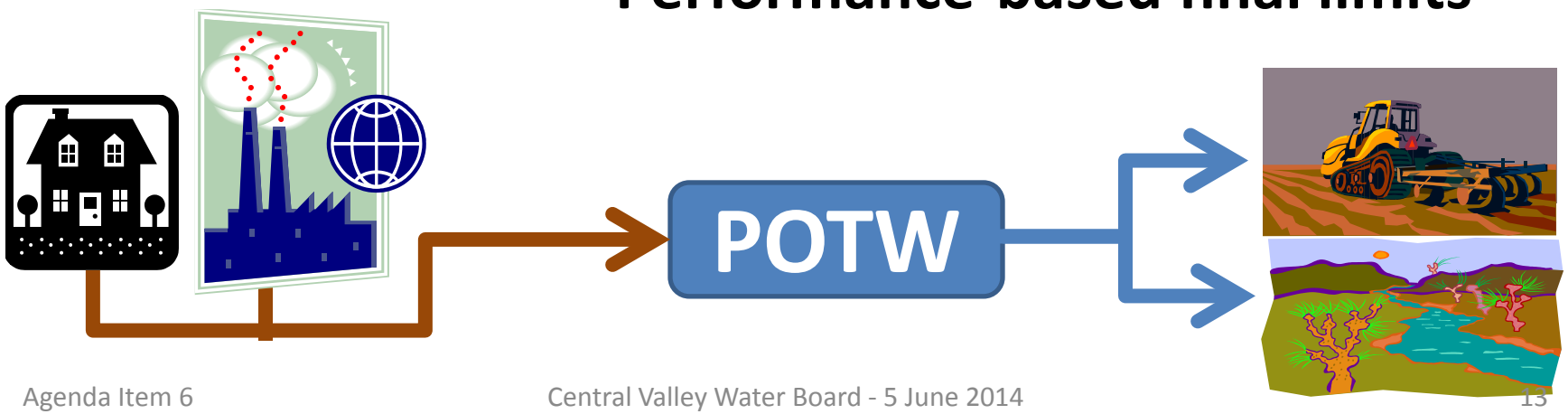
- **Reduced forage**
  - **Over grazing**
- **Increased wind and rain erosion**
- **Higher peak runoff / floods**
- **Warmer runoff**
- **Reduced infiltration**



POTW Impacts

Conservation / Reduced Flow

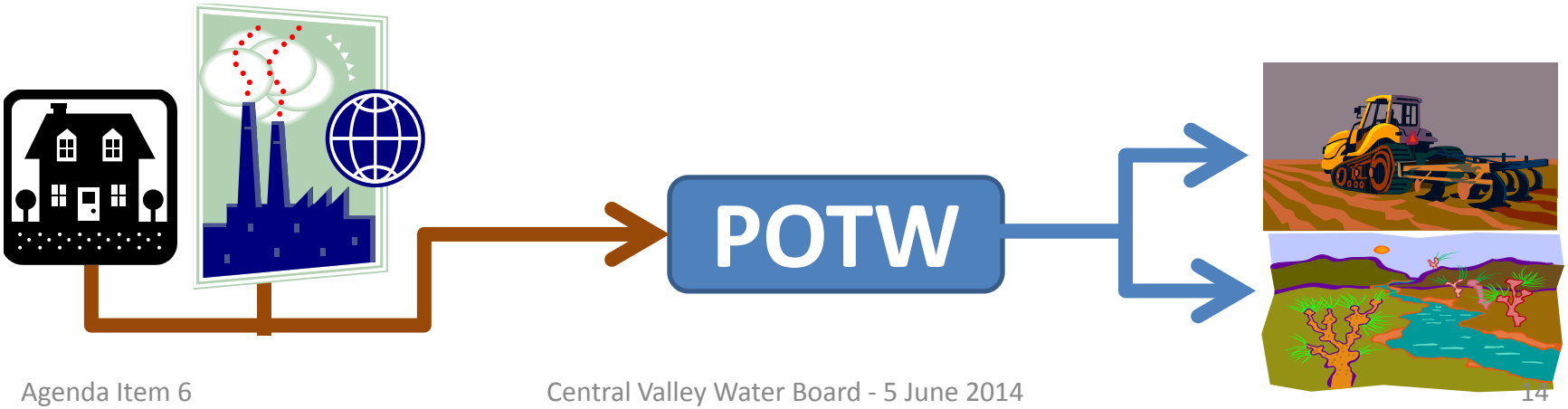
- **More concentrated effluent**
  - **Potential effluent violations**
  - **Possible Permit changes**
    - **Interim effluent limits**
    - **Performance-based final limits**



POTW Impacts

Water supply changes

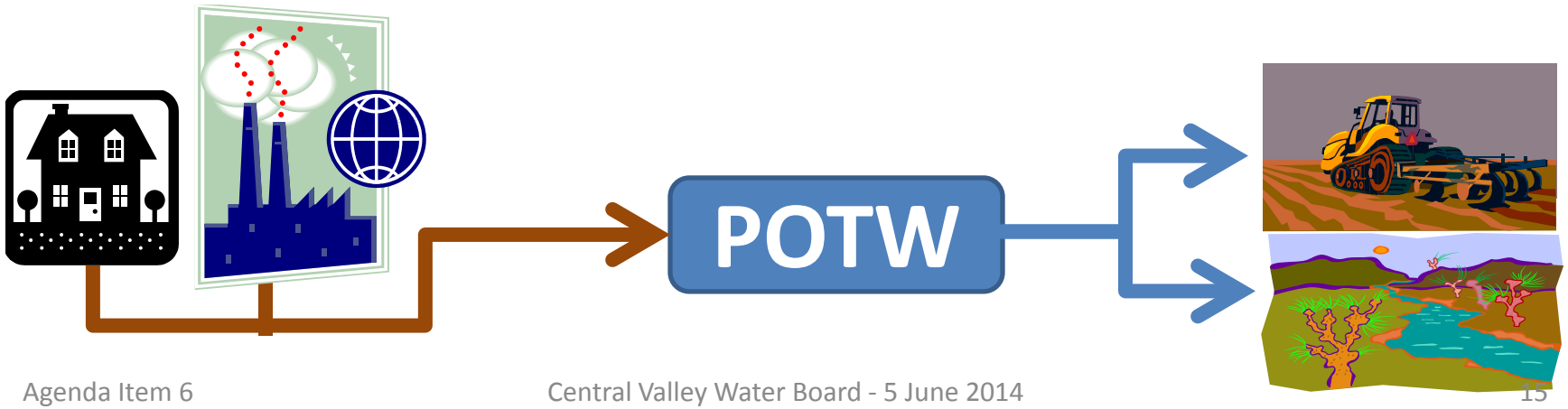
- **Shift to ground water**
- **Poorer quality wells in use**
- **More salt and trace metals**



POTW Impacts

Lower wastewater flows

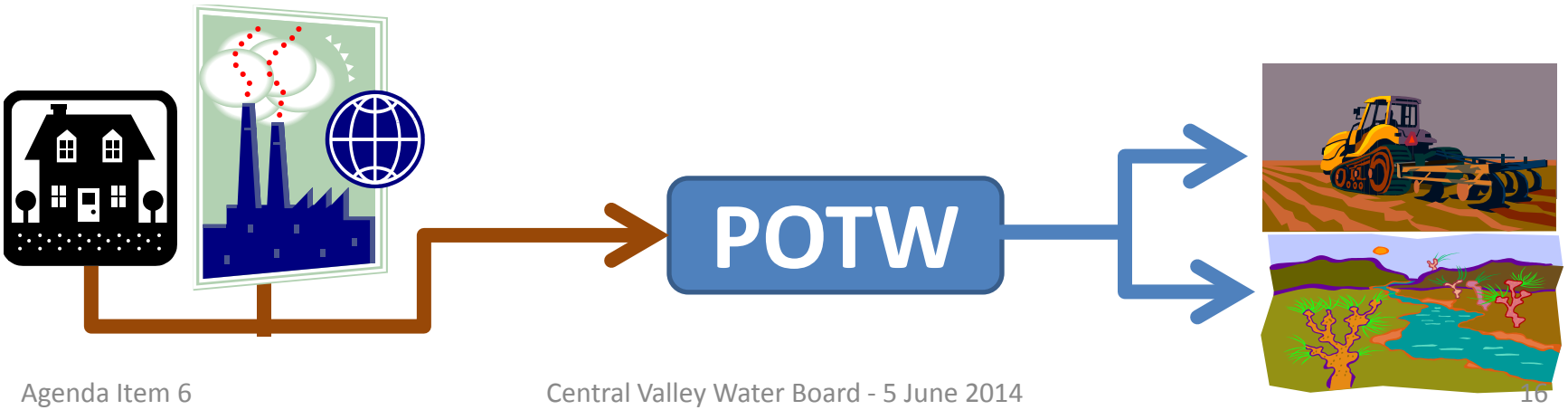
- **Reduced overflow risk for land disposal**
- **Reduced dilution for NPDES**
  - **May change dilution for future permits**



POTW Impacts

Increased demand for recycled water

- **State Board recycle Gen. WDRs**
- **Enforcement discretion**
- **Clean Water Act**
- **Cal. Wat. Section 1211**



Irrigated Lands

Reduced supply – fewer crops

- **Fallow land – increased erosion**
- **Lower ILRP fees**
- **Delayed Rice submittal alternative**

Urban Runoff

Less rain – less runoff

- **Best water quality at monitored ocean beaches in years**

Impacts on Water Board

- Continued work with Water Rights
- Increased post-fire response
- Increased recycling
  - Project reviews, WDRs, construction stormwater, WQ Certs
- Permit modifications
  - Consider relaxing limits, IF POSSIBLE
  - More stringent effluent limits

Possible permit modifications

- More concentrated effluent – more limits
- Lower river flows – less dilution available
  - More stringent effluent limits
- Higher background concentrations in rivers
  - Less assimilative capacity available
  - More stringent effluent limits
- Effluent cooling could become common
- Major WWTP upgrades could be needed

Questions?

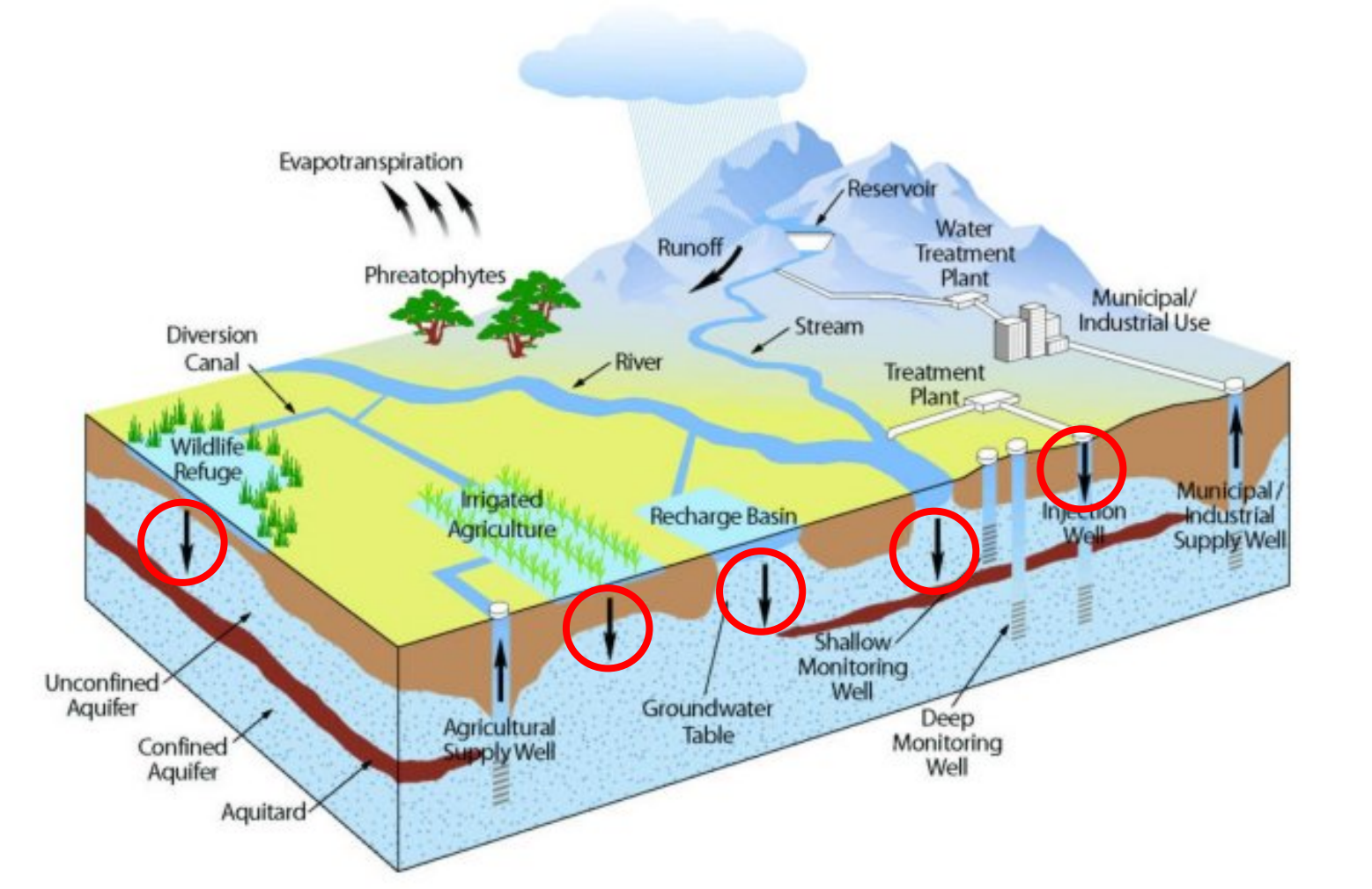
DROUGHT, GROUNDWATER, AND PERMITTED DISCHARGERS

Clay Rodgers
Assistant Executive Officer

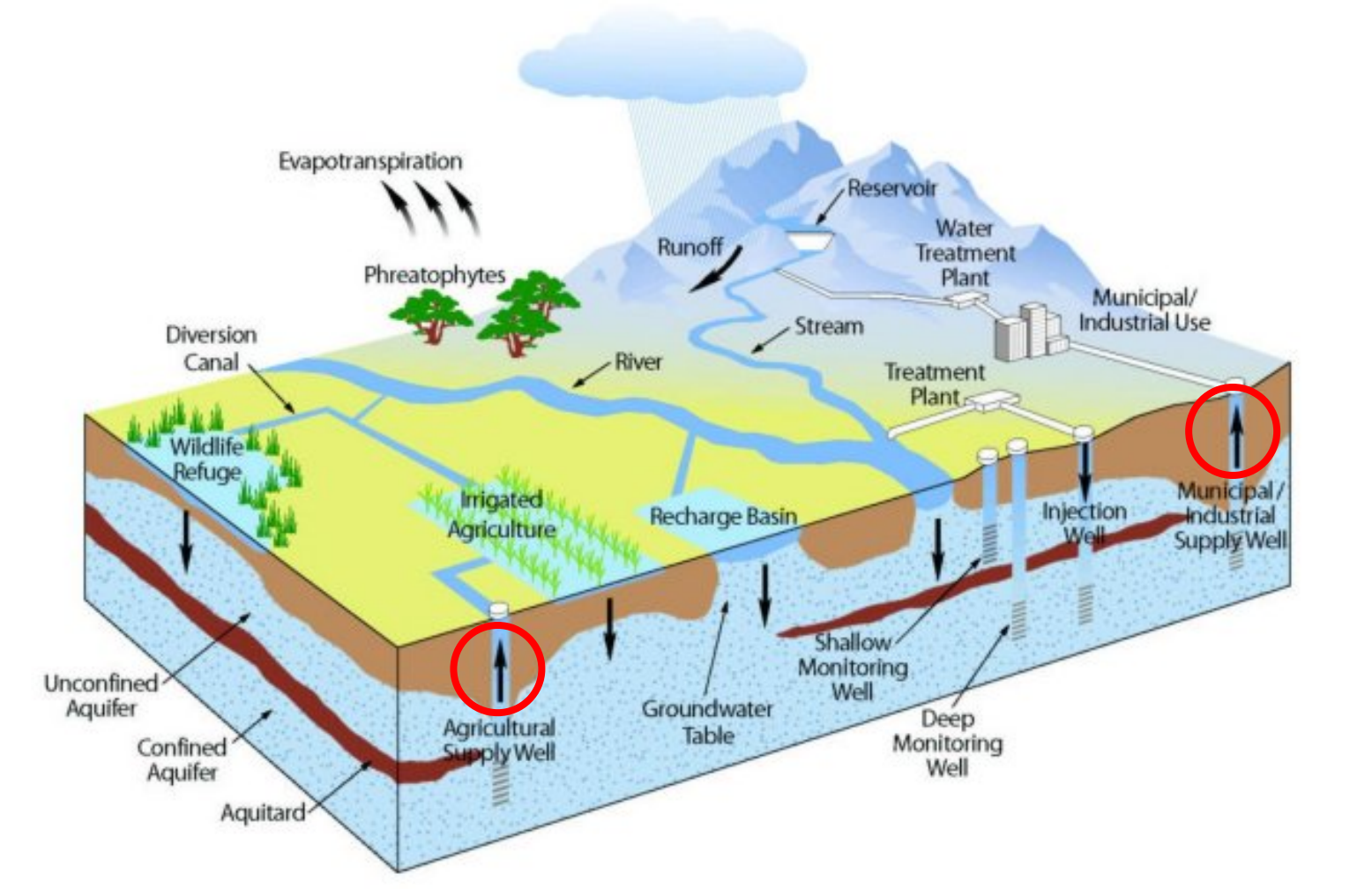
Presentation Overview

- Groundwater Cycle
- Potential Impacts (short & long term)

Groundwater Cycle

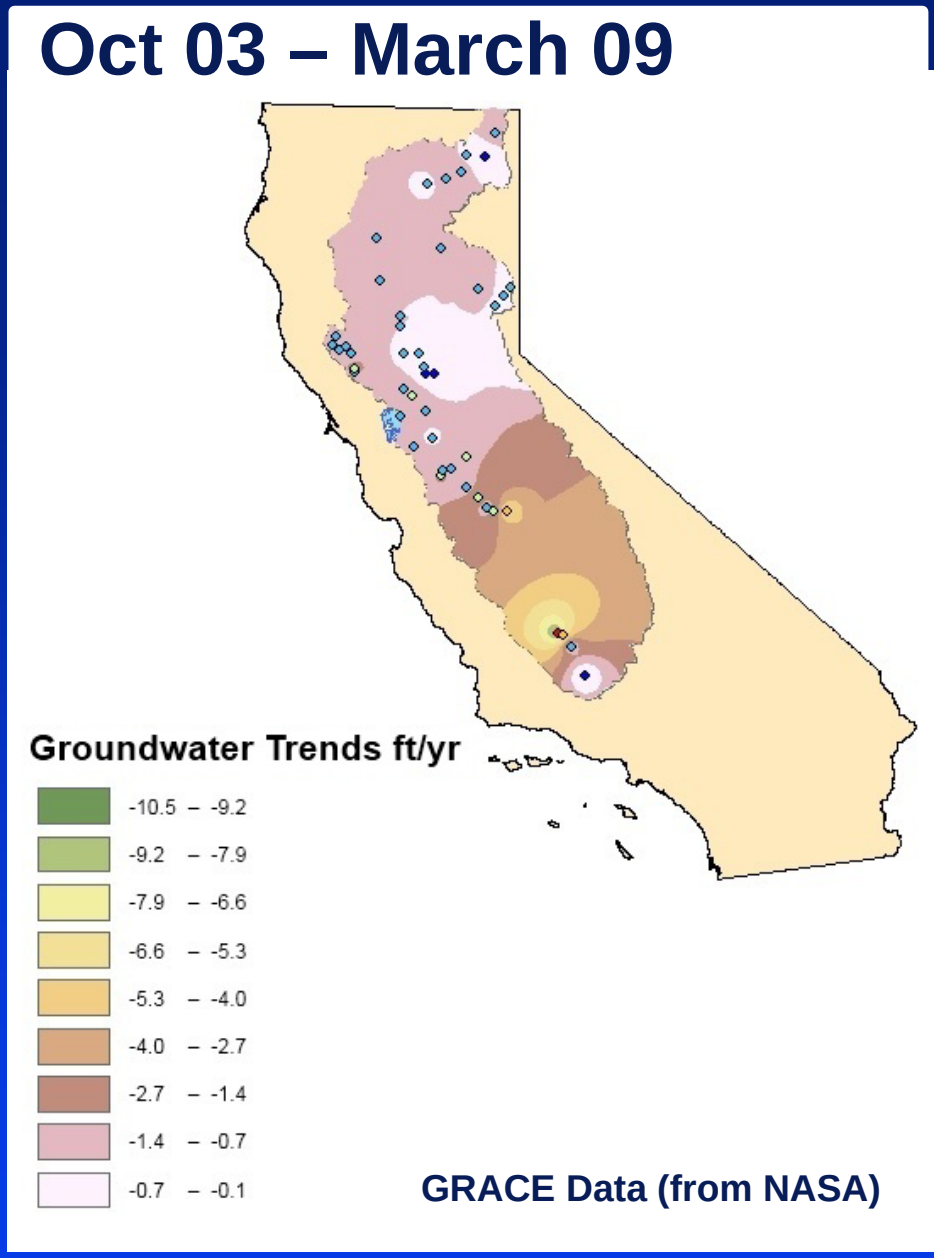


Groundwater Cycle



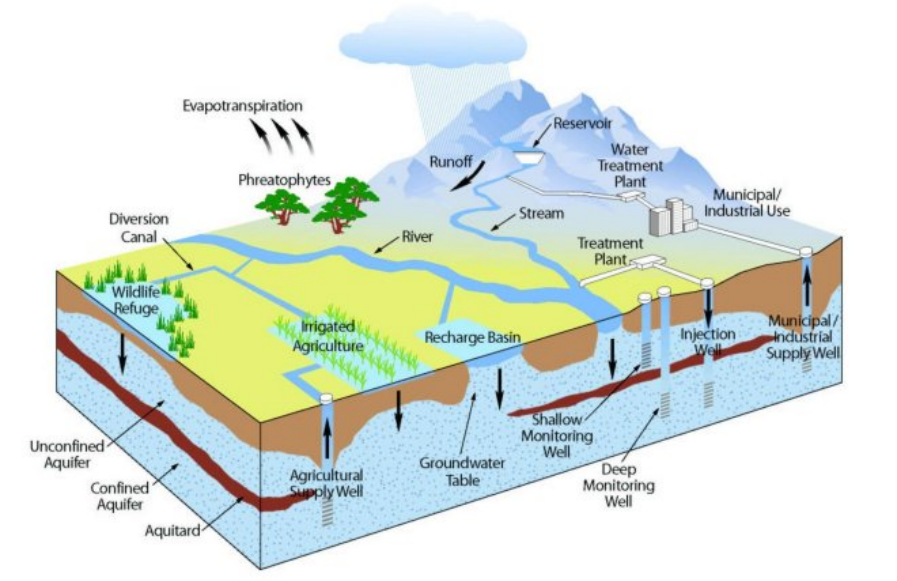
Impacts

Drop in water levels



Impacts

Overall decrease in groundwater quality



Impacts

Subsidence

Summary

- Drought will have significant impacts
- Effects will be long lasting
- Presents significant challenges to Dischargers and the public

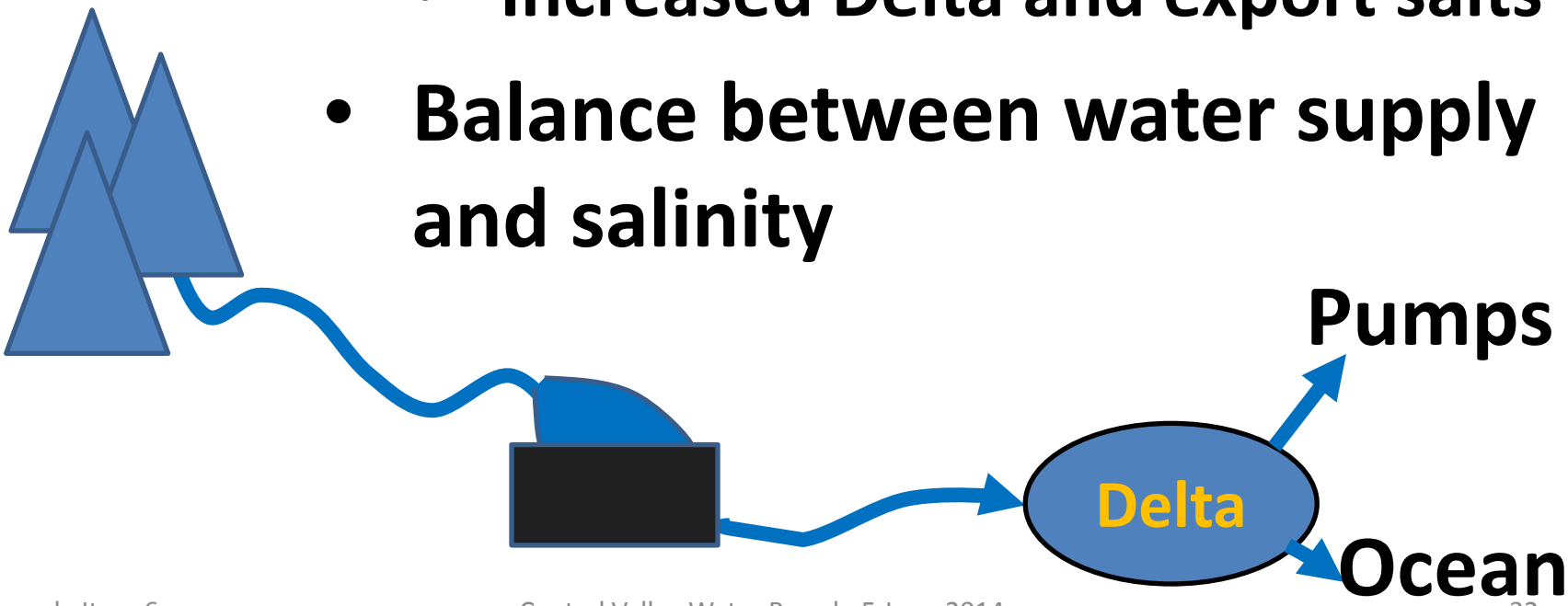
Questions ?


STATE OF CALIFORNIA
CENTRAL
VALLEY
REGION
REGIONAL WATER QUALITY CONTROL BOARD

Surface Water Impacts

The Delta

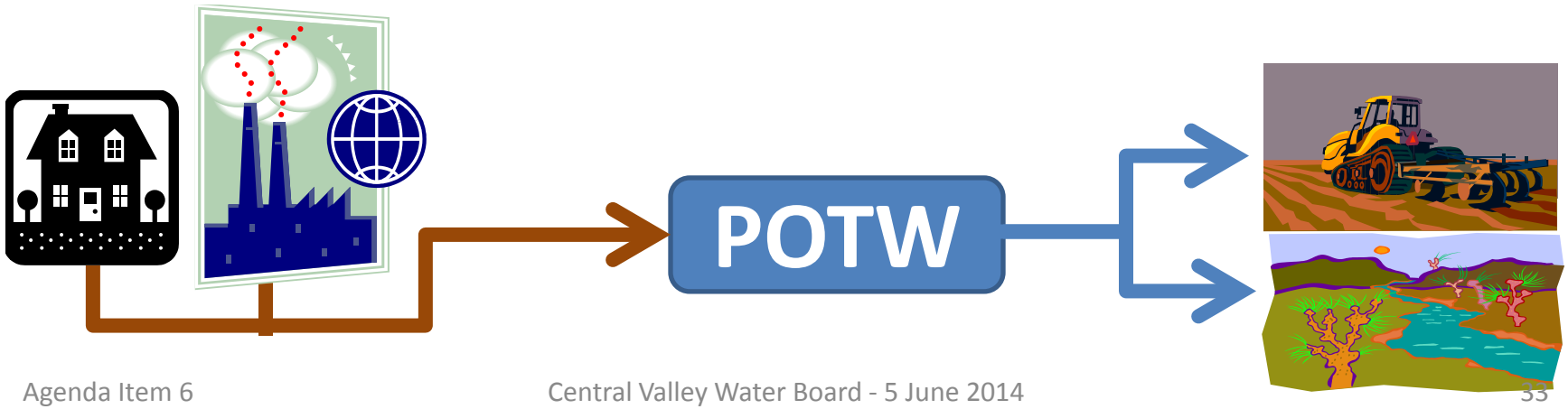
- **Reduced river flow**
  - **Increased salt water intrusion**
  - **Increased Delta and export salts**
- **Balance between water supply and salinity**



POTW Impacts

Conservation / Reduced Flow

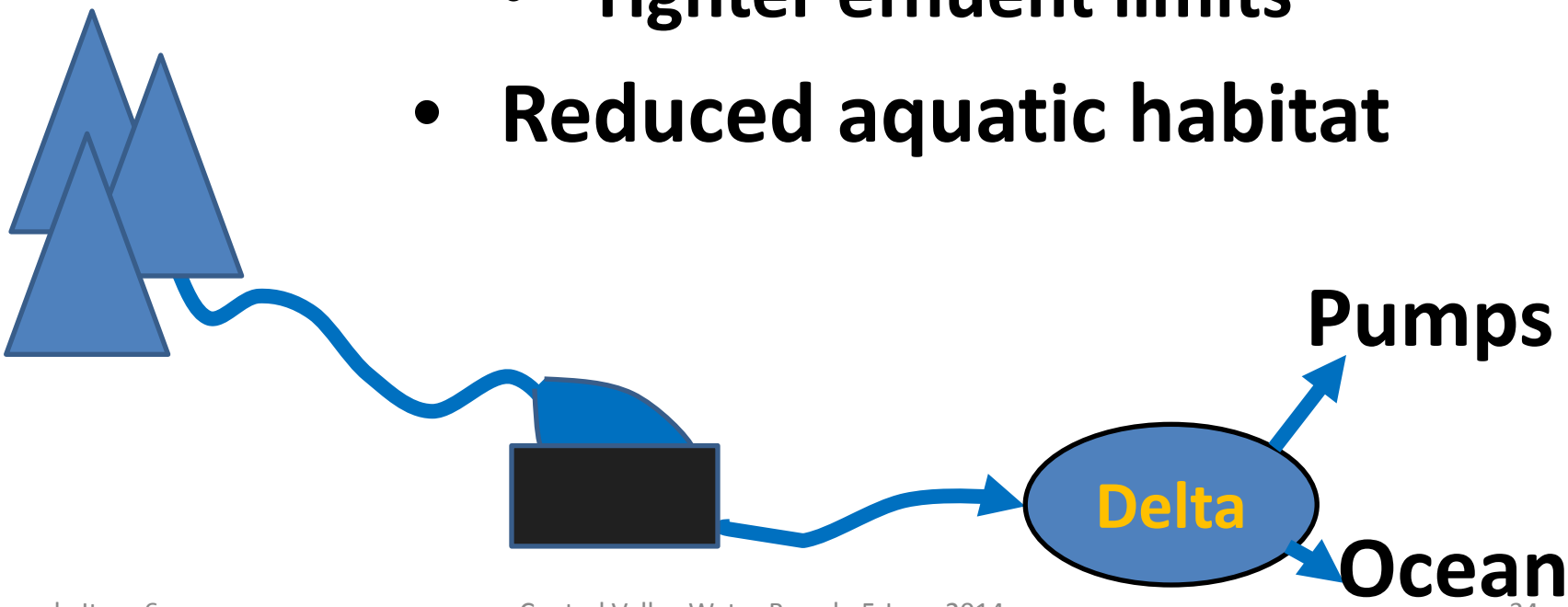
- **Less flushing of sewers**
- **More concentrated sewage**
  - **Operational changes?**



Surface Water Impacts

Lower River Flows

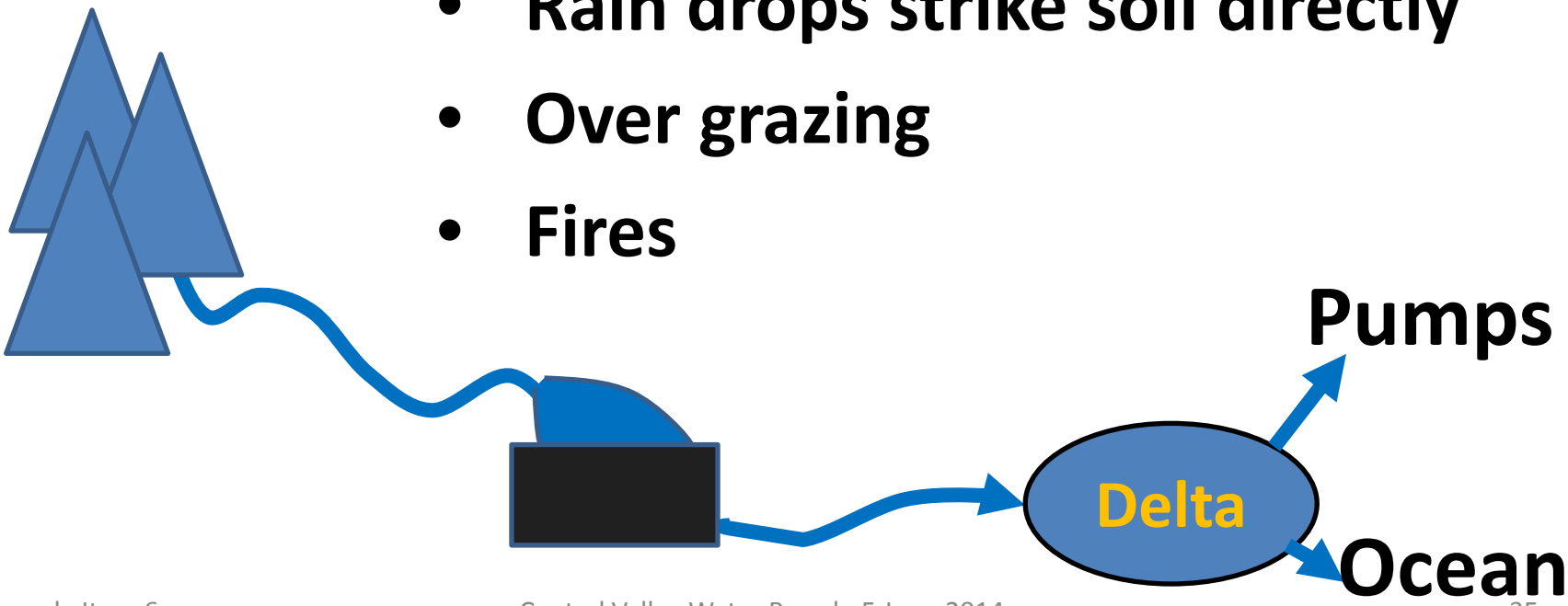
- **Less dilution**
  - **Reduce dilution in Permits**
  - **Tighter effluent limits**
- **Reduced aquatic habitat**



Surface Water Impacts

Increased erosion / sedimentation

- **Drier ground more erosive**
- **Reduced vegetation**
  - **Rain drops strike soil directly**
  - **Over grazing**
  - **Fires**



Surface Water Impacts

Lower groundwater levels

- **Reduced accretions to rivers**
- **Lower river flows**
- **Increased river temperatures**
- **Reduced deep pool refuges**