

## **Groundwater, Rivers, Ecosystems and Conflicts**

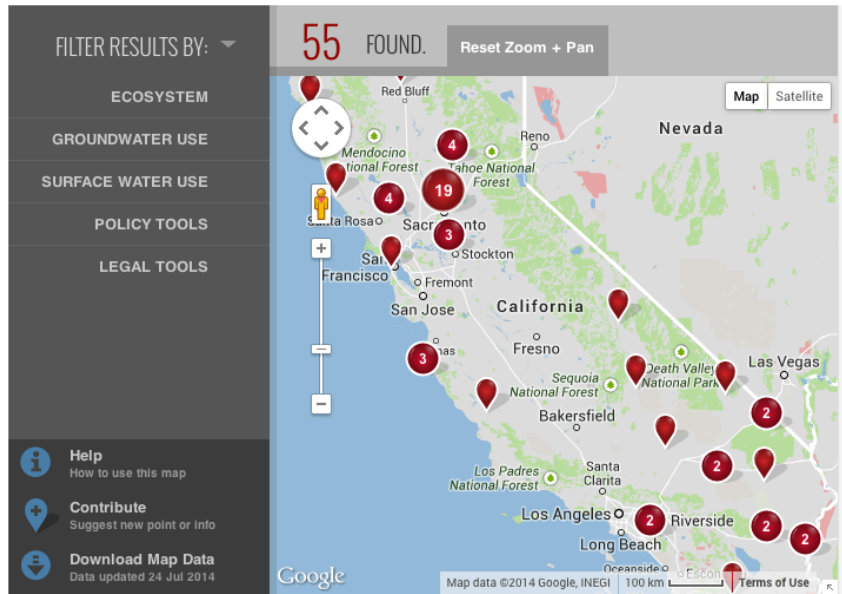
### **Groundwater-Surface Water Conflicts: Widespread and Largely Ignored in California**

There is a common and false perception that groundwater and surface water are separate and disconnected resources. California water law enshrines this misperception by creating mostly separate water rights and governance systems for surface waters and groundwater. This practice has resulted in negative impacts to groundwater-dependent plants, animals, and ecosystems, as well as conflicts between surface water and groundwater users and water rights holders. For example, groundwater depletion is often thought to impact only people who use groundwater. In fact, the lowering of groundwater levels can also affect surface water users and ecosystems. Conversely, diversions of surface flows from rivers and streams eliminate an important source of replenishment or recharge to many groundwater aquifers.

Groundwater-dependent ecosystems (GDEs) are defined as terrestrial, aquatic, and coastal ecosystems that require access to, replenishment or benefit from, or otherwise rely on subsurface stores of water to function or persist. GDEs include springs and seeps, wetlands, and terrestrial vegetation (e.g., oaks in Mediterranean climates that drawn directly from the water table). California is home to surprisingly diverse and widespread GDEs - some of which are endangered - and many rivers receive some or even most of their flow from groundwater, particularly during the driest months.

The disputes between groundwater pumping and groundwater-dependent species and ecosystems, rivers, and surface water right holders ("groundwater connection conflicts") are far-reaching and under-recognized in California. This new research, the first study of these groundwater connection conflicts in California, shows that these conflicts are surprisingly common. This dataset of 55 conflicts is based on publicly available information collected from 2008 to 2012. Water in the West has released an interactive map to highlight these groundwater connection conflicts in California, showing where these conflicts occur, what the problems are, and how they are dealt with.

## Groundwater-Surface Water Connection Conflicts in California



*Water in the West's interactive map highlights groundwater-surface water conflicts in California, showing where these conflicts occur, what the problems are, and how they are being addressed.*

## Where Groundwater Use Has Triggered Conflicts

### Agricultural Pumping Leads to Diminished River Flow

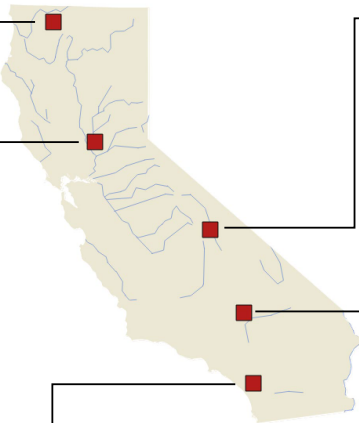
Scott River Region, Siskiyou County

Recognizing that groundwater and surface water are connected, the California Superior Court recently ruled that Siskiyou County and the State Water Resources Control Board have not regulated groundwater in accordance with public trust principles by allowing pumping that has diminished flows in Scott River and affected salmon.

### Controversial Water Transfer

South Sutter Water District, Sutter County

Environmental and sport fishing groups alleged that the South Sutter Water District's action to transfer 10,000 acre-feet of surface water to DWR – in exchange for compensation and an equivalent amount of groundwater to be pumped as substitution – impacts the environment and other water users.



### State-Run Fish Hatchery Sued for Effects of Groundwater Use

Owens Valley, Inyo County

Groundwater pumping in Owens Valley to support state-run trout hatcheries, amounting to 40-60% of the groundwater pumped in the valley, dried up springs and damaged rare groundwater-dependent resulting in lawsuit and settlement.

### Concerns Over Proposed Solar Project's Groundwater Needs

Mojave Desert, San Bernardino County

250 megawatt solar project would use up to 1,077 acre-feet of groundwater from new wells, with potential to affect Harper Dry Lake, considered one of the most ecologically productive areas in the Mojave Desert with sensitive bird and wildlife species.

### Quarry Plan Sparks Resistance

Liberty Quarry, Riverside County

A proposed quarry became the most contentious land development ever in Riverside County over potential interception of groundwater table and impacts to nearby rivers and streams and groundwater-dependent ecological features.

## **Key Facts about Groundwater Connection Conflicts in California**

**Where they occur:** Groundwater connection conflicts arise throughout California, with more intense areas of conflict occurring in the northern Central Valley (generally proposed out-of-basin water export projects), the California desert (usually groundwater-using renewable energy projects), and coastal counties (often pertaining to the existing effects of municipal and agricultural pumping).

**What is impacted:** Conflicts most often concern groundwater pumping that diminishes river flow or harms vegetation, and sometimes its dependent fauna, by lowering groundwater levels. Other objects of concern include wetlands, lakes, springs, riparian areas, and even the micro-fauna that live in aquifers.

**Who is involved:** A diverse community of disputants are involved. Private entities that challenge existing and proposed groundwater pumping tend to be local and national environmental nongovernmental organizations, residents' groups, and water utilities that use surface water. State government "challengers" tend to be permitting or enforcement bodies like the State Water Resources Control Board and the California Energy Commission. Federal government agencies are heavily represented, although they have no broad regulatory role in relation to groundwater. They appear through the federal Bureau of Land Management, the Fish and Wildlife Service, the National Park Service, the Bureau of Reclamation, and the Environmental Protection Agency.

## **How Do These Conflicts Fall through the Gaps in California Law and Policy?**

Since California law does not routinely require a permit to pump groundwater, no law or policy deals comprehensively with the impacts of pumping on surface water rights or ecosystems, or the resulting conflicts. The failure of California's groundwater law to acknowledge the impacts of pumping groundwater on surface water rights and GDEs produces significant potential for pumping to impact these assets, in circumstances under which their owners and advocates have little power to do anything about it.

Even when existing legal tools cover these impacts of groundwater pumping, it can be challenging to use them. Some problems relate to information: low levels of awareness that rivers and other ecosystems can be harmed by pumping, and little data about the precise nature of impacts. Other problems stem from legal vagueness or agency attitudes. Laws usually lack quantitative standards for acceptable levels of impact, and impact assessments can be inconsistent between agencies and through time. Project conditions that require "mitigation" of potential impacts on GDEs are often just monitoring requirements that lack triggers for specific action if particular physical conditions appear. Agencies can be reluctant to assert their rights in the case of "federal reserved rights" that can protect the flow of rivers that supports key wilderness values.

## **How Can Law and Policy Better Address These Conflicts?**

There are two fundamental ways to improve how California law and policy consider and manage the impacts of pumping groundwater on surface water. The first, "low-hanging fruit" approach is to ensure that agencies that currently review groundwater pumping projects consistently consider and deal with impacts on surface water rights and GDEs. This could be done by amending and expanding the existing [CEQA environmental checklist](#), the Department of Water Resources' ["Required and Recommended Components of Local Groundwater Management Plans,"](#) and its [Groundwater Management Model Ordinance](#) to require consideration and management of these impacts. If there is the potential to adversely affect surface water rights, an aspiring pumper could be required to offset or otherwise compensate for these effects, as is required in many Western states. If there is potential to adversely affect GDEs, comprehensive monitoring conditions on

projects should be linked to clear and specific remedial management actions, like cease-to-pump rules based on quantified ecological triggers.

A more ambitious approach to improving law and policy would be to develop new laws and policies that connect groundwater pumping, rivers, and ecosystems where these conceptual connections currently do not generally exist. This requires an increased level of political coordination and will.

Options include:

- Expanding environmental protections in surface water laws (like the public trust doctrine) [to groundwater](#)
- Requiring permits for groundwater pumping generally, which would only be granted after considering these potential impacts (as suggested in a decade-old [report](#))
- Defining groundwater “waste” and “unreasonable use” to encompass in-stream and ecological concerns
- Requiring the preparation and implementation of local groundwater management plans, including in-stream and ecological elements, in areas experiencing a threshold level of groundwater depletion, supported by state and citizen suit enforcement options, [as we have suggested elsewhere](#)

Non regulatory policy mechanisms, like grant-making activities, technical assistance programs, and industry-led guidance, would also assist, as would producing and better distributing information about groundwater-dependent species or ecosystems. [Work mapping the density of GDEs in California](#) could form the basis of an electronically searchable “California Atlas of Groundwater-Dependent Rivers and Ecosystems,” as has been done [elsewhere](#).

The impacts of pumping groundwater on surface waters and ecosystems are generally under-recognized in California, yet they cause significant conflict. Law and policy to consider and deal with the underlying impacts are grossly under developed. Understanding the nature of these conflicts, and the laws and policies that are being used or could be used to address them, can help shape better laws and policies for preventing and dealing with them. Multiple paths to better laws and policies have already been charted. Now we just need to follow them.