

Making the Most of Water for the Environment

A Functional Flows Approach for California's Rivers

September 3, 2020

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Supported with funding from the S. D. Bechtel, Jr. Foundation and the funders of the PPIC CalTrout Ecosystem Fellowship



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Overview

- Need for a new approach
- What are functional flows?
- Assessing functional flow needs
- Putting functional flows into practice
- Governance requirements

AUGUST 2020

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with research support from
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supported with funding
from the S. D. Beeson, Jr.
Foundation and the Analysis
of the PPIC Center
Academy Fellowship

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Need for a new approach

- Under current approach, environmental flows are:
 - Managed as minimum flows
 - Species focused
 - Uncoordinated and inconsistently applied



Photo: Mike Weir

What are functional flows?

- Functional flows mimic key components of a river's flow that support critical biological, chemical and physical functions
- Efficient use of environmental water to improve ecosystem health



Photo: David Jensen

Functional flows need water and physical habitat



Photo: DWR



Photo: Josh Viers

Assessing functional flow needs

- Define ecosystem goals
- Quantify functional flow targets
- Scope physical habitat improvements
- Set environmental flow standards



California Environmental Flows Framework



The screenshot shows the header of the California Water Quality Monitoring Council website. On the left is the CA.GOV logo. Next to it is the Water Quality Monitoring Council logo, which features a stylized wave and the text 'WATER QUALITY MONITORING COUNCIL'. To the right of these logos, the text reads 'California Water Quality Monitoring Council' and 'My Water Quality' in a large font. Below this, in smaller text, it says 'A COLLABORATION BETWEEN THE CALIFORNIA ENVIRONMENTAL PROTECTION AND NATURAL RESOURCES AGENCIES'. A dark blue navigation bar contains a home icon, the text 'Portals', and 'About Us'. Below the navigation bar, the text 'California Environmental Flows Workgroup' is displayed in a large, orange font.

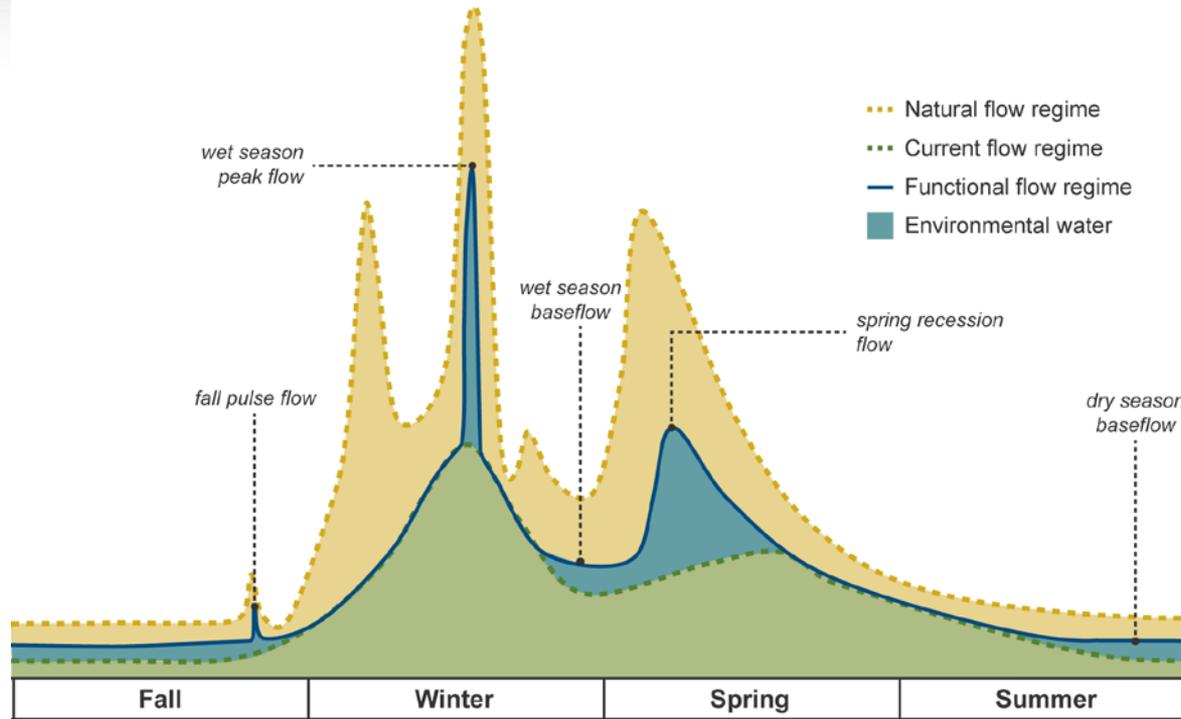
Putting functional flows into practice: dammed rivers

- Modify timing and magnitude of water released from reservoirs
- Environmental water augments existing releases to restore ecosystem functions and satisfy species' needs
- Restore floodplain connectivity and in-channel habitat



Shasta Dam on the Sacramento River

Functional flows in a dammed river



Putting functional flows into practice: undammed rivers

- Timing, volume, location of diversions managed to maintain functional flows
- Groundwater withdrawals managed to sustain flows in connected surface waters



South Fork Eel River

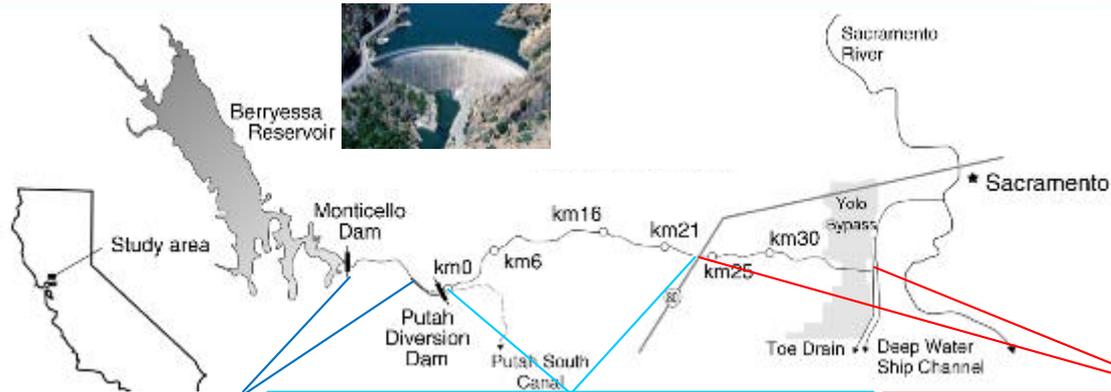
Putting functional flows into practice: urbanized rivers

- Manage treated wastewater and urban runoff to maintain dry-season flows
- Control winter stormwater runoff through retention structures and watershed restoration
- Restore physical habitat in channel and banks



Los Angeles River

Functional flows in practice: Putah Creek



Rainbow trout



Prickly sculpin

native



Sacramento pikeminnow



Sacramento sucker



California roach



Hitch

native



Bigscale logperch



Common carp

non-native



Channel catfish



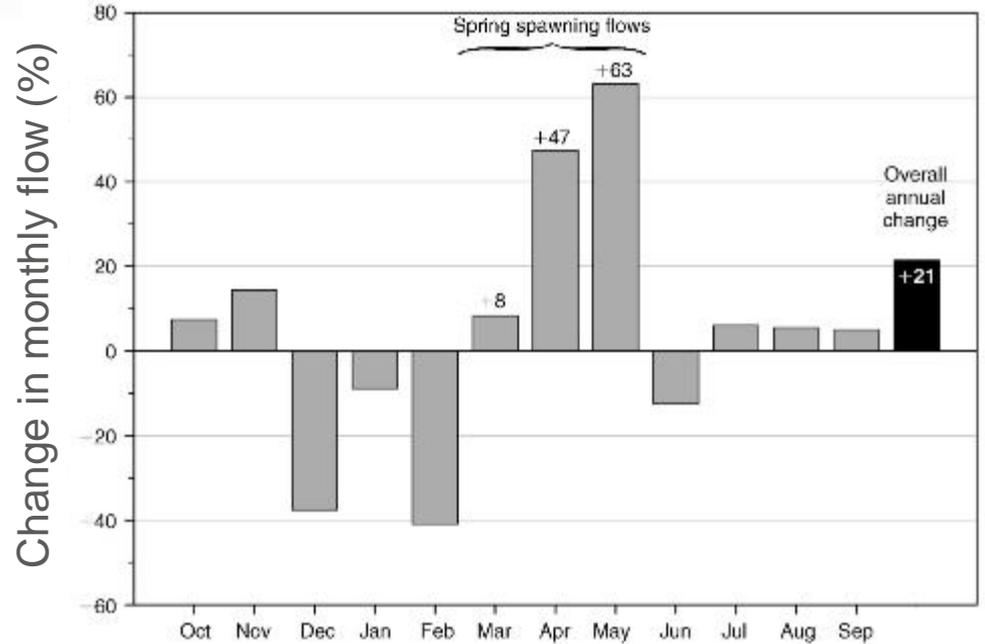
Bluegill



Black crappie

Putah Creek flow recommendations

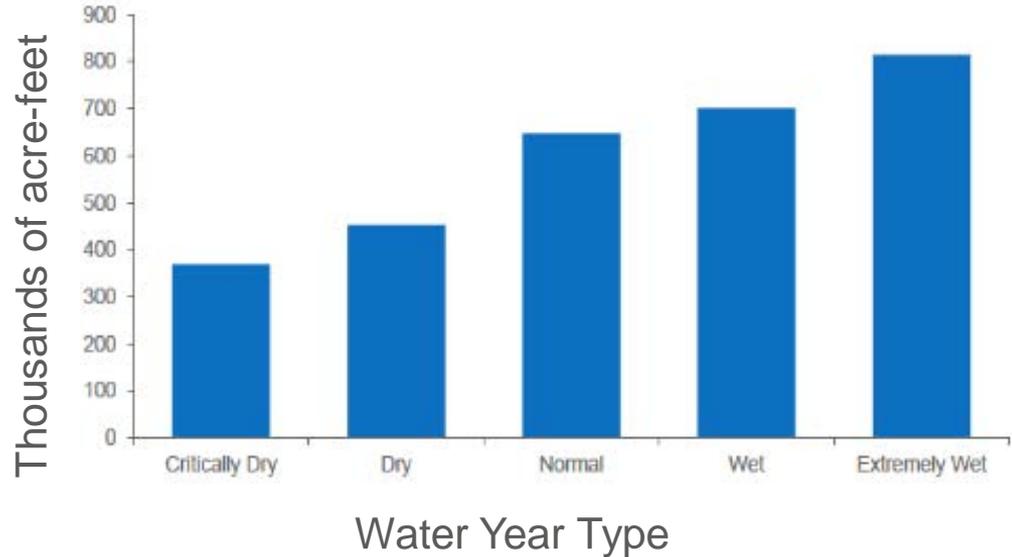
- Enhance spring flows
- Sustain summer baseflows
- Enhanced winter baseflows
- Winter pulse flows



Source: Kiernan et al. 2012

Governance requirements

- **Ecosystem water budgets:** Fixed annual environmental water allocations that can be flexibly managed
- **Ecosystem water trustees:** Independent entity manages water budget for functional flows, with authority to store, sell, trade water



Functional flows compatible with existing laws

- Water Quality and Water Rights Proceedings
- Federal and State Endangered Species Acts
- Federal Energy Regulatory Commission (FERC) Licensing
- Sustainable Groundwater Management Act



Photo: Damon Winter/The New York Times/Redux

Conclusions

- Gains efficiencies by focusing on flow components to support ecosystem health
- Incentivizes multi-benefit projects that satisfy both human and ecosystem needs
- Provides assurances that environmental water is used effectively and helps build resilience



About these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, methods, and interpretations. To avoid misinterpretations, please contact:

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Thank you for your interest in this work.

