

Using Otolith Chemistry to Study the Production of Yuba River Salmon



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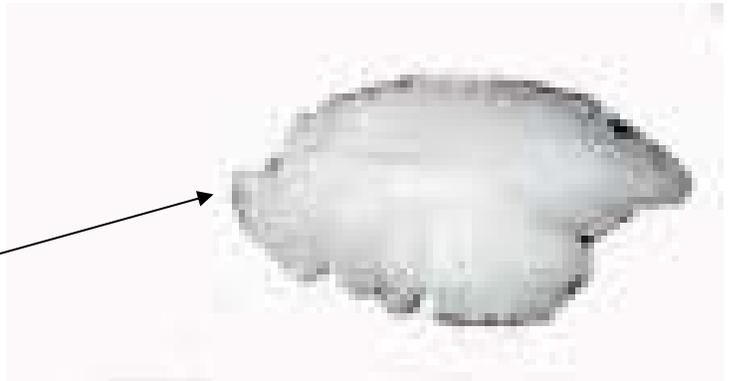
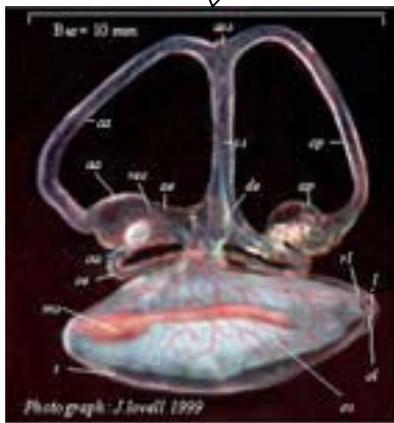
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What is an Otolith?



1. Bone found in the inner ear of fish

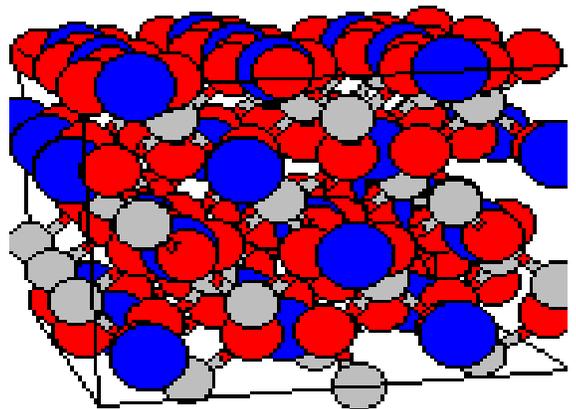


2. Otoliths make age rings like trees!

-measure age and growth



3. Composed of calcium carbonate (CaCO_3) and other trace minerals



Fish Otolith Chemistry Reflects Stream Origins: A Natural Tag

2. Spawn in natal streams



1. salmon migrate upstream



3. Alevin take up natal water chemicals

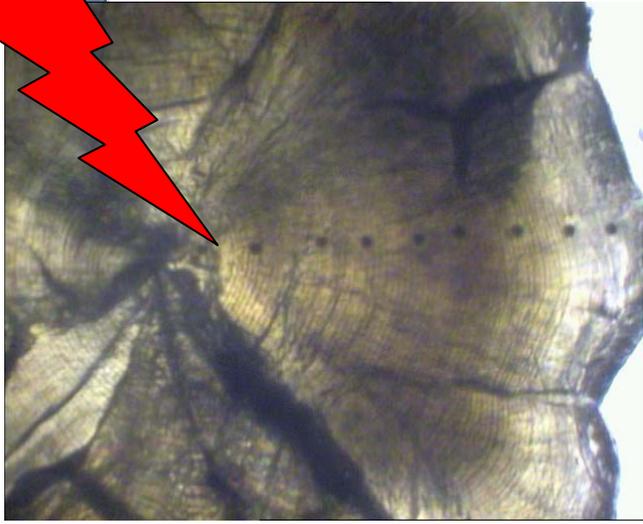


5. Otoliths are like flight recorders for fish, can tell when and where they've been.

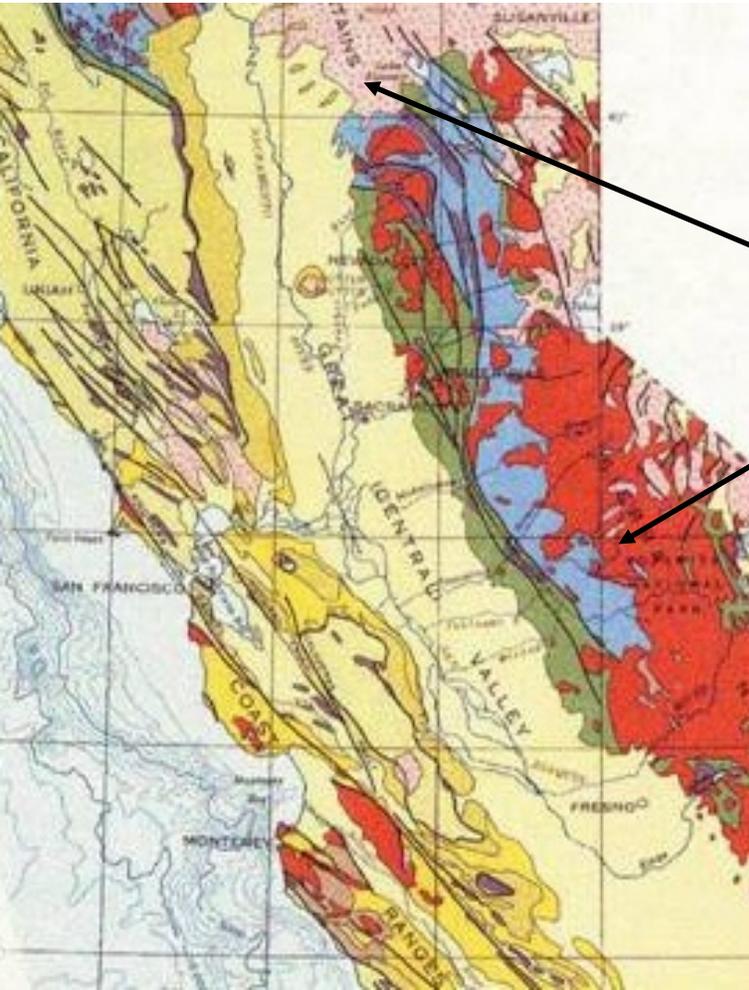


4. Using a laser we sample the chemicals in Calcium lattice of the otolith

“the Laser & state of the art multi-collector”



Why Strontium Isotopes?

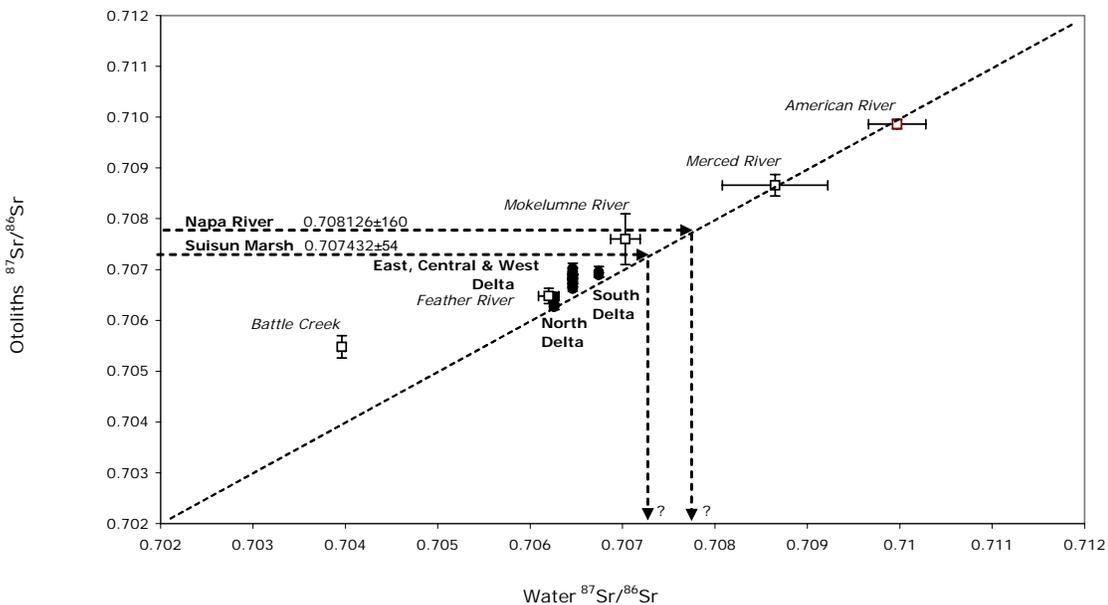


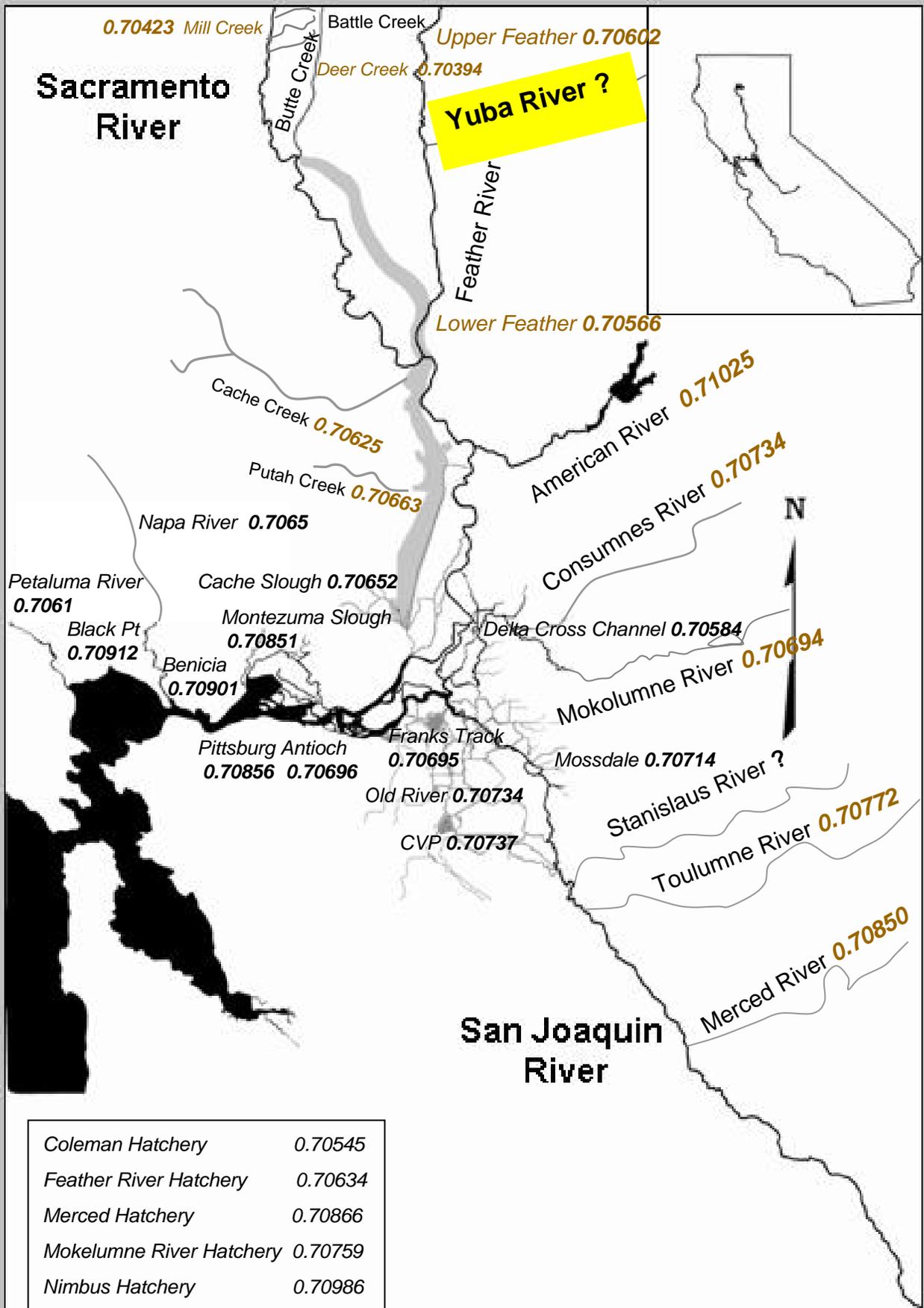
1. Strontium is geologically stable Isotopes

2. Central Valley Geology varies From north-South

3. Old Rock in the South and new rock in the north = Different Strontium Isotope natural tags

4. Water chemistry matches the otolith chemistry!!!

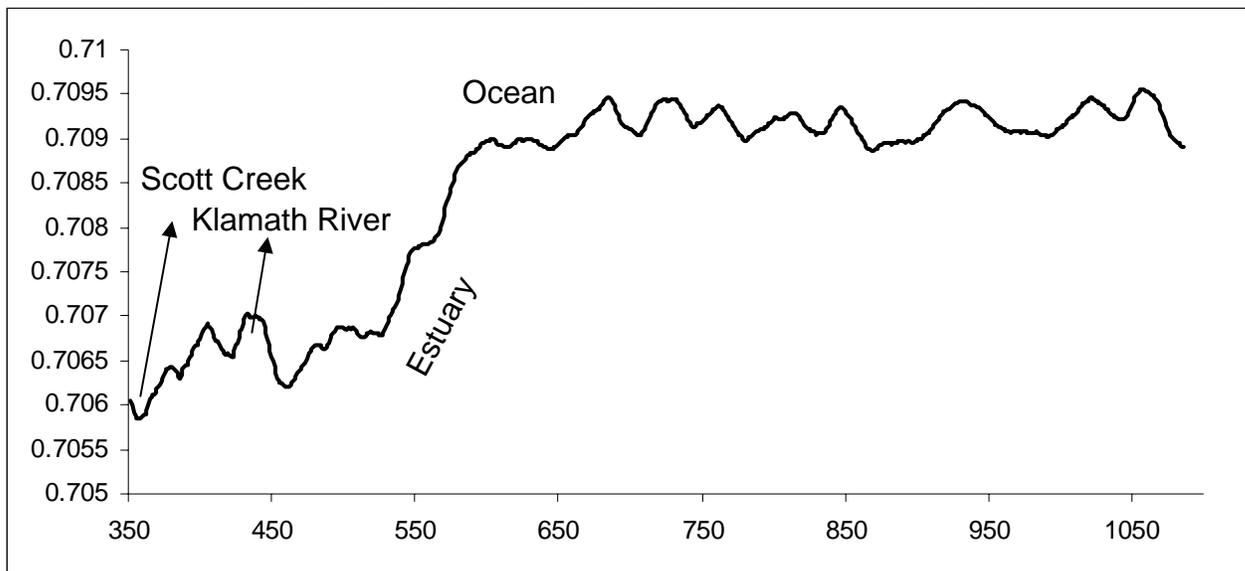
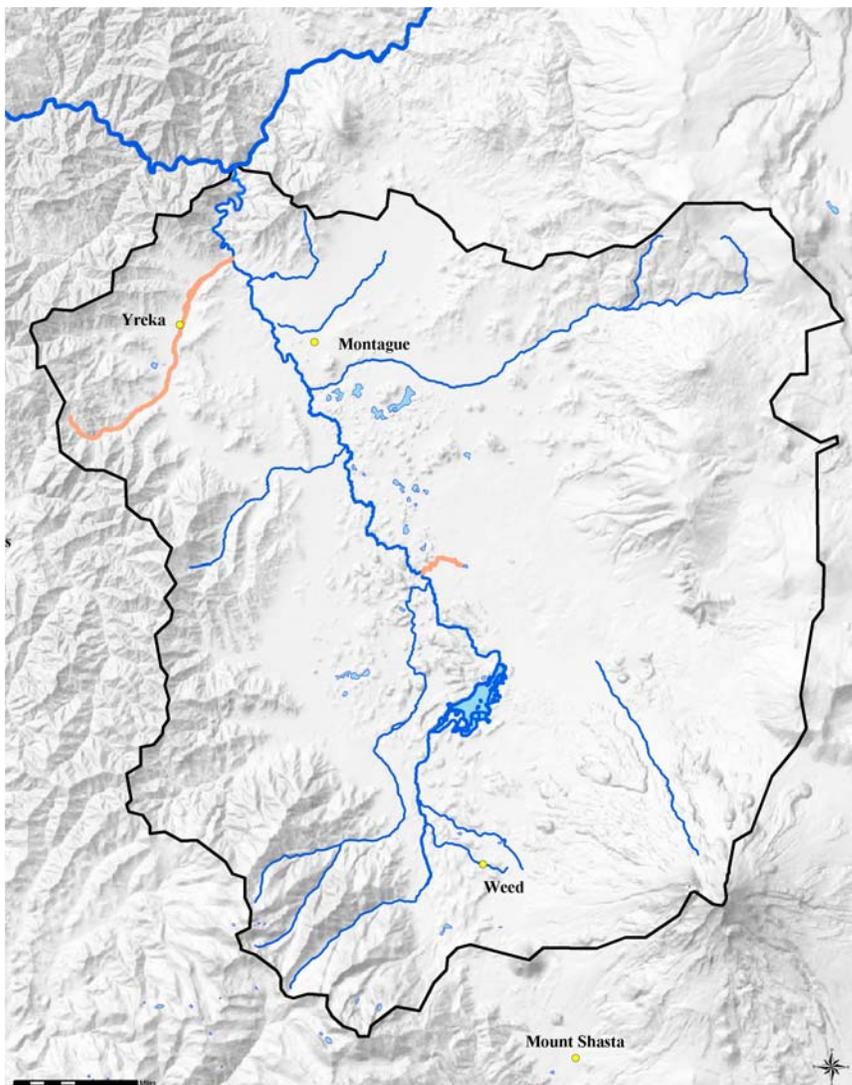




Data from salmon and delta smelt; Ingram et al 1999 & Hobbs et al 2005!

Klamath River Chinook Salmon

in collaboration with CDFG and USFS



Data from Quinones and Hobbs in prep

Study Questions?

- Natal stream origin of Yuba River salmon?
 - Returning Adults were really born in Yuba?
 - Hatchery strays from other rivers?
 - Wild strays from other rivers?

I hope my babies find home Okay...

