# Juvenile Chinook Salmon Life History Variation and Phenotype Success on the Lower American River, CA

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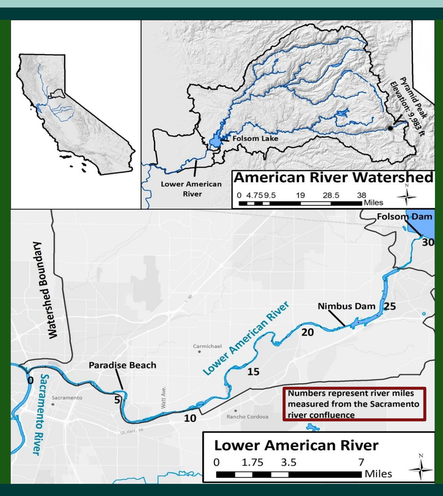


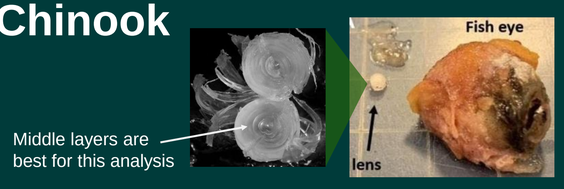

## BACKGROUND

- Fall-run Chinook Salmon juvenile river rearing and ocean migration timing is variable and influenced by spring flow magnitude
- Longer in-river rearing has been associated with higher survival to adulthood
- However, the relative fitness of juvenile migration strategies may depend on spring flow
- Otolith microchemistry offers a tool to reconstruct juvenile out-migration timing of returning adults

## METHODS

- Collect otoliths from adult Chinook Salmon carcasses on the Lower American River between 2014 – 2021


- For 2018-2021, assess for lower levels of sulfur isotope ($^{34}S$) in eye lenses to discriminate for wild Chinook

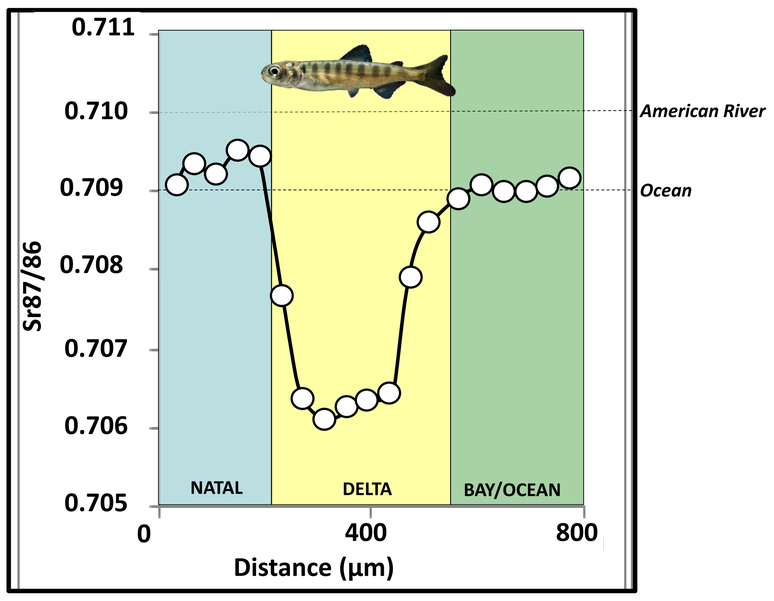



- Analyze 2014-2021 otoliths from wild Chinook using strontium isotope ($^{87}Sr/^{86}Sr$) and radius measurements to reconstruct origin and out-migration timing

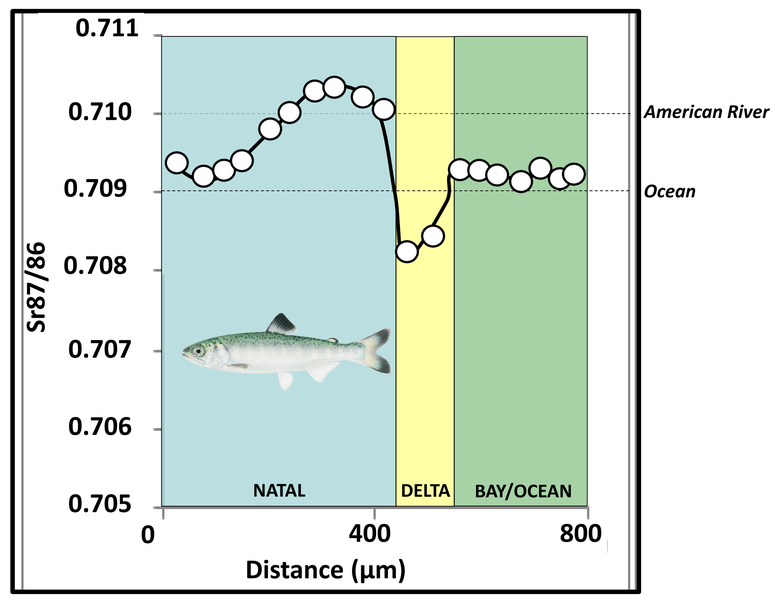
# Successful Juvenile Chinook Migration Strategies Vary Under Different Water Year Types

## RESULTS

### Successful Juveniles in 2014 - 2021 Exhibited Two Dominant Migration Strategies

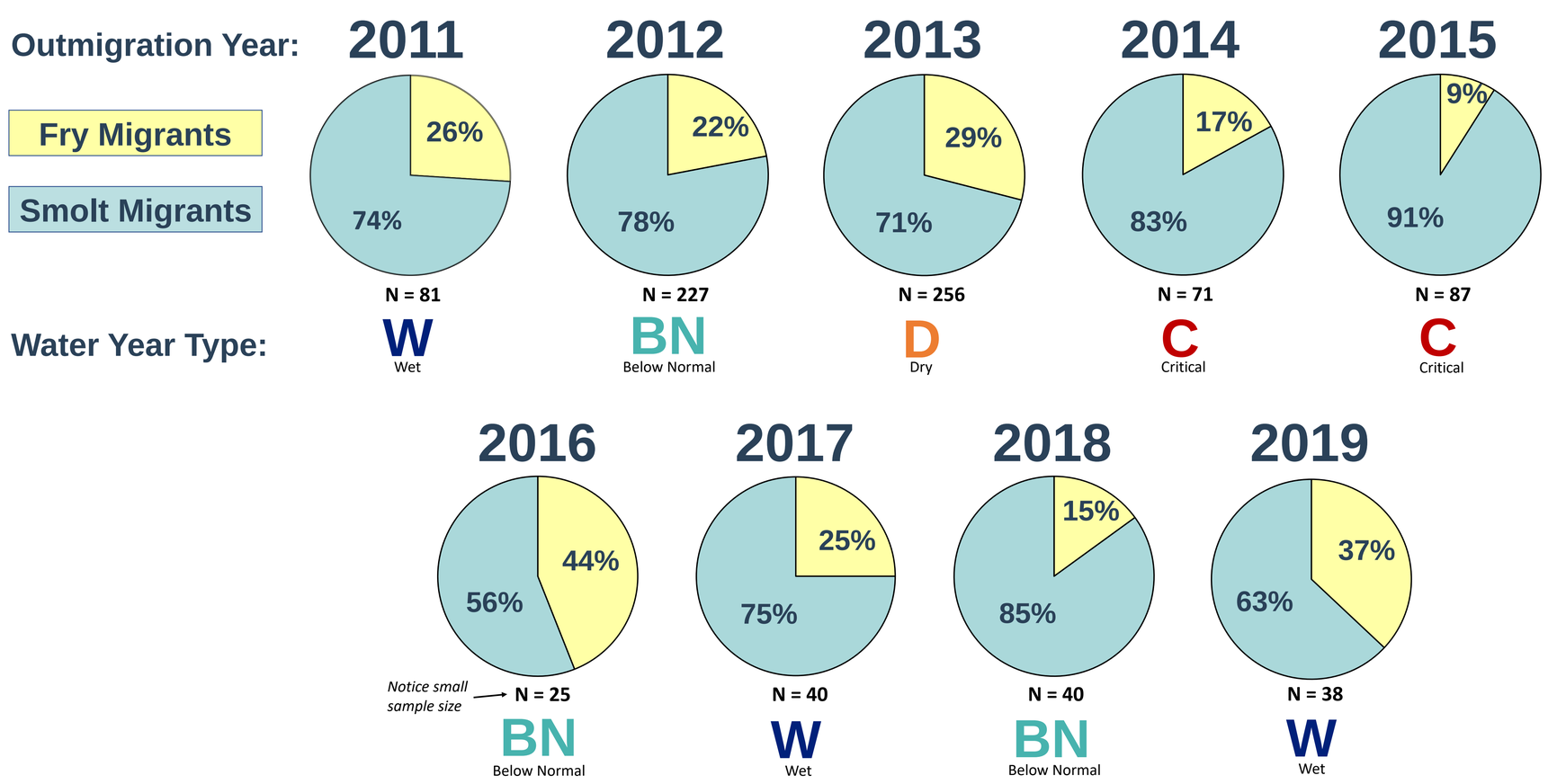



FRY MIGRANTS / DELTA REARERS




SMOLT MIGRANTS / IN-RIVER REARERS

### Proportion of Juvenile Migration Strategies Utilized by 2014 - 2021 Spawners




- More successful spawners exhibited a smolt out-migration strategy across all water year types
- During wet years, a quarter or more of the returning adults had out-migrated as fry
- The proportion of fry outmigrants that survived to adulthood was generally lower (and more variable) in drier years

## NEXT STEPS

1) Use rotary screw trap data to compare proportion of juveniles that out-migrated as smolts/fry to the proportion of smolts/fry that returned as adults
2) Model outmigration data to explore how success of different strategies is influenced by water year type, flow variance, temperature, and other potentially important factors
3) Publish results!

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