



## Tools for understanding groundwater connectivity for salmon and people



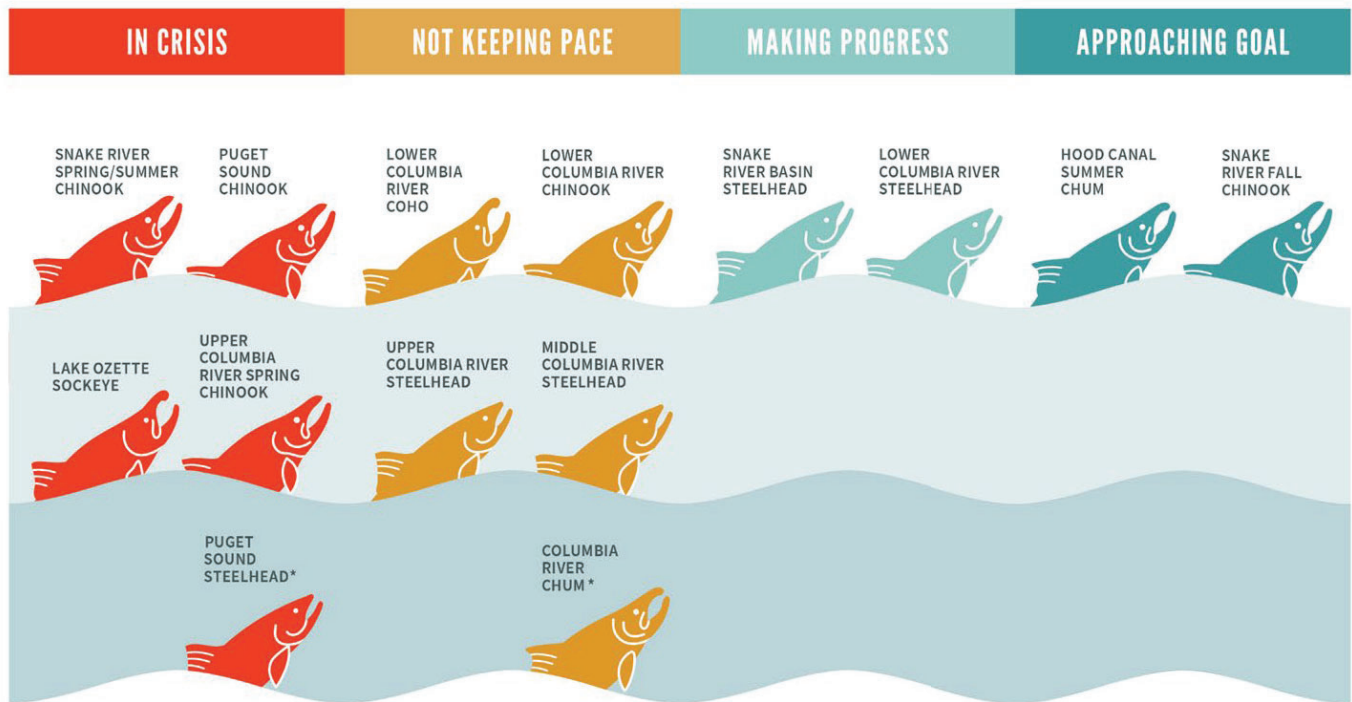
# Outline

1. Salmon and groundwater science background
2. Science-based tools
3. Decision-making
4. Training and Education

# 1. Salmon and groundwater science background

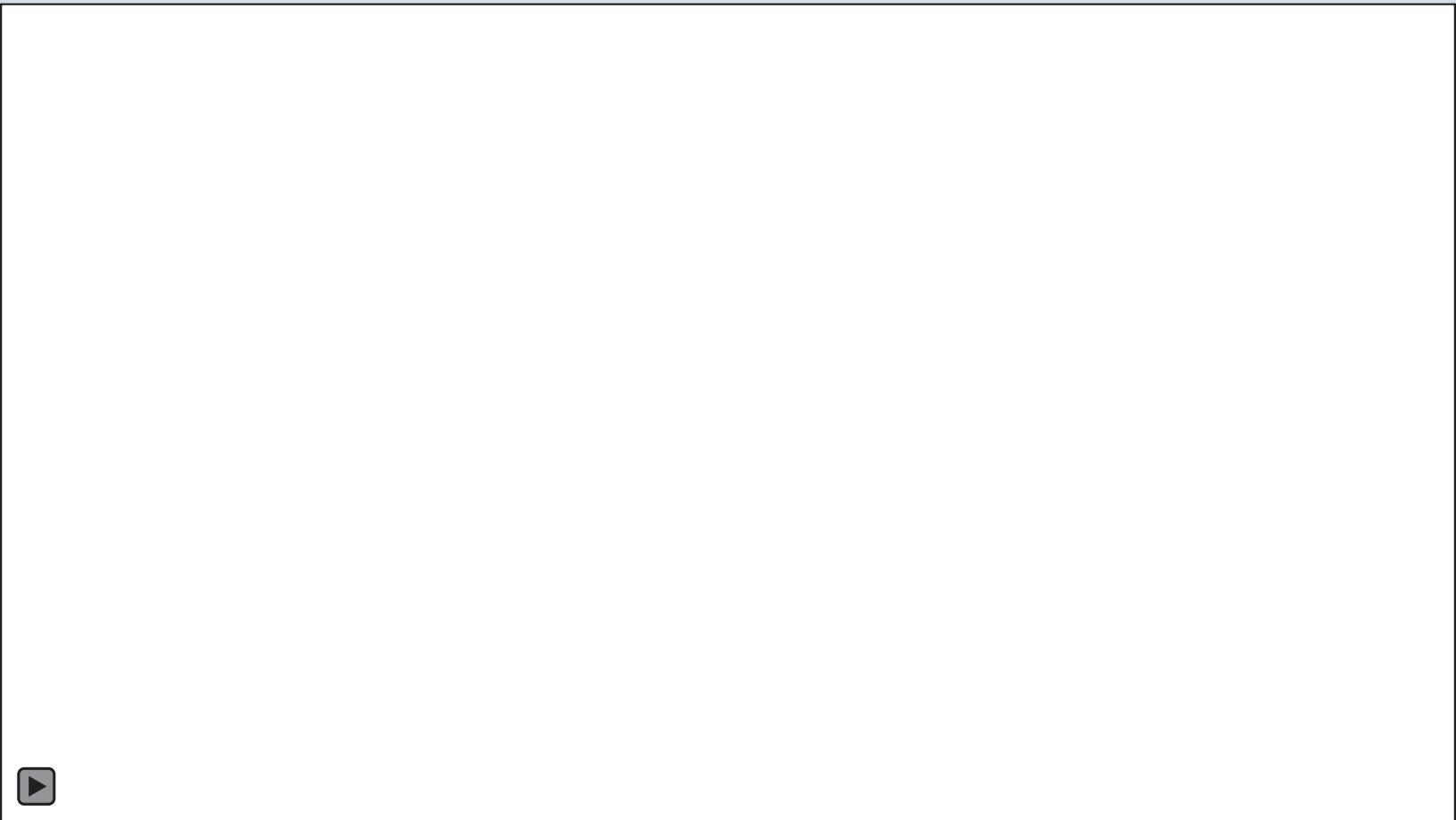
*“We have the remarkable opportunity to not mess things up here.”*

## Salmon Abundance

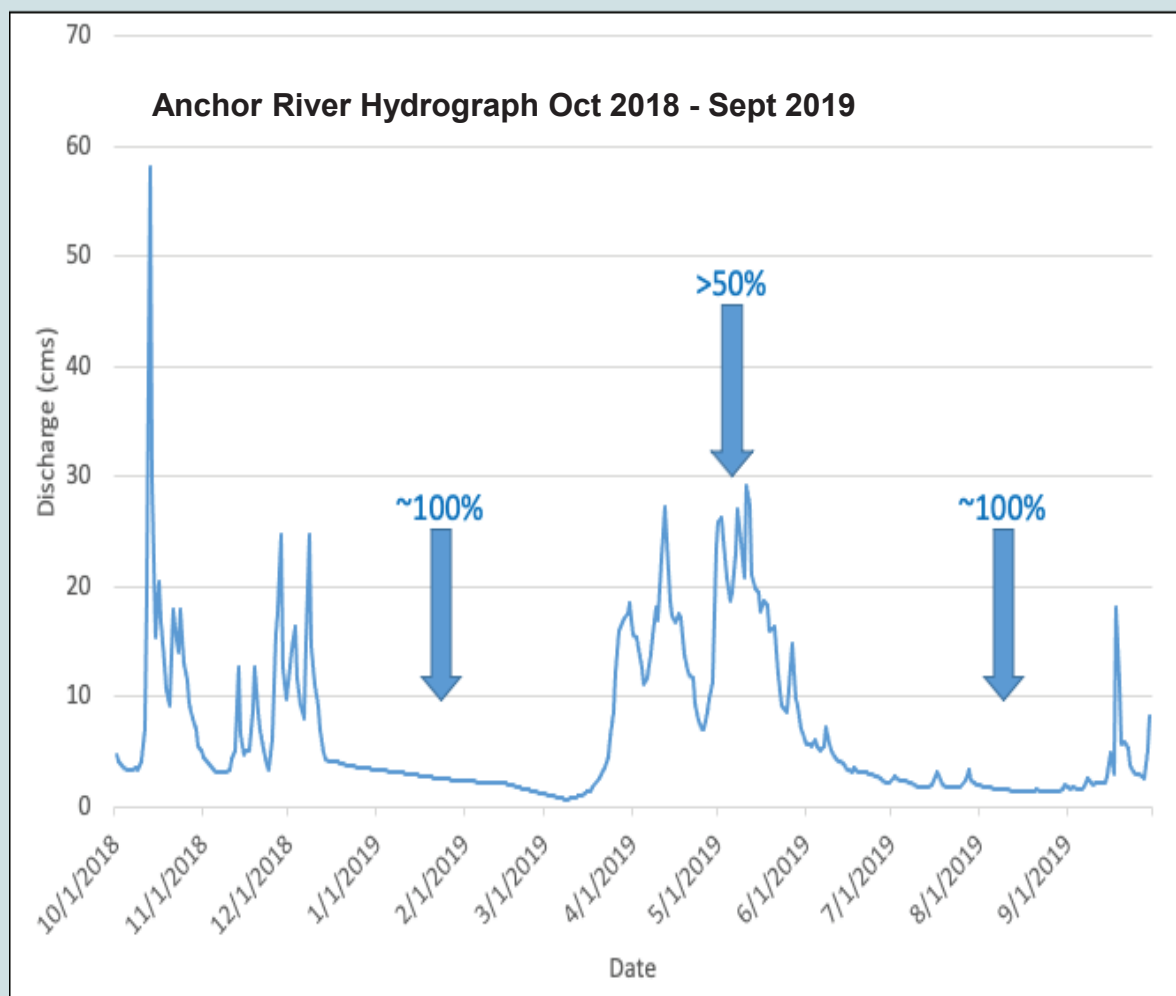


\* Lacks complete data

Data Source: Washington Department of Fish and Wildlife



# Groundwater and salmon-streamflow



Source: Brigino et al. In Preparation

Millions of juvenile salmon rear in headwater streams that rely on groundwater



Groundwater = stream temperature moderation



cooling our warming  
streams in summer



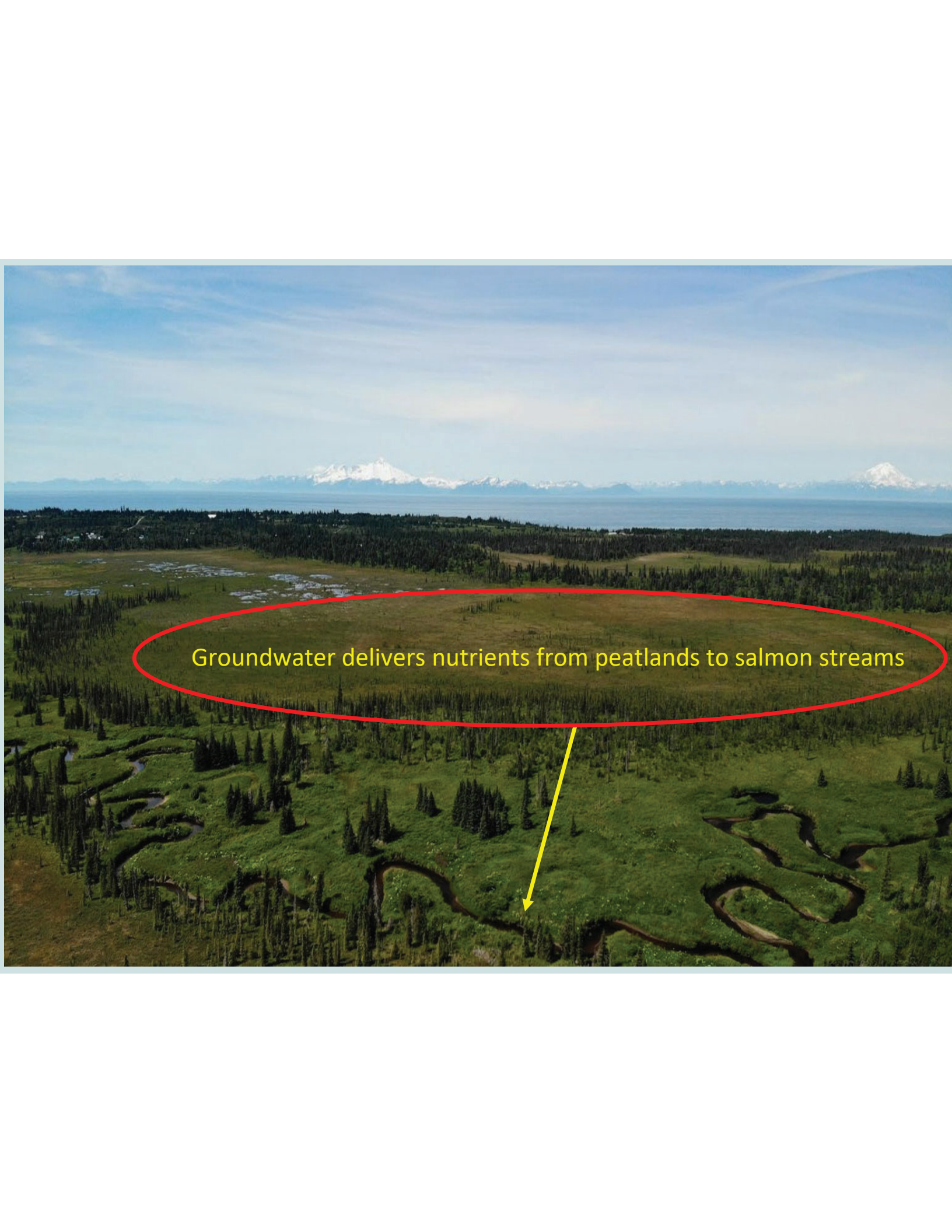
keeping streams  
flowing in winter



Groundwater delivers nutrients from alders to salmon streams



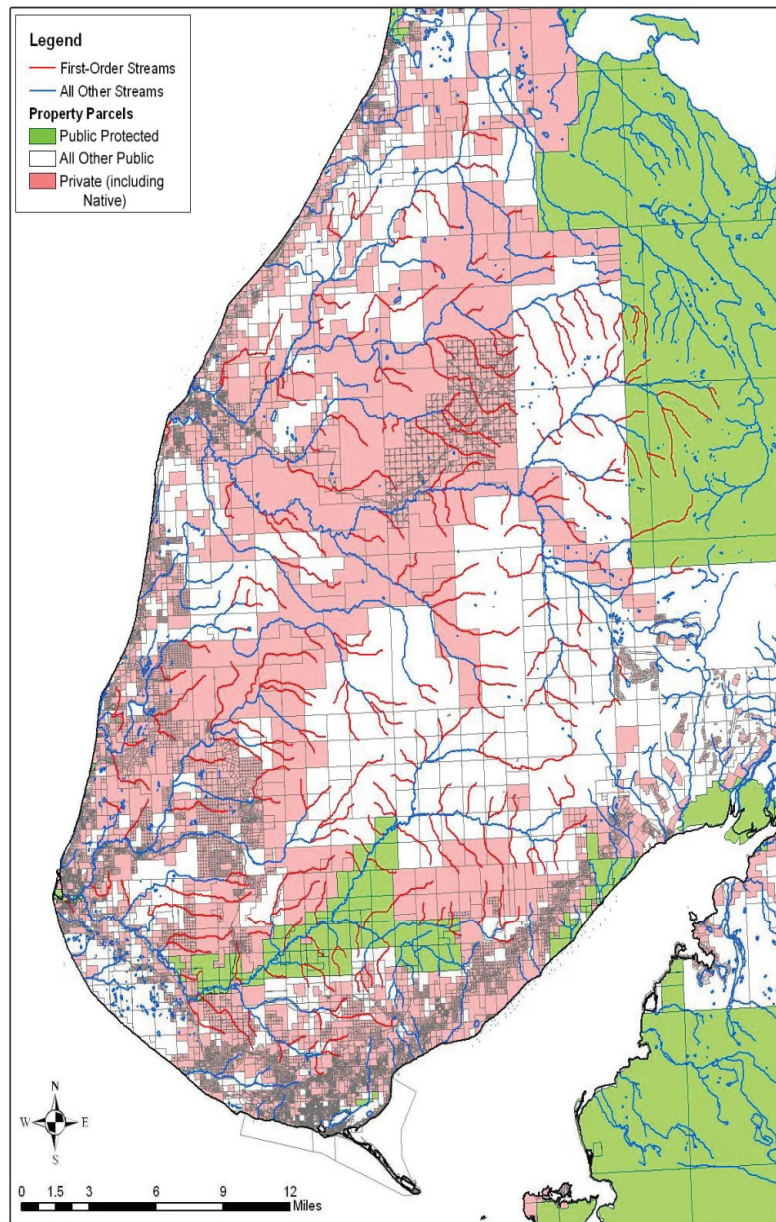


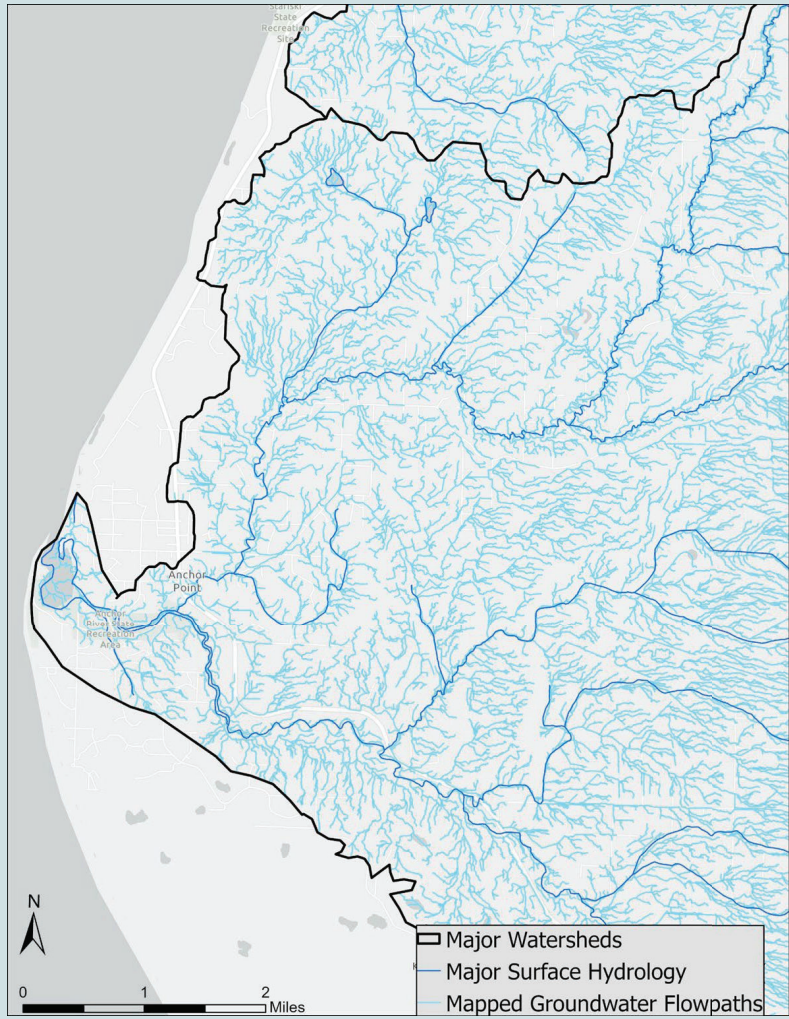
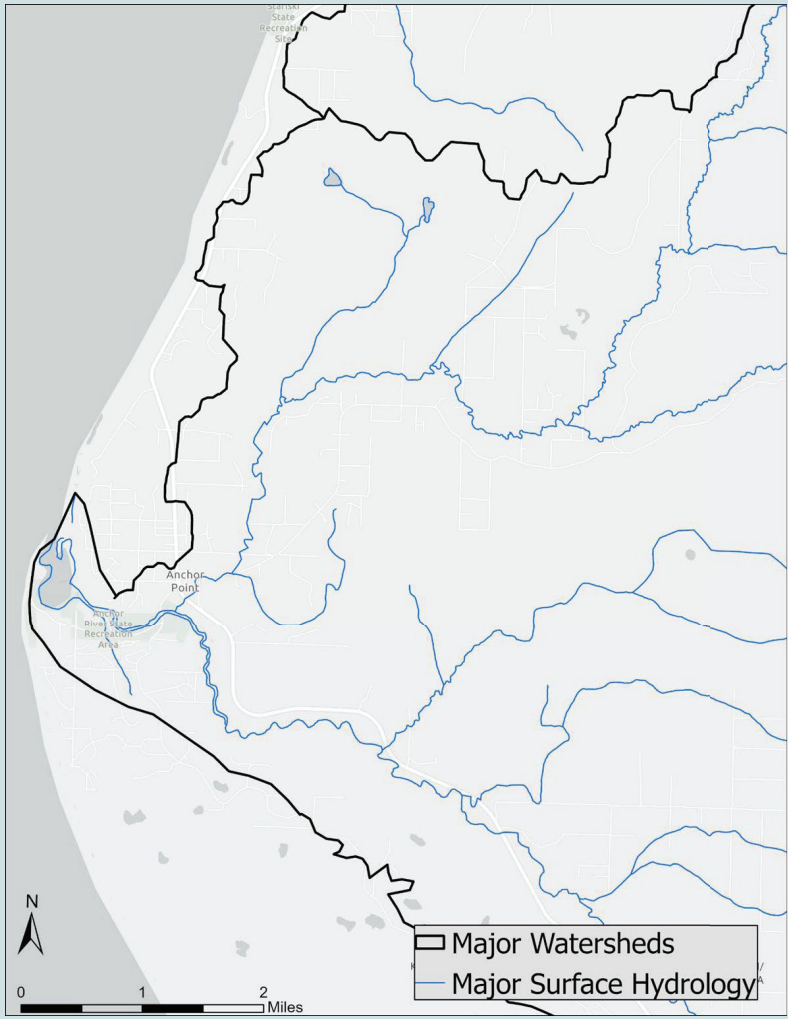
An aerial photograph of a vast peatland landscape. The foreground and middle ground are dominated by a dense forest of evergreen trees, with a prominent, winding stream meandering through the terrain. The stream's path is highly irregular, creating a complex network of channels. In the background, a wide expanse of peatland stretches towards a range of snow-capped mountains under a clear blue sky. A red oval highlights a section of the peatland, and a yellow arrow points from this area towards the stream.

Groundwater delivers nutrients from peatlands to salmon streams

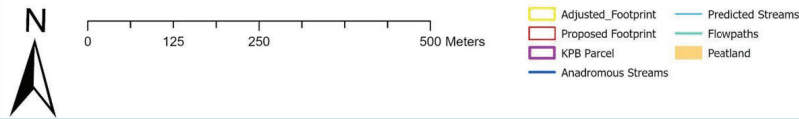
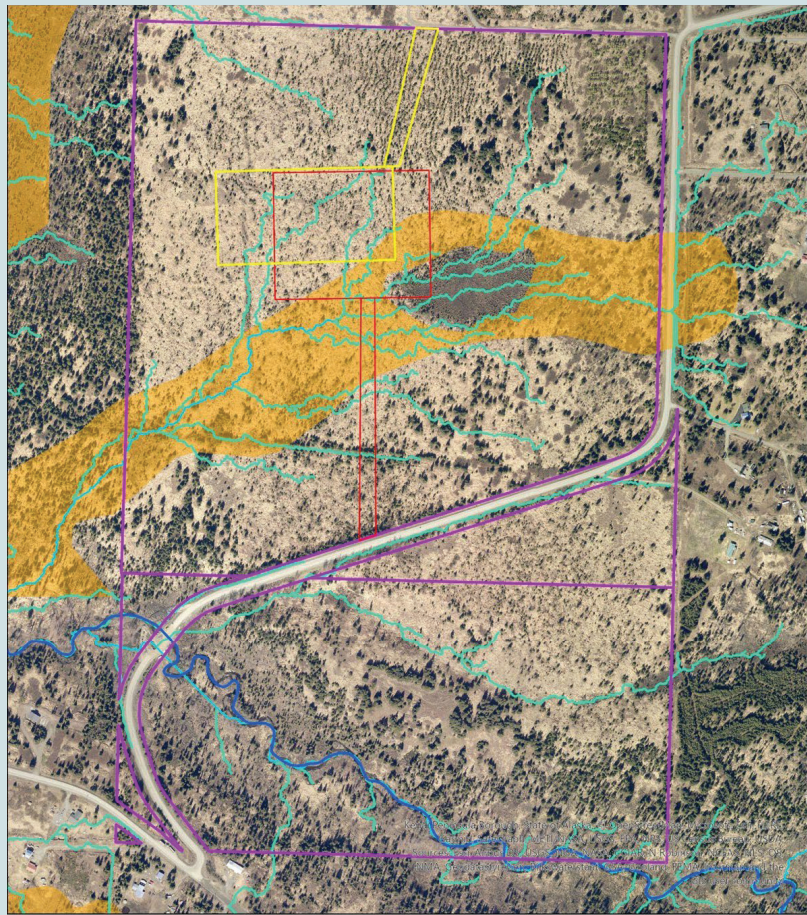
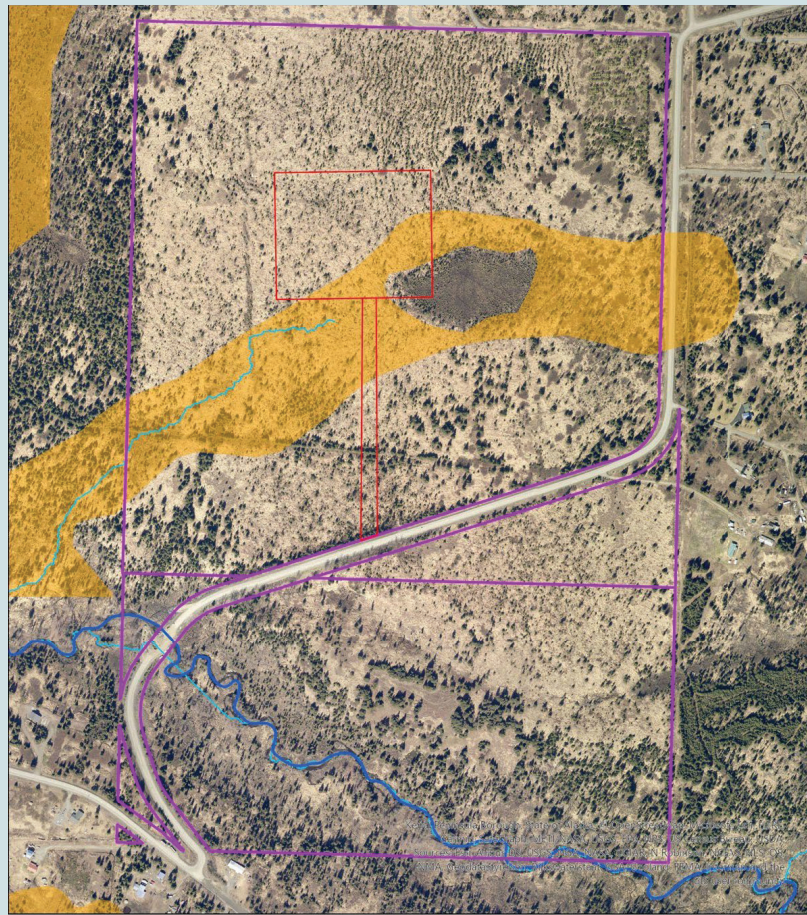
## 2. Science-based tools

1. Most land on the southern Kenai Lowlands is unprotected (pink and white).
1. Lots of parcelization.
1. Headwater streams (red) where juvenile salmon rear are throughout the watersheds.





### 3. Decision-making





## Planning Commission

“Concerns about water quality and fish habitat are routinely voiced during public testimony during hearings for conditional land use permits for material sites. If additional information was included in the application on hydrology of sites, the planning commission would be more effective at acknowledging and engaging with the public to address their concerns.”

Syverine Bentz, served planning commission 6 years

# Conditional Land Use Permits-River Center

## 4. Training and Education



Engaging with remote villagespartnering with Project GRAD



Field trips with KPB middle schools

# Field trips for commercial and sport fishermen, partnering with Kachemak Heritage Land Trust





Municipal field trips,  
partnering with City of Homer



# Groundwater table demonstration



