

# Assessing potential impacts of in-river hydrokinetics on juvenile fishes



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Picture courtesy of Todd Paris - UAF

# Background

- Possible juvenile fish using river thalweg
- Potential overlap in time and space of hydrokinetic devices and juvenile fish migration
- Necessary to understand river channel use





# Goal

- Conduct baseline study to assess potential overlap in time and space
- Objective
  - Develop a comparative index of river channel usage by juvenile fishes
    - River margins
    - Middle of river channel
      - Top of water column
      - Middle water column
      - Bottom of water column



# Yukon River 2010

## Tanana River 2011







## Fyke nets



Picture courtesy of Todd Paris - UAF

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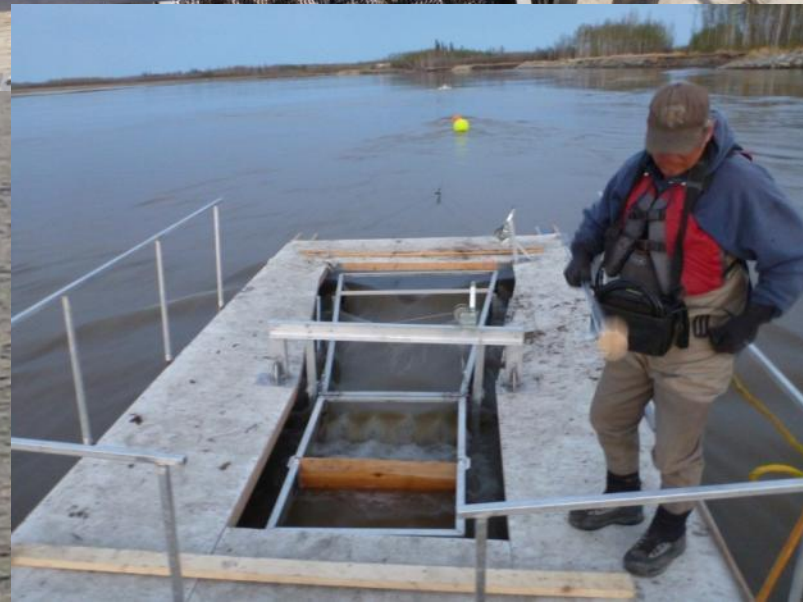
Frame Trawl



# Tanana River Mid-Channel Methods

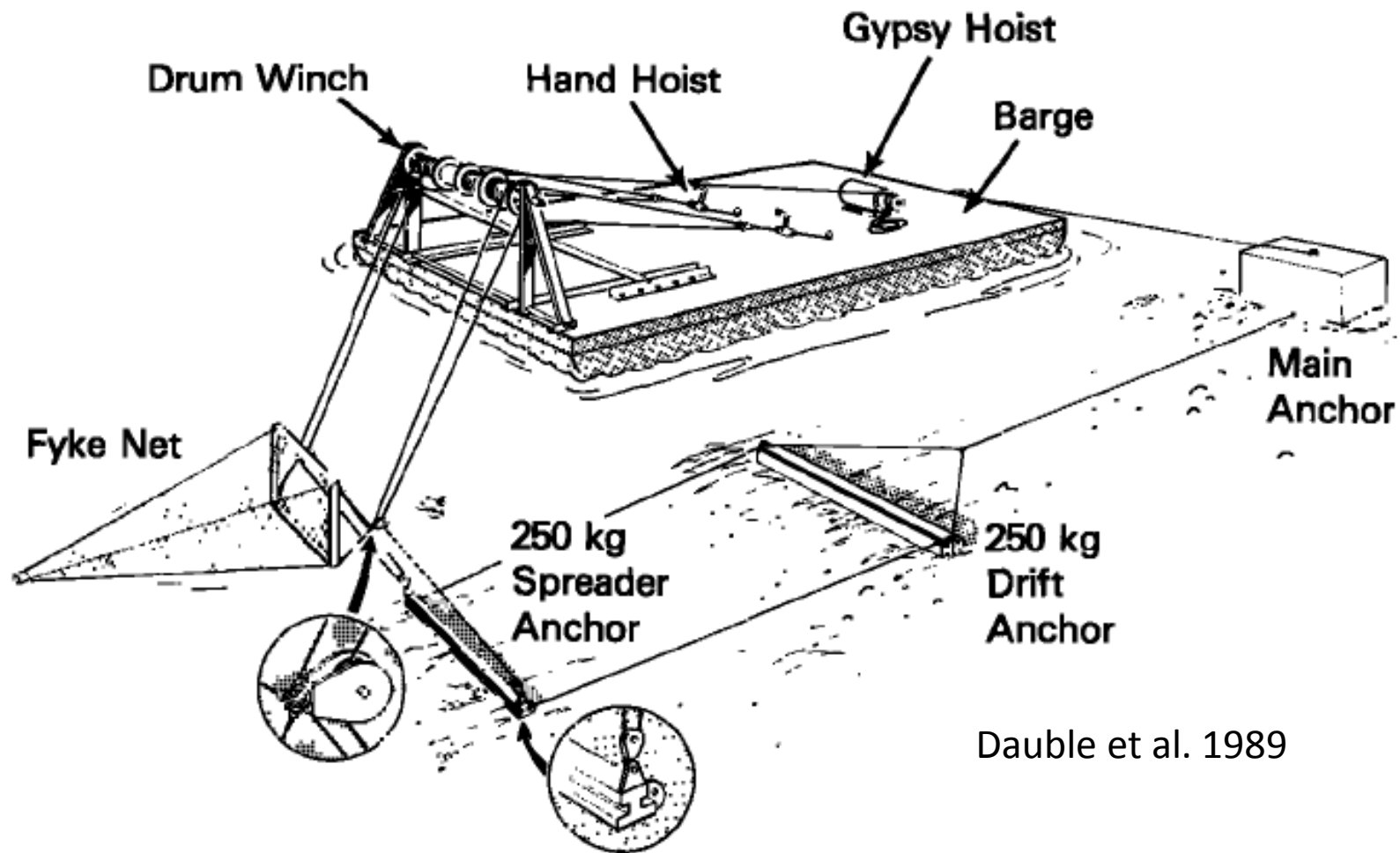


- Incline Plane Trap
  - Top of water column





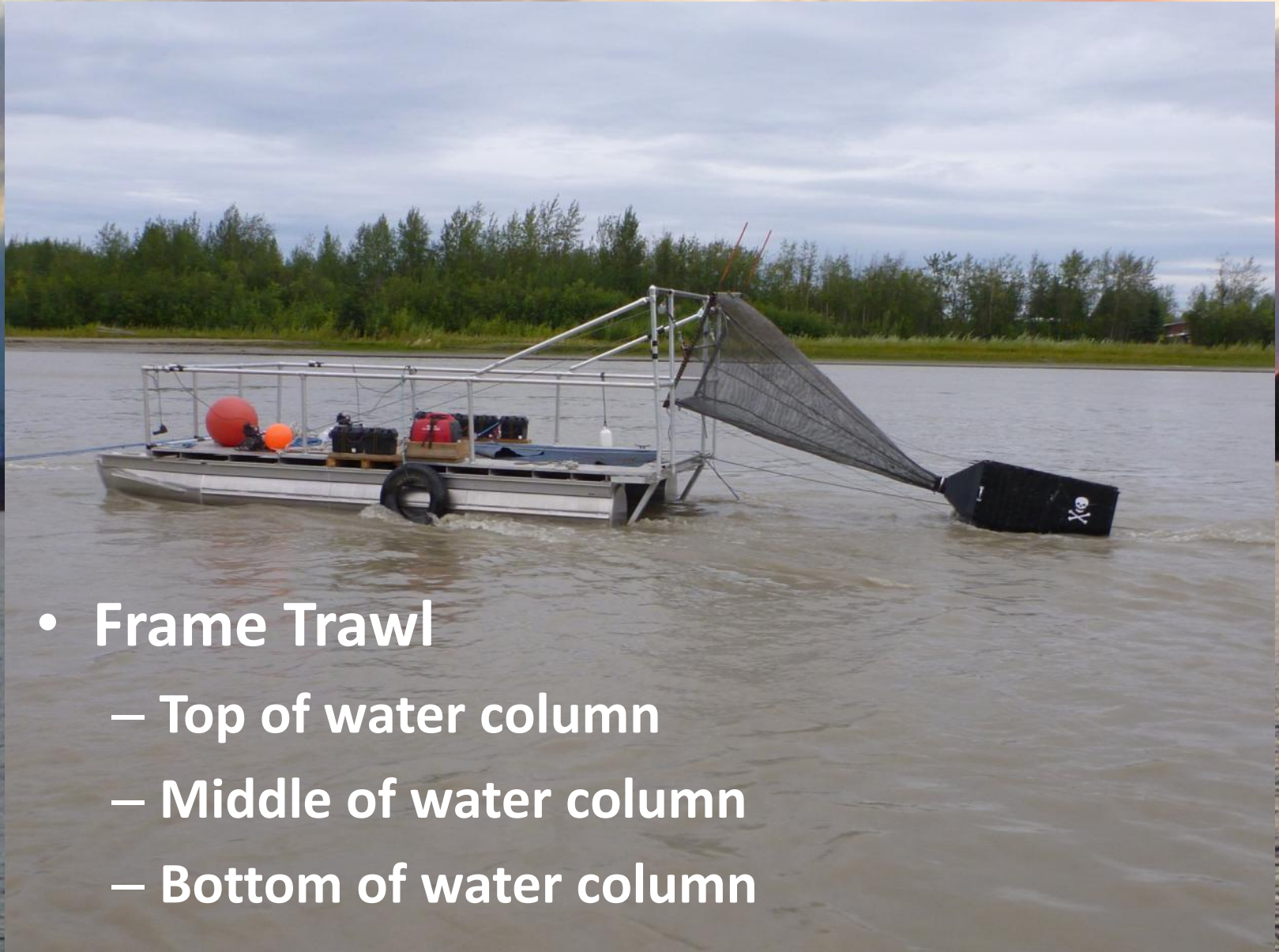
# Tanana River Mid-Channel Methods



Dauble et al. 1989




# Tanana River Mid-Channel Methods



- **Frame Trawl**
  - Top of water column
  - Middle of water column
  - Bottom of water column



# Mid-Channel Challenges

A wide river flows under a dramatic, cloudy sky at sunset. In the distance, a large bridge with a high arch is visible. The water is calm with some small ripples. A small boat is visible on the right side of the river.

Heavy debris  
Deep river channel  $\approx 30$  feet  
Glacial turbidity  
Swift current  
Short open water season  
“Flashy” discharge rates



# Yukon River 2010 margin catches

- Captured 6,312 fishes
- 499 total fyke net settings
- Longnose Sucker - 2,523
- Arctic Grayling - 1,932
- Whitefish spp. - 1,167
- Chum salmon - 336
- Chinook salmon - 131
- Lake Chub - 90
- Lamprey - 77
- Burbot - 28
- Inconnu - 23



# Tanana River 2011 River Margin Catches

- Captured 3,896 fishes
- 329 total fyke net settings
- Whitefish spp. - 1,512
- Longnose sucker - 911
- Chum salmon - 774
- Lake Chub - 494
- Arctic Lamprey - 126
- Arctic Grayling - 29
- Chinook /Coho salmon - 22
- Burbot - 21
- Slimy Sculpin - 4
- Western Brook Lamprey - 2
- Northern Pike - 1





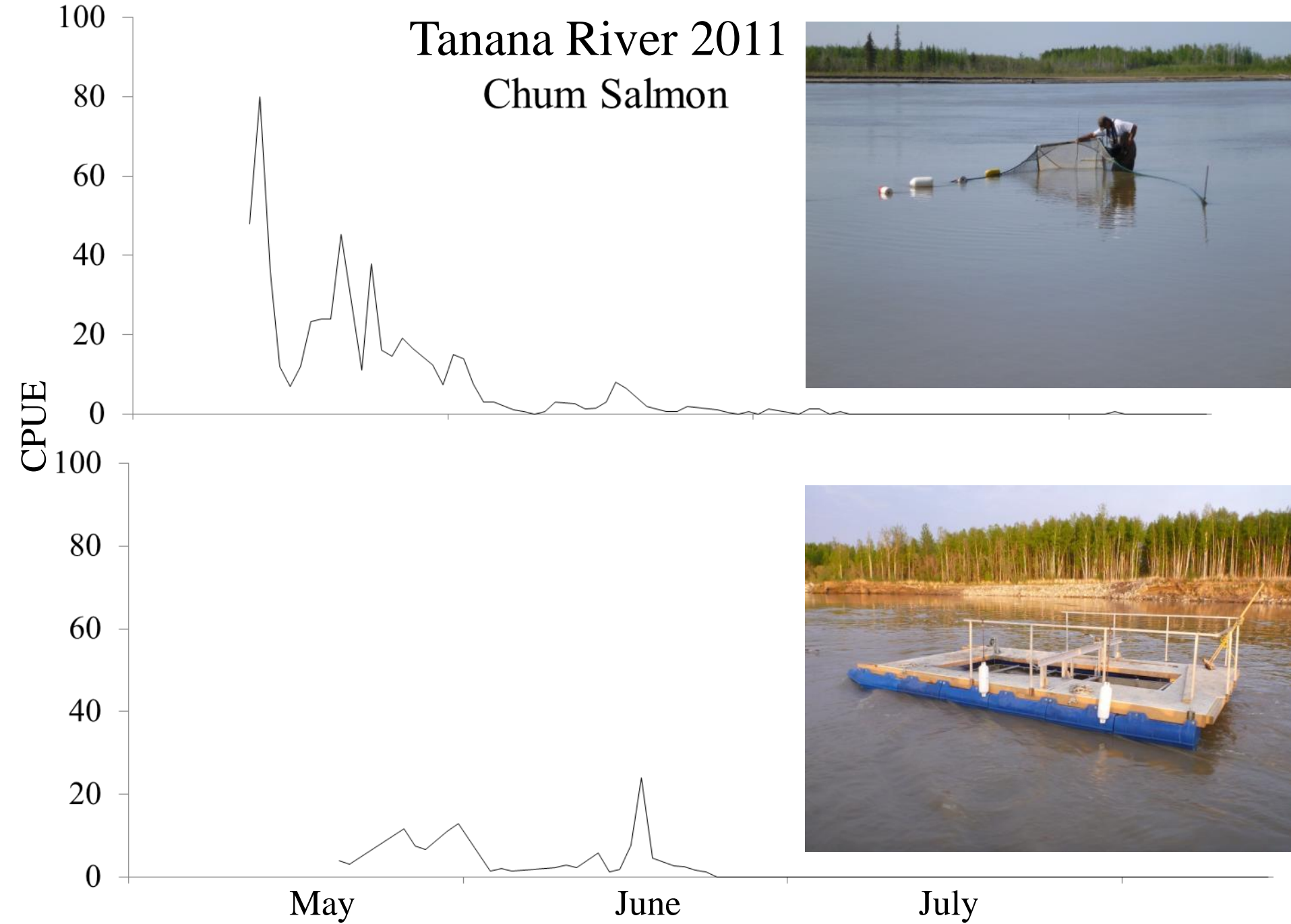
# Tanana River 2011 Mid-Channel Surface Catches

- Captured 583 fishes
- 69 total incline plane trap sets
- Chinook/Coho salmon - 330
- Chum salmon - 239
- Whitefish sp. - 10
- Arctic Lamprey - 3
- Burbot - 1



# Tanana River 2011

## Chum Salmon

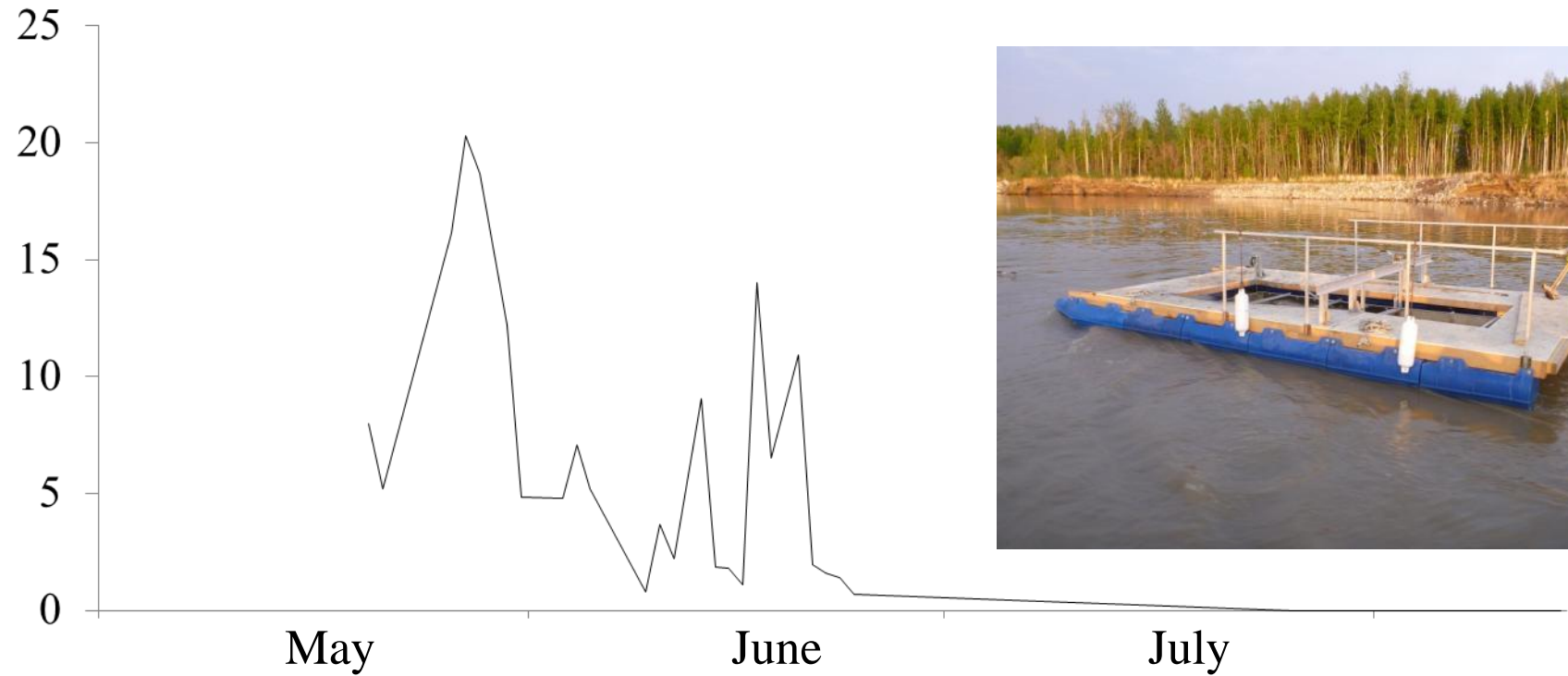
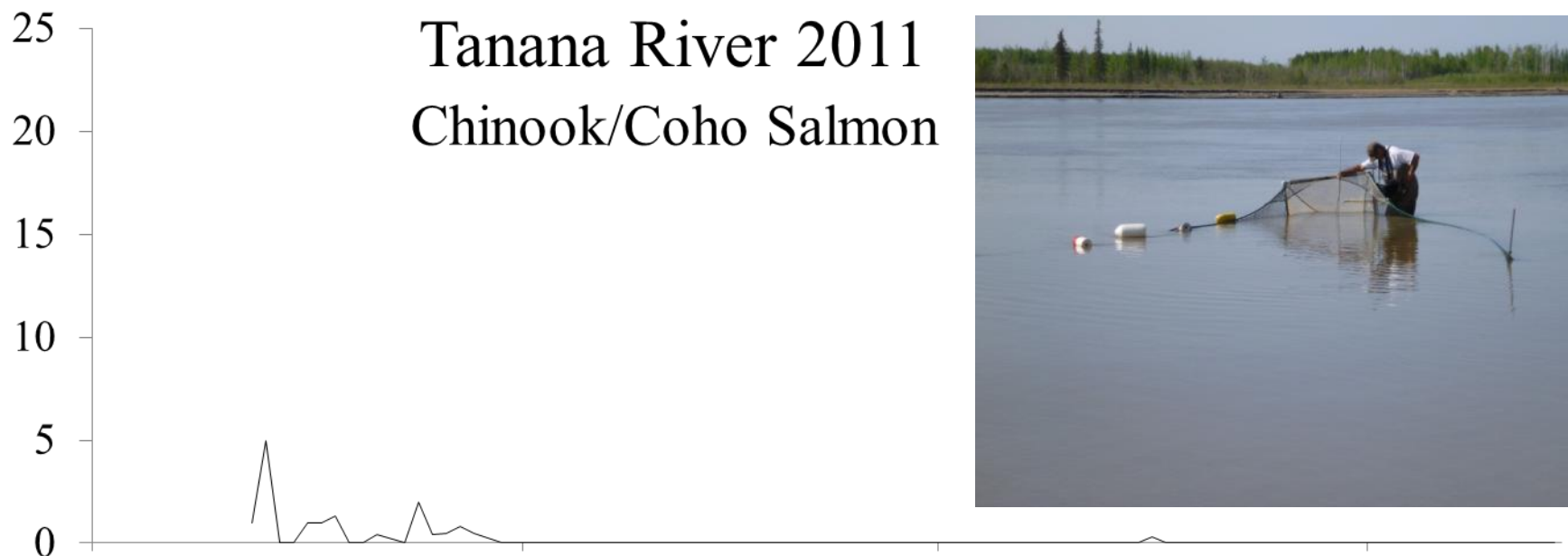




# Tanana River 2011

## Chinook/Coho Salmon

CPUE



# In Summary...

- First documented mid-channel sampling in large glacially influenced Alaskan Rivers
  - Logistical problems
  - Development of methodology

- Some use margins

Longnose Sucker

Chum salmon

Lake Chub

Slimy Sculpin

Western Brook Lamprey

Arctic Grayling

Chinook salmon

Burbot

Northern Pike

Whitefish spp.

Coho Salmon

Inconnu

Arctic Lamprey

- Some use middle

Chinook Salmon

Whitefish spp.

Coho Salmon

Arctic Lamprey

Chum Salmon

Burbot

- To assess impacts we need to capture fish directly behind hydrokinetic devices





Any Questions???