Depth and Flow: Do juvenile salmon demonstrate preference on a managed agricultural floodplain?

Lynn Takata[1], Louise Conrad[1], Naoaki Ikemiyagi[1], Eric Holmes[2], Carson Jeffres[2] and Ted Sommer[1]

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8th Biennial Bay Delta Science Conference
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Many people, many thanks…

Louise Conrad
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Angie Munguia
Jamie Suria

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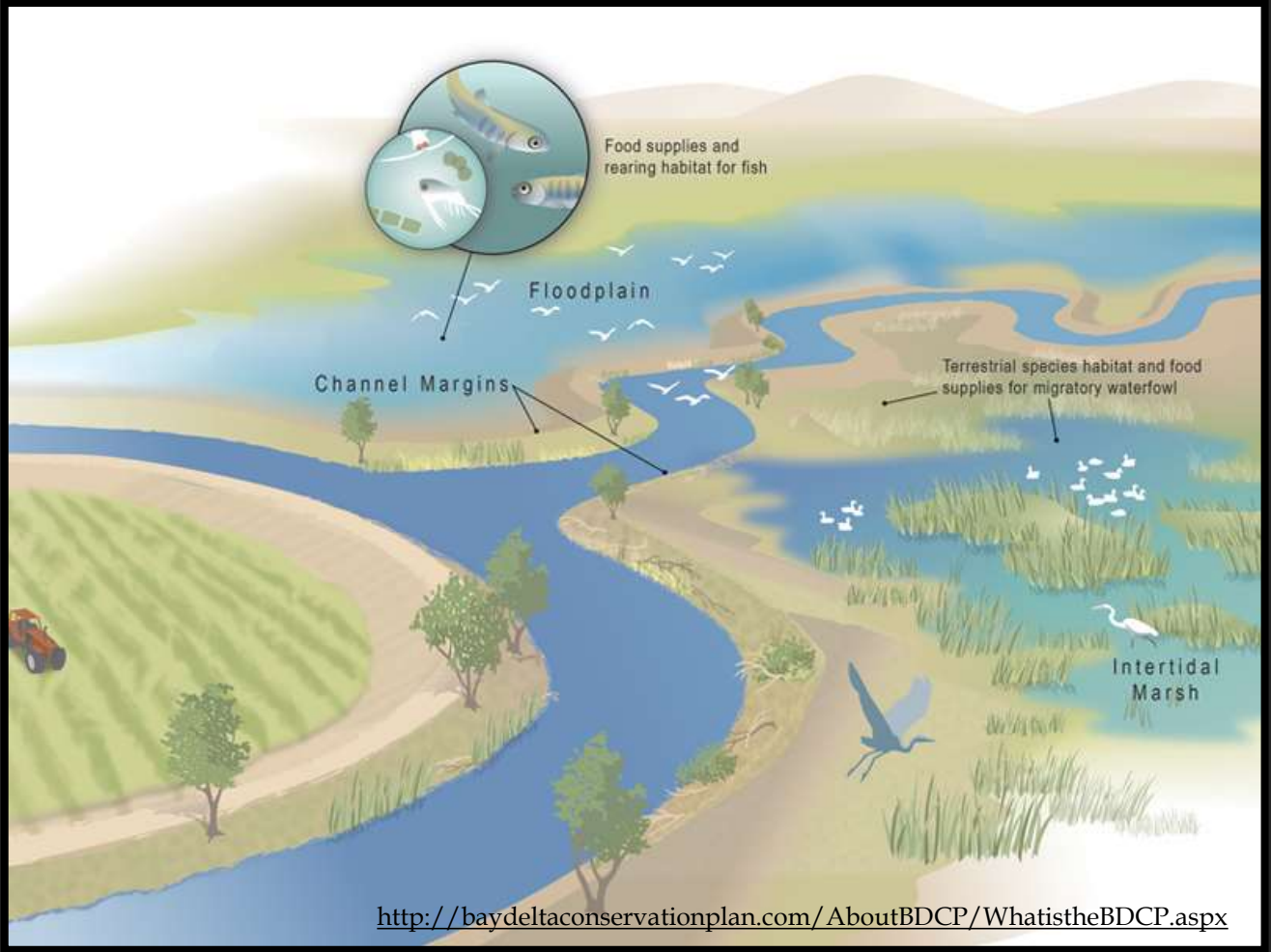
Jared Frantzich
Heather Fuller
Danika Tsao
James Newcomb
Jason Kindopp
Krystal Acierto
Josh Israel

Cal Marsh & Farm Venture, LLC

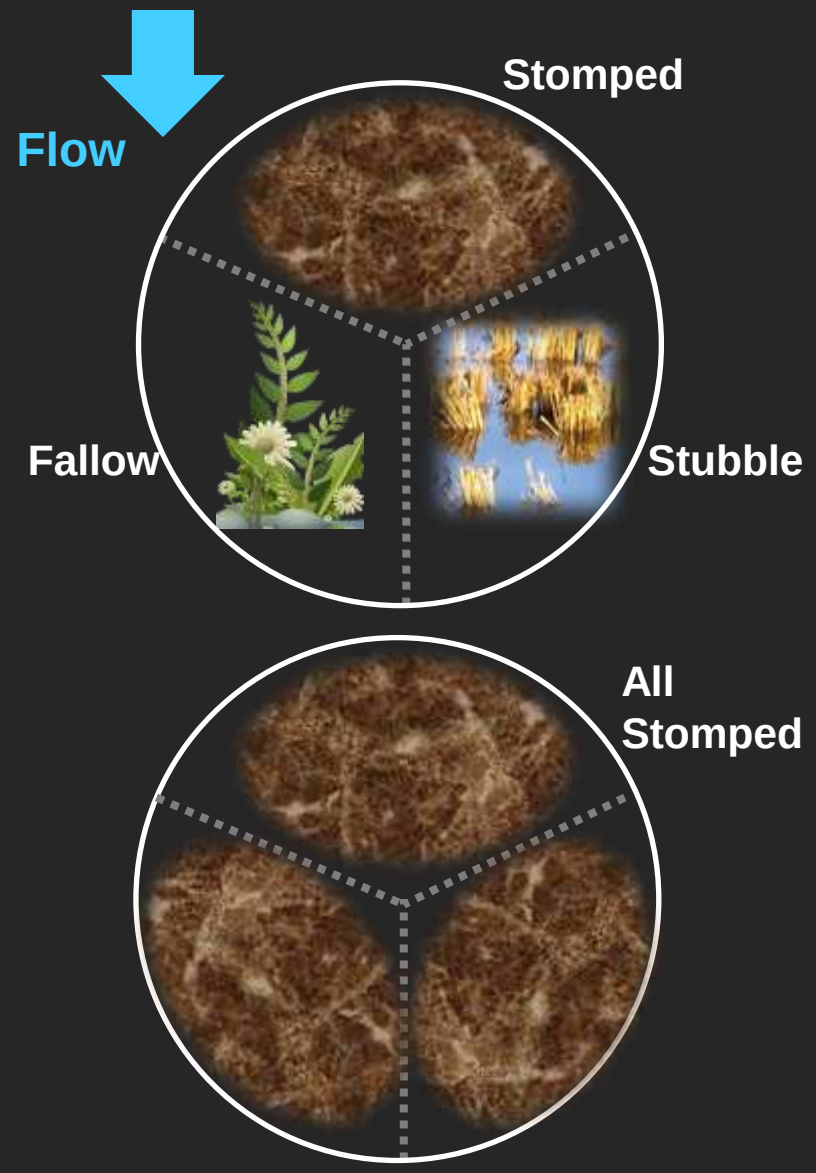
Yolo Bypass Floodplain & Ecosystem Benefits



http://baydeltaconservationplan.com/AboutBDCP/WhatistheBDCP.aspx

2013 Knaggs Ranch Investigation

2013 Habitat Preference Study



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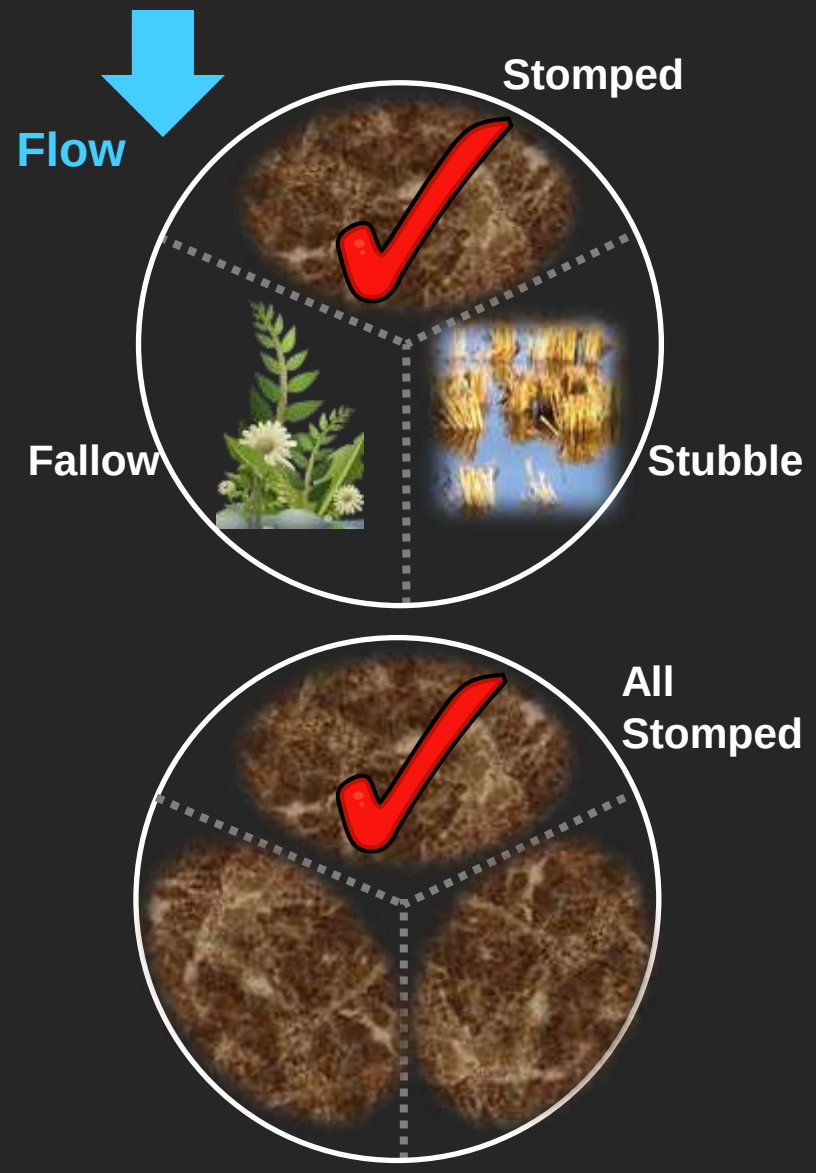

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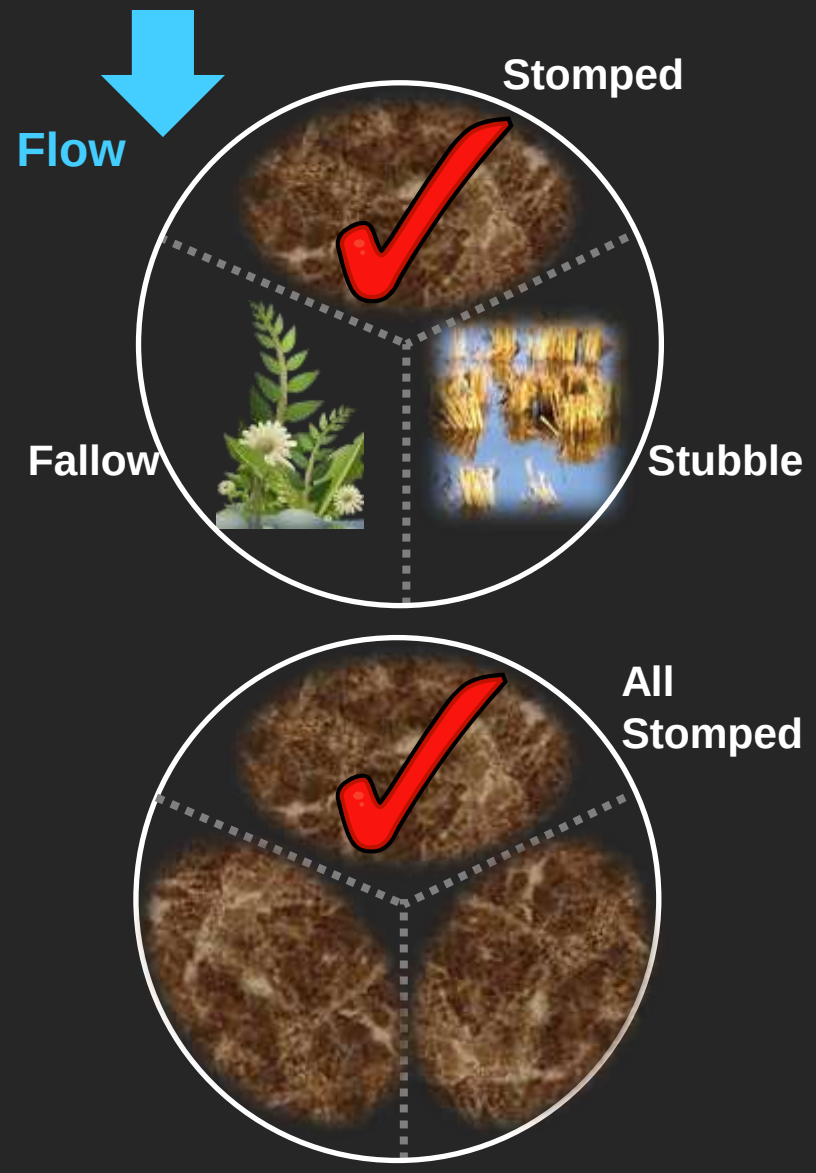

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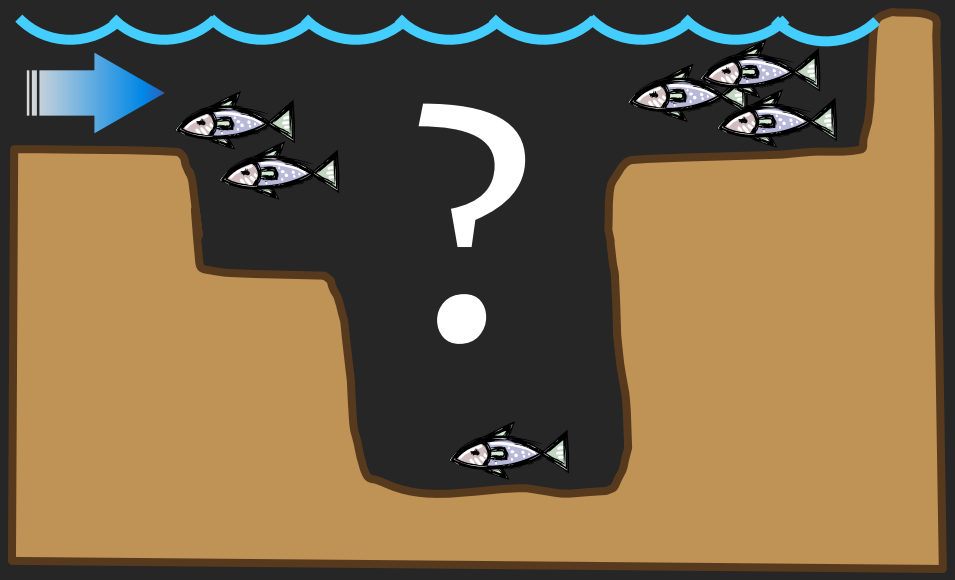
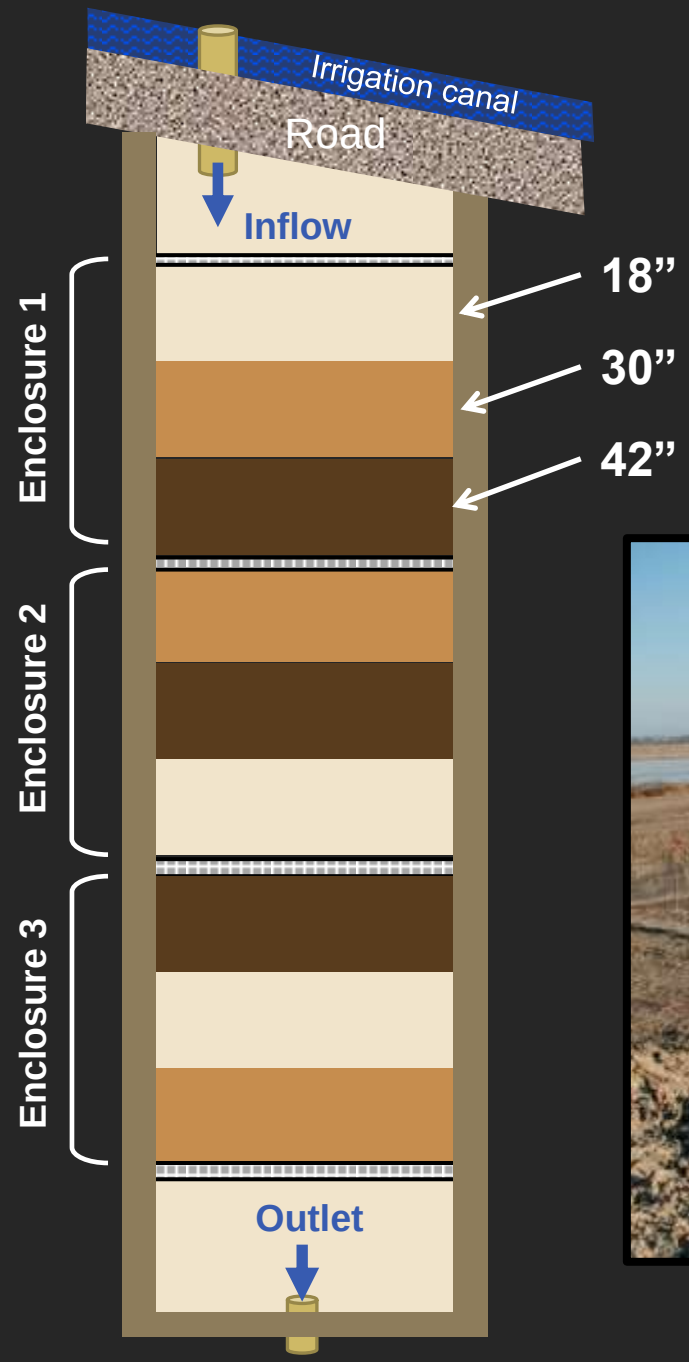


2014: Varying depth & proximity to inflow?



2014 Experimental Layout

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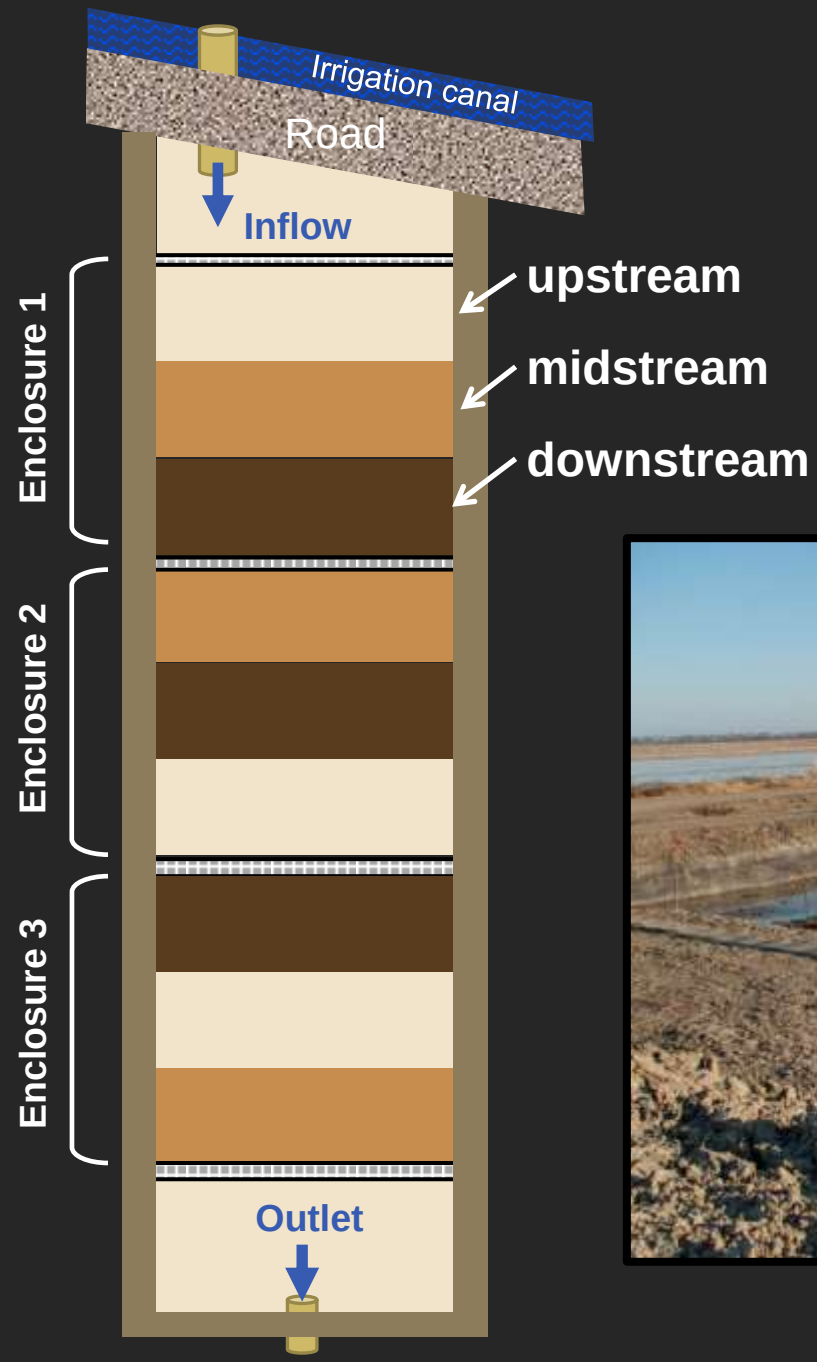

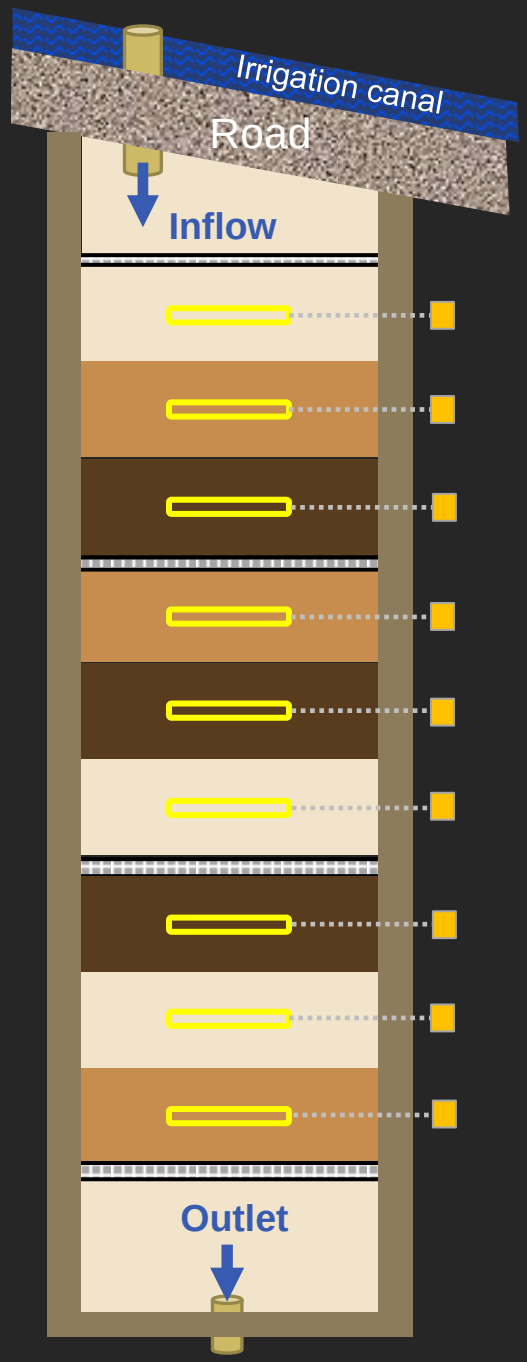

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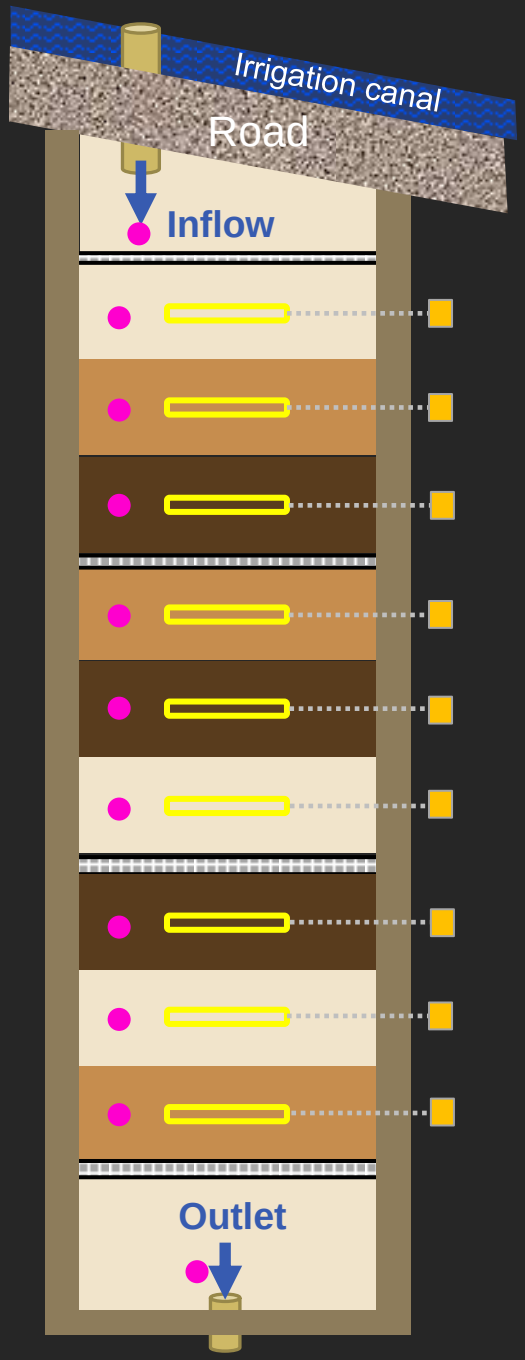
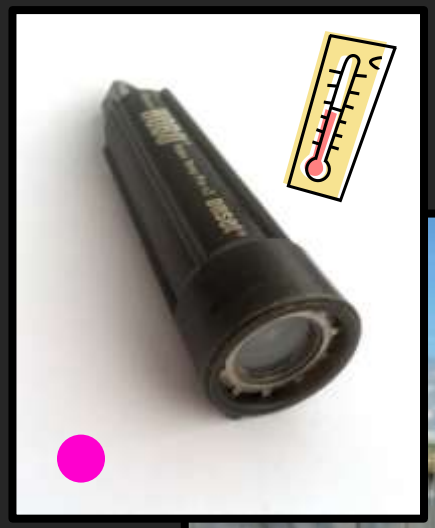
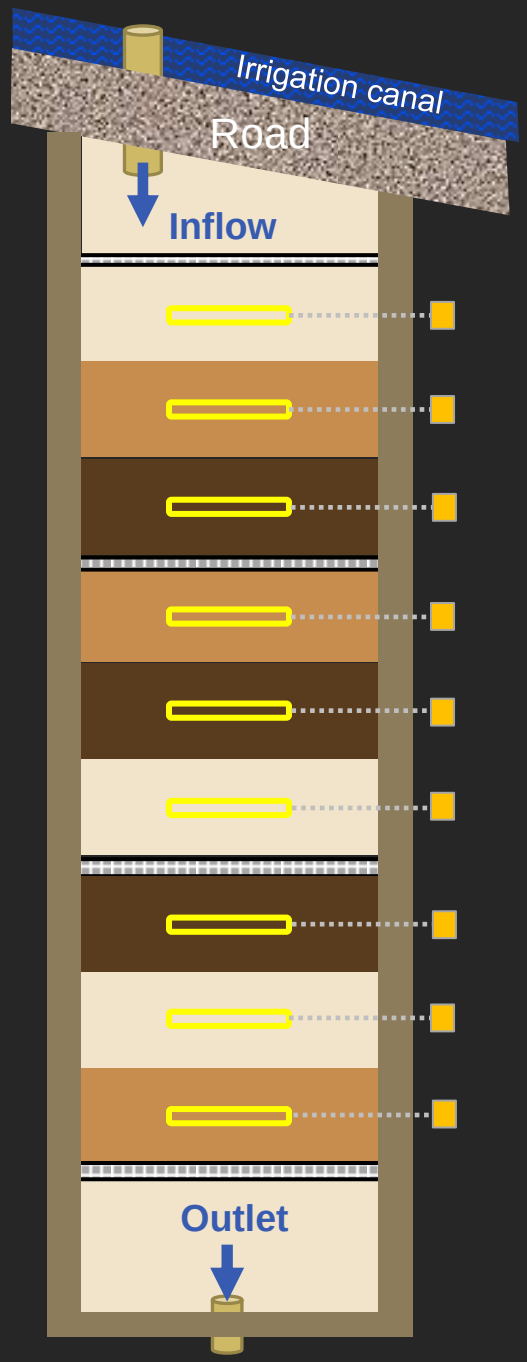
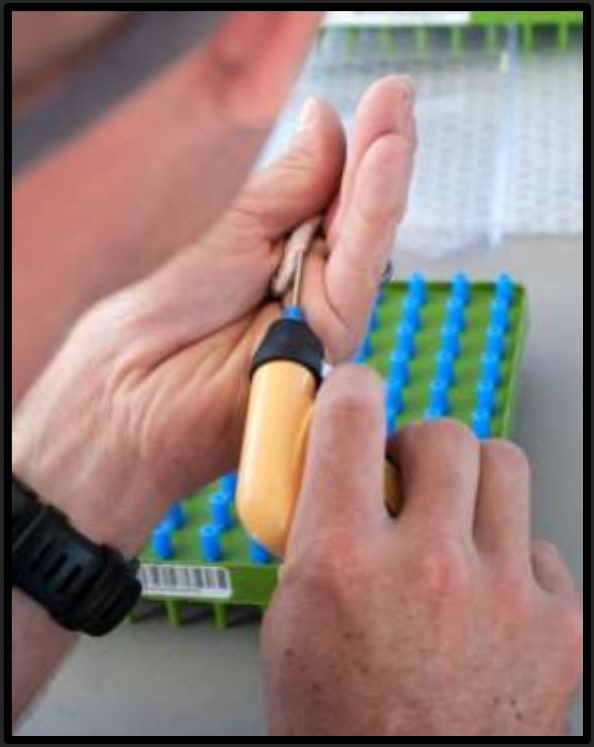






PIT Tagging

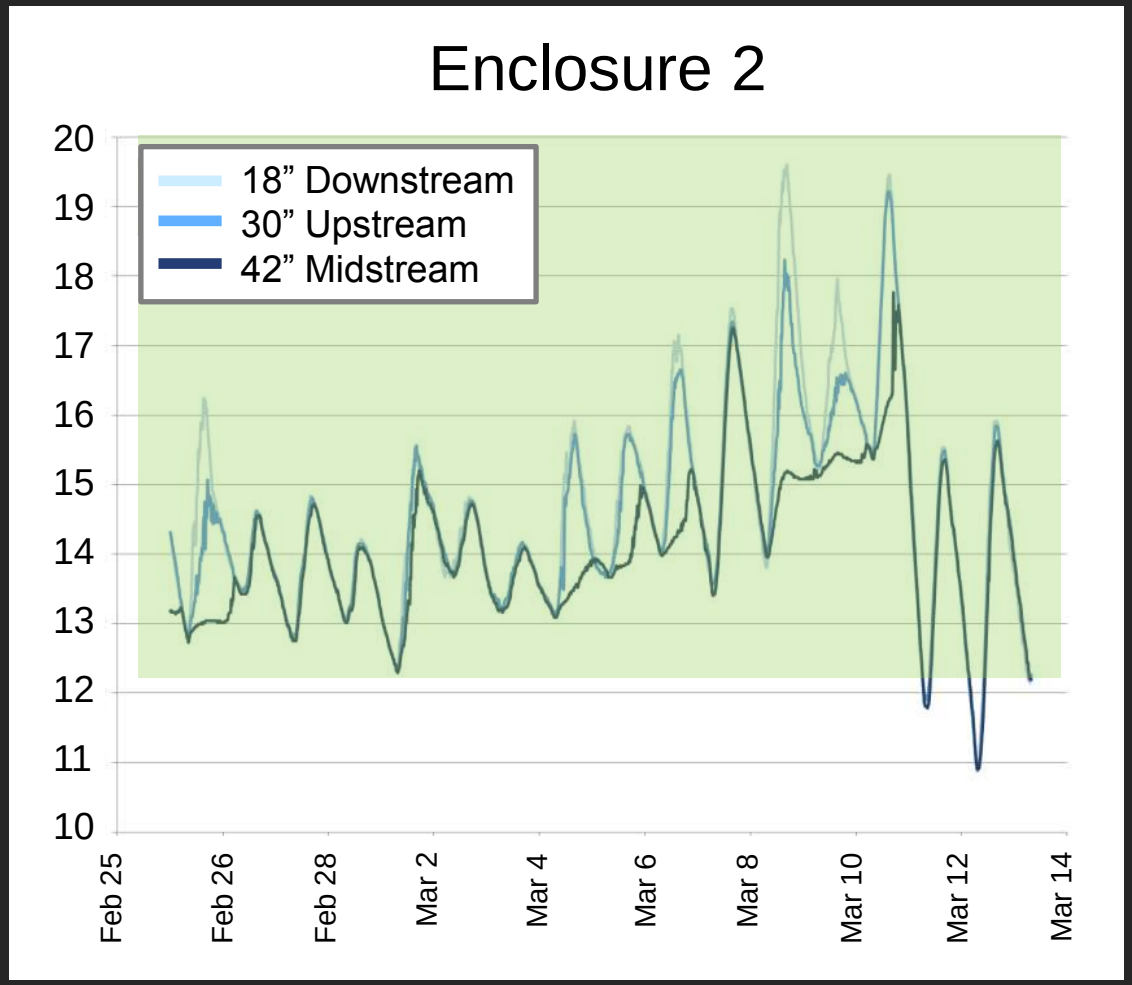
- ❖ Fish ≥ 60 mm
- ❖ 12 mm PIT tags
- ❖ 44-50 each enclosure
- ❖ February 27-March 13, 2014



Water Quality

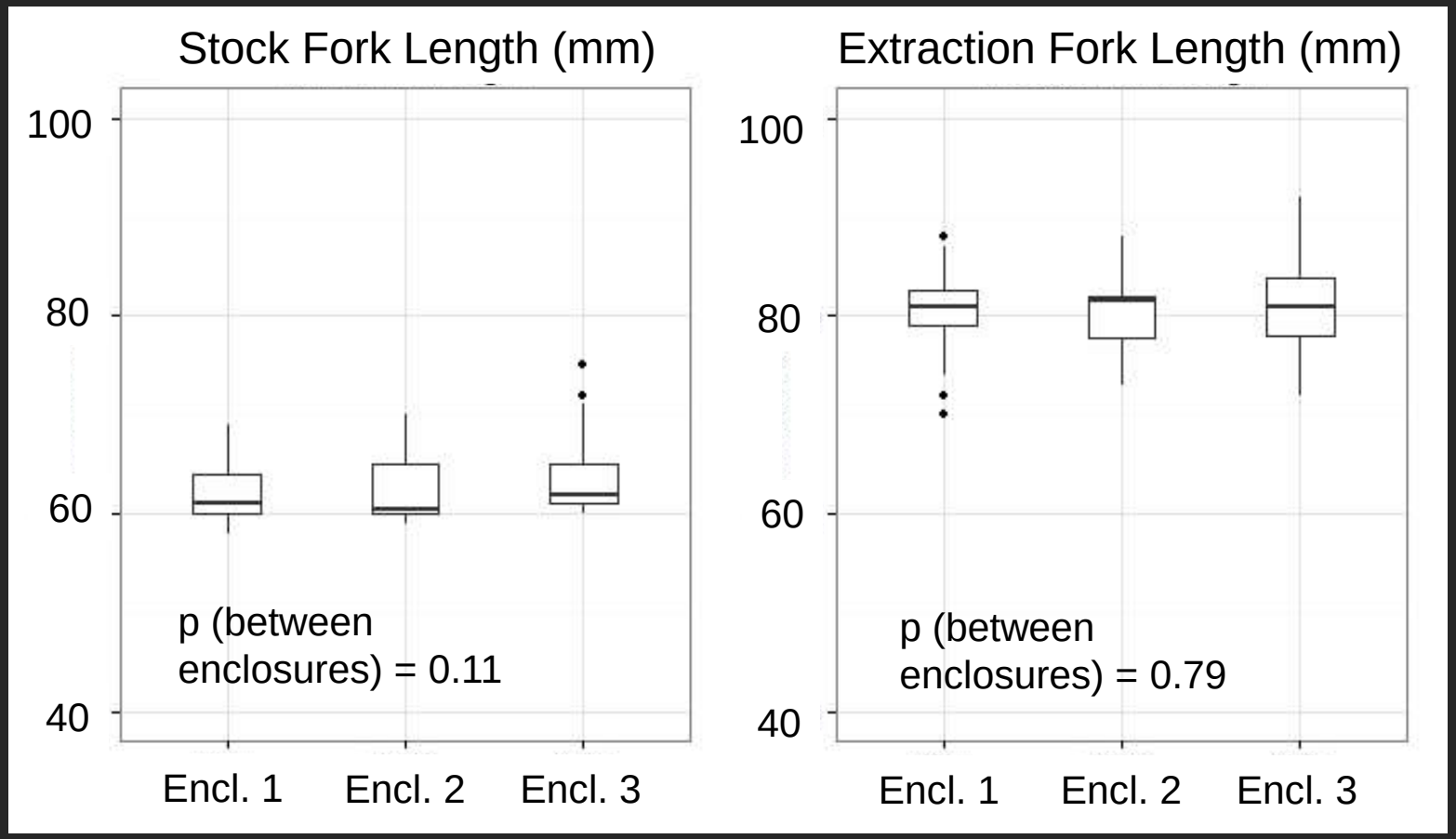
Parameter	Mean (±Std Dev)	Range	p (Within Enclosures)
Dissolved Oxygen	8.1 (± 1.5) mg/L	5.0-11.5 mg/L	≥0.64
Turbidity	24.4 (±12.7) NTU	11.9-61.9 NTU	≥0.73
pH	7.6 (± 0.3)	7.1-8.1	≥0.89

Temperature



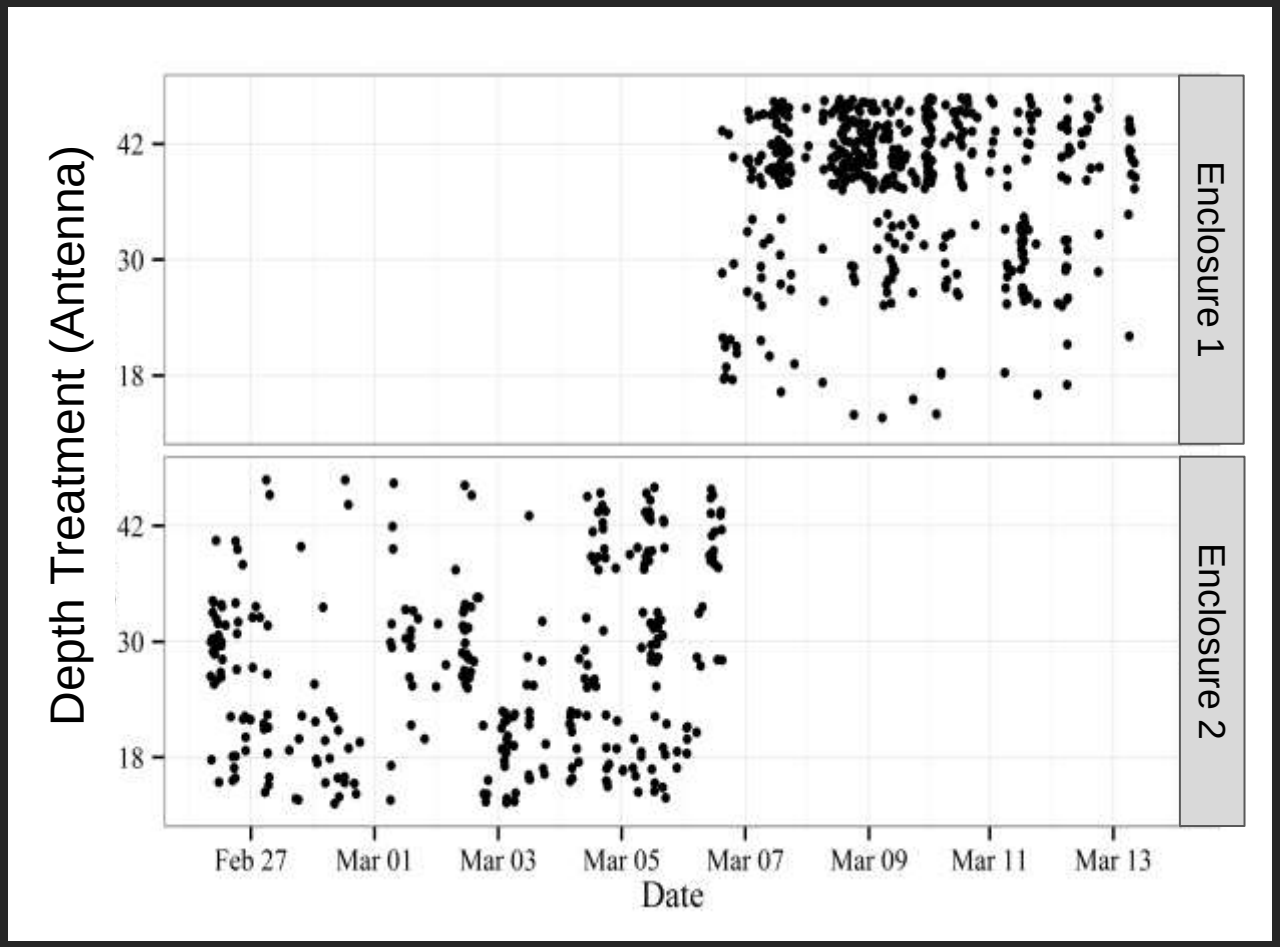
- Within tolerances
- Similar across enclosures
- 42” sections coolest ($p<0.001$)
- More variable in 18” & 30” sections ($p<0.001$)

Growth & Survival



- 1.28 mm/day (Std Dev ±0.23)
- Not significantly different between enclosures
- Survival: 92%-98%-100%

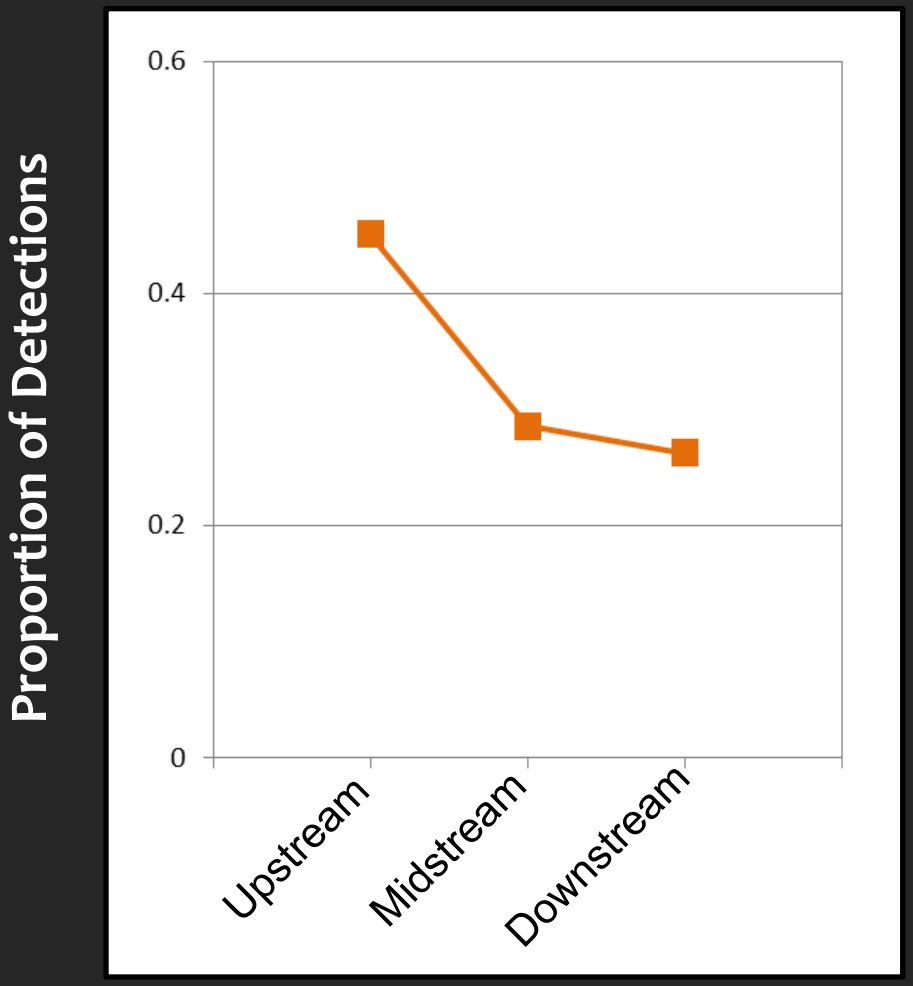
PIT Tag Detections



- 3.8 million detections
- Every fish detected multiple times/day
- Subsampling: 97k detections
- Gap between enclosures 1 & 2

Day: Upstream

Position (p<0.001)

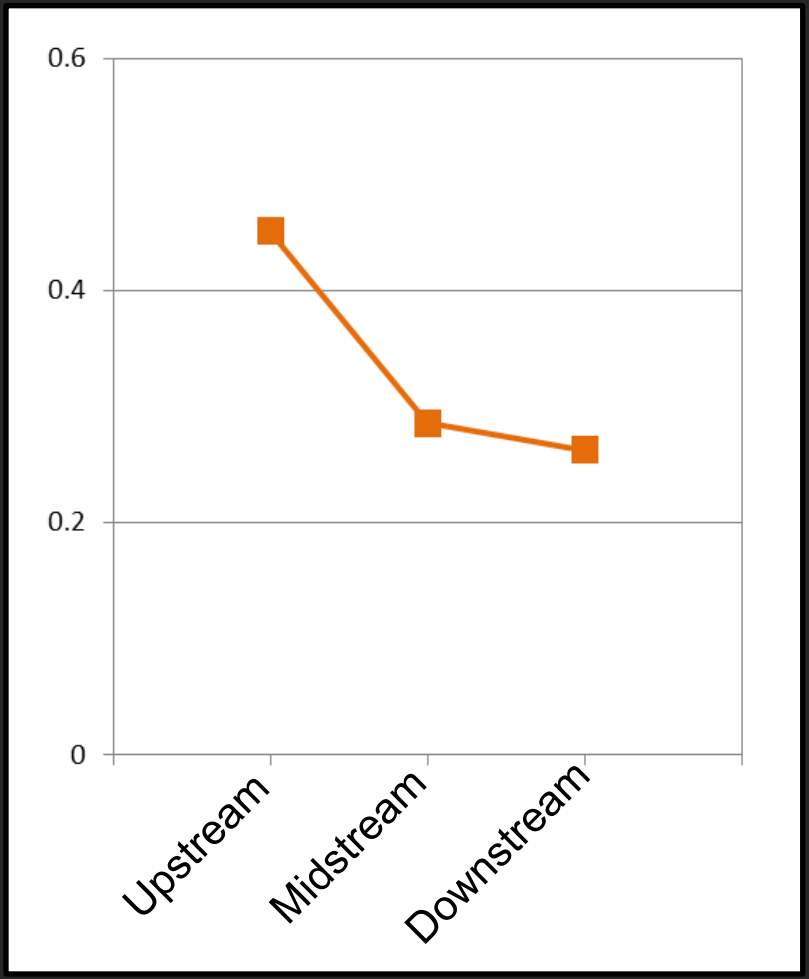


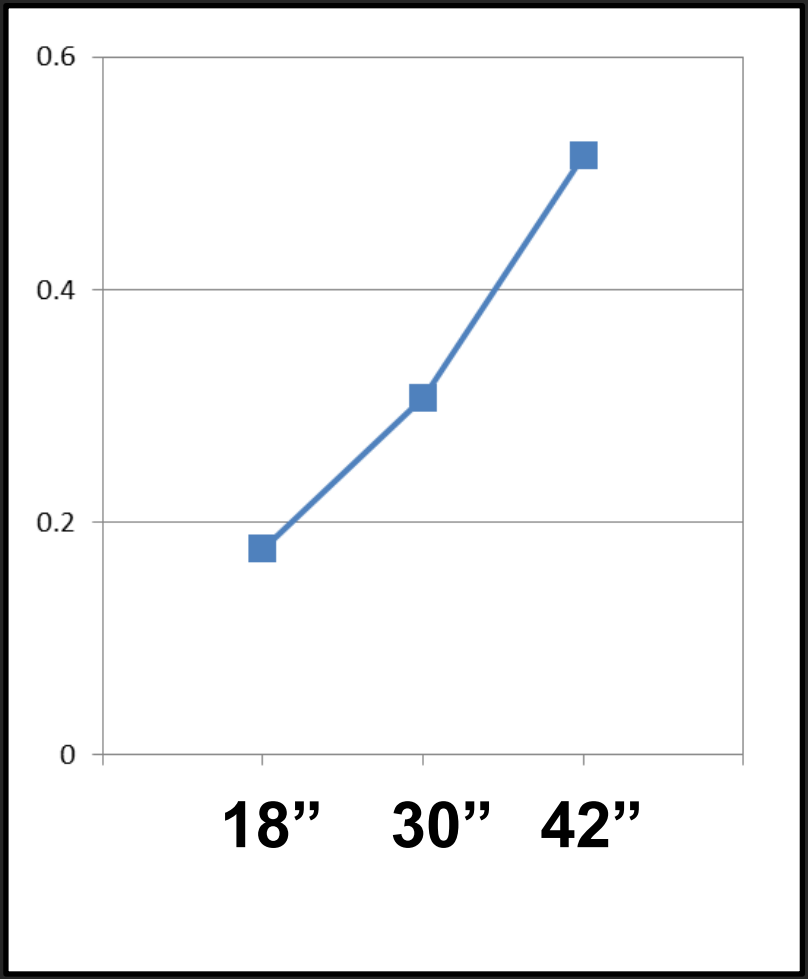
Day: Upstream & Deep

Position (p<0.001)

Depth (p<0.001)

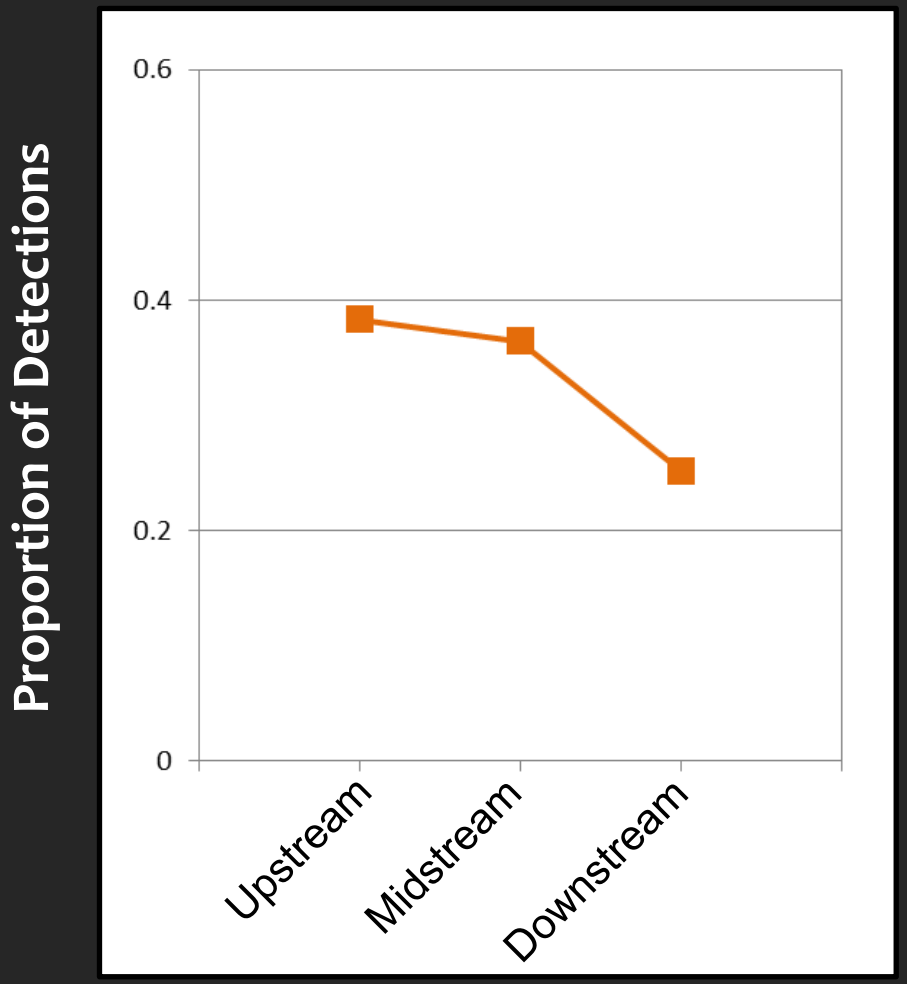
Proportion of Detections





Night: Upstream & Shallow

Position ($p<0.001$)



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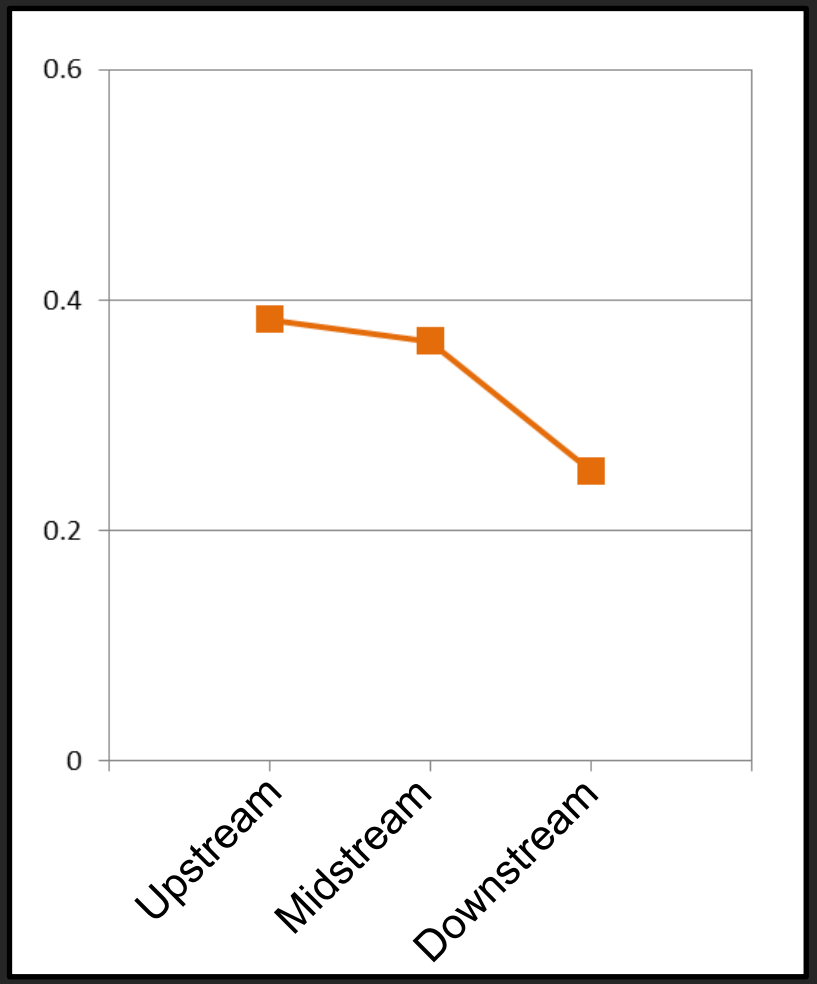

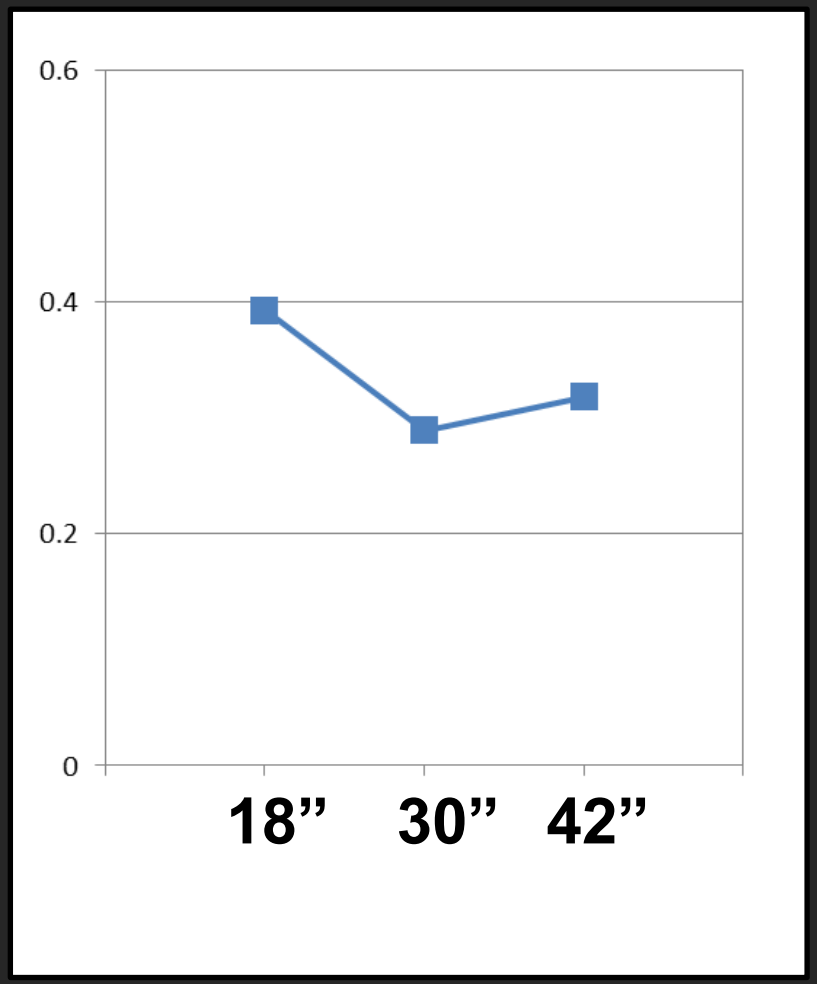

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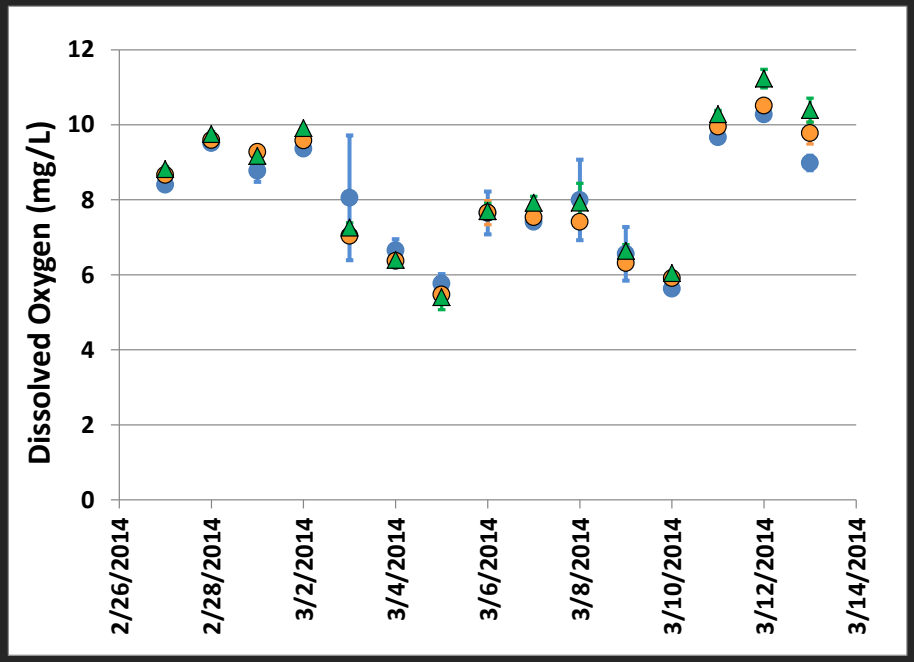
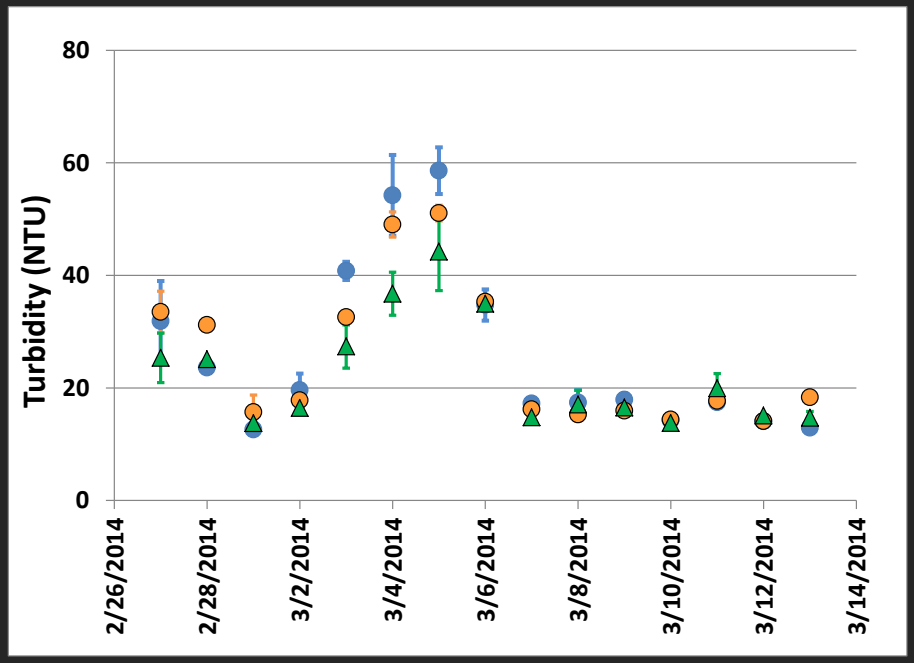
  - Depth variation
  - Flow (even if very low)

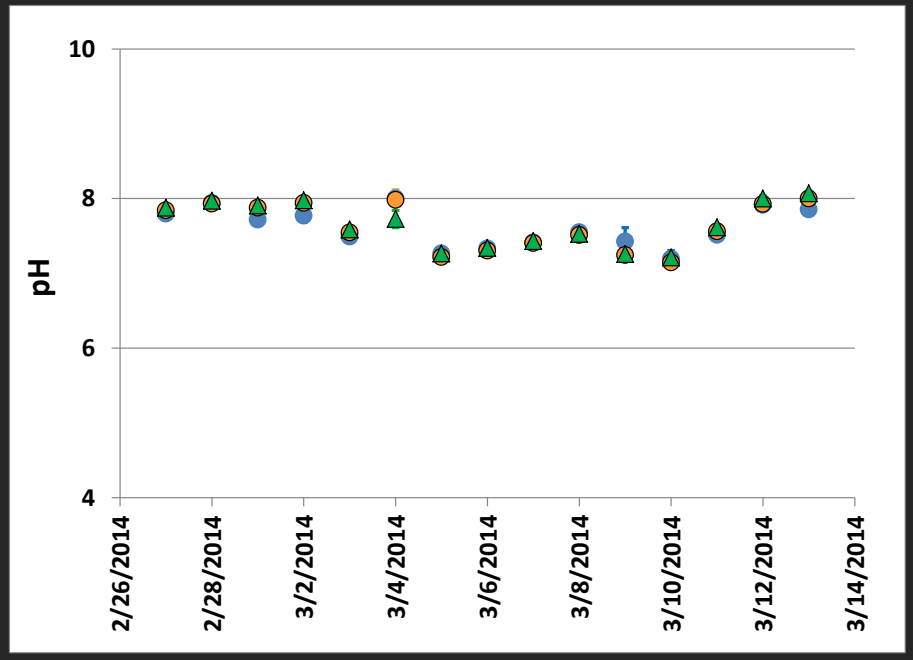
Questions?

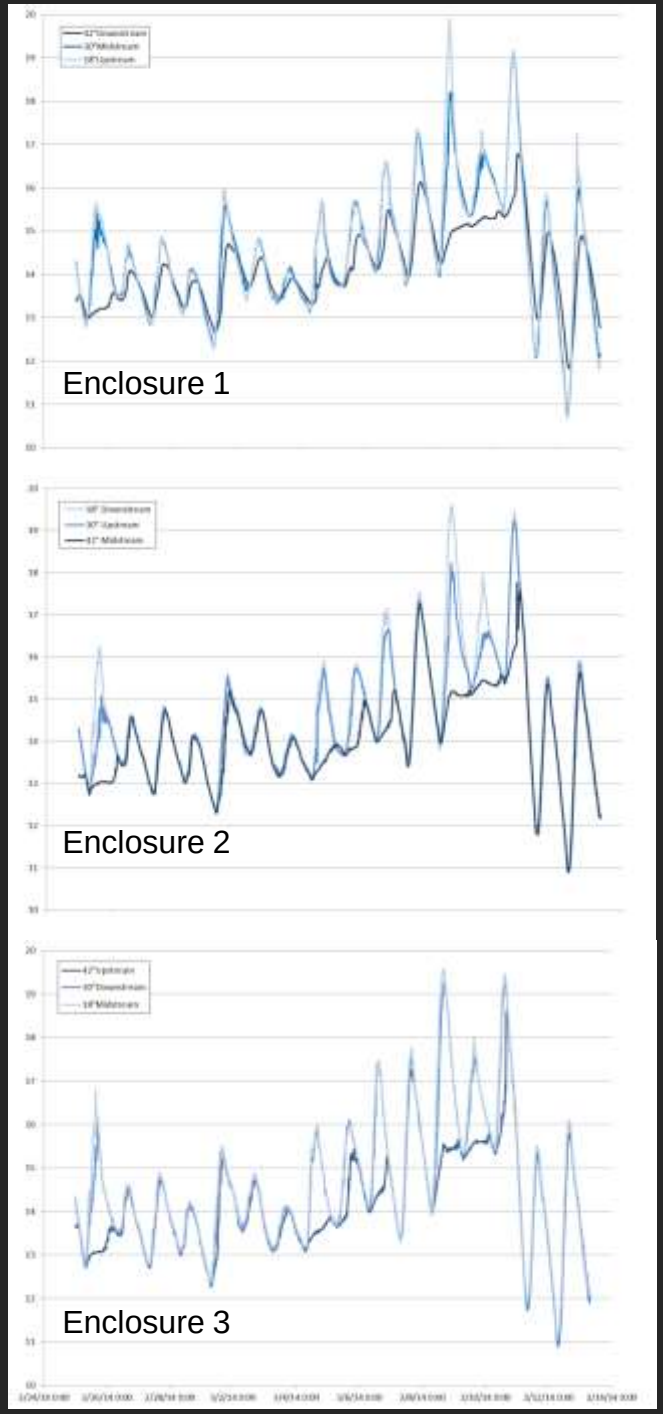
Water Quality
(DO, Turbidity, pH)



Enclosure 1 Enclosure 2 Enclosure 3







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Position
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Depth
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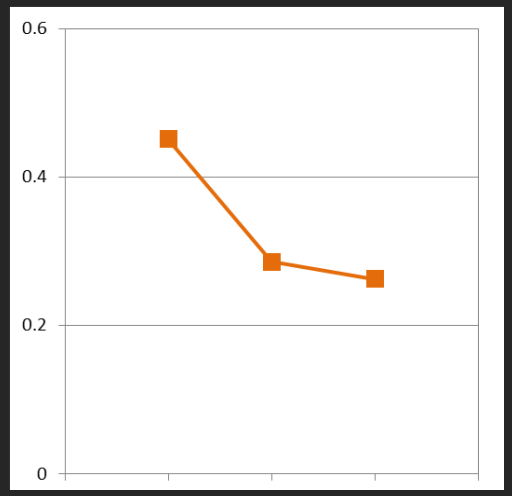
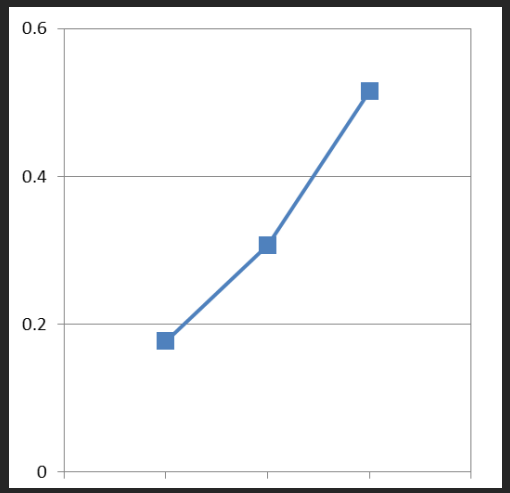
Main Effects





Interaction Effects
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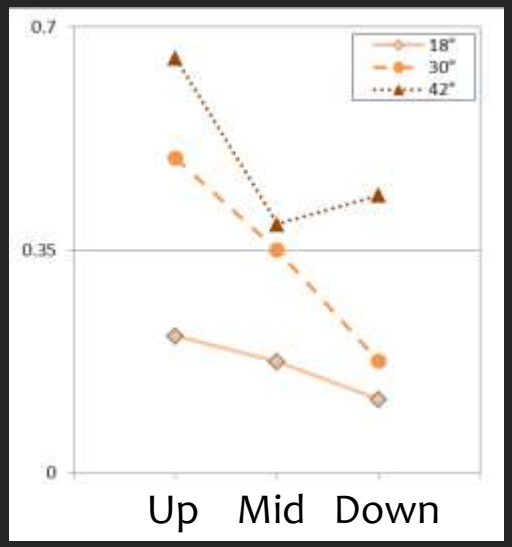

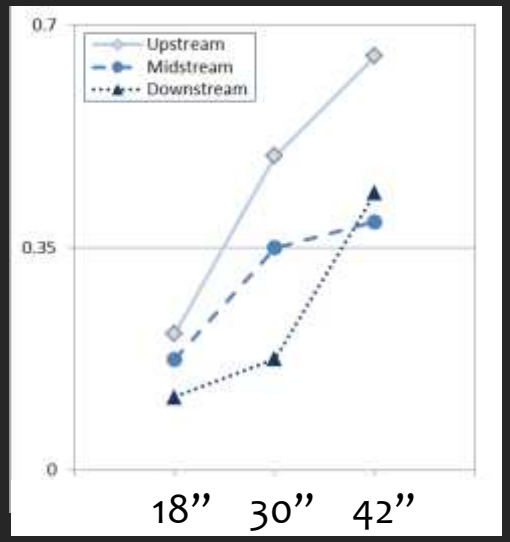

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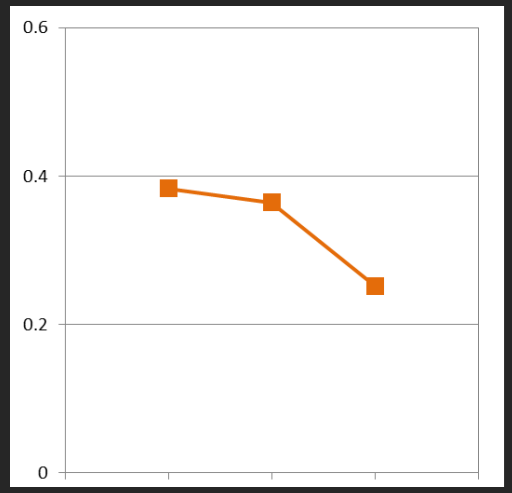

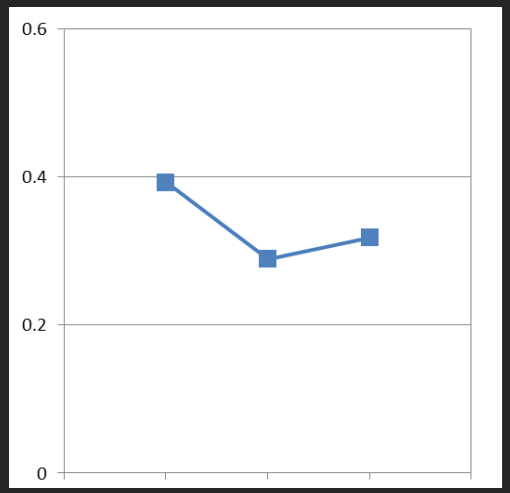
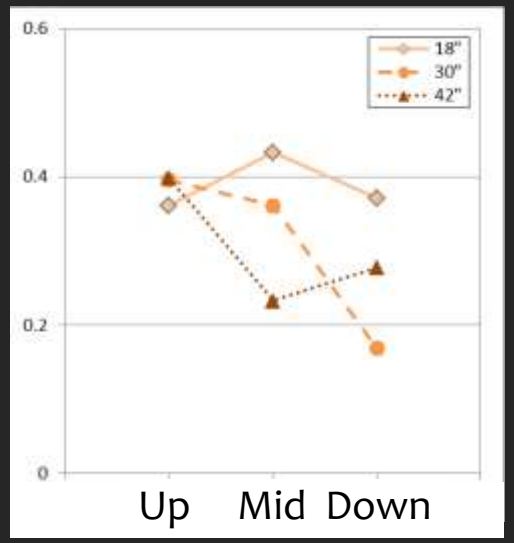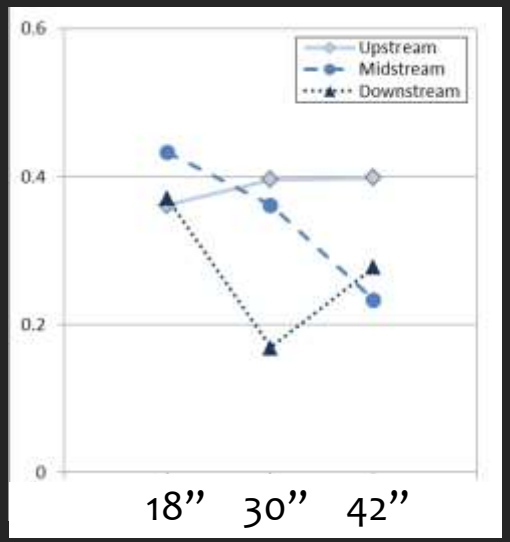
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