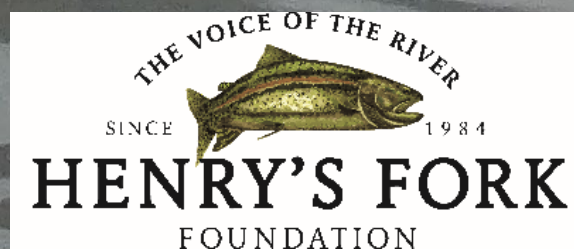


The Henry's Fork Fishing Experience: *Effects of water quantity and water quality*

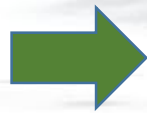
Rob Van Kirk, Henry's Fork Foundation
Henry's Fork Watershed Council, December 13, 2022



Outline

- What determines *fishing experience*?
- Angler expectations
- Trout and their habitat
- Effects of streamflow
- Effects of water quality
- The 2022 season & beyond





*Fishing
Experience*

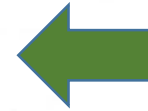
- Abundance
- Size
- Species
- Behavior



- Abundance
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*Fishing
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- Abundance
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- Aesthetics
- Habitat and water quality



- Weather
- Streamflow



- Abundance
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*Fishing
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- Weather
- Streamflow



- Abundance
- Size
- Species
- Behavior

- Preferences
- Prior experience

*Fishing
Experience*



- Abundance
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- Species
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- Expectations
- Perception



The Henry's Fork fishing experience



1. Rising fish



The Henry's Fork fishing experience

1. Rising fish



2. Aesthetics

The Henry's Fork fishing experience



1. Rising fish



2. Aesthetics

3. Size and
quantity of
fish caught



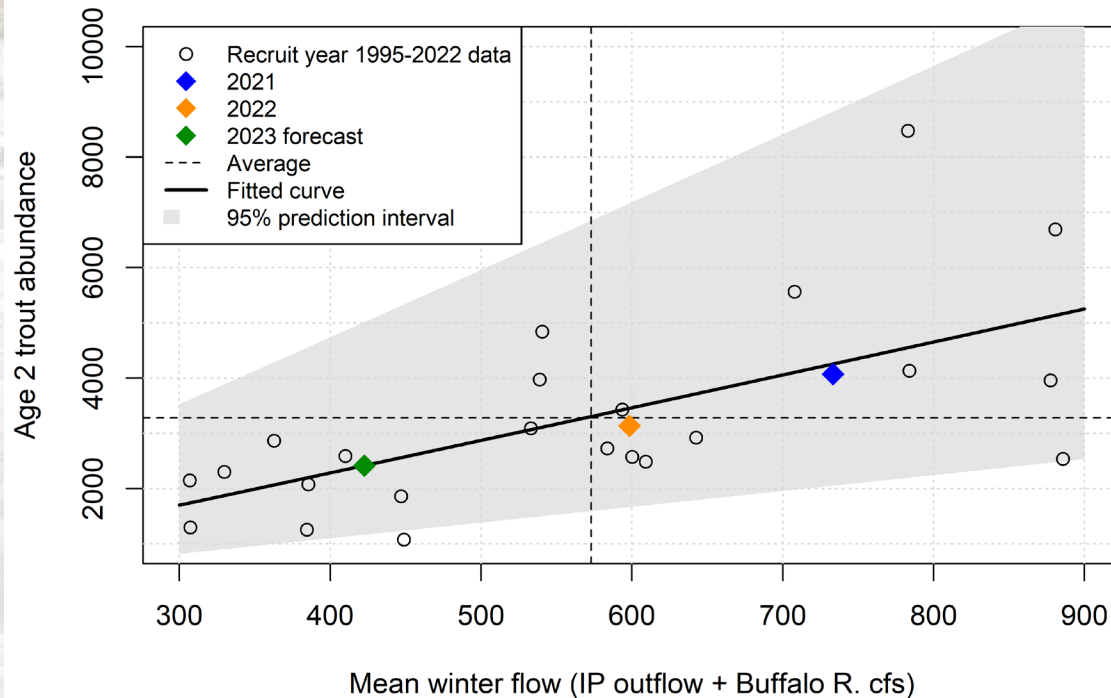
Trout and Habitat

- Size: HF is extremely productive
- Abundance: varies by reach
 - Upper HF: Jack covered that
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 - “Middle” (Mesa Falls to St. Anthony): No statistically significant relationships apparent

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Box Canyon Trout Recruitment vs. Winter Flow

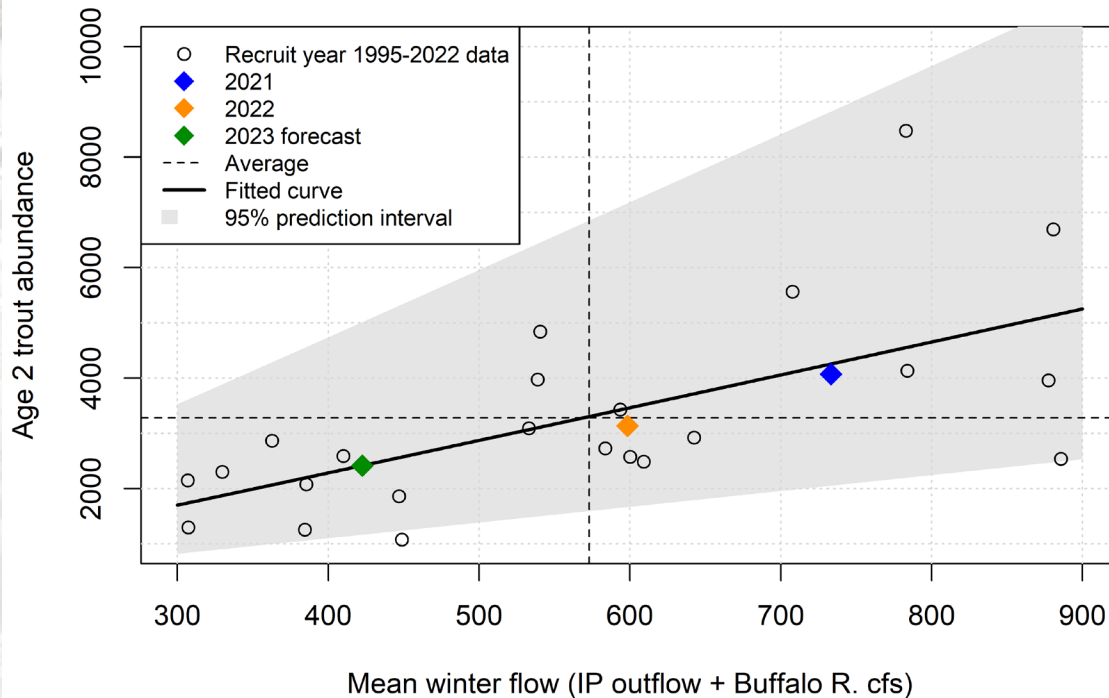


Population data from IDFG

Trout and Habitat

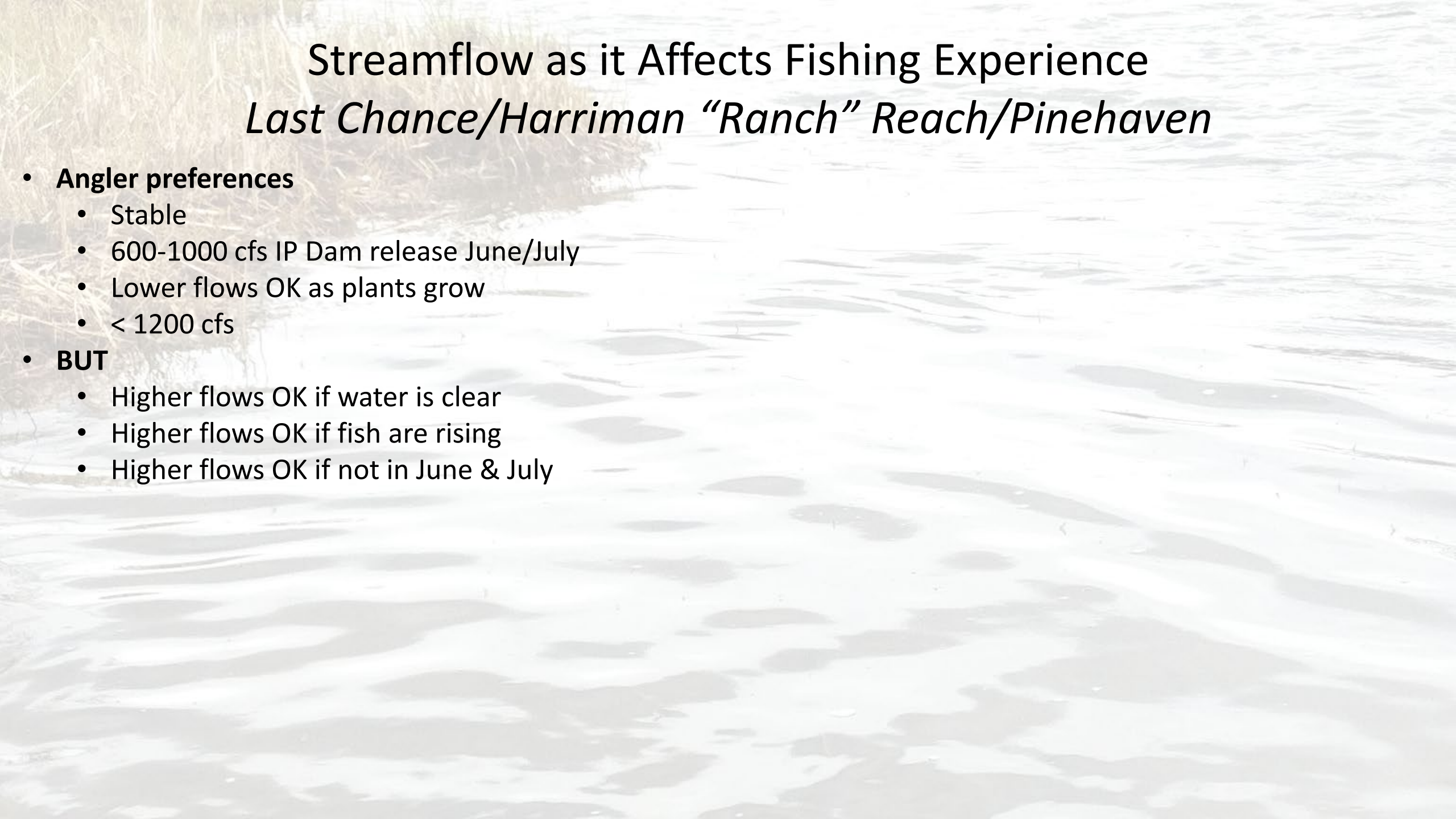
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Box Canyon Trout Recruitment vs. Winter Flow



- “Recruit” = 2-year old fish
- 2-year lag in response to water supply
- Variability in age classes = variability in size distribution
- 2-4 year lag between water supply and angler experience

Population data from IDFG



Streamflow as it Affects Fishing Experience

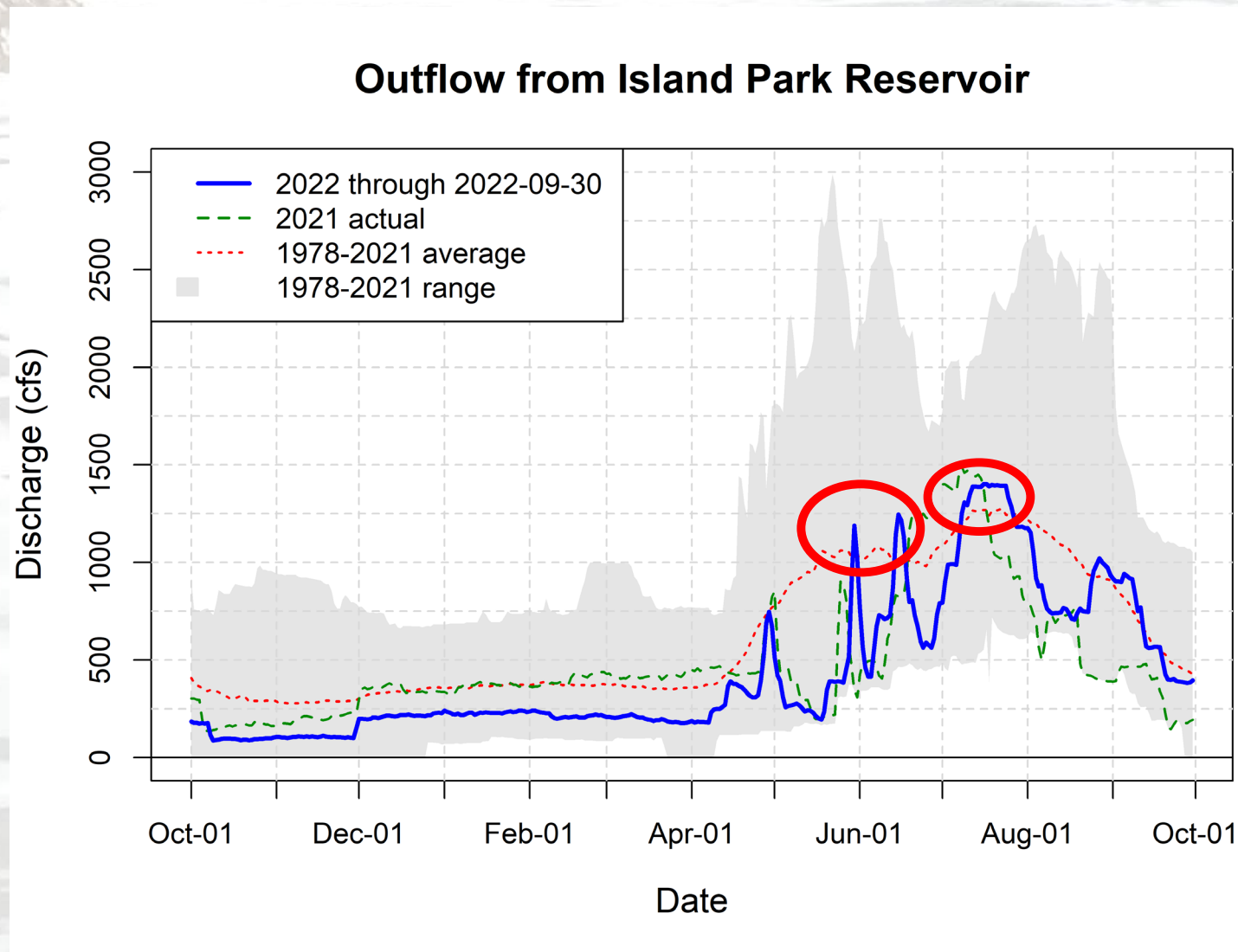
Last Chance/Harriman “Ranch” Reach/Pinehaven

- **Angler preferences**
 - Stable
 - 600-1000 cfs IP Dam release June/July
 - Lower flows OK as plants grow
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- **BUT**
 - Higher flows OK if water is clear
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Key Water Quality Factors on HF

1. Water temperature

- Low: delays hatches, slows aquatic productivity
- High: can stress fish, affects species composition
- High-temperature effects moderated in HF:
 - High dissolved oxygen
 - Cool groundwater inputs
 - Fish can move easily among locations

2. Dissolved oxygen

- Good throughout watershed
- Requirement at IP hydroelectric plant

3. Turbidity (“lack of clarity”)

- Reflects suspended material (mineral and organic)
- Natural rain/runoff events
- Export from IP Reservoir
- Direct negative effect on experience
- Indirect negative effect via sediment deposition

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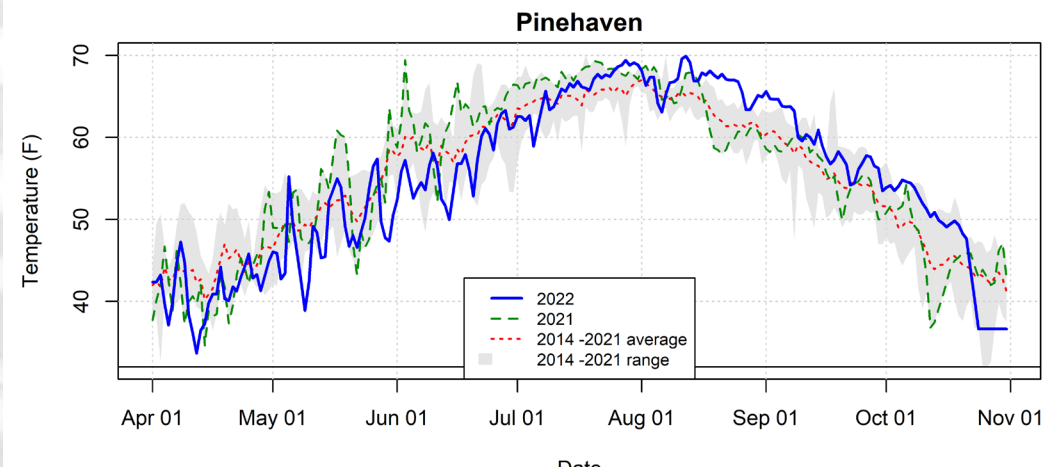
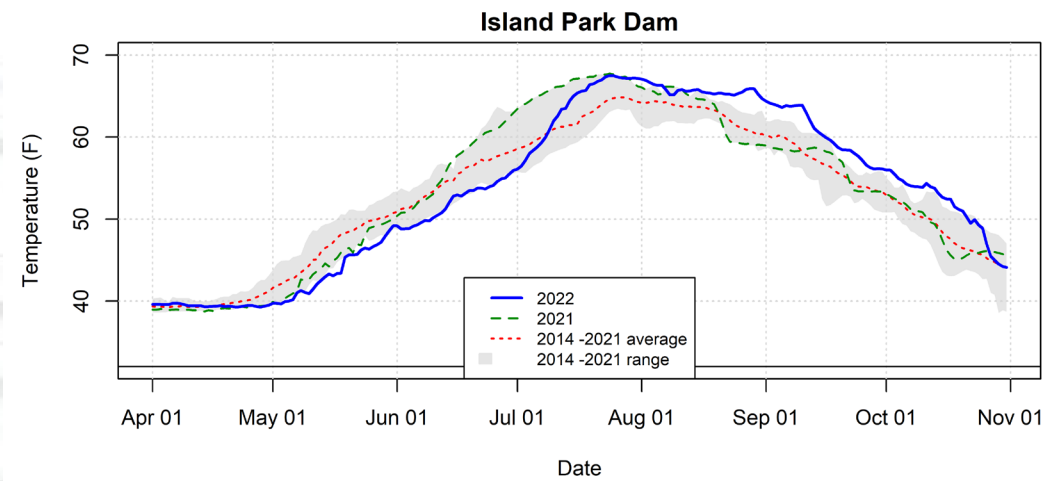
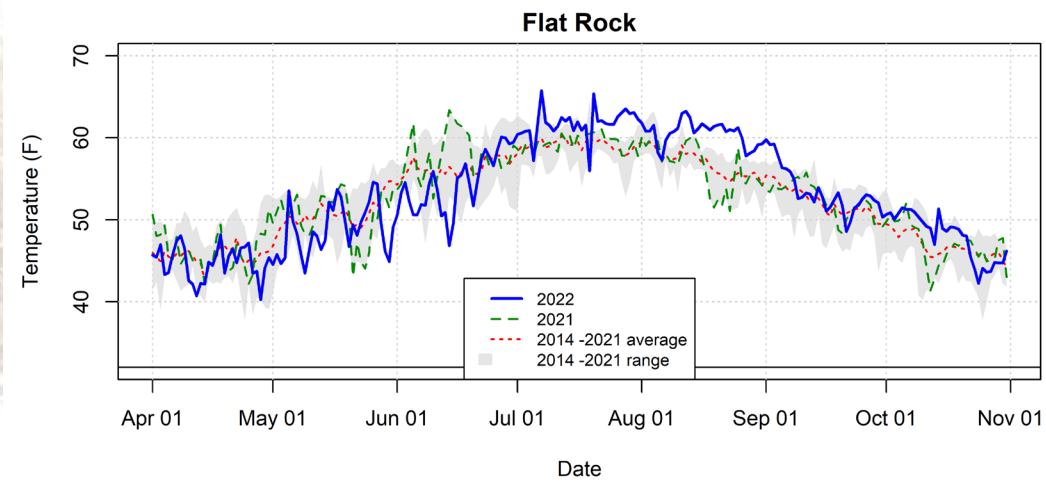
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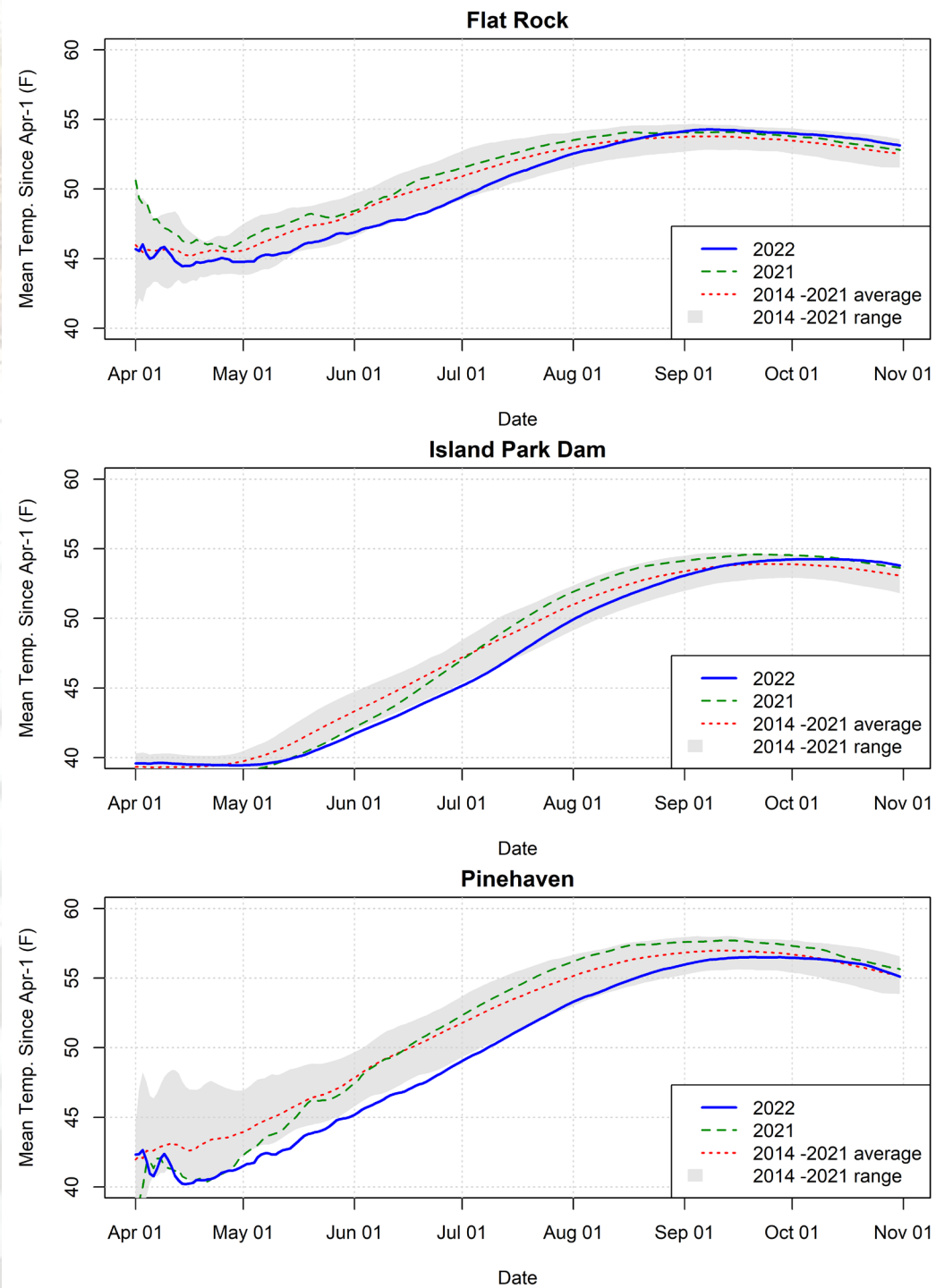
Daily Temperature

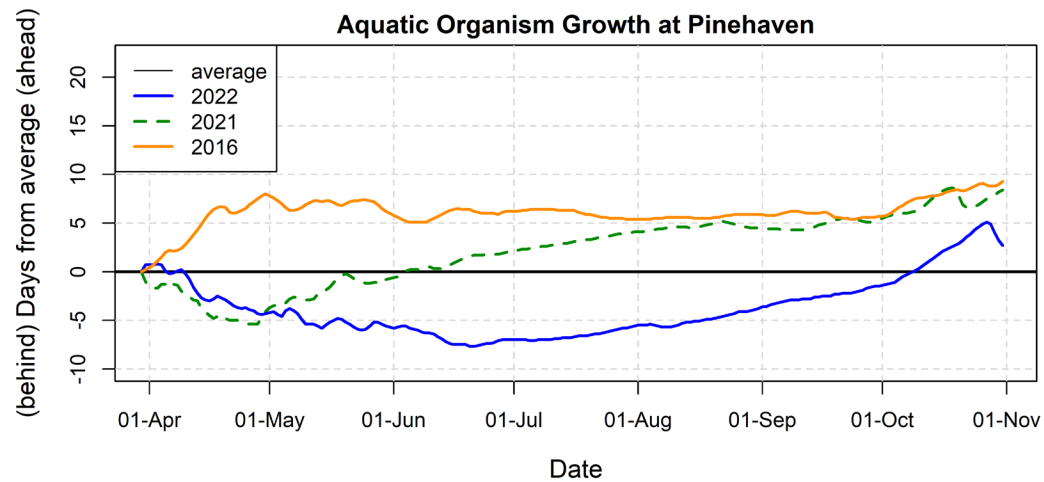
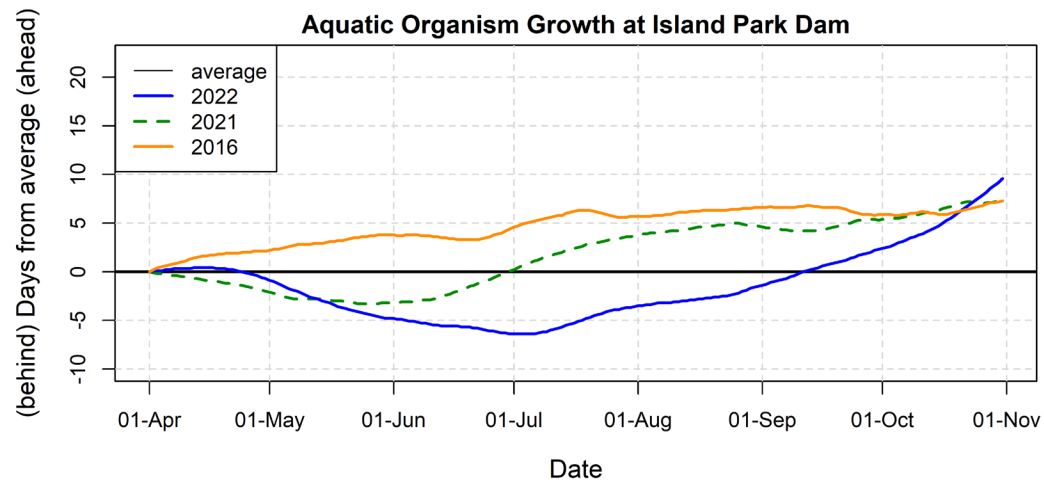
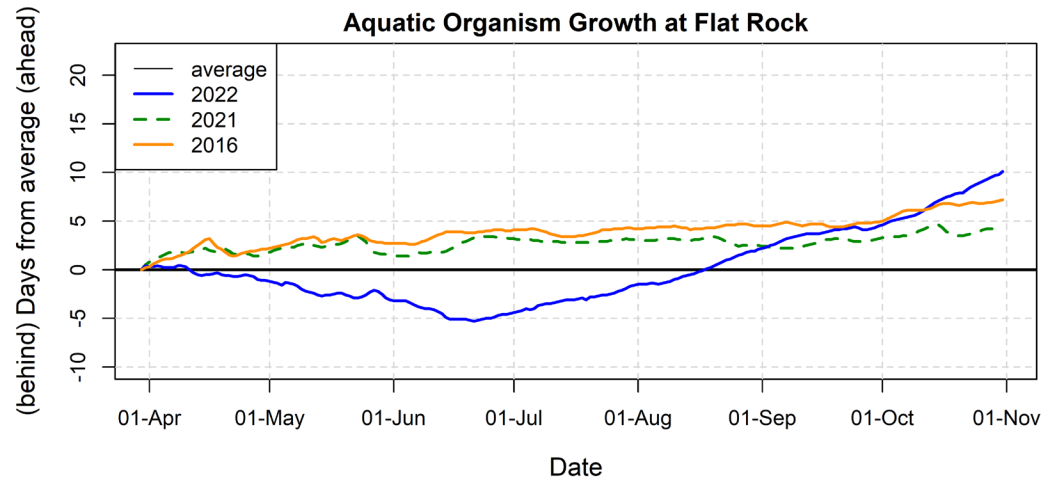
Cool spring

Hot summer/fall



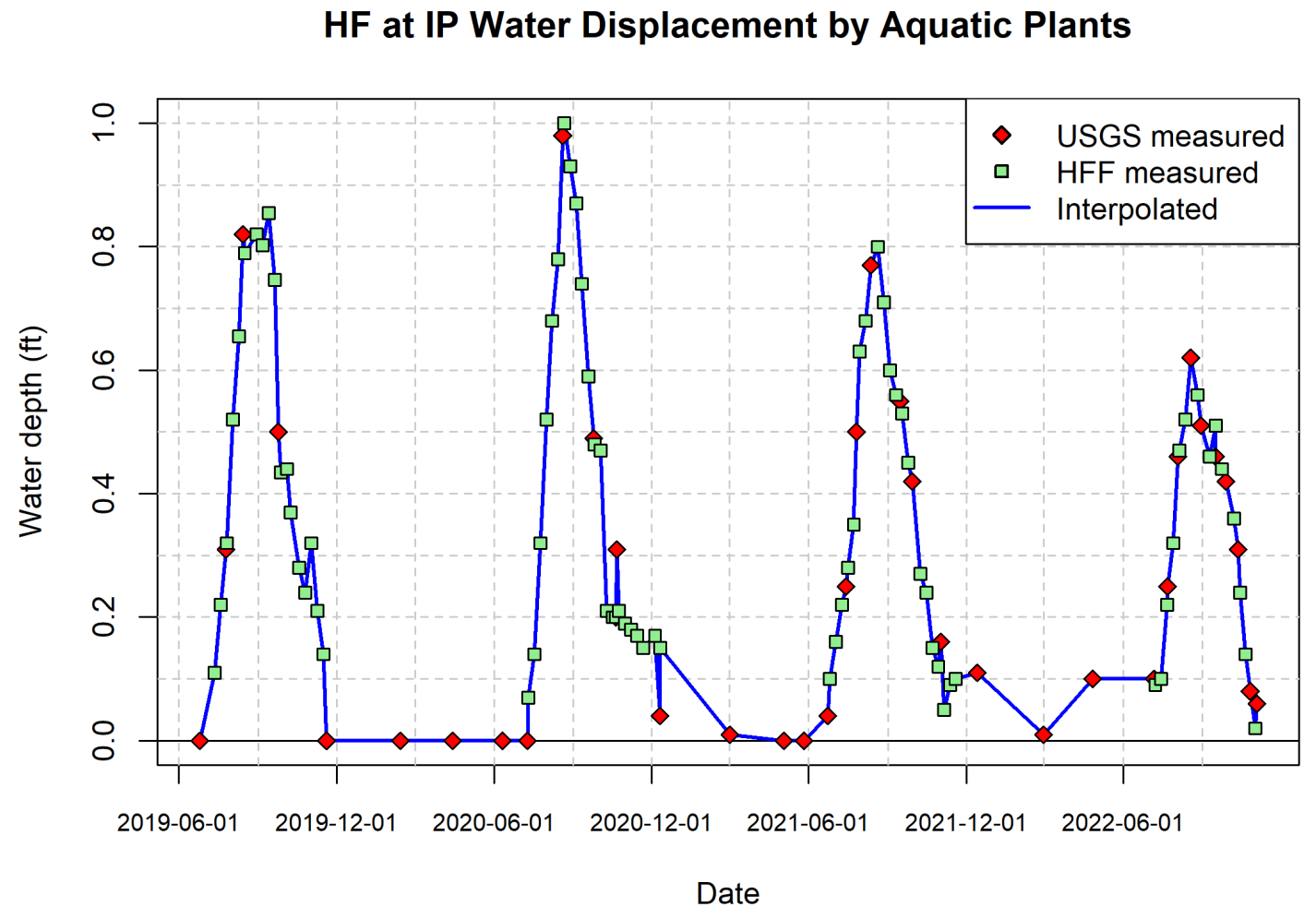
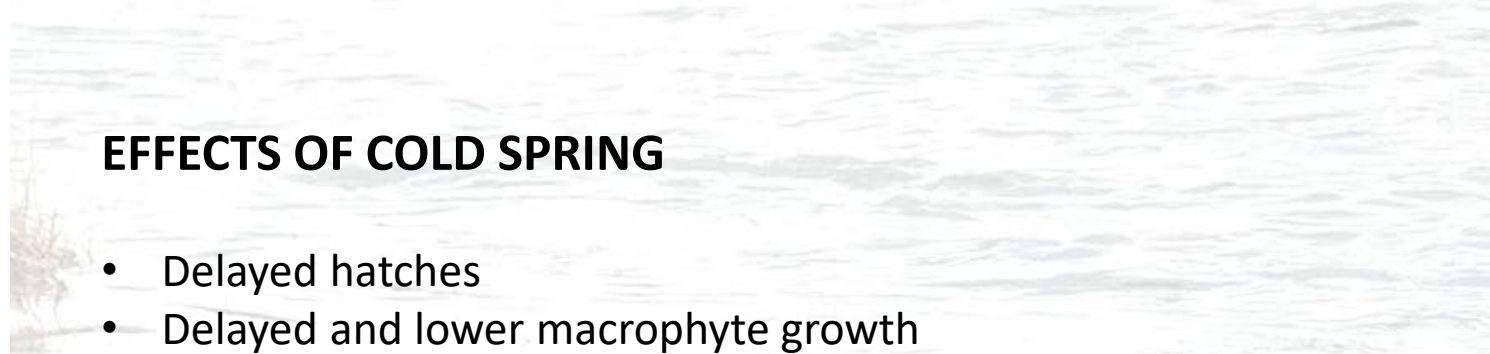
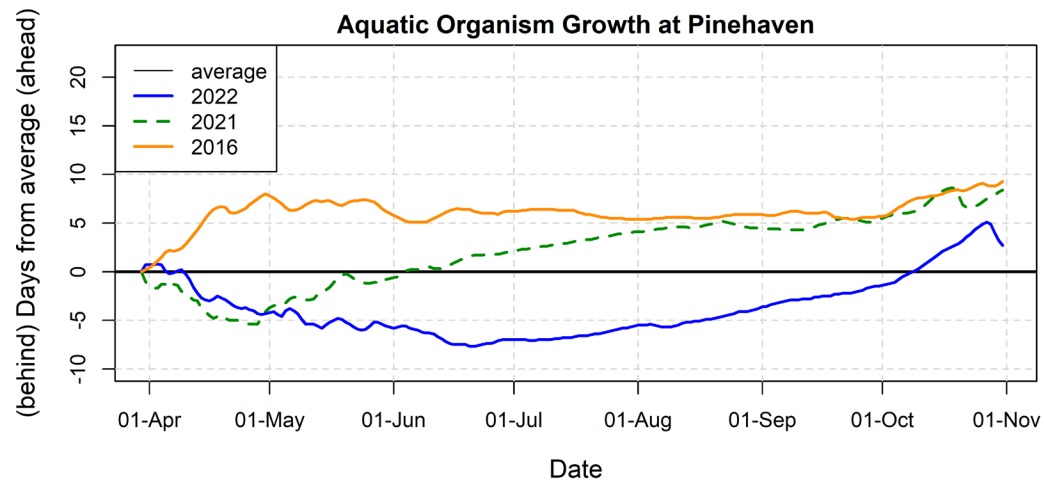
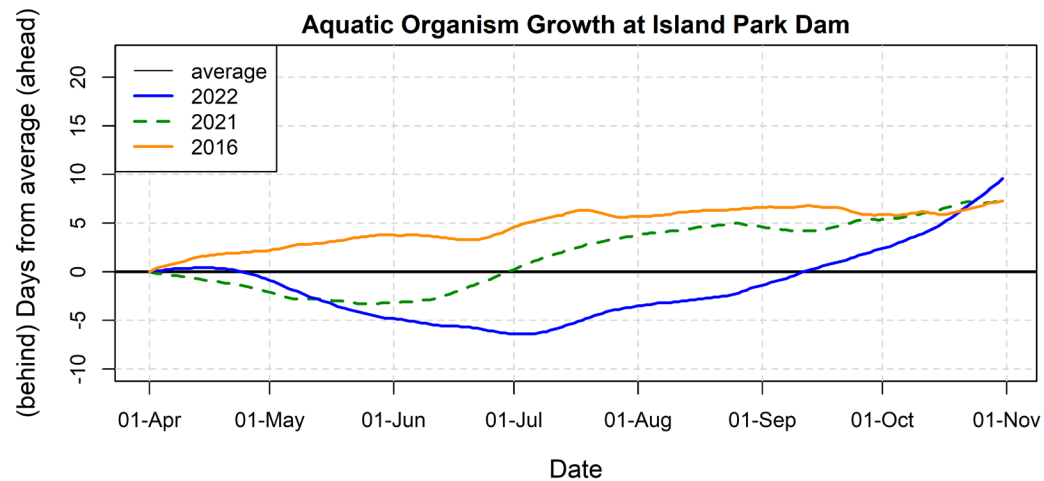
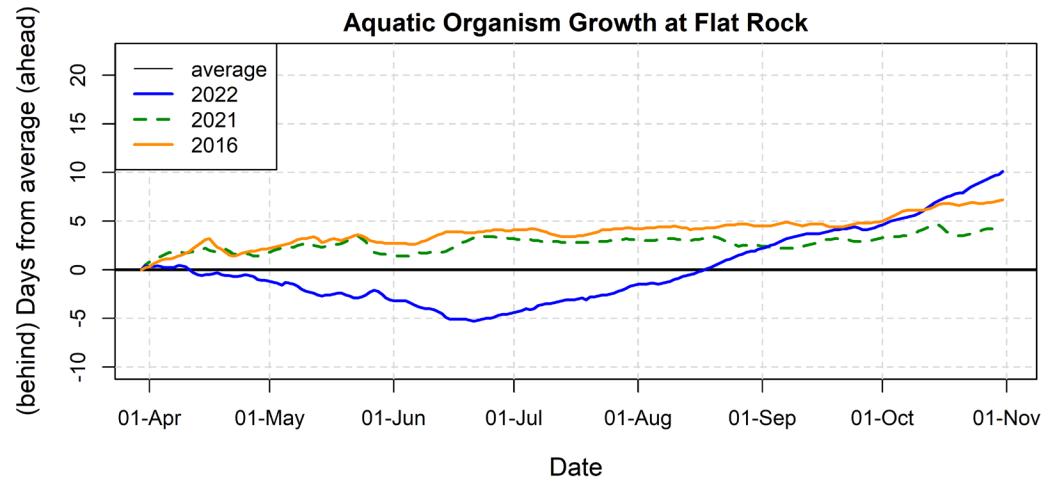
Another view: mean
from April 1 to date

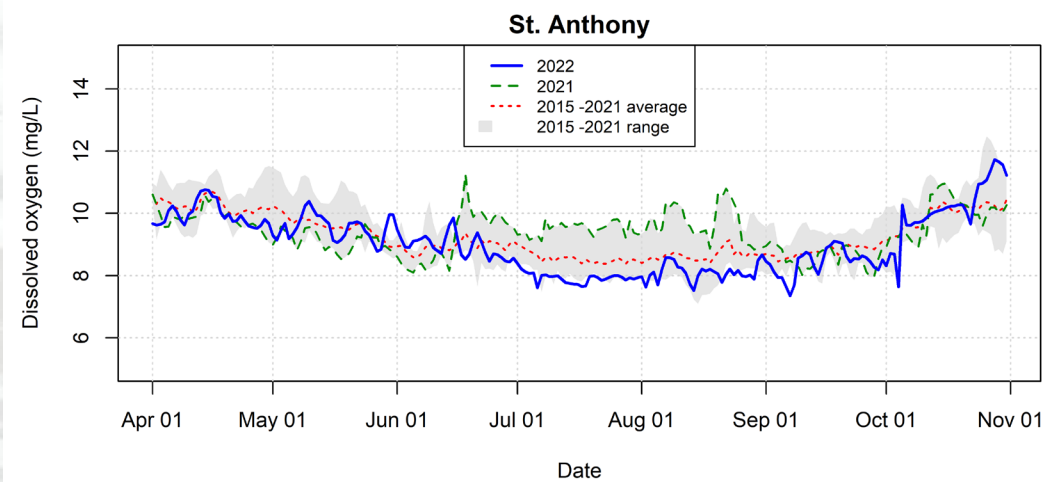
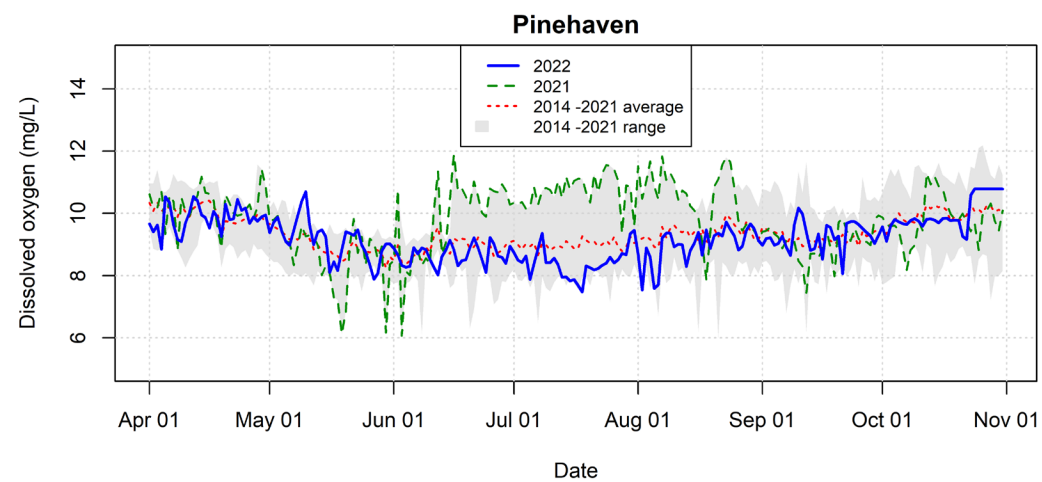
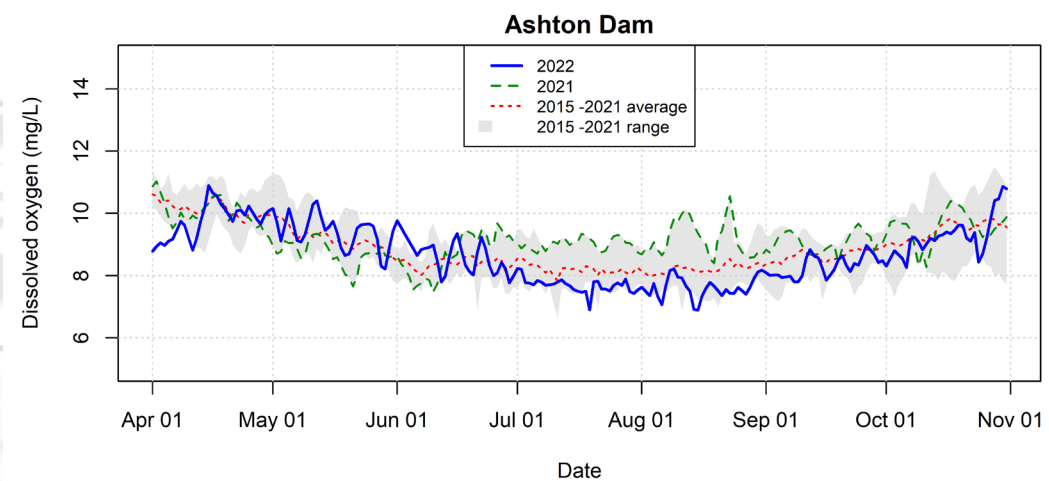
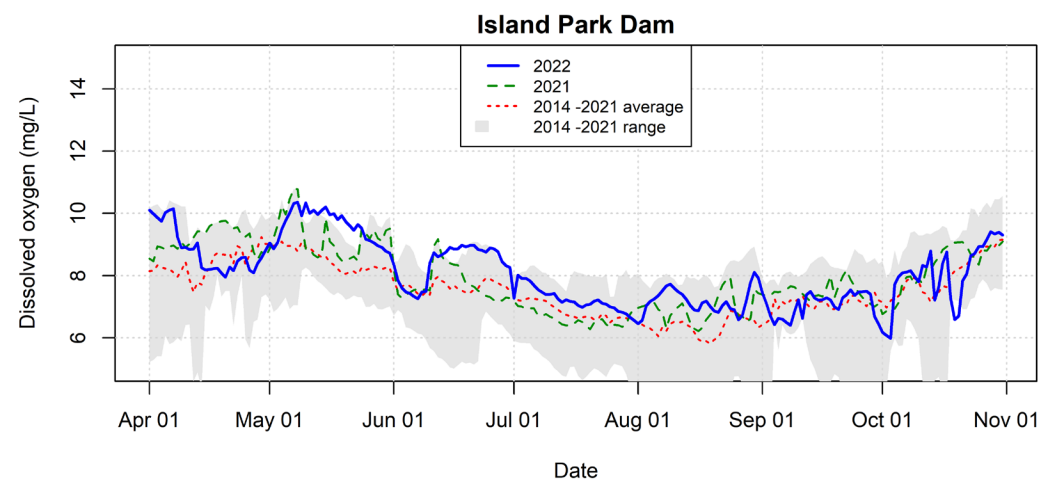
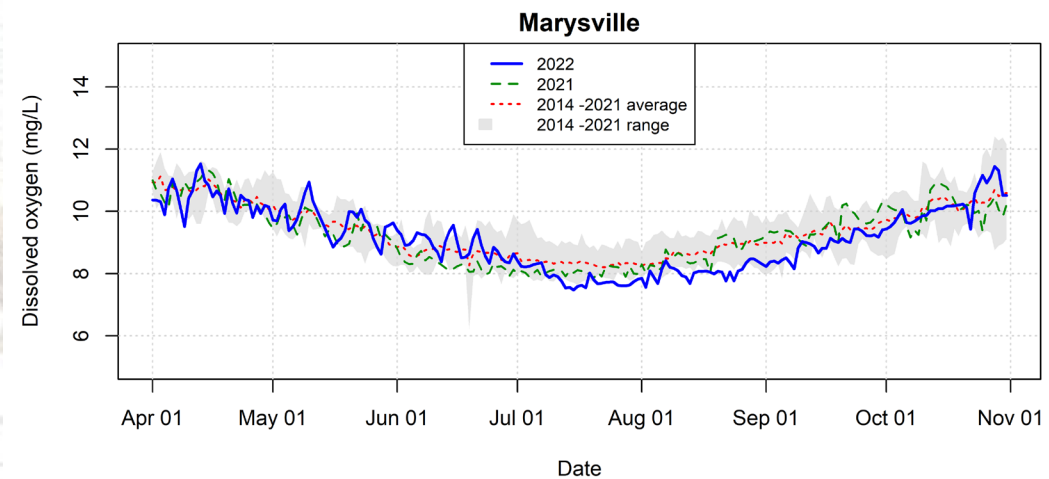
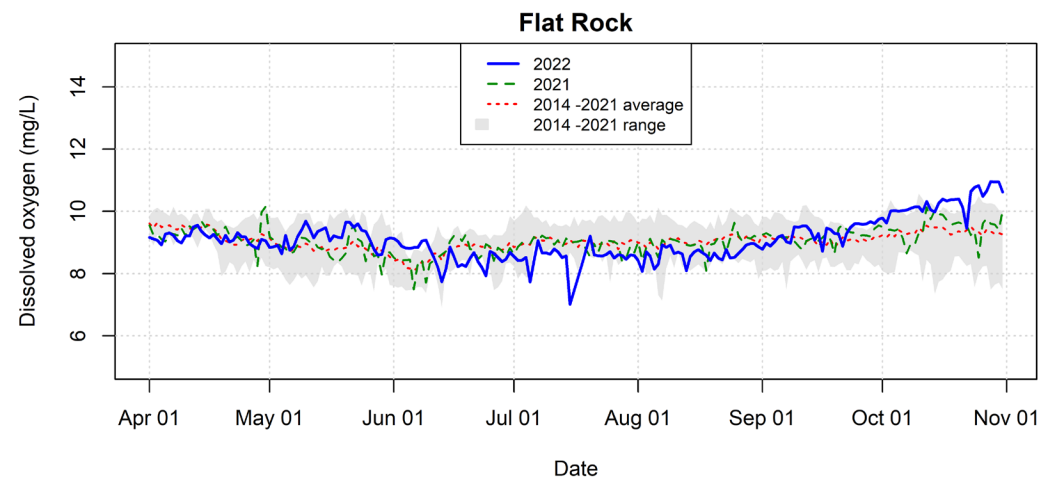




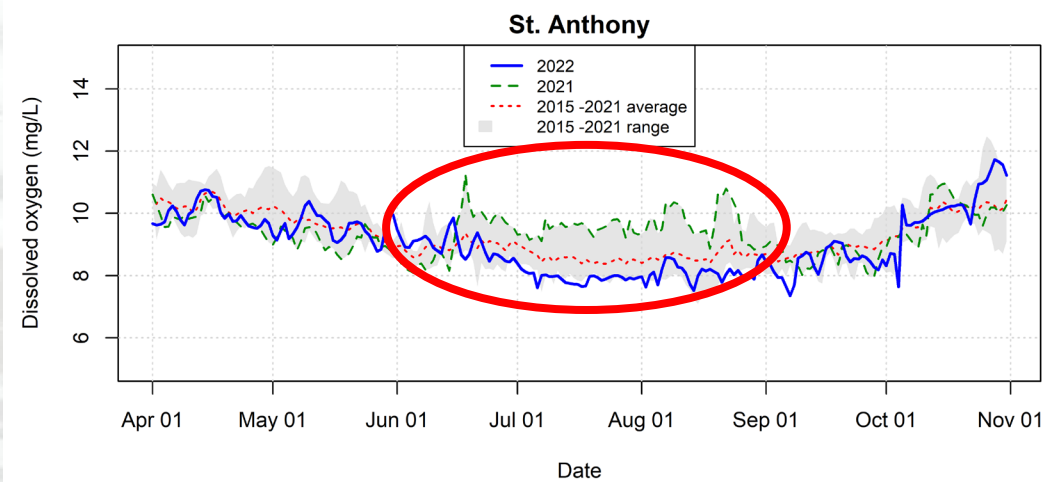
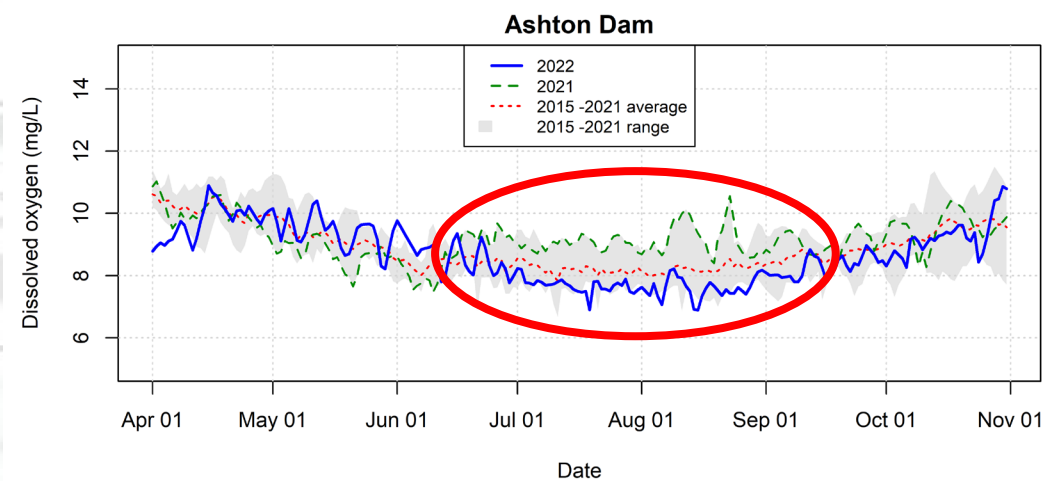
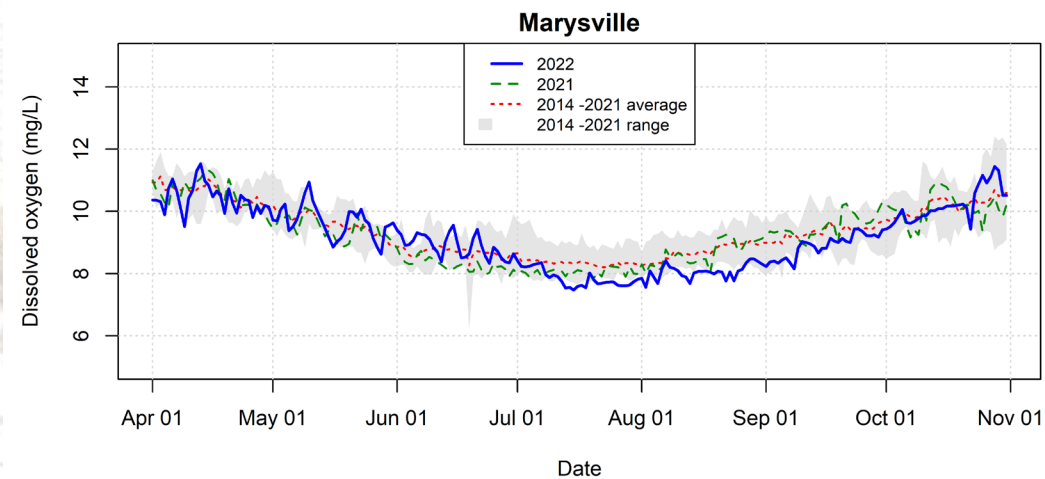
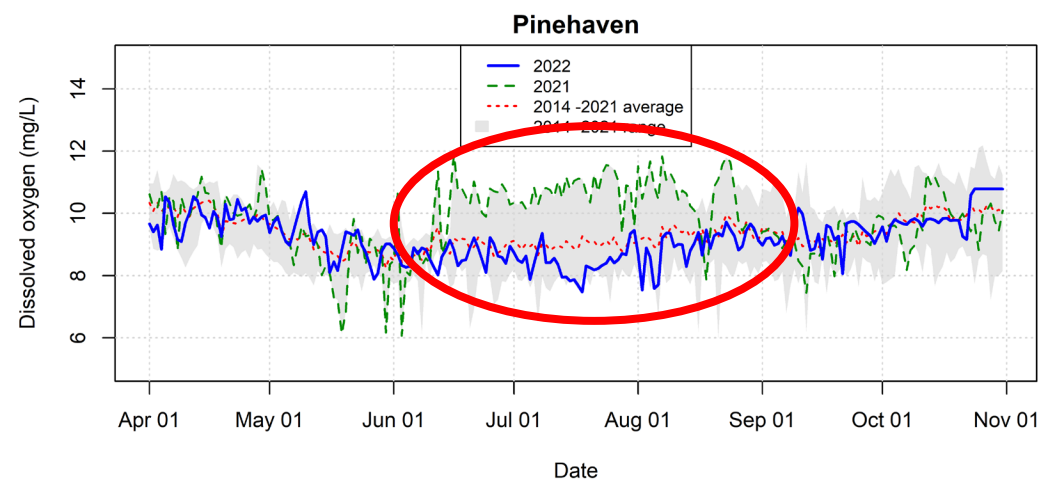
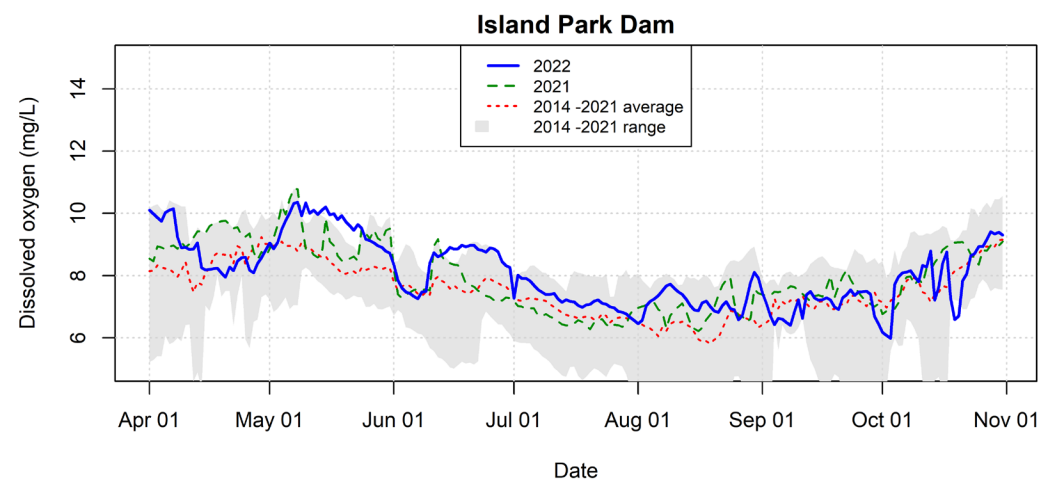
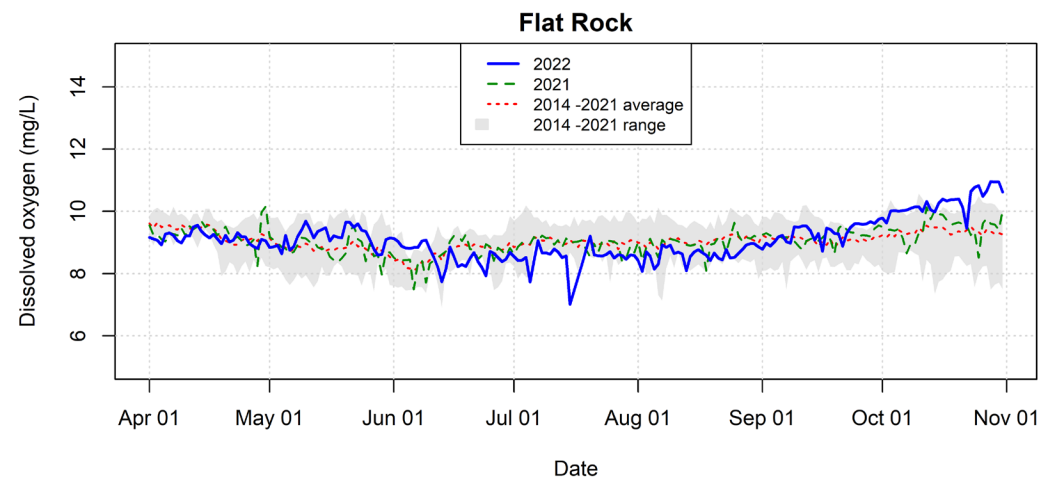
EFFECTS OF COLD SPRING

- Delayed hatches





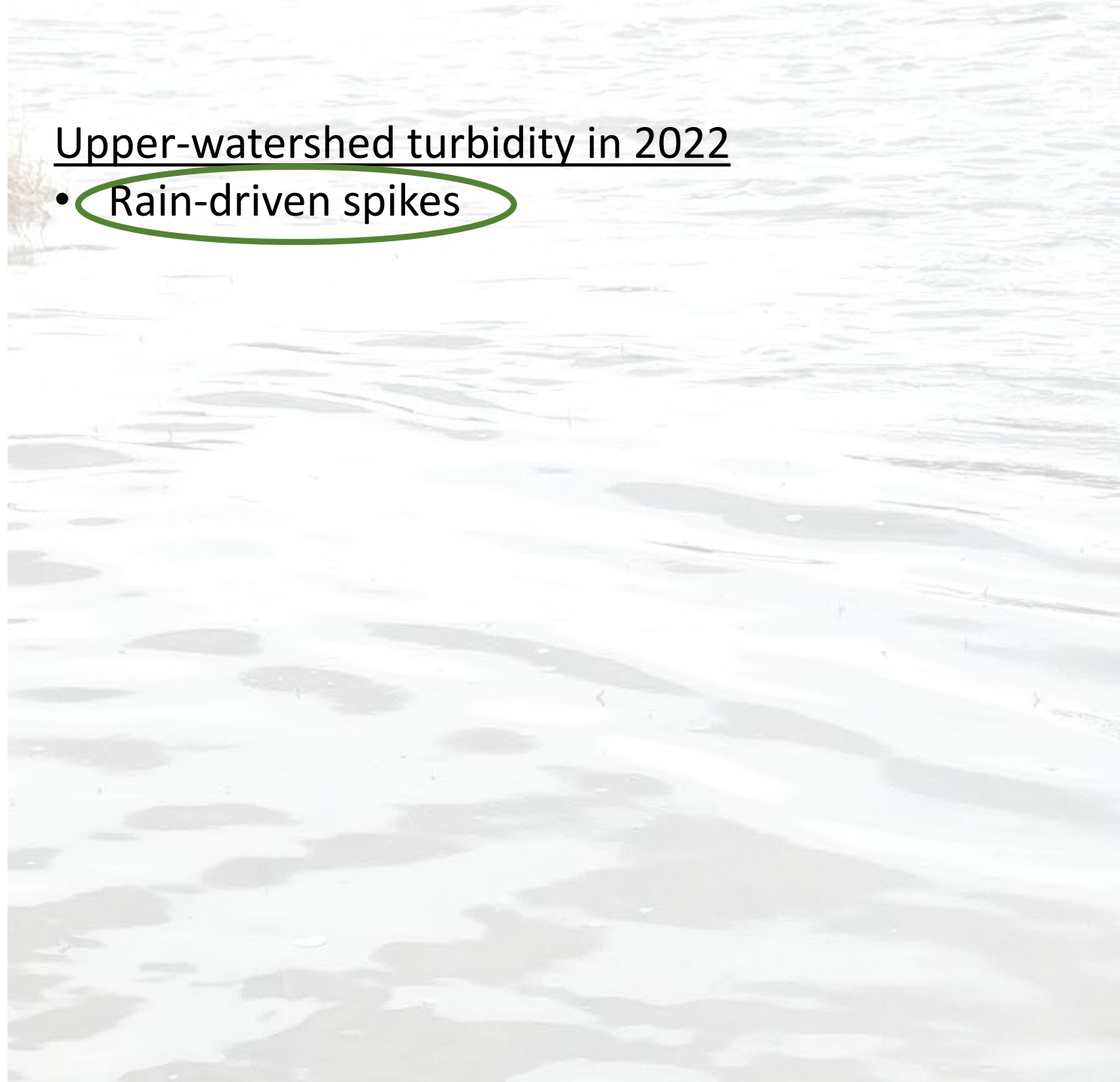
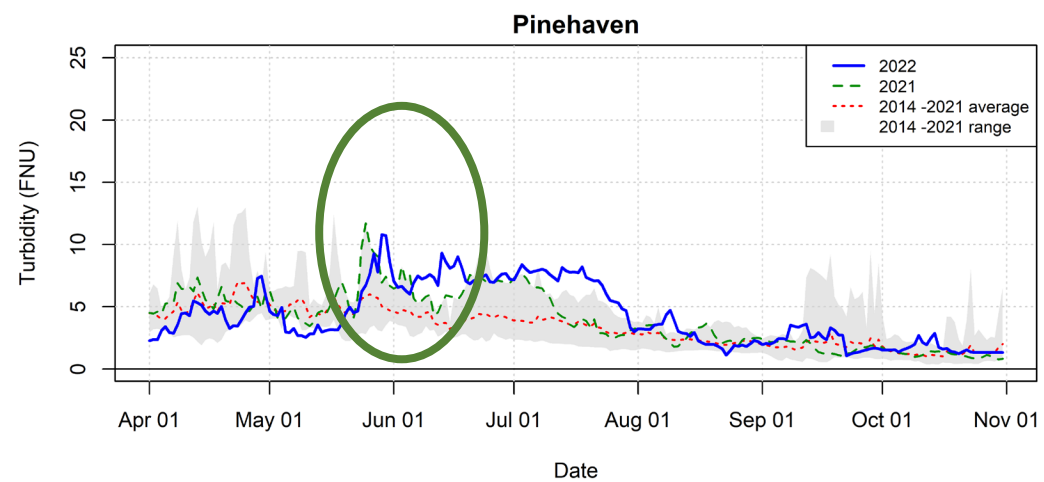
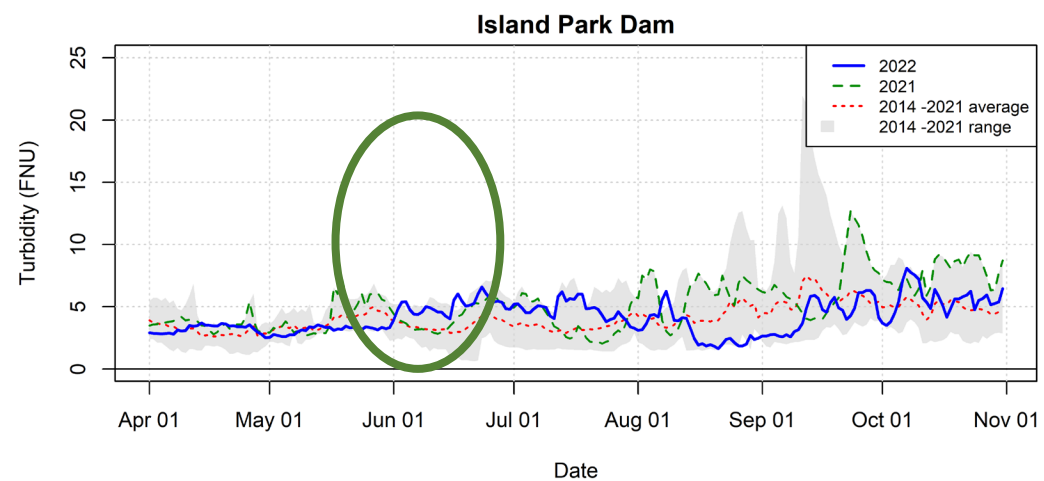
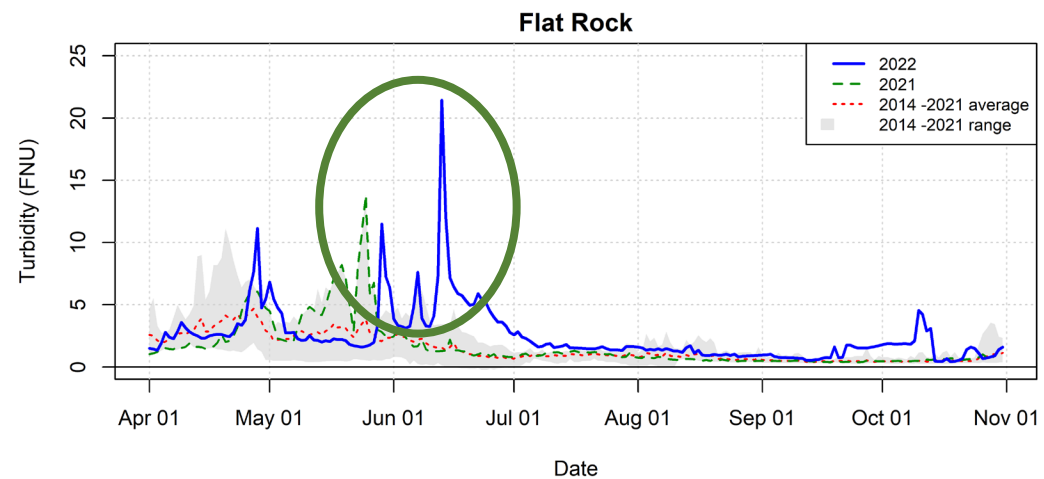
DO
> 6 mg/L

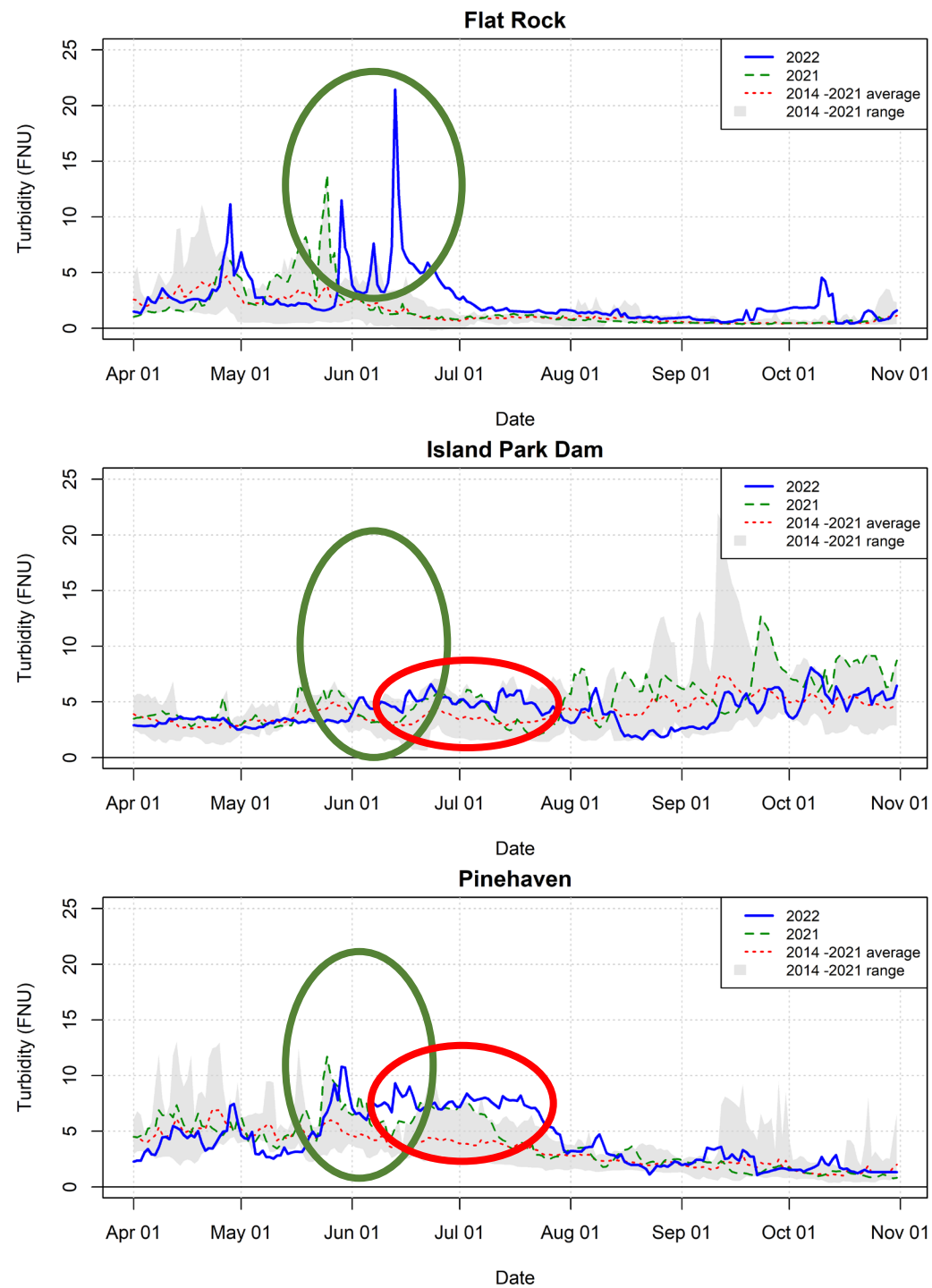


DO
> 6 mg/L

Macrophyte
effect!

Fewer plants
= lower
photo-
synthesis =
lower DO





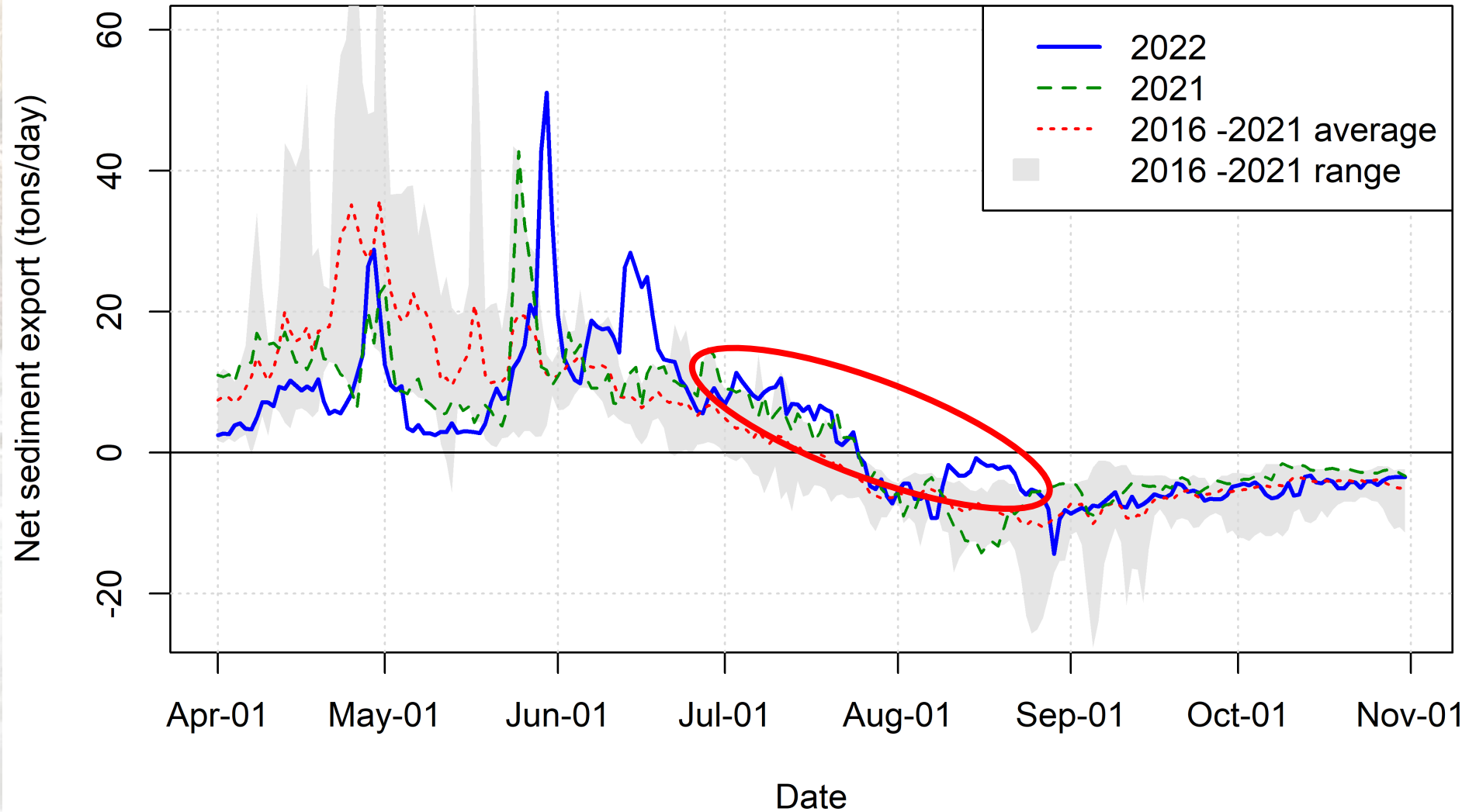
Upper-watershed turbidity in 2022

- Rain-driven spikes
- Above-average June-July at IP Dam
- Well above-average at Pinehaven

Another effect of low macrophyte abundance in June and July!

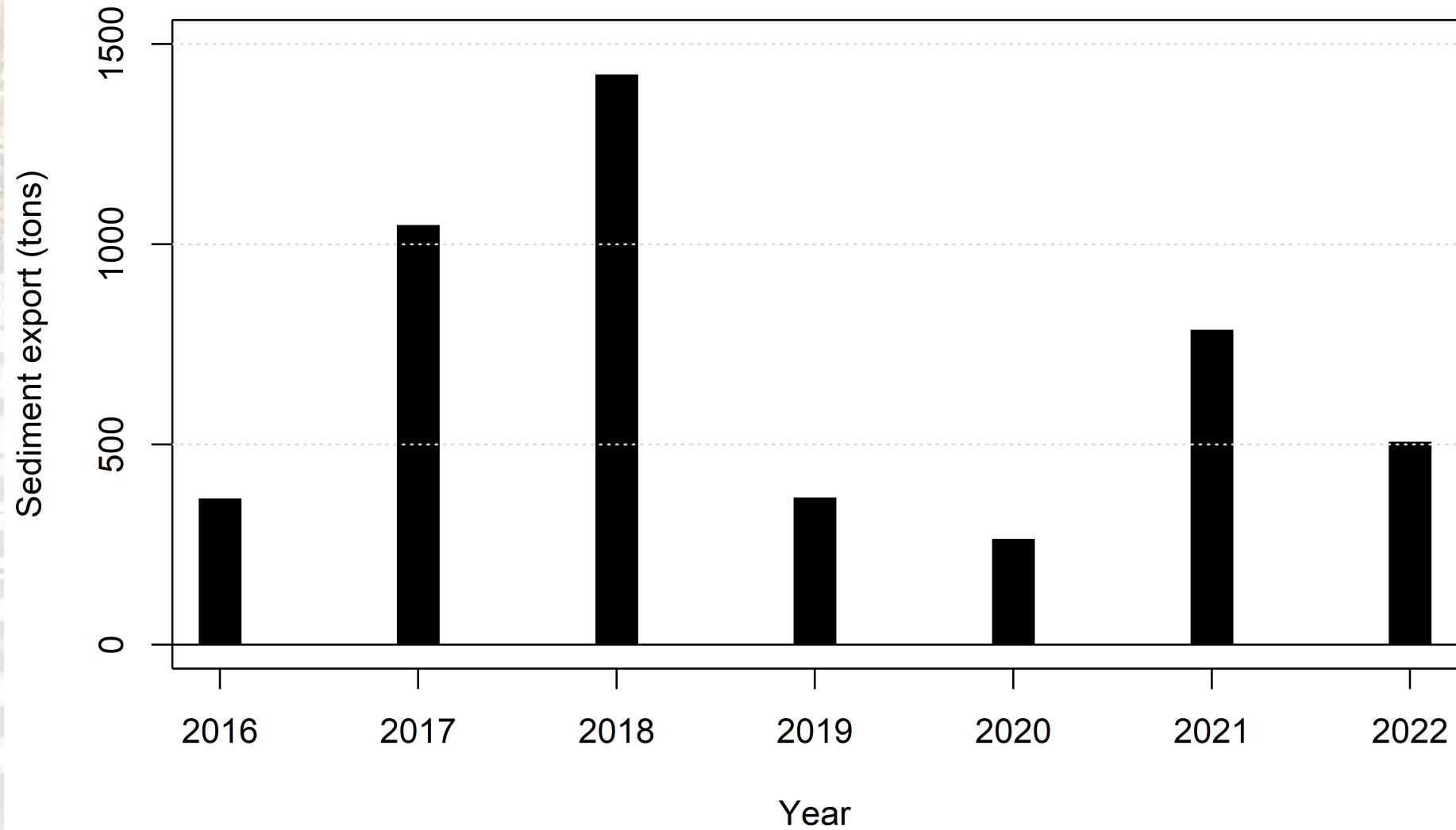
- August-September near average

IP to Pinehaven Sediment Budget

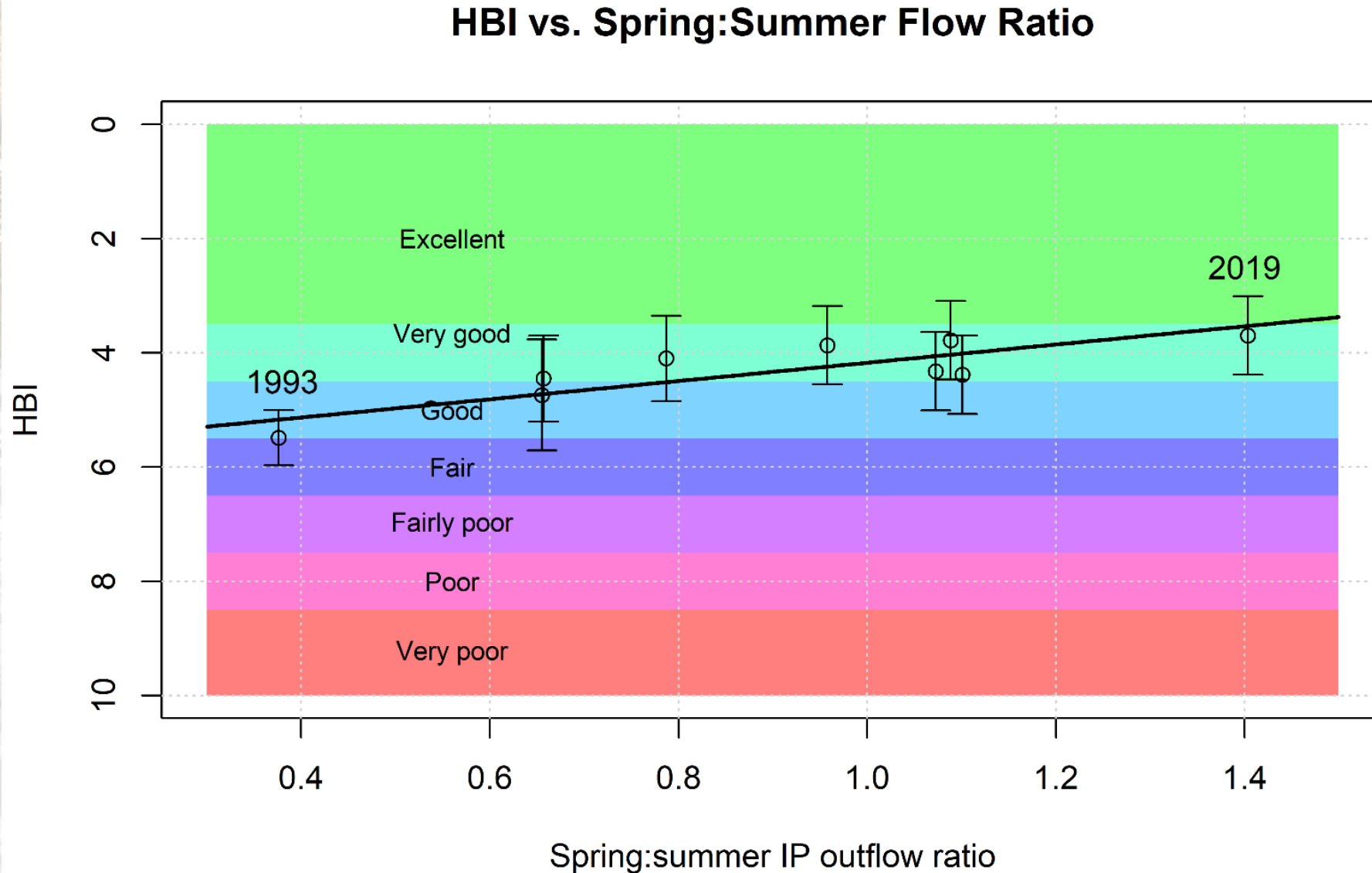


Another
macrophyte
effect: more
export/less
deposition

Net Sediment Export from IP to Pinehaven

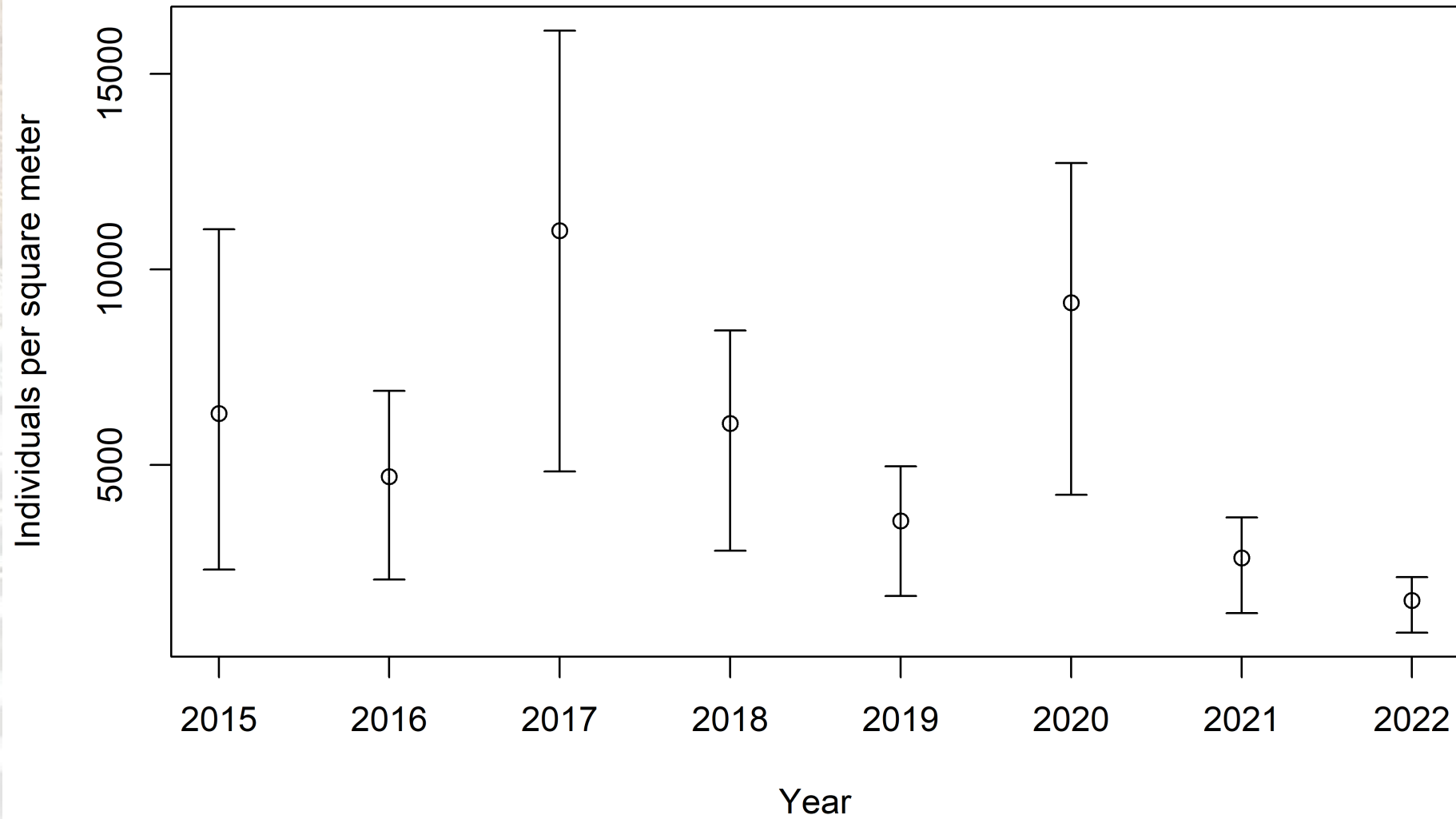


Hilsenhoff Biotic Index (HBI): invertebrate-based index of tolerance to habitat degradation/pollution
Higher freshet & lower summer flow = better invertebrate community = better habitat



IP outflow effect:
1-2 year lag on
fishing experience

PMD Abundance at Last Chance



Conclusions

1. Streamflow affects fishing experience
 - Indirectly: fish abundance, sediment transport
 - Directly: angler perception
2. Water quality affects fishing experience
 - Indirectly: sediment/hatches, species composition
 - Directly: angler perception (temperature and turbidity)
3. Aquatic insects
 - Respond to streamflow and environment, but data set is limited
4. Suspended sediment IP-Pinehaven
 - Scours during spring freshet; deposits August-March
 - Legacy of 1992 event is still apparent
5. Poor fishing experience in 2022
 - 7th lowest streamflow in upper HF since 1930; 3rd consecutive dry year
 - Cold, wet spring; hot, dry summer and fall
 - Late, lower growth of macrophytes
 - High turbidity, but also higher sediment export than expected
6. Turbidity/sediment/hatches are challenges to maintaining fishing experience

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