

# Fluctuations in physical habitat below a hydropeaking dam

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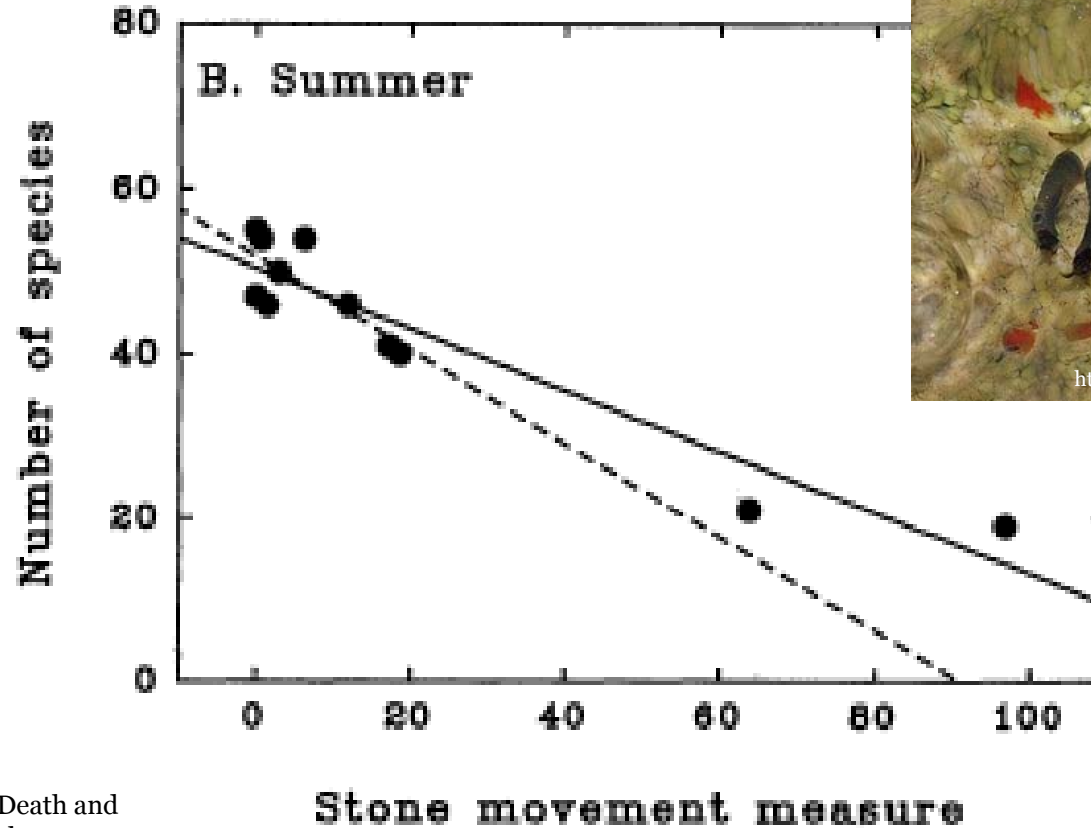
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# Hydropeaking regimes: fish

- **Bioenergetics** (Geist et al. 2005)
- **Stress levels** (Flodmark et al. 2002; 2006)
- **Discharge & habitat** (Brenden, Murphy & Hallerman, 2006)

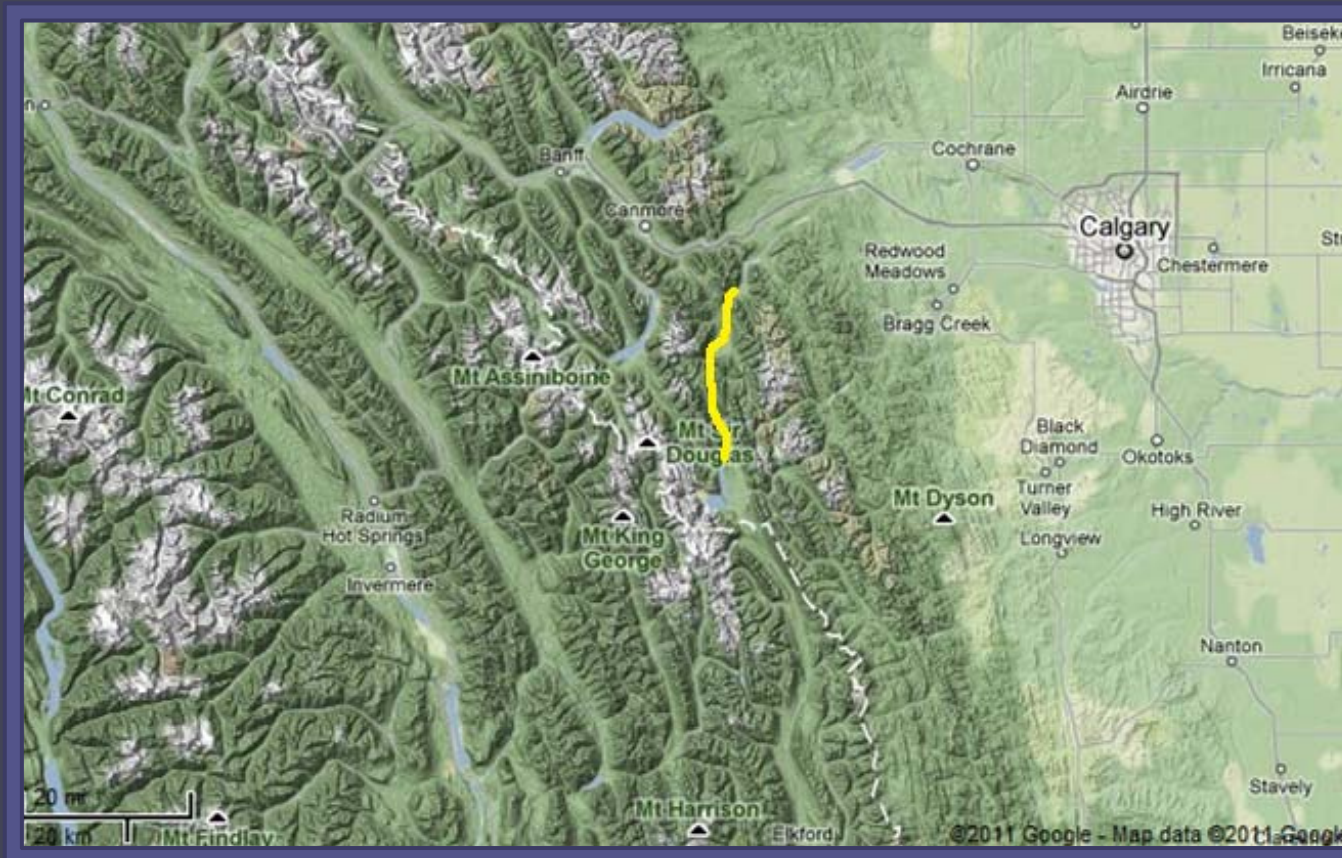


# Hydropeaking regimes: invertebrates



From Death and  
Winterbourne, 1995.

# Study Site: Kananaskis River & Pocaterra dam

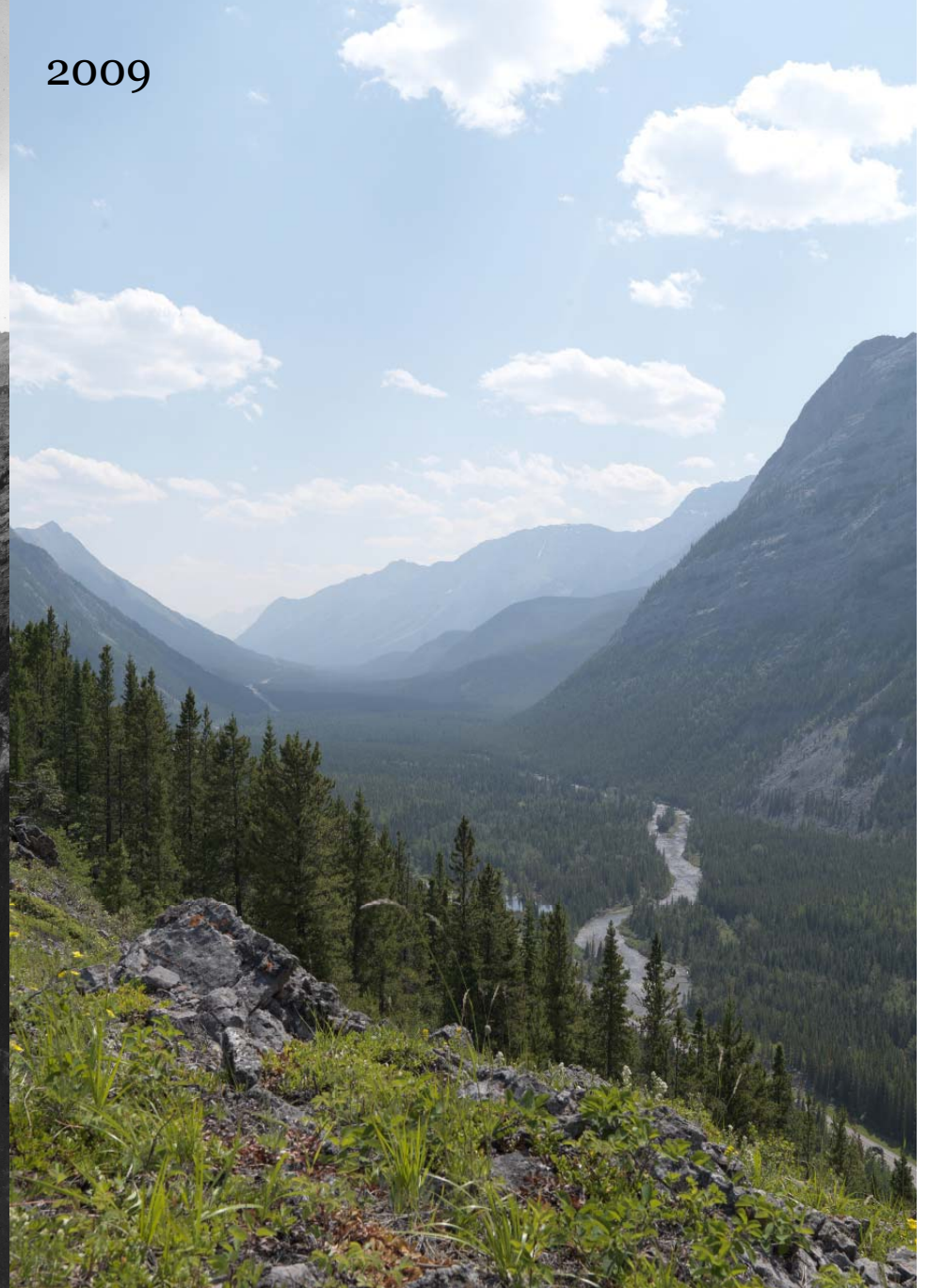




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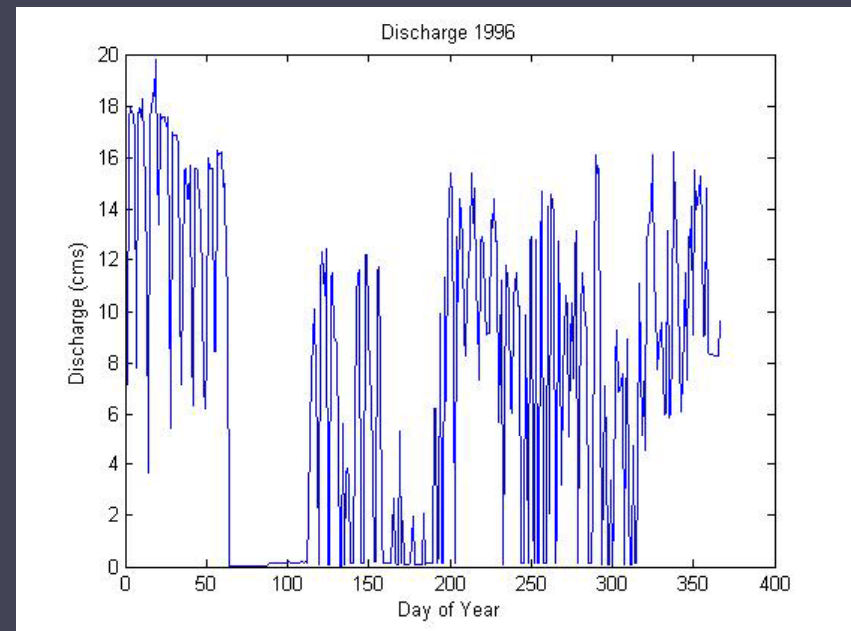
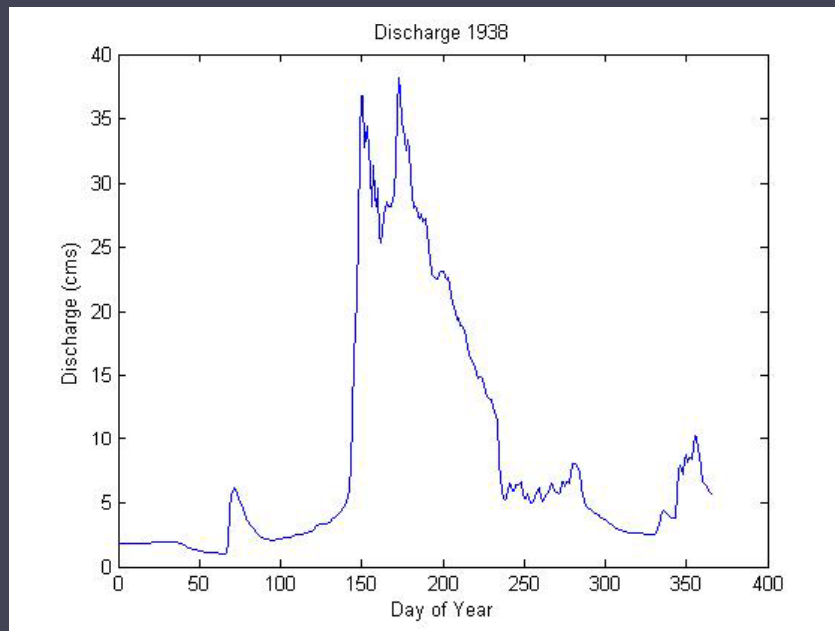


2009



Photos: Mountain Legacy Project

# Kananaskis Discharge



# Research Question

- How do short-scale fluctuations in flow alter available physical aquatic habitat and how are these changes moderated by tributary inputs.
  - How do depths and velocities change?
  - How often is the bed mobile?



# Daily Temporal Variations



Bankfull flow (7 cms)



Low flow Q (1 cms)



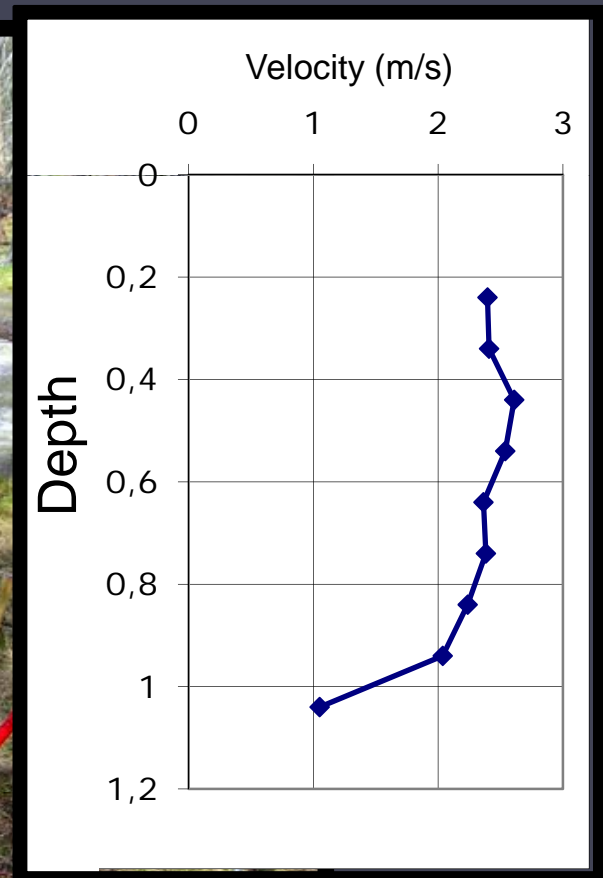
# Spatial & temporal data collection

	<b>Discharge from dam</b>	<b>@ dam</b>	<b>Trib A</b>	<b>Trib B</b>	<b>Trib C</b>
Velocity	High				
& Depth	Low				
Bed mobility	High				
	Low				

# Depth - water level loggers

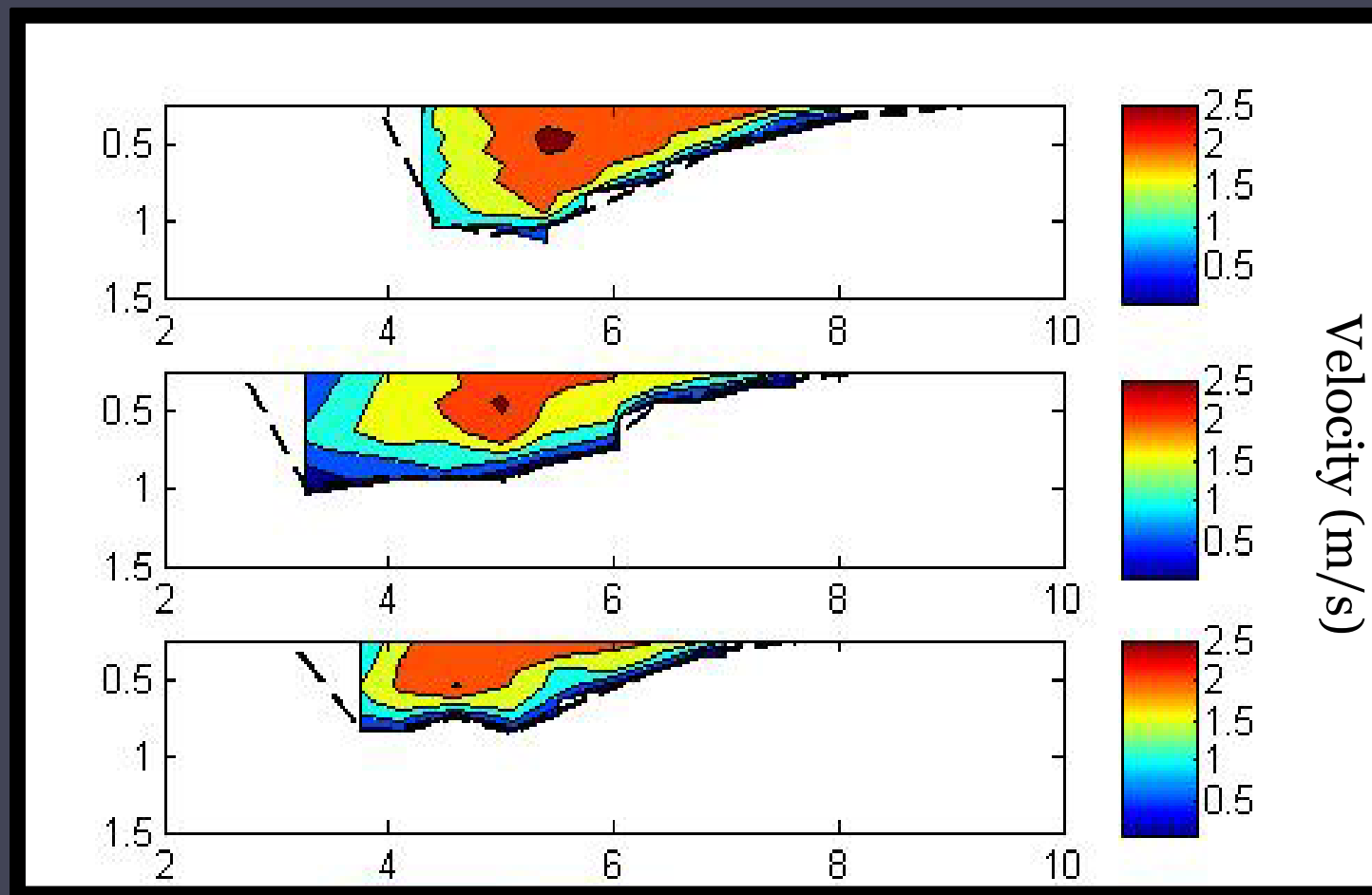


# Depth & velocity - ADCP





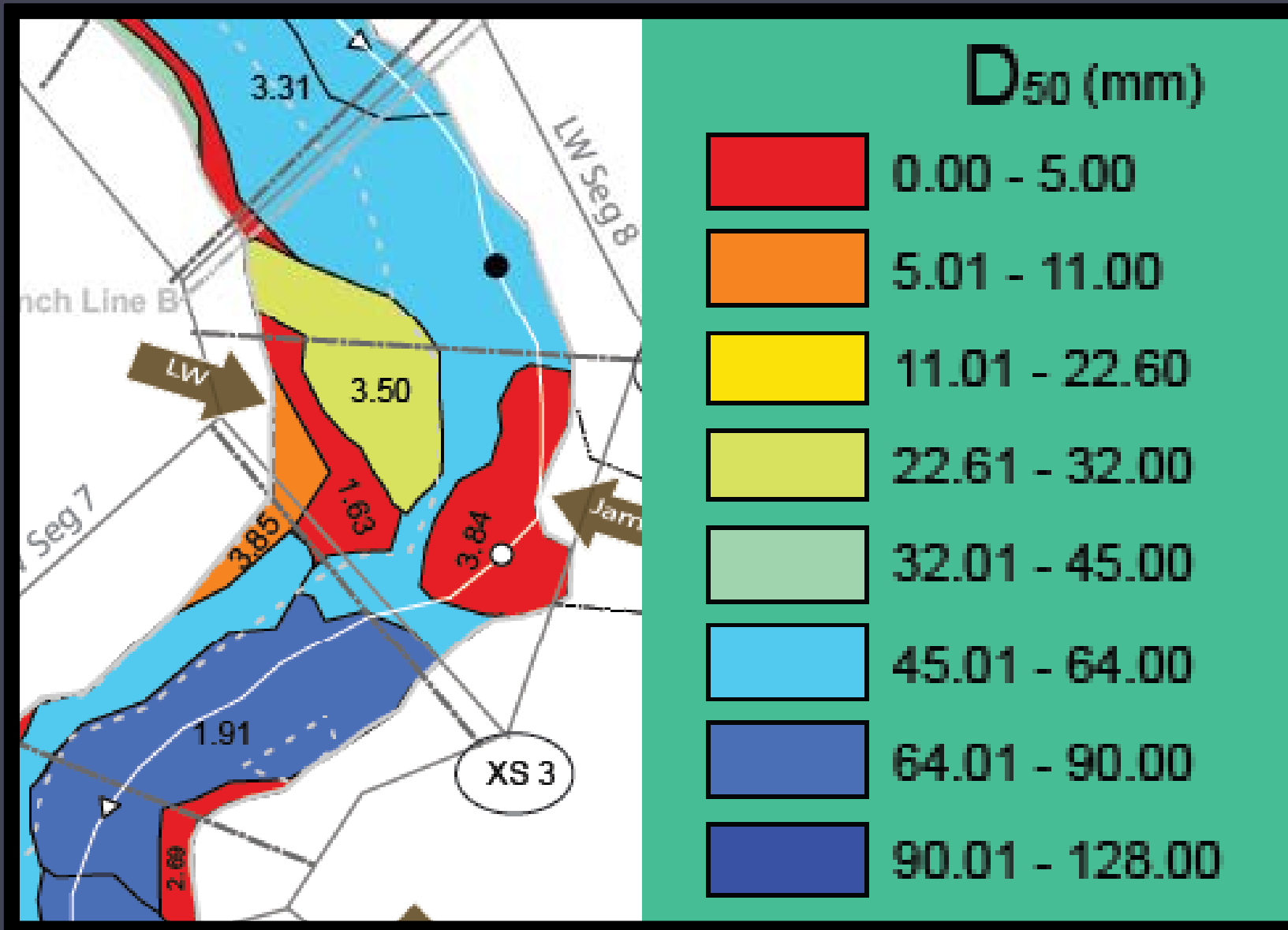
# Depth & velocity - ADCP



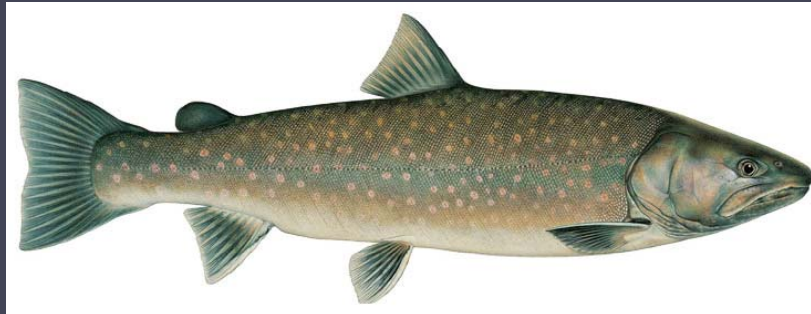
# Bed mobility - tracers



# Bed material grain size







Questions?

# References

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- Flodmark, L. E. W., H. A. Urke, J. H. Halleraker, J. V. Arnekleiv, L. A. Vøllestad, and A. B. S. Pole' o. 2002. Cortisol and glucose response in juvenile brown trout subjected to a fluctuating flow regime in an artificial stream. *Journal of Fish Biology* **60**:238–248.
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