



**CBCL LIMITED**

Consulting Engineers

# OVERVIEW OF DESIGN SERVICES

for the Design of the Avon River Aboiteau  
and Causeway Upgrades

CLC Presentation  
January 16, 2018

# Agenda

Introductions

CBCL Project Scope

Project Overview

Q&A Period



# Introductions



PROJECT MANAGER  
Rick Giffin, P.Eng.

**CBCL Limited**  
Prime Consultant



HYDROLOGY,  
ENVIRONMENTAL LEAD  
Alex Wilson, M.Eng., P.Eng.

**Golder Associates**  
Geotechnical Investigation  
and Design,  
Dam Safety Analysis

**Thaumas Environmental**  
Fish Passage

**Scott Architecture+ Design  
Limited**  
Architectural Design

**Acadia University**  
Fish Migration

**Saint Mary's University**  
Sediments, Salt Marsh  
& Morphodynamics

**J.M. Giffin Engineering**  
Structural - Sluice Gates

**Dalhousie University**  
Turbulence Analysis

**Particle Dynamics Lab**  
External Review

# Project Overview



- Provide corridor over the Avon River for twinned Highway 101
- Ensure continuity of rail, trail and utility services
- Protect communities and agricultural land from the effects of sea level rise and climate change
- Improve fish passage
- Achieve all the above safely and cost effectively

# Phase 1 – Preliminary Design

## Pre-design

- Gather/review existing documents
- Site surveys and data collection
- Regulatory requirements analysis
- Fish passage requirements analysis
- Other environmental protection requirements
- Geotechnical review
- Hydrology & Hydraulic Model Preparation
- Preliminary sediment transport model

## Design concept

- Develop design criteria & parameters
- Design option development (3 Options)
  - Geometry / alignment
  - Hydrology / hydraulic
  - Fish passage
  - Sediment
  - Structure
  - Mechanical & electrical
  - Cost estimates
  - Etc
- Develop approved option and present to NSTIR

## Phase 2 – Design Development

- Refine approved option
- Detailed design
- Regulatory review and approval
- Refine cost estimates
- Construction drawings and specifications

## Phase 3 – Post Design Services

- Tendering support
- Construction support
- Construction inspections
- Commissioning support

# Project Overview – Ecosystem considerations

Fish Presence and Fish Passage

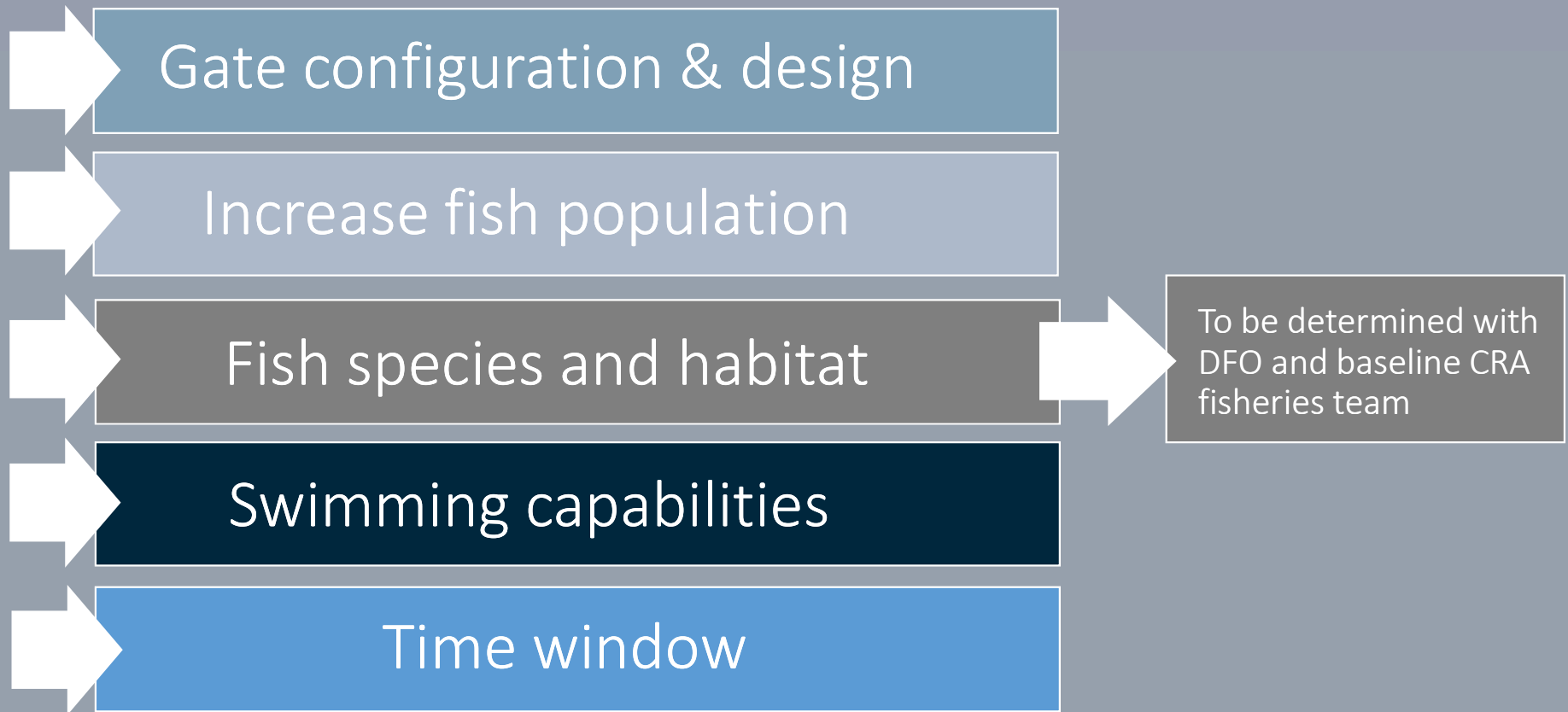
Protect Wetland Habitat and Shoreline Evolution

Sediment Transport Locally and System-wide

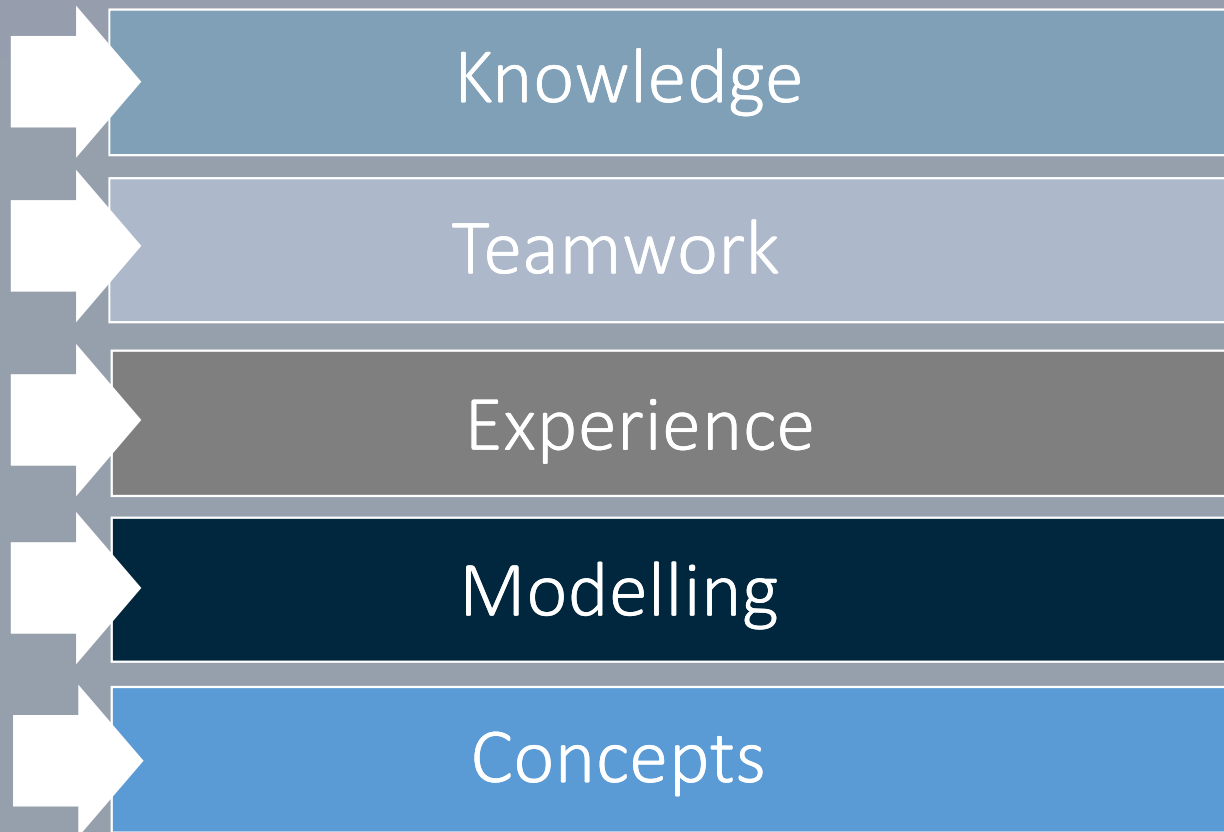
Flooding Risks and Control of Salt Water



# Fish Passage

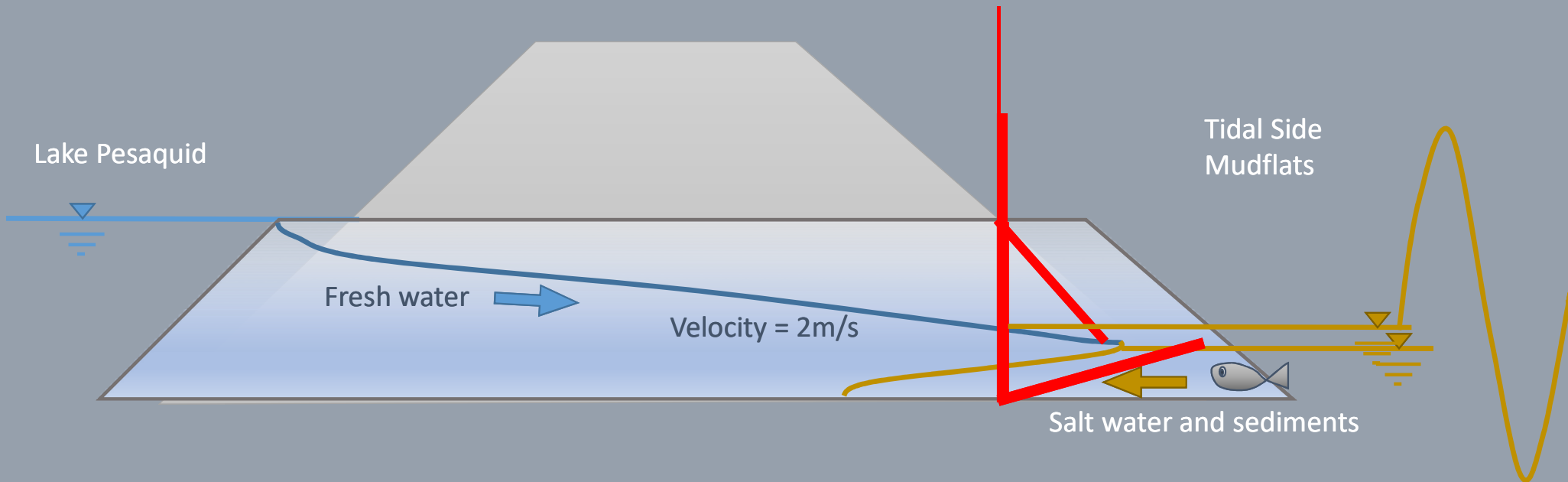


# Fish Passage – Proposed approach

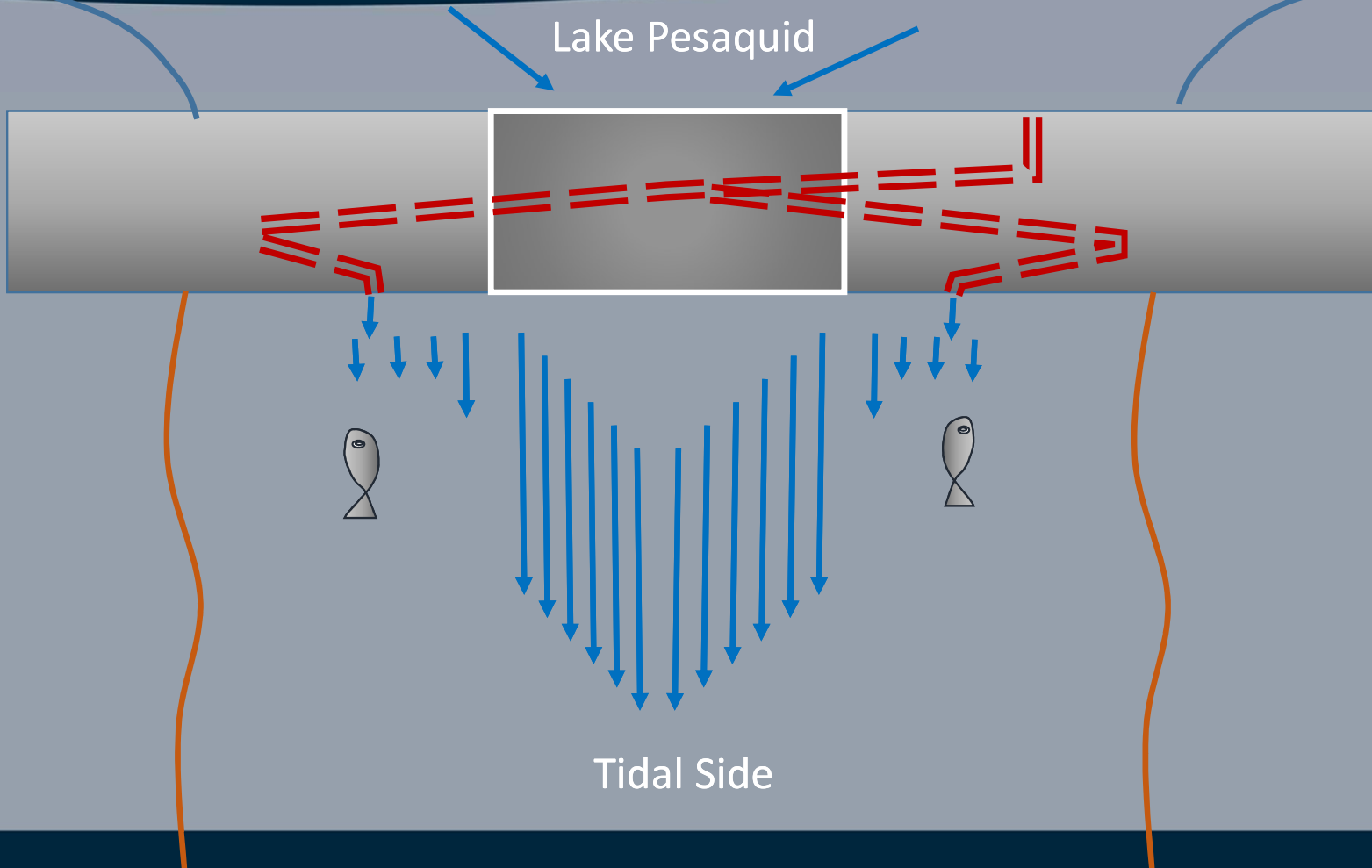


# Fish Passage Through an Aboiteau

## Fish Passage Within Gate:

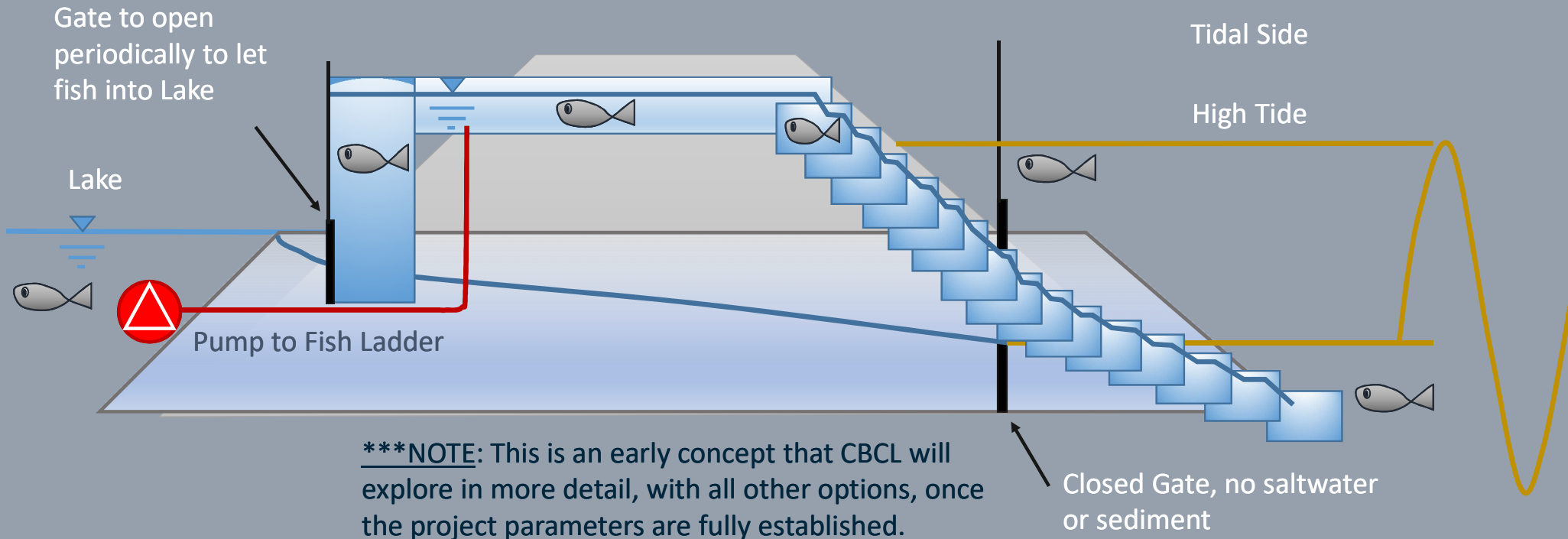


# Fish Passage as a Separate Structure: Plan View

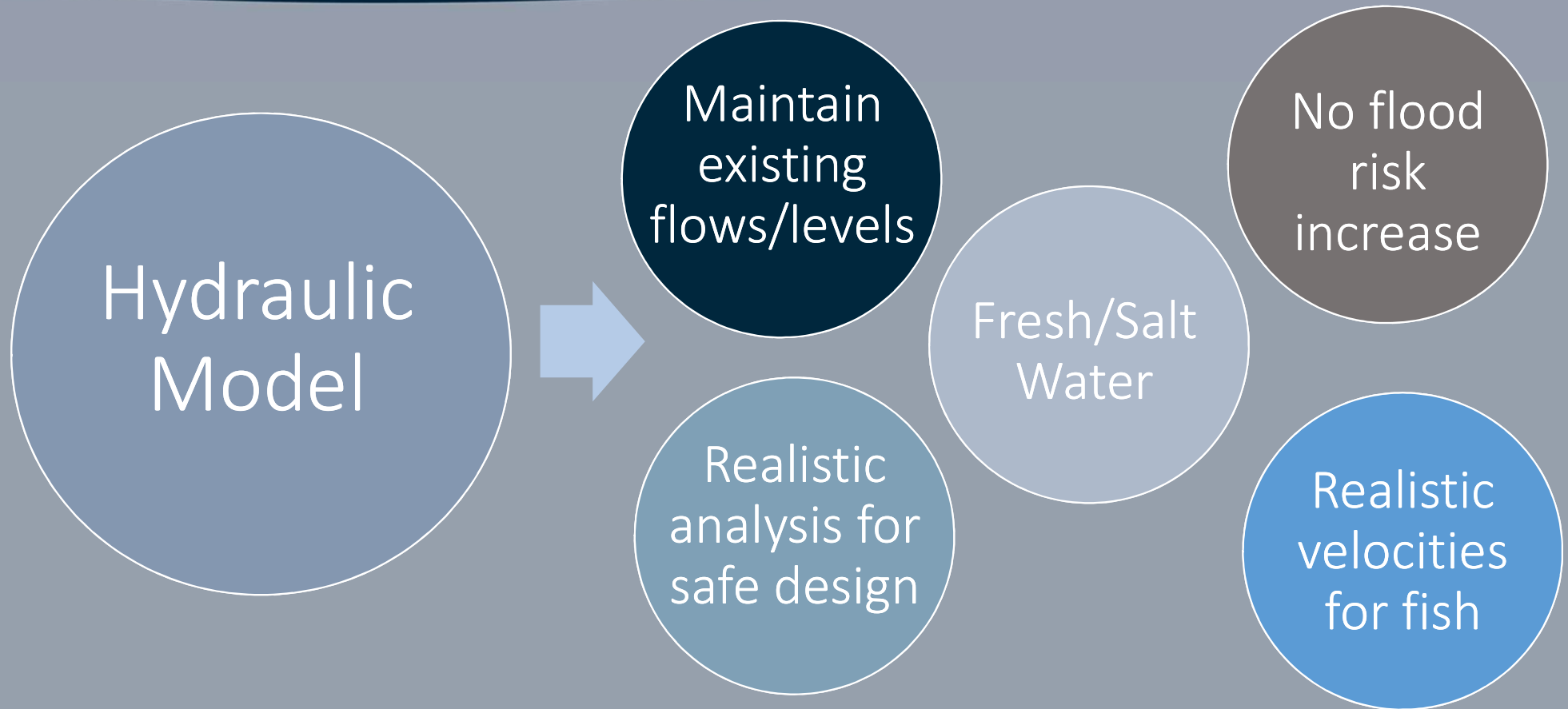


# Option to be Explored for Fish Passage Design

## Fish Passage as a Separate Structure:



# Hydraulic Modelling Considerations





# Sediment Model Considerations

Erosion: Wetland / Bird habitat

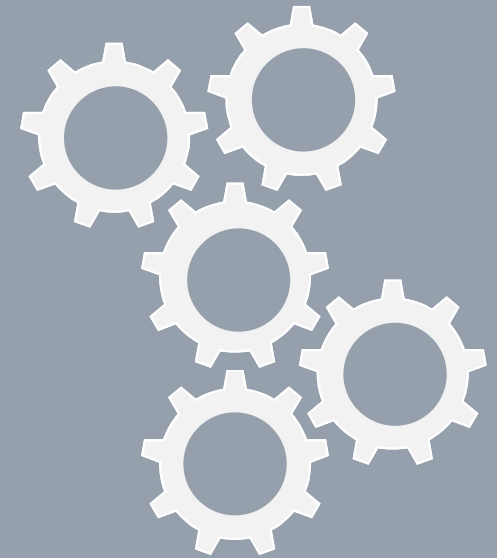
Impacts on larger river system

Deposition: navigation /drainage

Ingress of sediment into lake

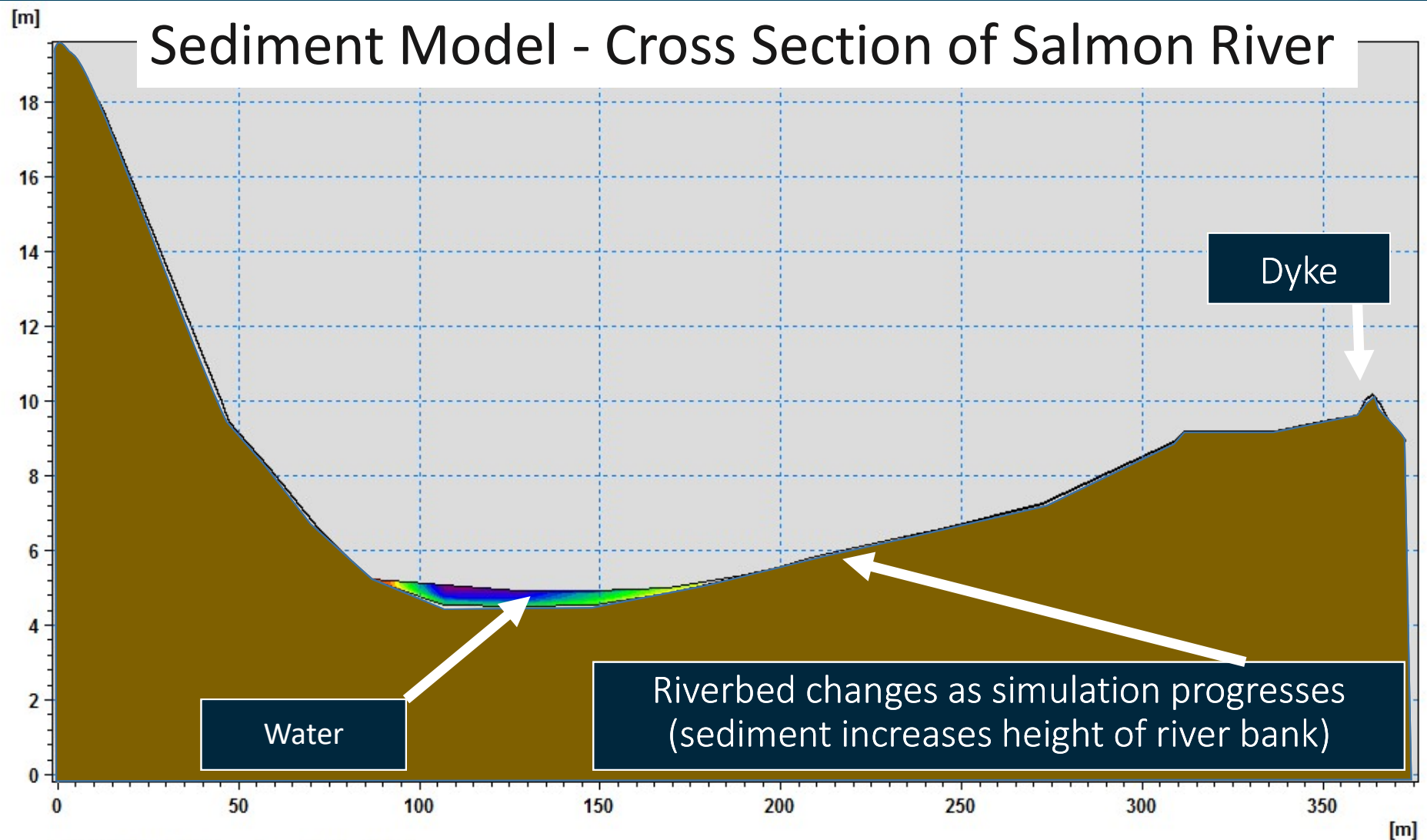
Salt and freshwater interaction

Tide gate blockage



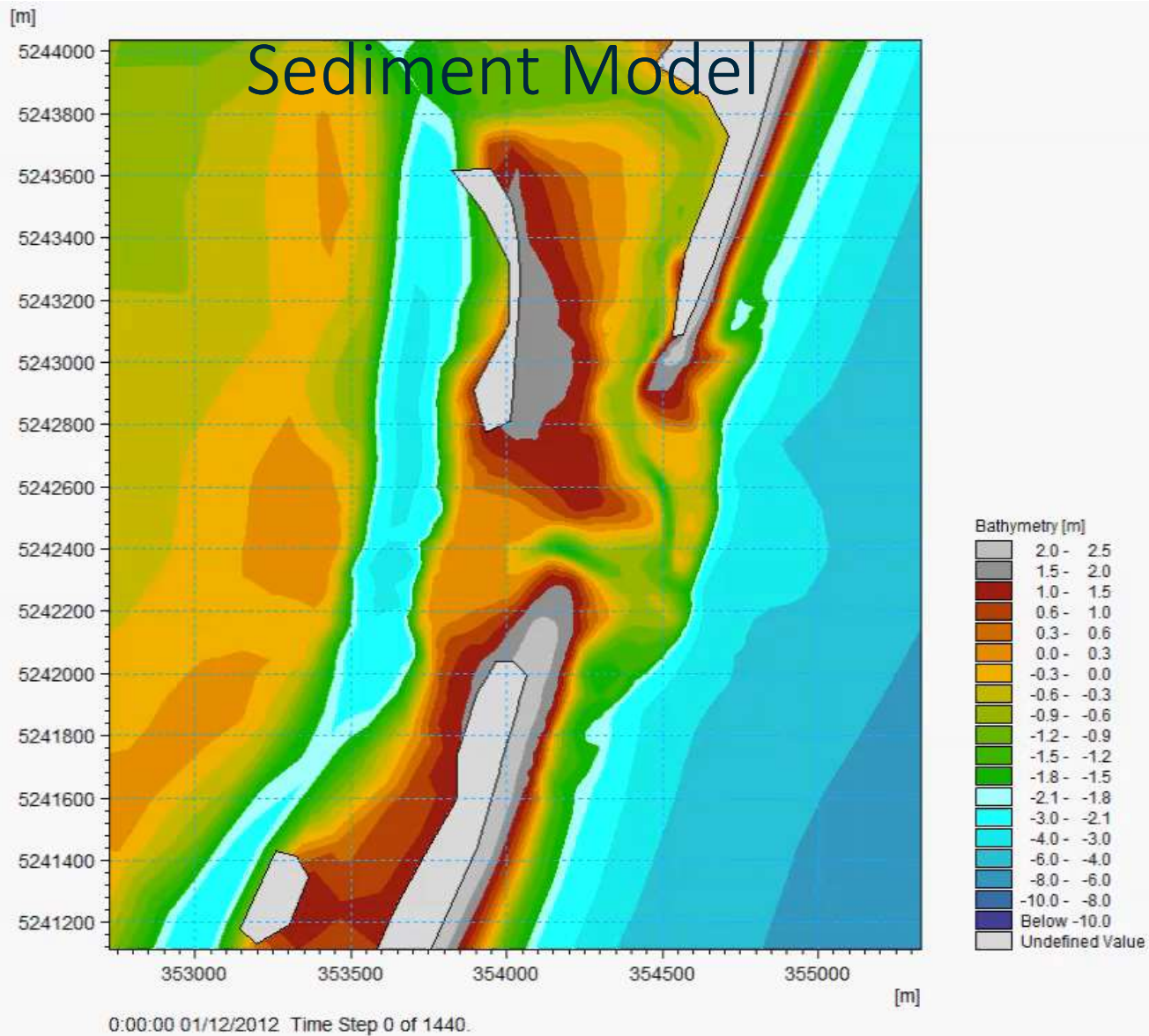


# Sediment Model - Cross Section of Salmon River



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# Sediment Model



**LaPlanche River Aboiteau**

August 2nd 2014



Google earth

Image © 2015 DigitalGlobe



100 m



**LaPlanche River Aboiteau**

October 20th 2014



Google earth

Image © 2015 DigitalGlobe



100 m

**LaPlanche River Aboiteau**

July 5th 2015



Google earth

Image © 2015 DigitalGlobe



100 m



**LaPlanche River Aboiteau**

July 25 2017

Legend




Google Earth

Image © 2018 DigitalGlobe

700 ft



# Closing



Clear, detailed  
understanding  
of the project

Rigorous project  
scope, detailed  
approach to  
complexity

Local team, local  
knowledge and  
experience

Proven track  
record in  
aboiteau and  
highway projects

# Questions and discussion