Project Overview and update

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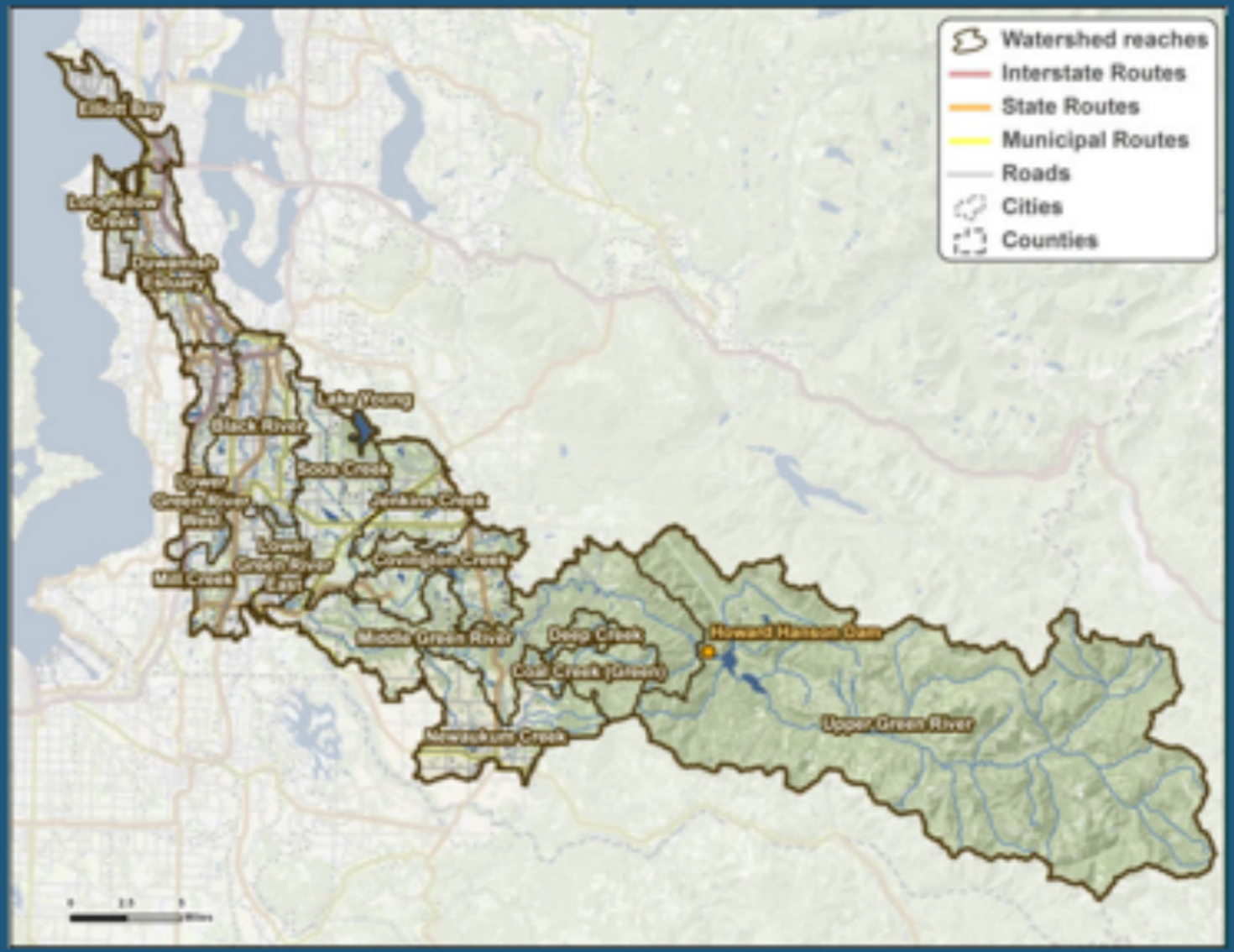
NWRO Water Quality Program

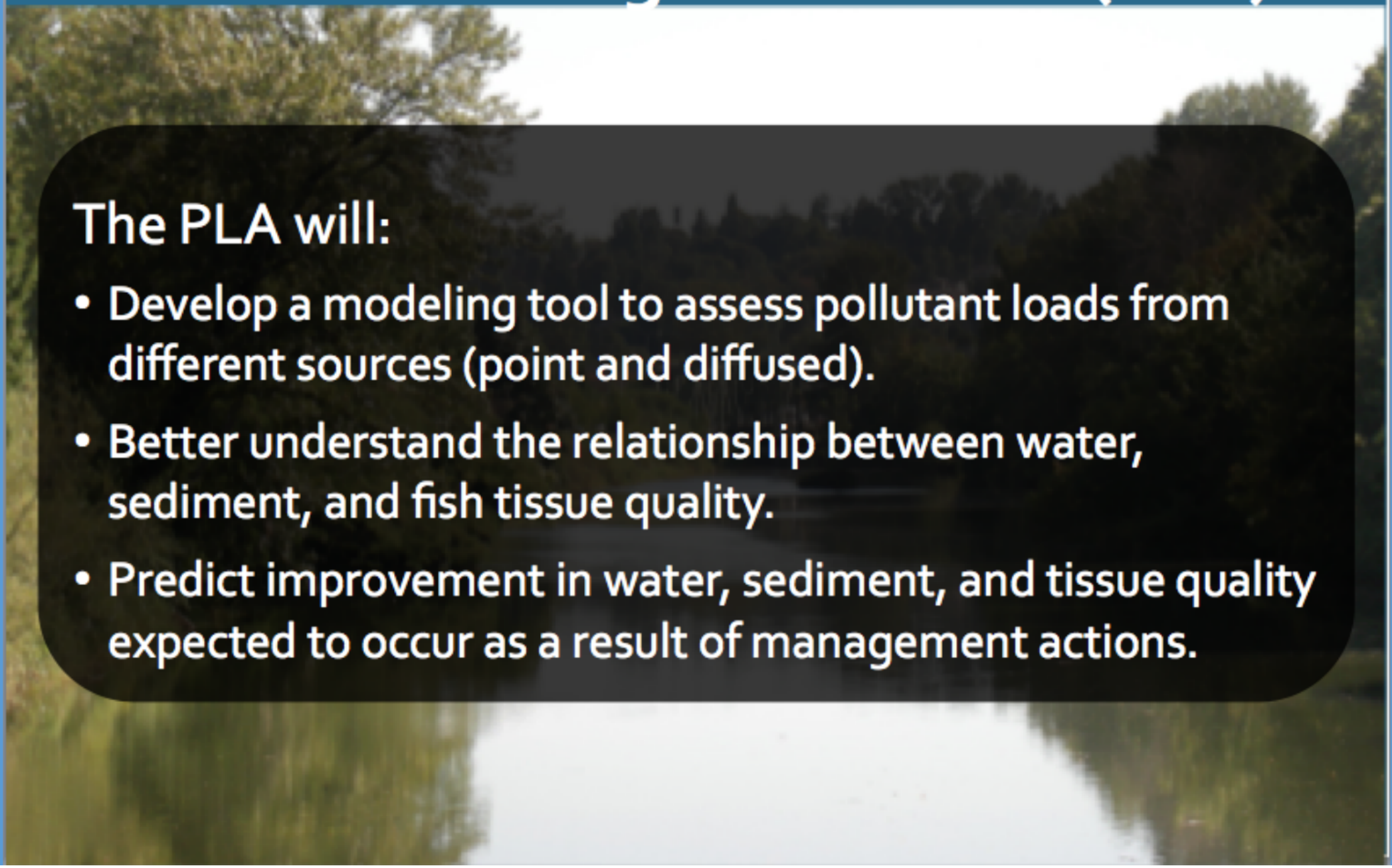
TMDL Alternative

Green-Duwamish Watershed Basics

- 480 square miles and 90 miles long

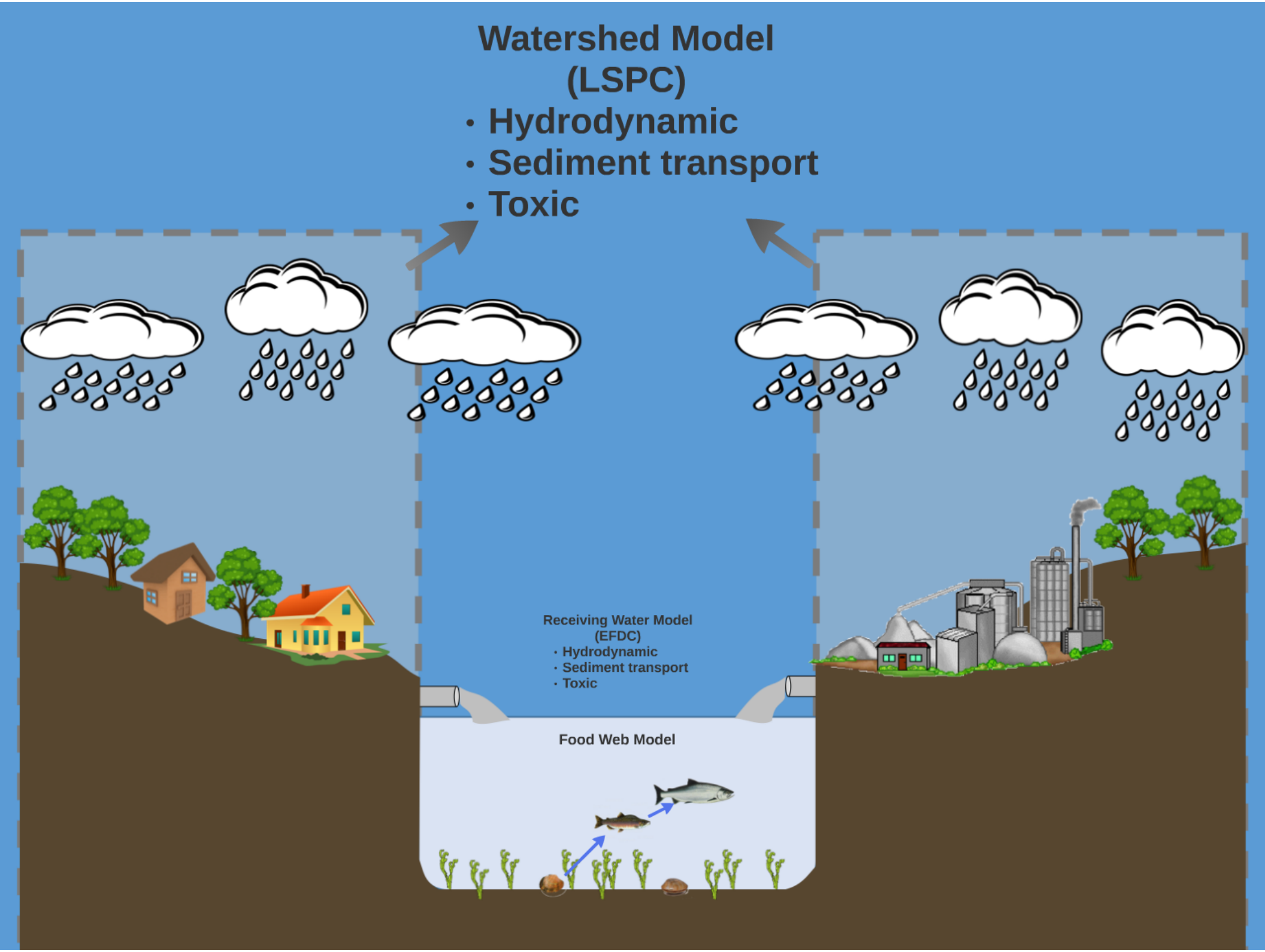


Green-Duwamish Watershed Pollutant Loading Assessment (PLA)



The PLA will:

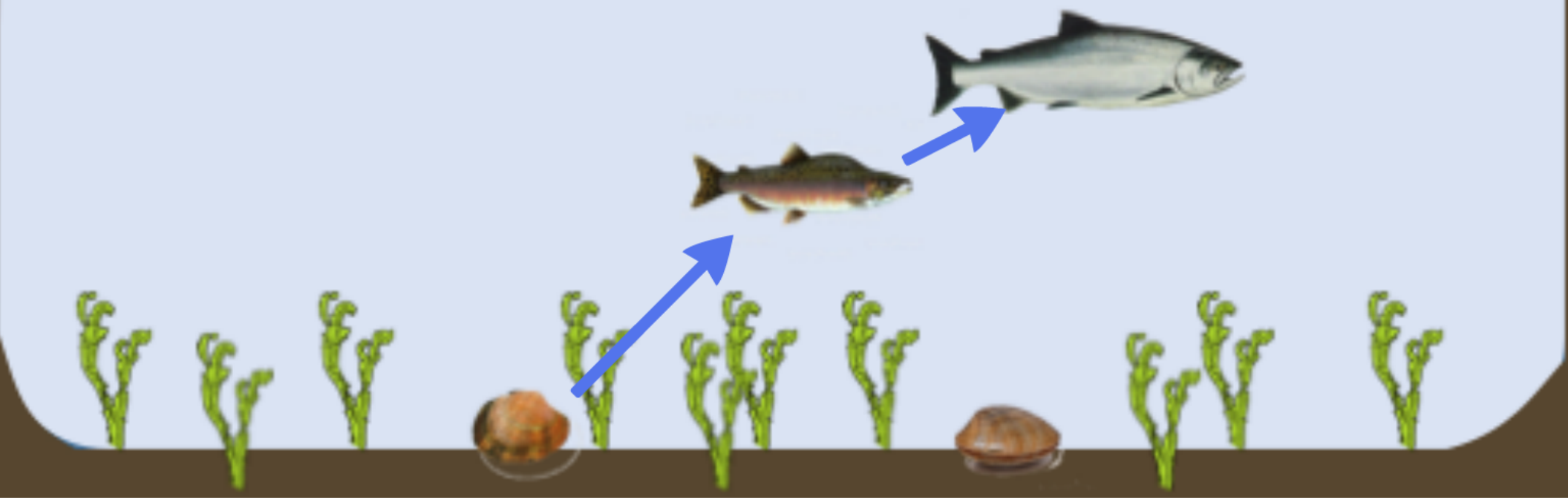
- Develop a modeling tool to assess pollutant loads from different sources (point and diffused).
- Better understand the relationship between water, sediment, and fish tissue quality.
- Predict improvement in water, sediment, and tissue quality expected to occur as a result of management actions.


Watershed Model
(LSPC)
• Hydrodynamic
• Sediment transport
• Toxic
Receiving Water Model
(EFDC)
• Hydrodynamic
• Sediment transport
• Toxic
Food Web Model

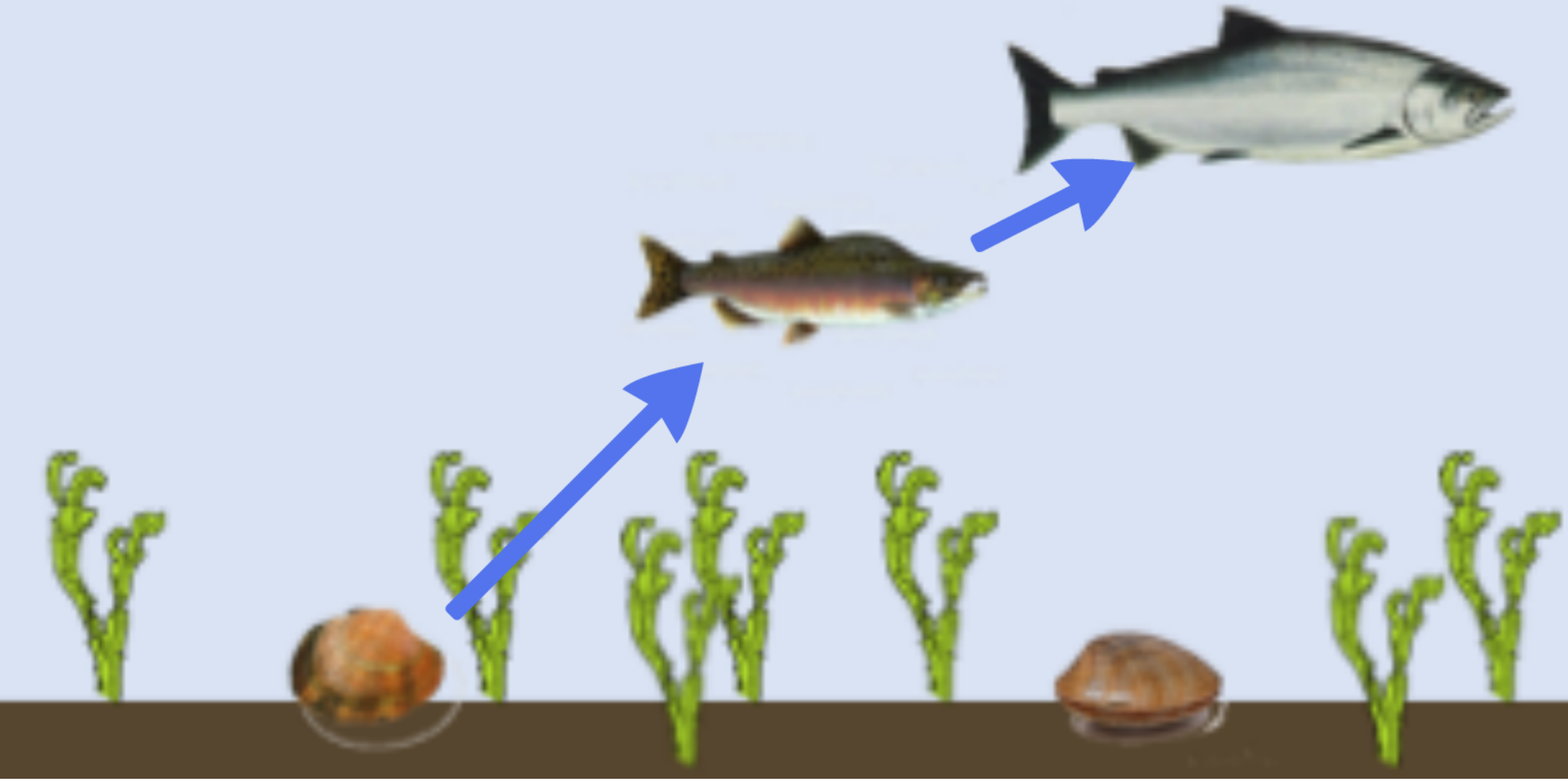
Receiving Water Model (EFDC)

- Hydrodynamic
- Sediment transport
- Toxic

Food Web Model



Food Web Model



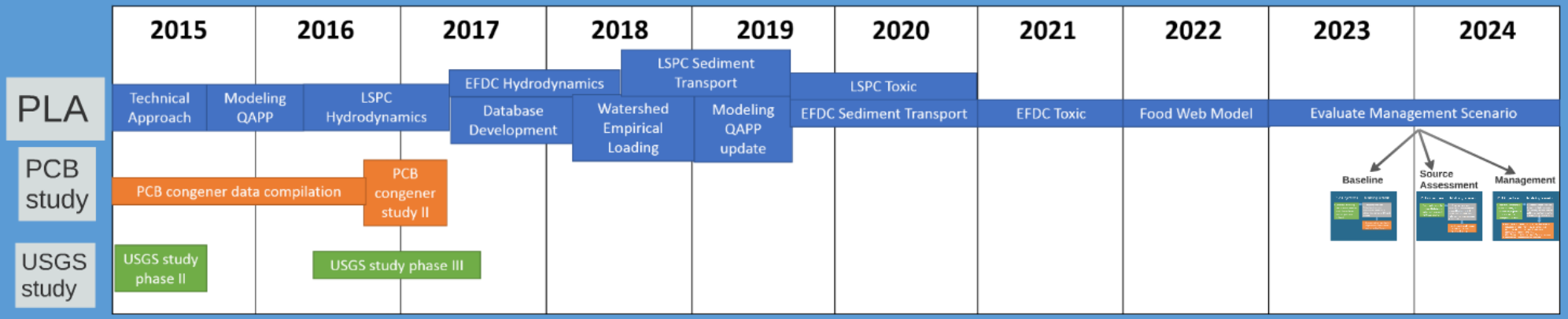
Selected Pollutants

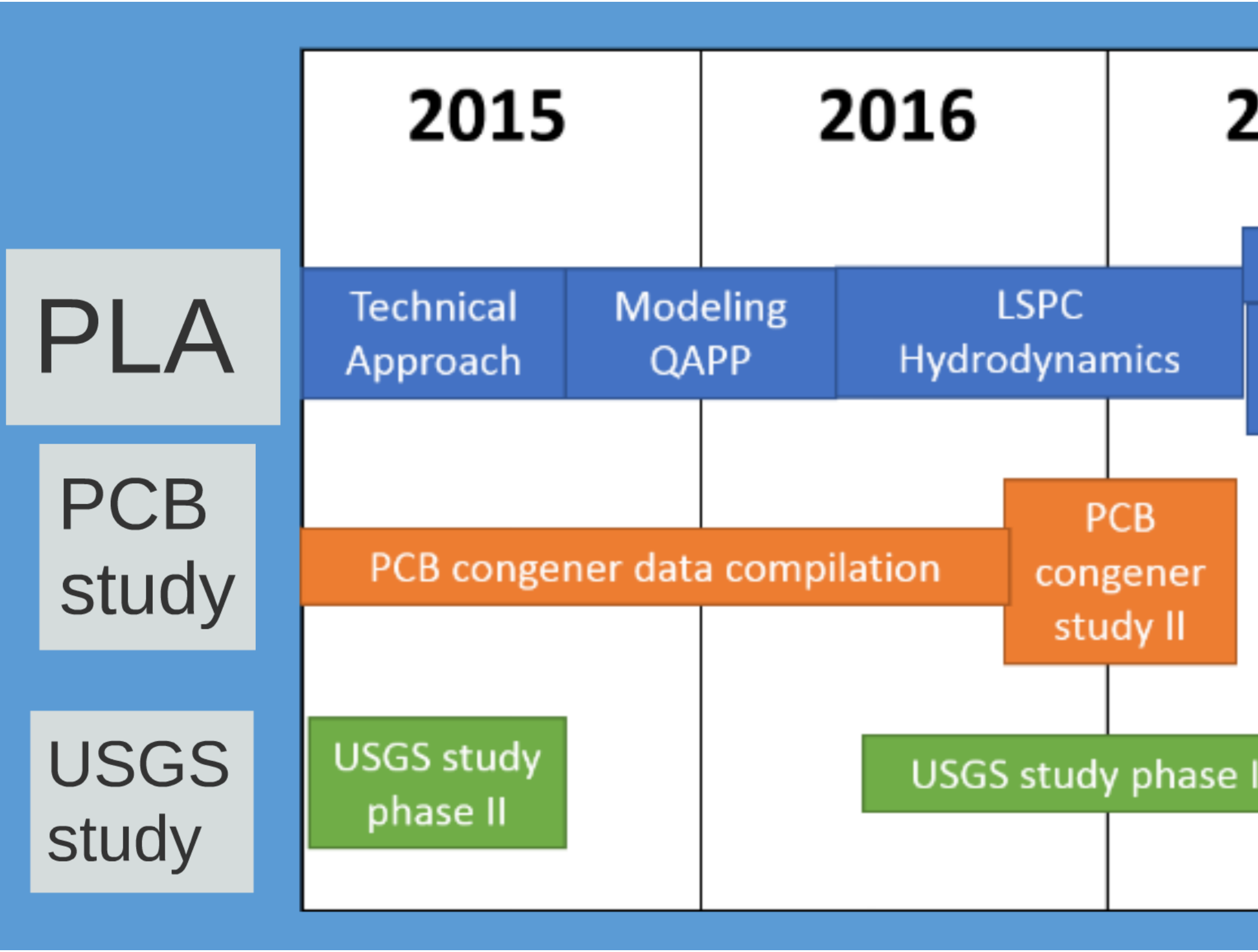
Pollutant	Fate/ Trans.	Food Web	Decision
PCBs	Y	Y	Select specific PCBs for modeling based on data review and analysis.
Carcinogenic PAHs	Y	Y	Simulate cPAHs as a group with approximated characteristics; reassess based on data analysis if necessary.
Dioxins/ Furans	N	NA	Delay modeling until additional data area collected.
Phthalates	Y	N	Simulate DEHP. Use as a surrogate appears reasonable.

Selected Pollutants

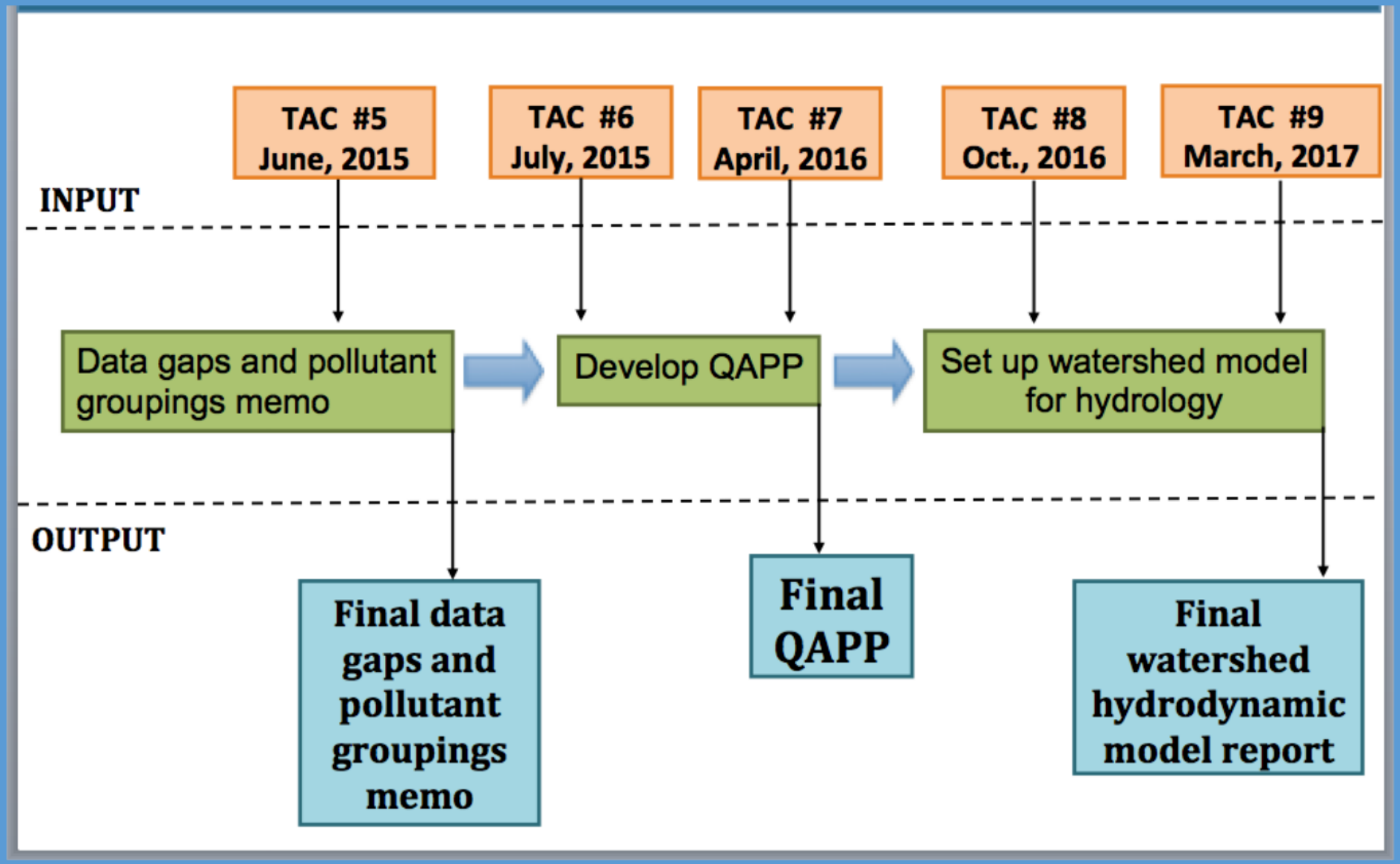
Pollutant	Fate/ Trans.	Food Web	Decision
Arsenic (inorganic)	Y	N	Simulate inorganic arsenic only using a simplified mass balance approach
Copper	Y	N	Simulate dissolved and sorbed inorganic forms using USEPA translator guidance (1996) methods adjusted to local data.
Zinc	Y	N	Same as copper
Mercury	N	NA	Do not model mercury at this time.

Project Phasing




2015
2016
2
PLA
PCB study
USGS study
Technical Approach
Modeling QAPP
LSPC Hydrodynamics
PCB congener data compilation
PCB congener study II
USGS study phase II
USGS study phase I

PLA progress



PCB congener study

- Phase I completed
  - Summarized and compiled available PCB data in LDW and Green-Duwamish environmental media.
- Phase II started from October, 2016.
  - Leidos subcontracted Professor Lisa Rodenburg for the factor analysis on PCB data.

USGS Green River Chemical Loading Study

- Estimate sediment loads and toxic chemical loads from upstream sources in the watershed that are transported by the Green-Duwamish River to the LDW.

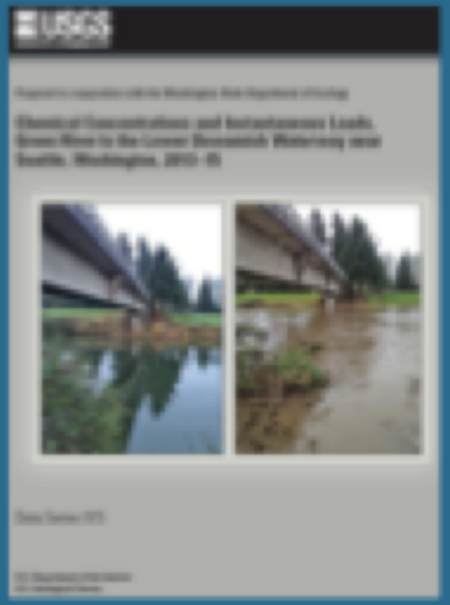
USGS Study Progress

Phase I

- Jan – June 2013

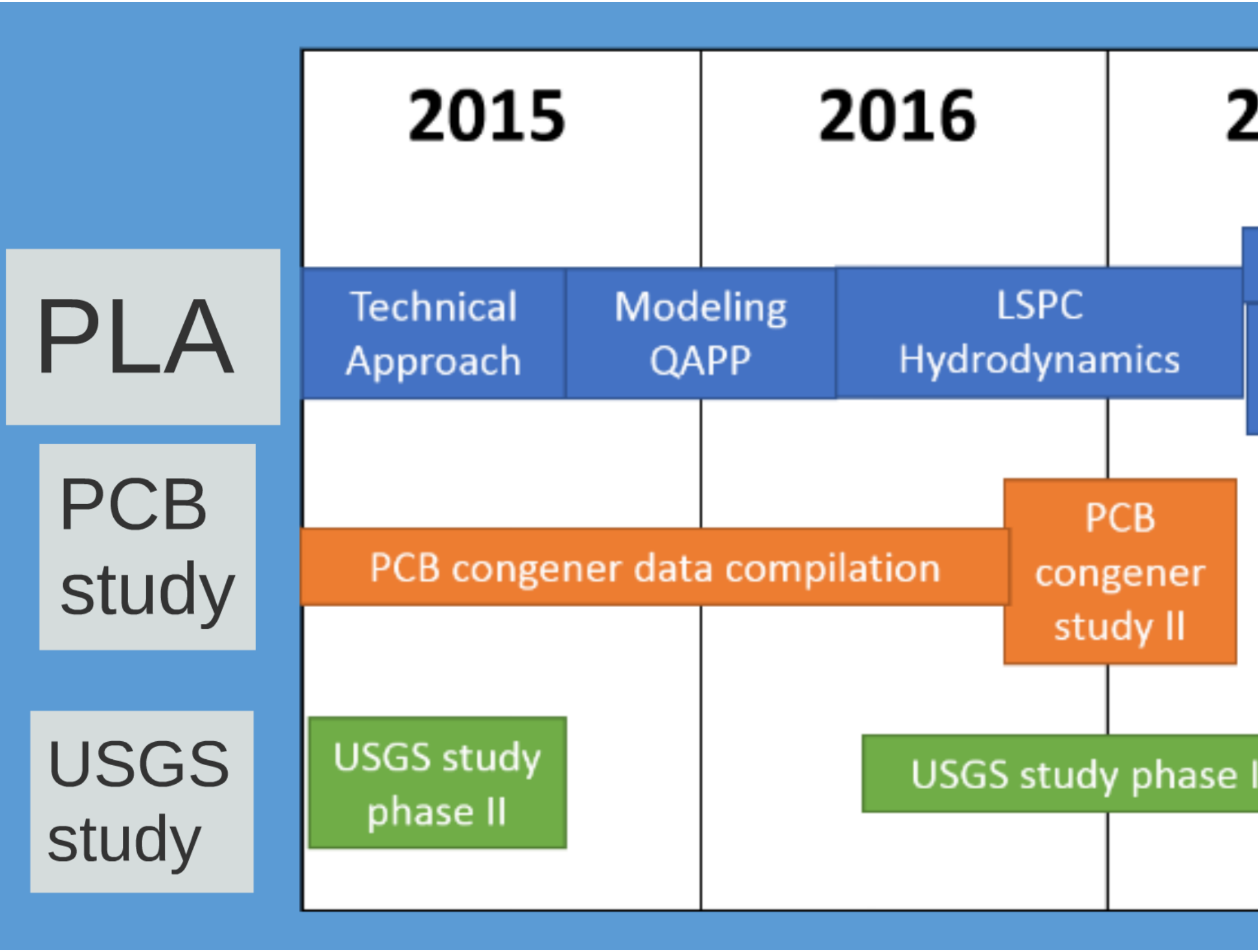
Phase II

- Jan 2014 –
- June 2015



Phase III

- **Started July 2016**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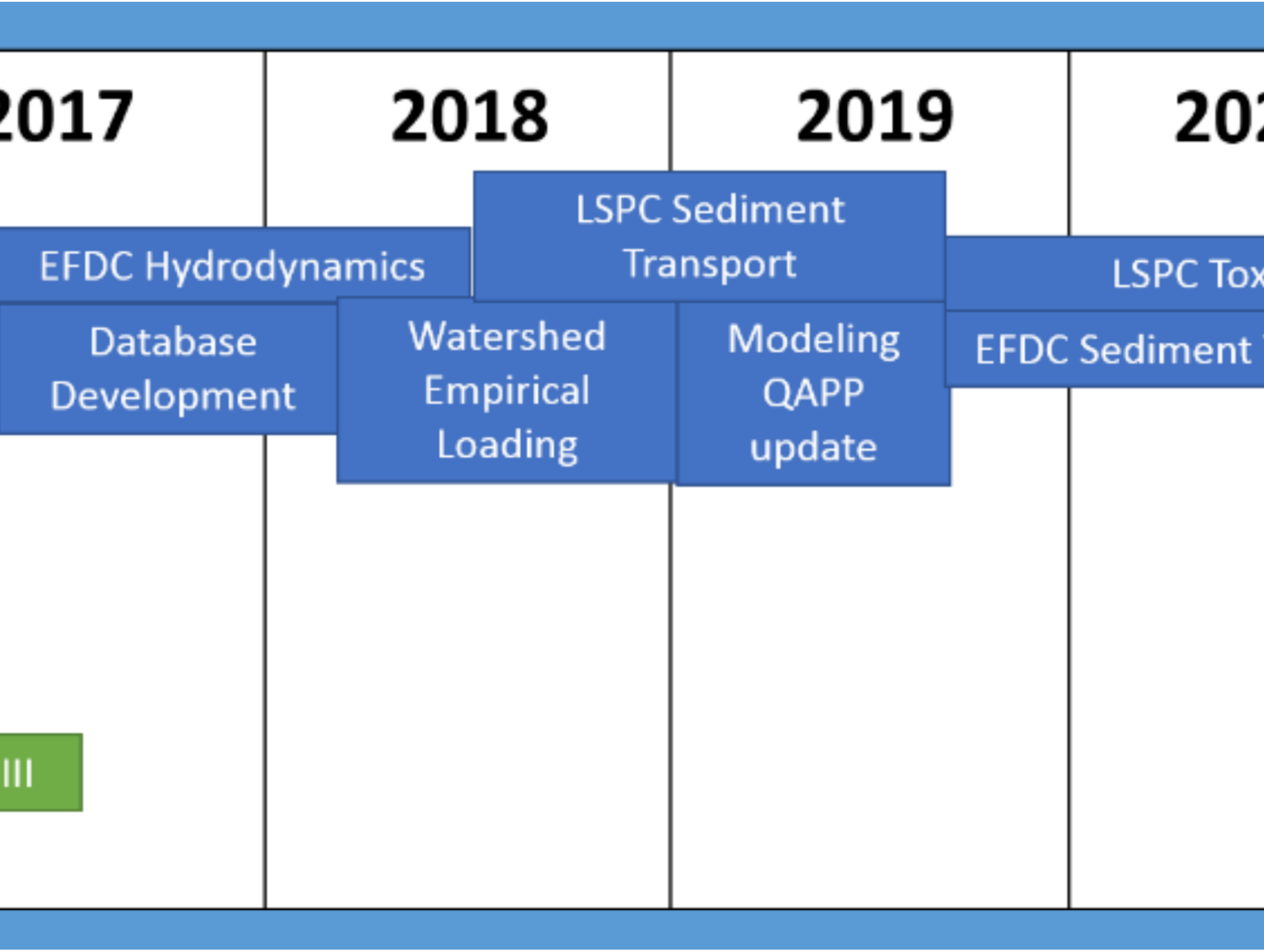
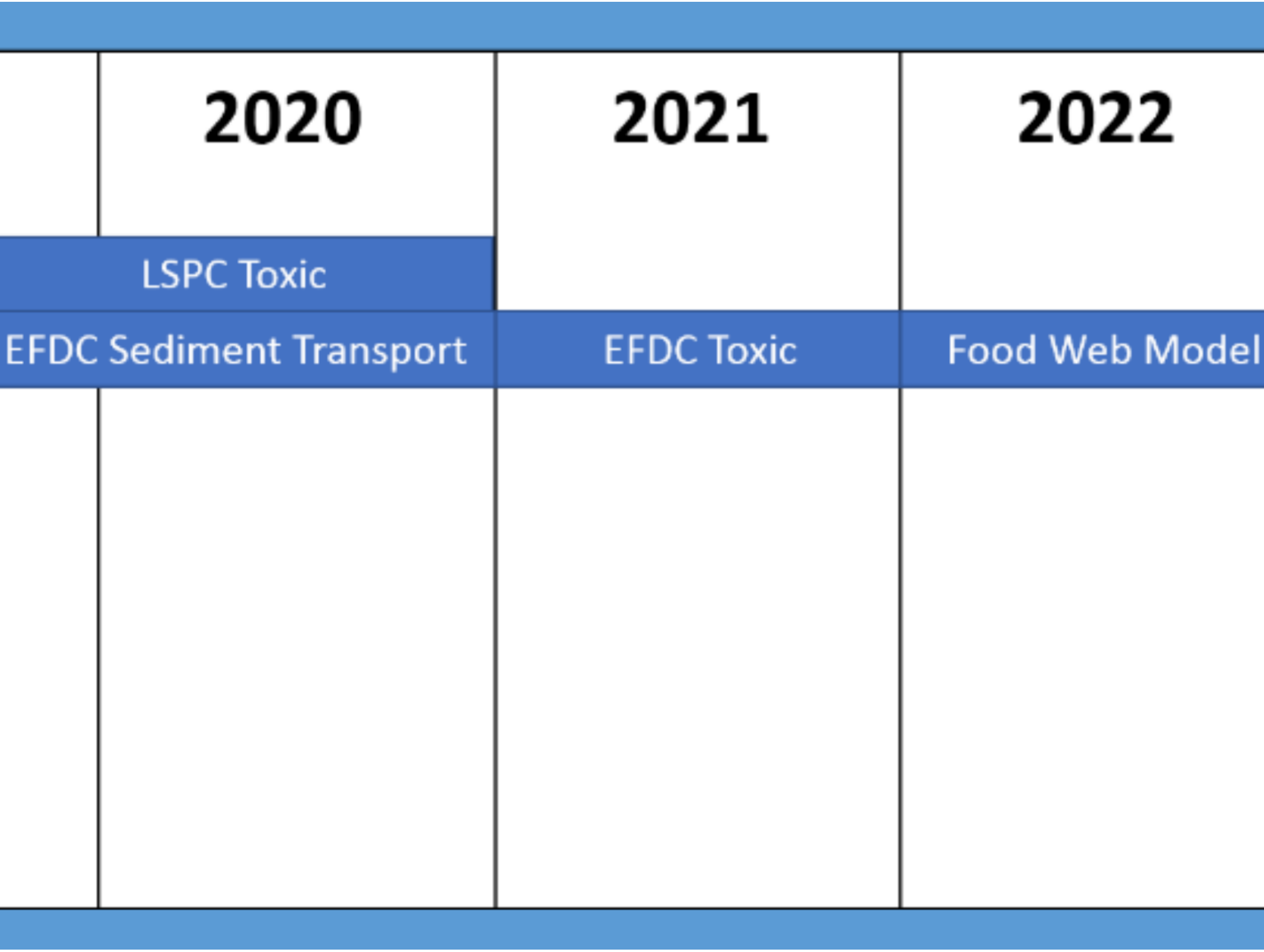
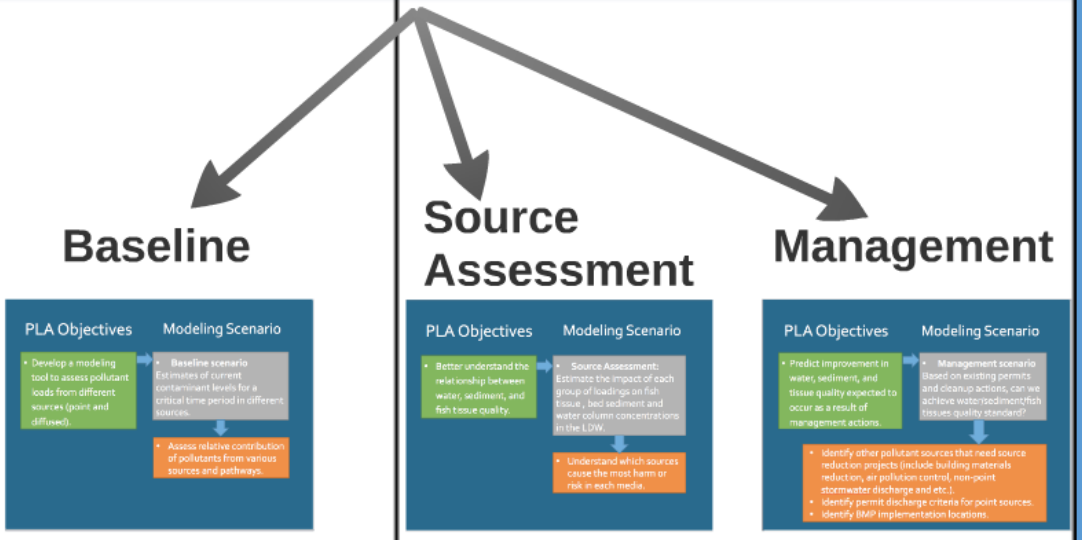

2017
2018
2019
EFDC Hydrodynamics
LSPC Sediment Transport
LSPC Tox
Database Development
Watershed Empirical Loading
Modeling QAPP update
EFDC Sediment
III


2020
2021
2022
LSPC Toxic
EFDC Sediment Transport
EFDC Toxic
Food Web Model

2	2023	2024
Model	Evaluate Management Scenario	



PLA Objectives

- Develop a modeling tool to assess pollutant loads from different sources (point and diffused).

Modeling Scenario

- **Baseline scenario**

Estimates of current contaminant levels for a critical time period in different sources.

- Assess relative contribution of pollutants from various sources and pathways.

PLA Objectives

- Better understand the relationship between water, sediment, and fish tissue quality.

Modeling Scenario

- **Source Assessment:** Estimate the impact of each group of loadings on fish tissue , bed sediment and water column concentrations in the LDW.

- Understand which sources cause the most harm or risk in each media.

PLA Objectives

- Predict improvement in water, sediment, and tissue quality expected to occur as a result of management actions.

Modeling Scenario

- **Management scenario**
  Based on existing permits and cleanup actions, can we achieve water/sediment/fish tissues quality standard?

- Identify other pollutant sources that need source reduction projects (include building materials reduction, air pollution control, non-point stormwater discharge and etc.).
- Identify permit discharge criteria for point sources.
- Identify BMP implementation locations.