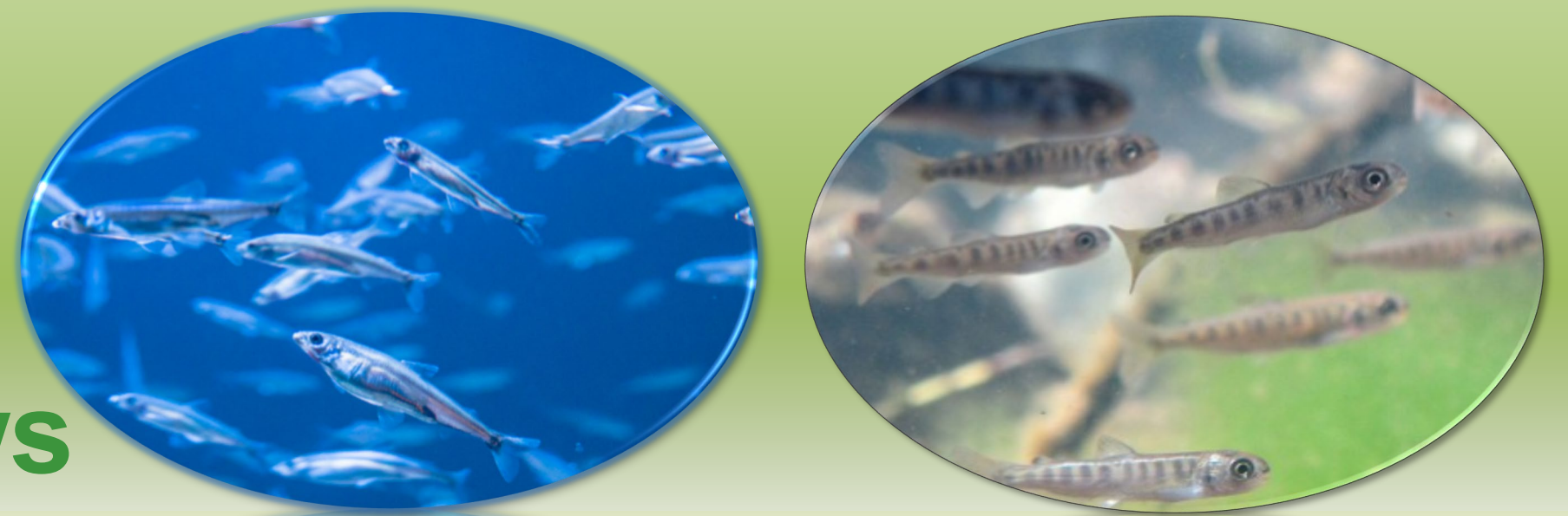# ECO-PTM -- An Individual Based Ecological Particle Tracking Model That Considers Tidal Flows
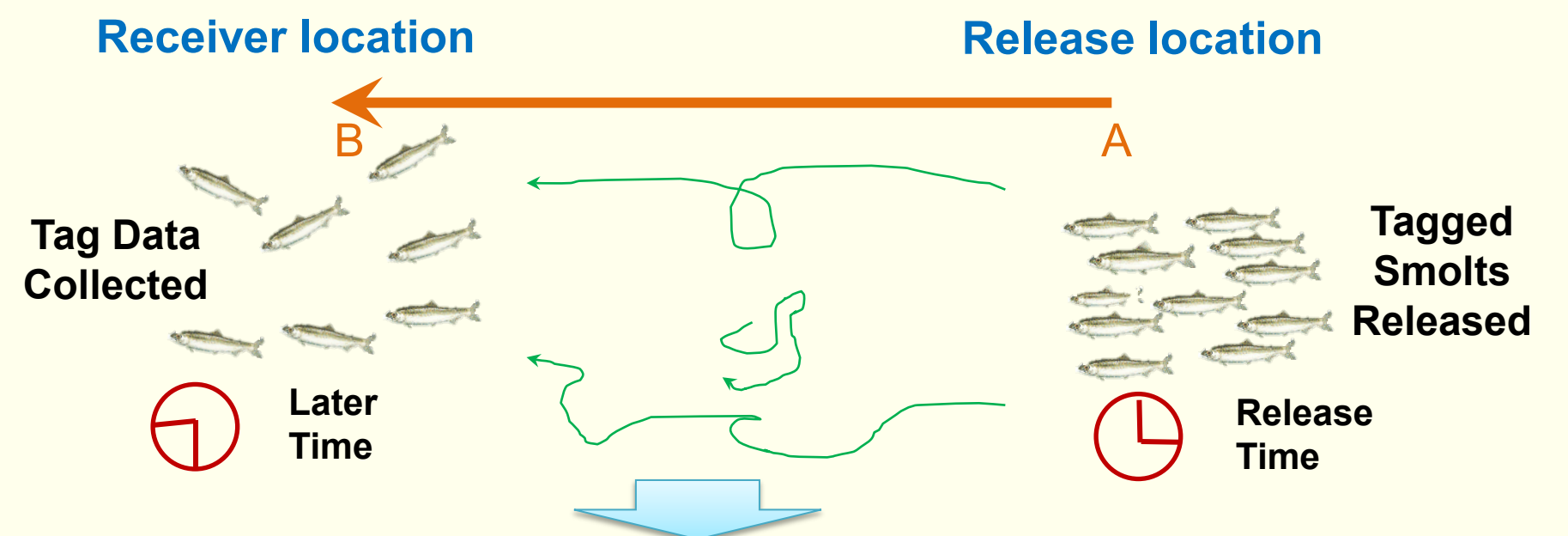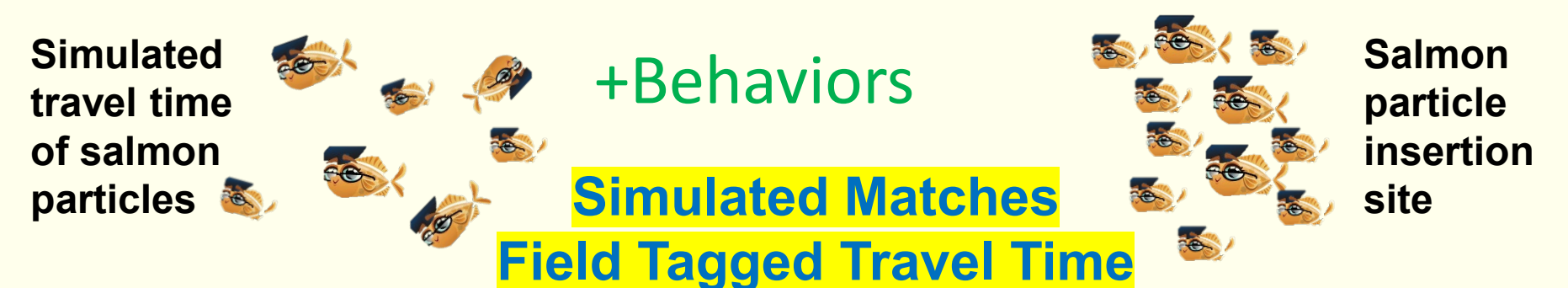
ECO-PTM FACTS

ECO-PTM is an individual-based ecological particle tracking model that tracks three types of particles, neutrally buoyant (Delta smelt larvae), position oriented (longfin smelt larvae), and salmon (Chinook salmon):

➢ Based on a random-walk particle-tracking method

➢ Utilizes flow information from a 15-minute-time-step hydrodynamic simulation of the Delta that captures the estuary's temporal and spatial tidal variations

➢ Used commonly for impact analyses of larvae entrainment of Delta smelt and longfin smelt into water project facilities

➢ Applied for analyses of juvenile salmon migration and survival through the Delta

➢ Attached fish-like behaviors to the salmon particles

➢ Calibrated and validated behavior parameters with field tag data: simulated outputs match observations

Field Tag Data for Salmon

Receiver location   Release location

B   A

Tag Data Collected

Tagged Smolts Released

Later Time

Release Time

ECO-PTM Calibrated and Validated with Tag Data

Simulated travel time of salmon particles

+Behaviors

Salmon particle insertion site

Simulated Matches Field Tagged Travel Time

Model Applications

ECO-PTM can be an effective tool for quantitatively assessing water resources management actions, such as impacts on entrainment or fish survival from:

➢ Fish Barriers

➢ Project operation changes

➢ Restoration actions

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