Jun 22nd, 2:15 PM - 2:30 PM

Session A2: Like Shooting Fish in a Barrel: Migratory Behavior of Fish at Intertidal Fish Passes in Dutch Wadden Sea

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"Fish in the Wadden Sea", Monitoring Fish Passes and fish migration

"Like shooting fish in a barrel?"

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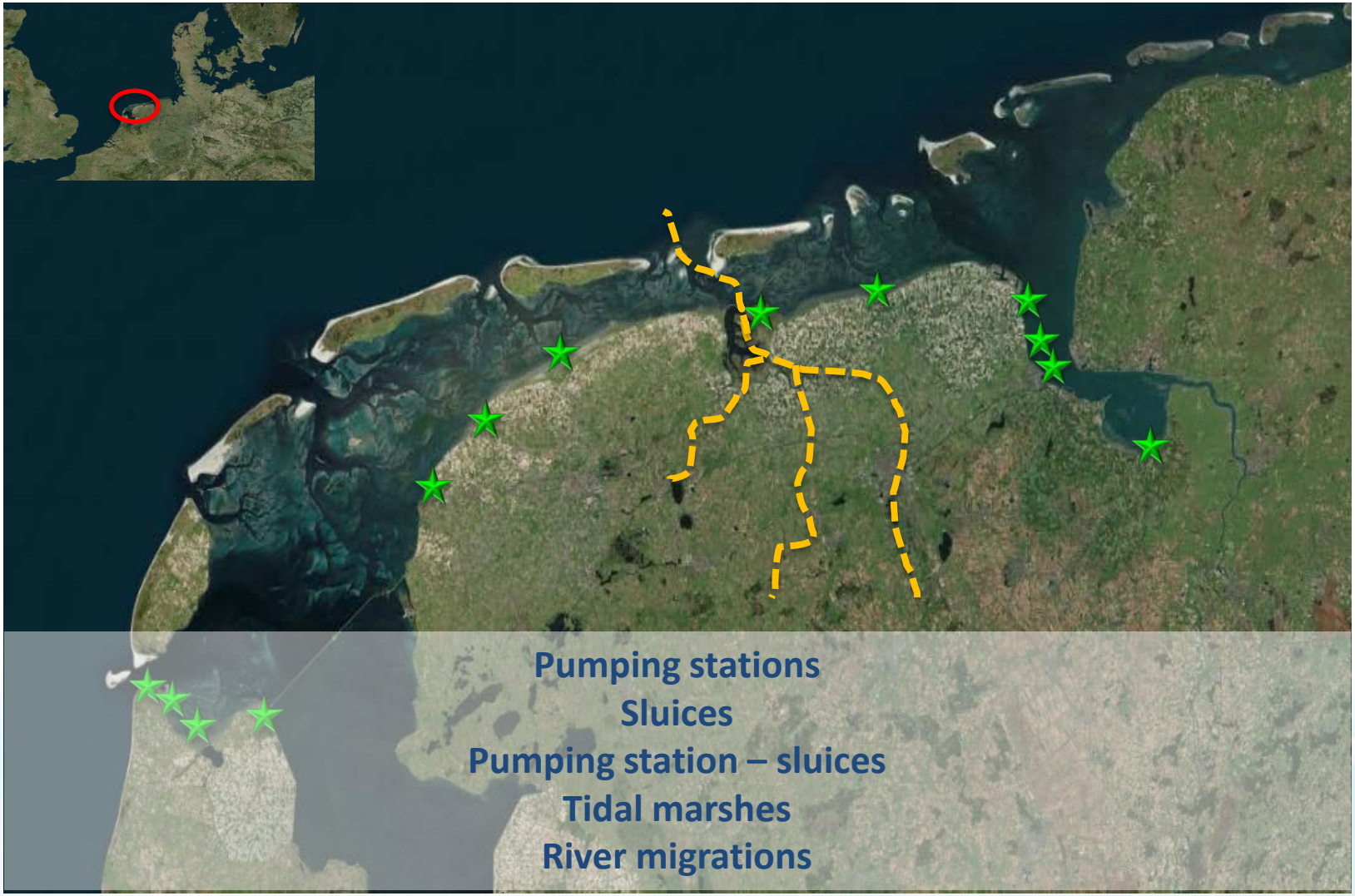
Research locations Dutch Wadden Sea



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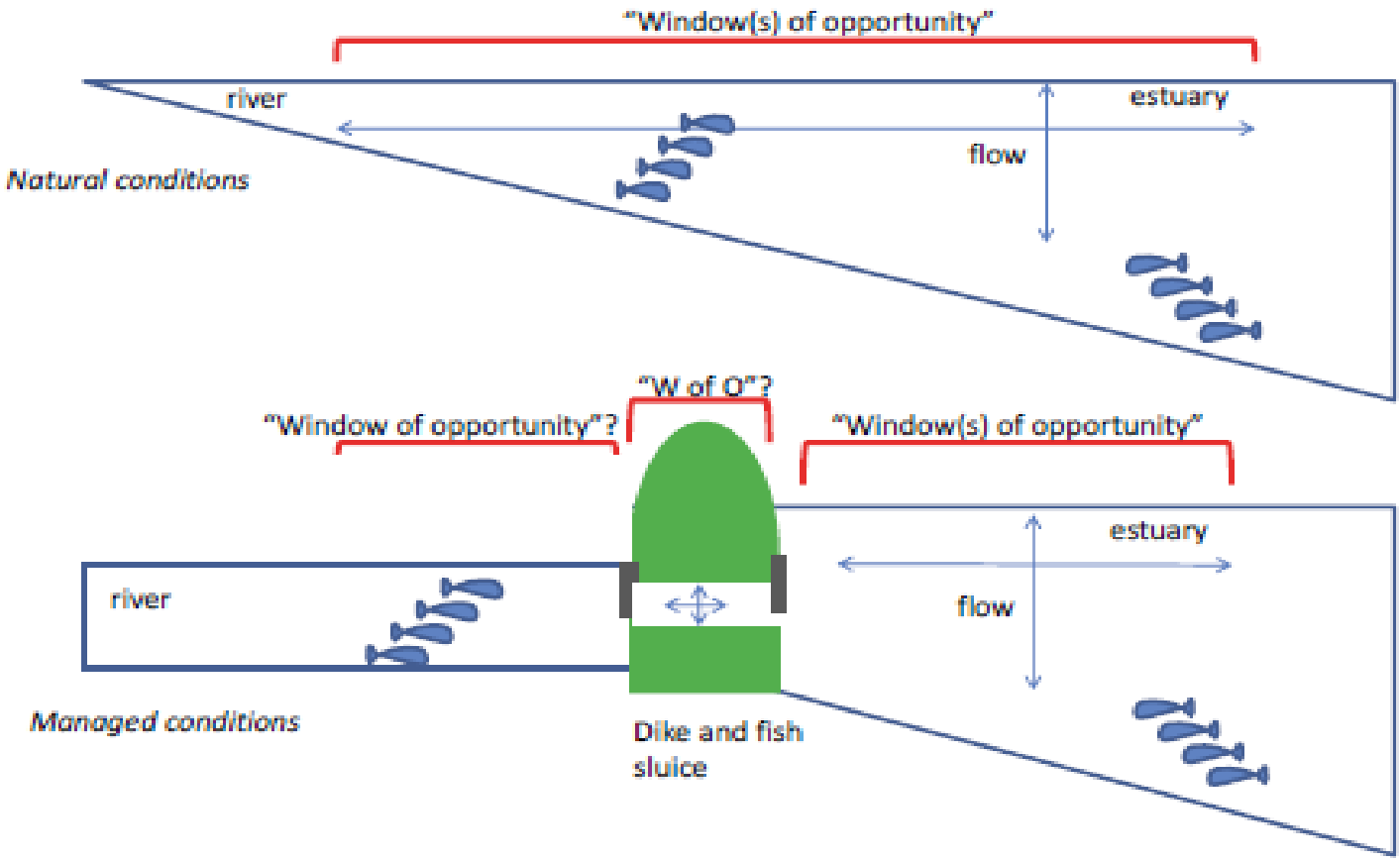
Diadromous fish

Tidal migrations Wadden Sea



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Barriers

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Fish Passes

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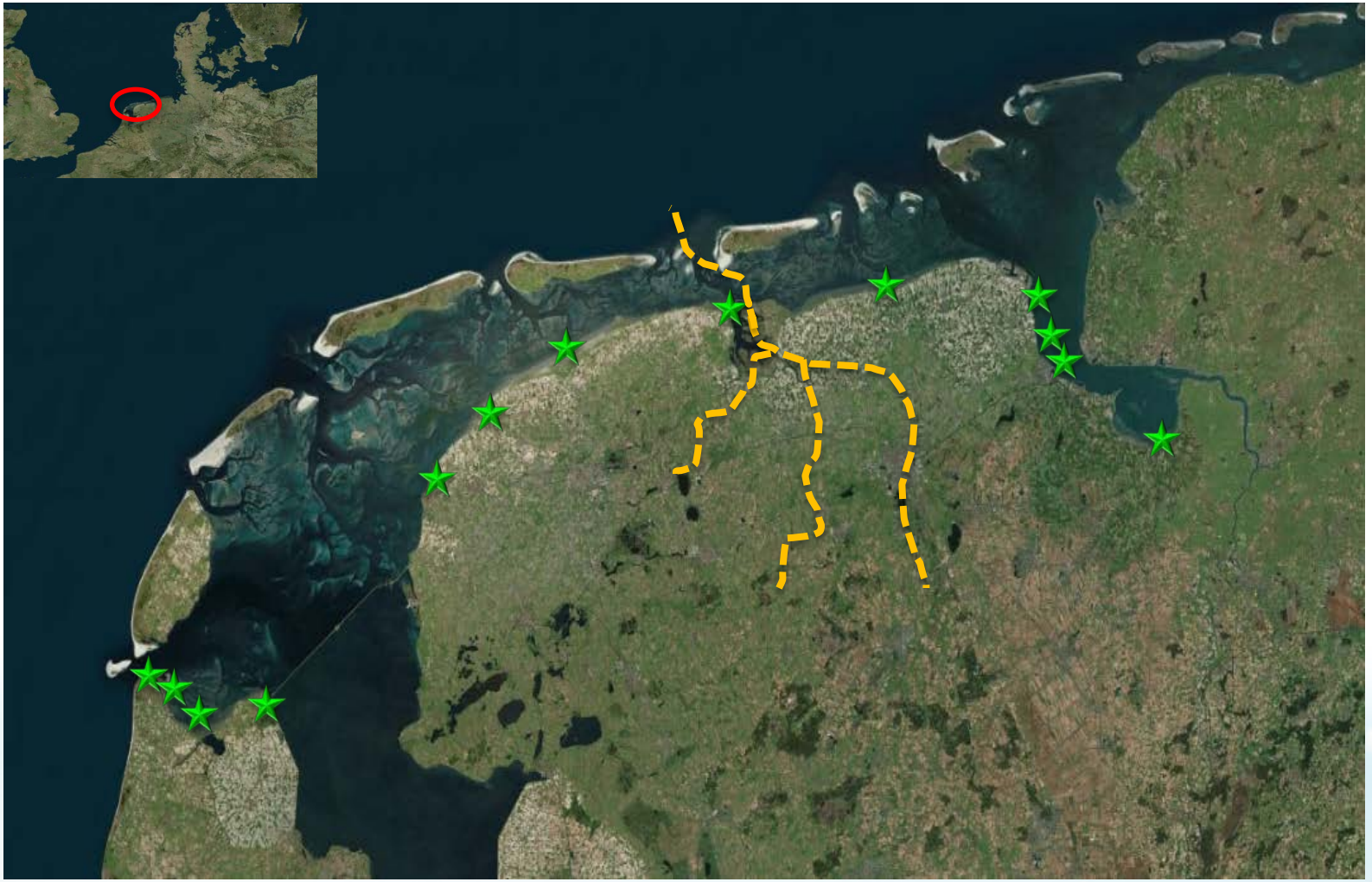
Dutch Wadden Sea



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Roptazijl

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Cleveringh-sluices Lauwersoog

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Method

We have selected fish species and life stages representing down- and upstream migrations and differences in size.

- Understanding use of tidal flow by threespined sticklebacks *(Gasterosteus aculeatus)* and the performance of intertidal fish passes
- Using telemetry to determine fish pass efficiency and differentiation in silver eel *(Anguilla anguilla)* migratory behaviour
- Researching migratory behaviour of Ide *(Leuciscus idus)* and river lamprey *(Lampetra fluviatilis)* in relation to fish passes in a managed river system
- Determine spatial temporal distribution of elvers and sticklebacks, juv. fish at intertidal barriers

Approach

Depending on fish, life stage, fish pass, pumping station, sluice, etc we are using:

- Several types of fike-nets (type, mesh size)
- Cross nets
- Pit-tags
- Acoustic tagging
- Underwater camera's
- Colouring scheme

In cooperation with:

- Researchers
- Students (20 Bsc/Msc per year- three years)
- Consultancy firms
- Ecologists Regional water authorities
- Professional fishermen

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All locations

Species: *Threespined stickleback, Elvers*

Method: *High frequency sampling during tidal cycle*

Results:

- *Locations are different in species composition*
- *Timing of arrival differs per species and location*
- *Arrival of species show relation with tidal action*
- *Diurnal and nocturnal migrations*

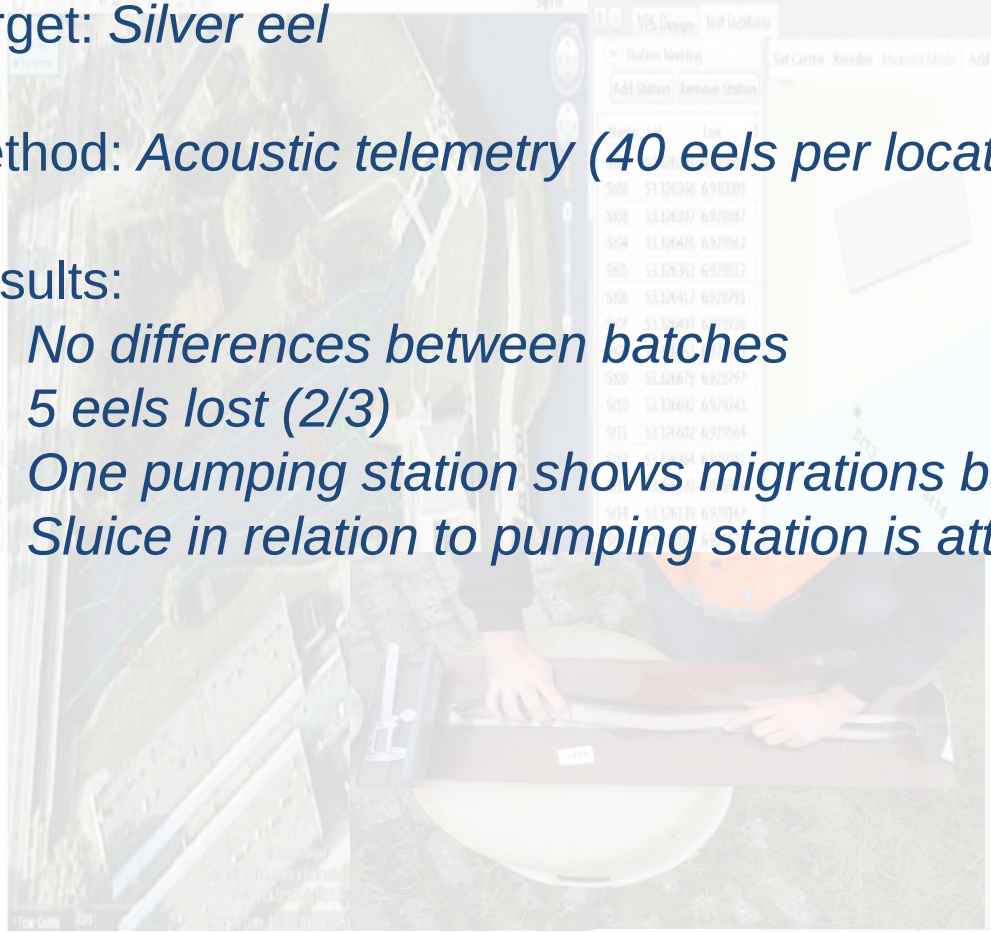
Silver eel migration at intertidal pumping stations Delfzijl

Target: *Silver eel*

Method: *Acoustic telemetry (40 eels per location)*

Results:

- *No differences between batches*
- *5 eels lost (2/3)*
- *One pumping station shows migrations back and forth*
- *Sluice in relation to pumping station is attractive*



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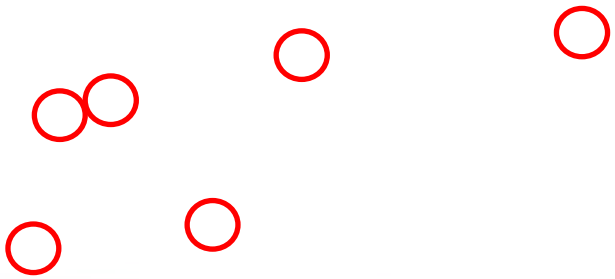
Surprise



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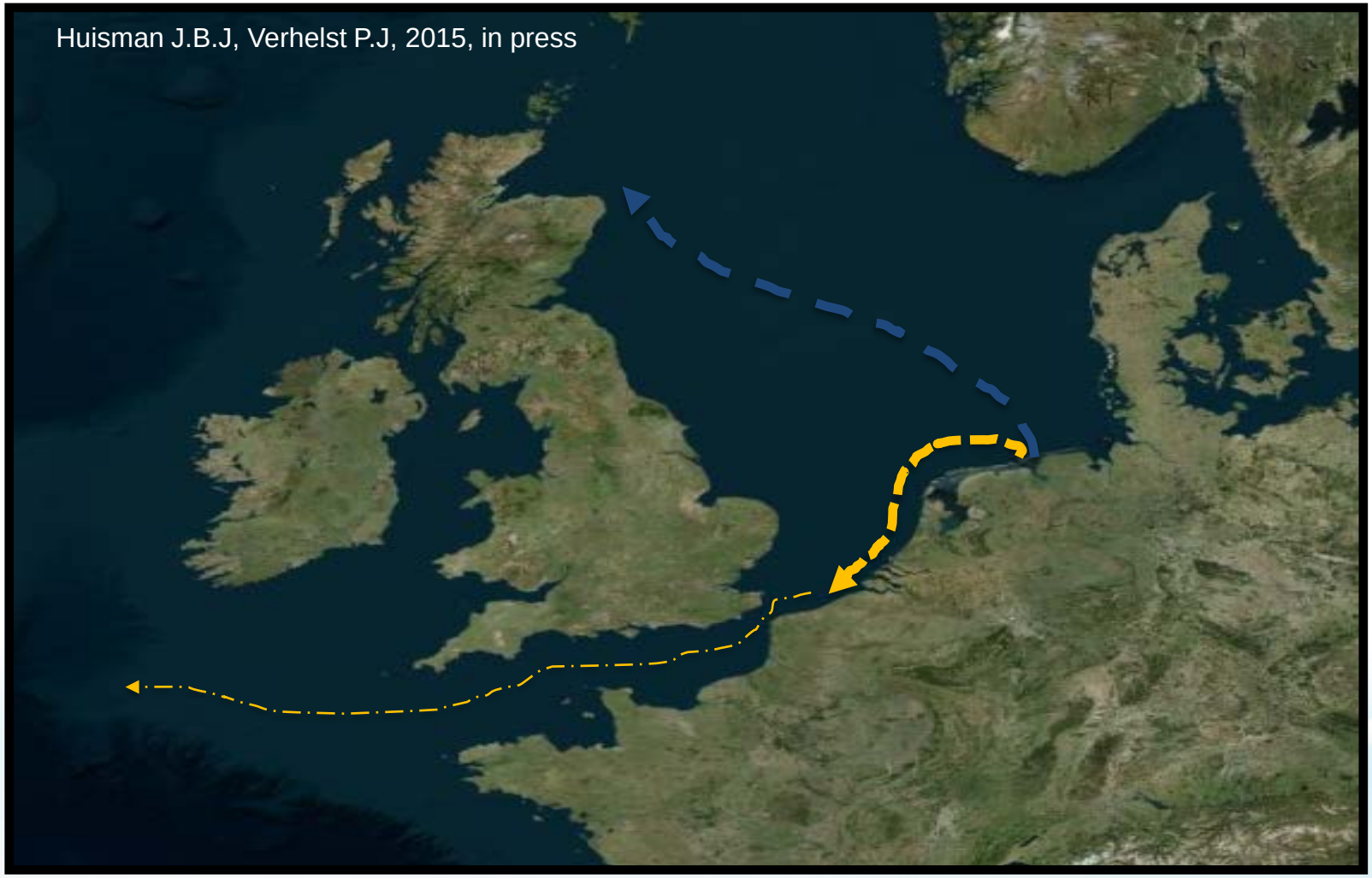
Migration Route



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Fish migration routes, Ide and River

Species: *Ide, River lamprey*

Method: *Acoustic telemetry, pit tagging*

Results Ide:

- *Spawning location fidelity*
- *Two groups of Ide, “stayers” and “migrating”*
- *Ide do not migrate through first fish pass*

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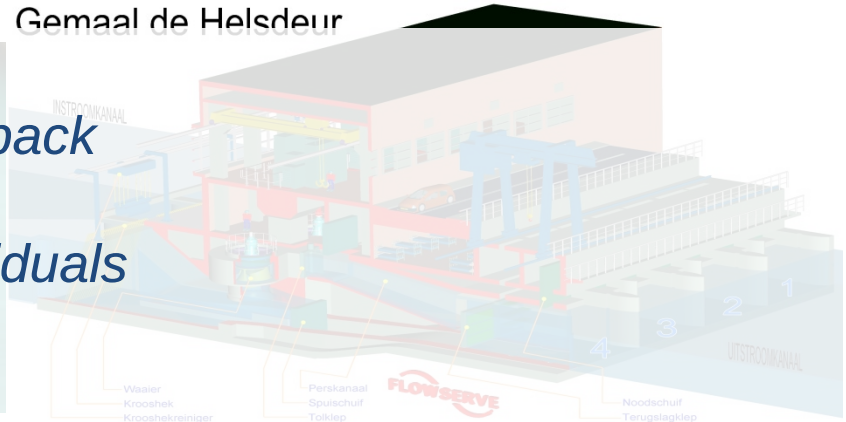
De Helsdeur: measuring fish pass efficiency using PIT-Telemetry



Target: *Three spined stickleback*

Method: *Pit tags, 1205 individuals*

Results:

- *No mortality*
- *226 individuals detected*
- *Predominant diurnal migration*
- *Incoming tide important*

Results

Tidal Phase	Incoming	Outgoing
# Detections	209	34

Huisman J.B.J, Gemert R, 2015, in press

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Thank you!