Predictive Species Distribution Modeling of Yelloweye Rockfish (*Sebastes ruberrimus*) in Oregon's Rocky Reefs for Improved Stock Management

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WHATS UP WITH YELLOWEYE

- 2002 Oregon rockfish fishery collapse - Yelloweye fishing stops.
- Considered a **constraining species** to Oregon's groundfish fisheries.
- Data for Yelloweye is **limited**.
- ODFW continues fisheries-independent surveys using video lander: a unique sampling method.
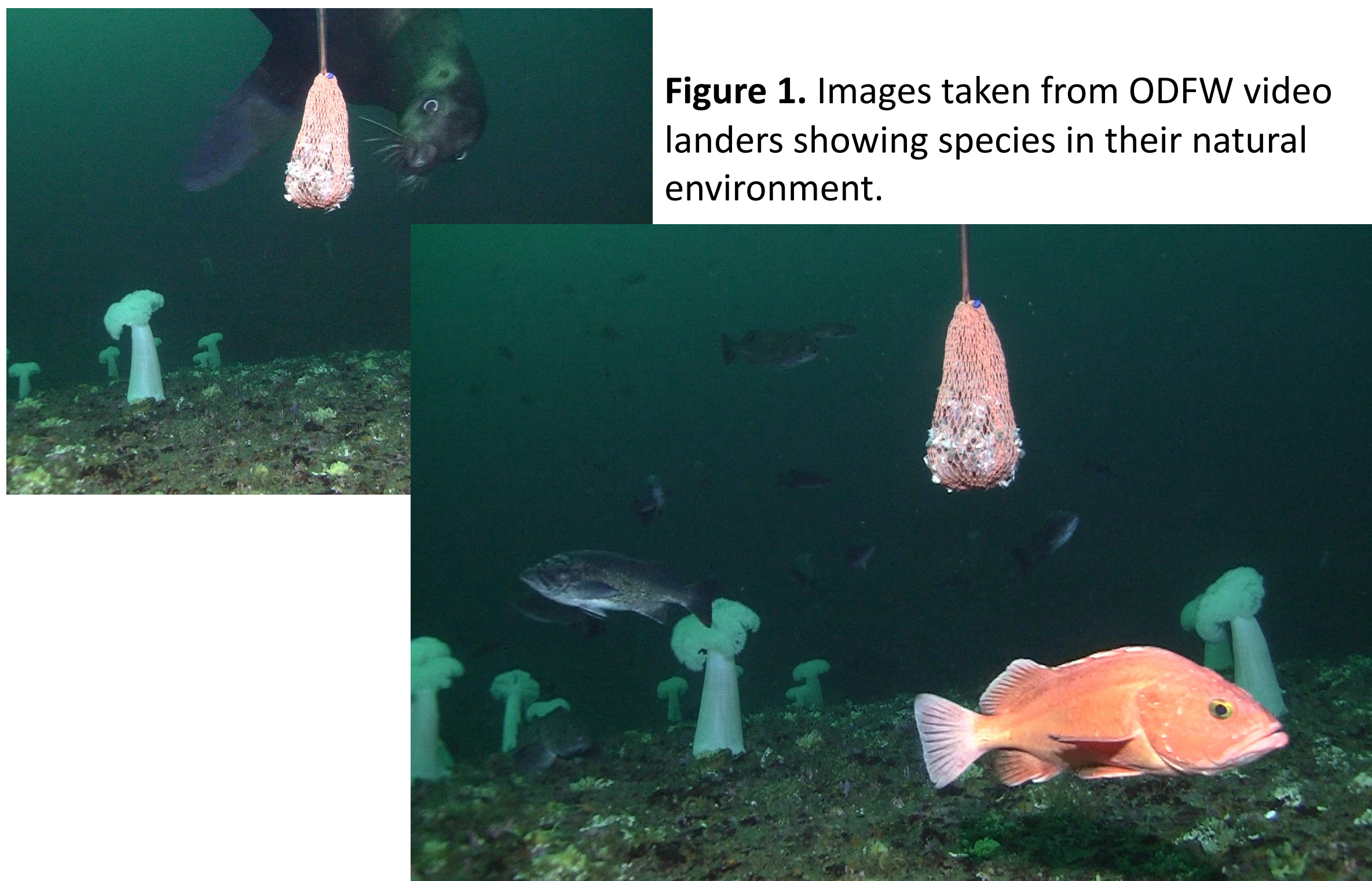- Dataset may be leveraged to help predict Yelloweye distribution and density.

Figure 1. Images taken from ODFW video landers showing species in their natural environment.

WHY IS STONEWALL BANK UNIQUE

- Yelloweye Rockfish Conservation Area
- High density of lander deployments
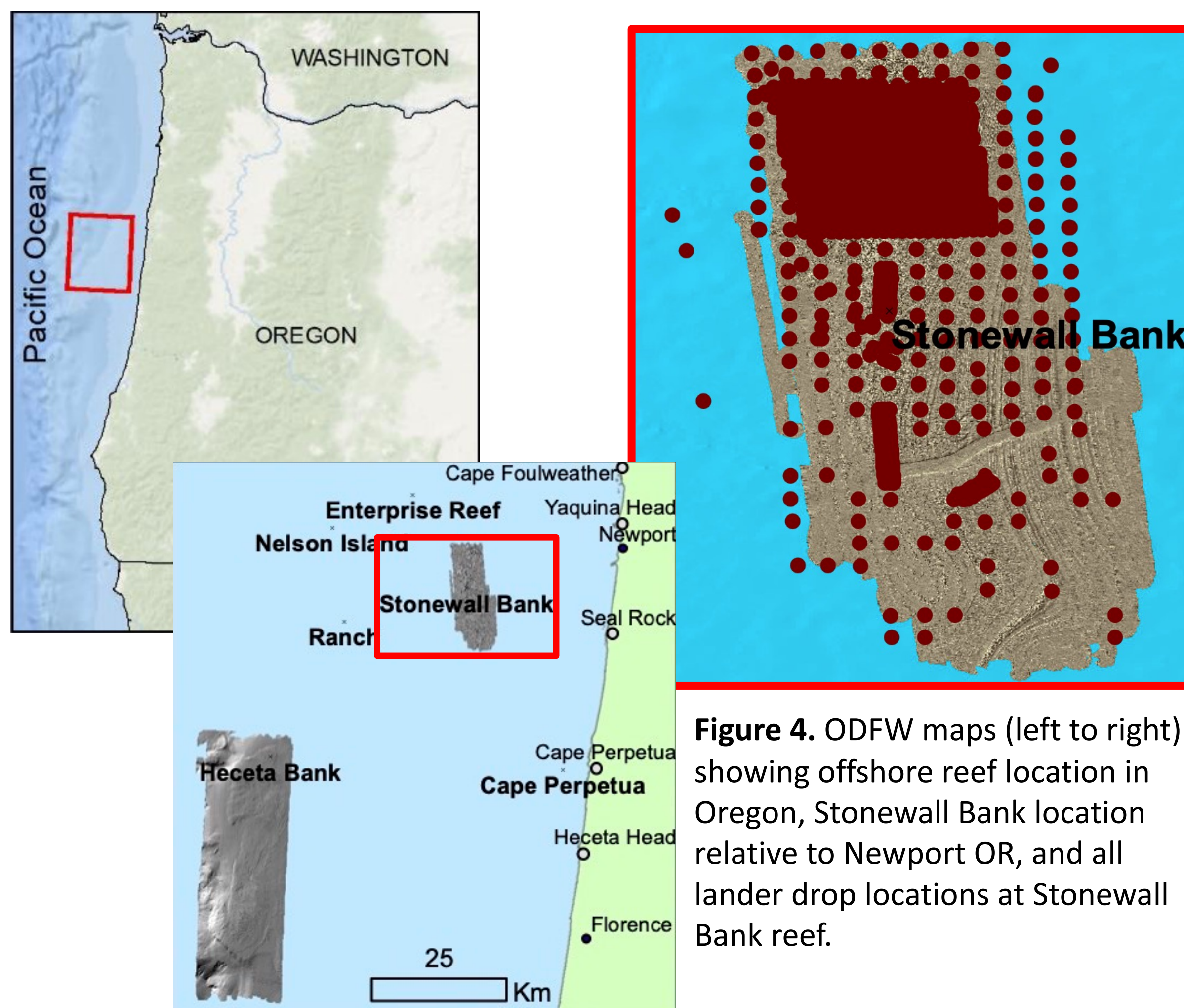- High resolution multibeam sonar bathymetry

Figure 4. ODFW maps (left to right) showing offshore reef location in Oregon, Stonewall Bank location relative to Newport OR, and all lander drop locations at Stonewall Bank reef.
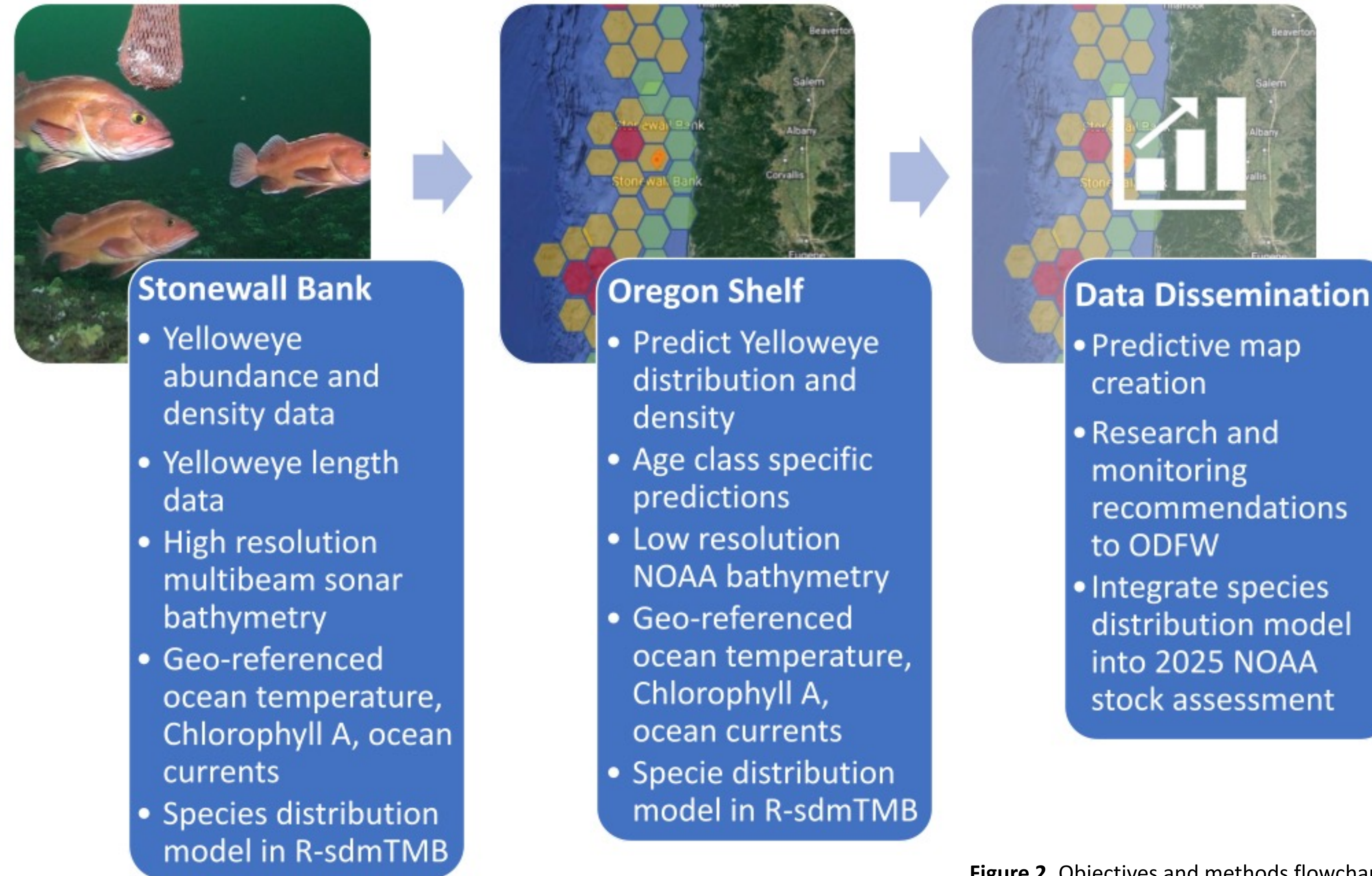
THE PLAN

Stonewall Bank
- Yelloweye abundance and density data
- Yelloweye length data
- High resolution multibeam sonar bathymetry
- Geo-referenced ocean temperature, Chlorophyll A, ocean currents
- Species distribution model in R-sdmTMB

Oregon Shelf
- Predict Yelloweye distribution and density
- Age class specific predictions
- Low resolution NOAA bathymetry
- Geo-referenced ocean temperature, Chlorophyll A, ocean currents
- Specie distribution model in R-sdmTMB

Data Dissemination
- Predictive map creation
- Research and monitoring recommendations to ODFW
- Integrate species distribution model into 2025 NOAA stock assessment

Figure 2. Objectives and methods flowchart.

SPECIES DISTRIBUTION MODELS: How they are useful

YE SDM

Stock Assessment

Scientific Survey / Catch Data

Management

Catch Target

YE SDM

Bycatch minimization

Figure 5. Flowchart showing how Yelloweye Rockfish (YE) species distribution models (SDM) can aid in the monitoring-assessment-management cycle at multiple stages, advancing efforts towards better spatiotemporal ecosystem management.

Figure 6. Matthew Blume (ODFW) holding a Yelloweye Rockfish caught on 2021 hook and line survey.

VIDEO LANDER DESIGN

- 1,958 offshore video lander deployments along the coast of Oregon since 2009.
- Breakaway "crab pot" base to minimize gear loss.
- Two high-definition stereo-video cameras and LED lights for high quality footage.
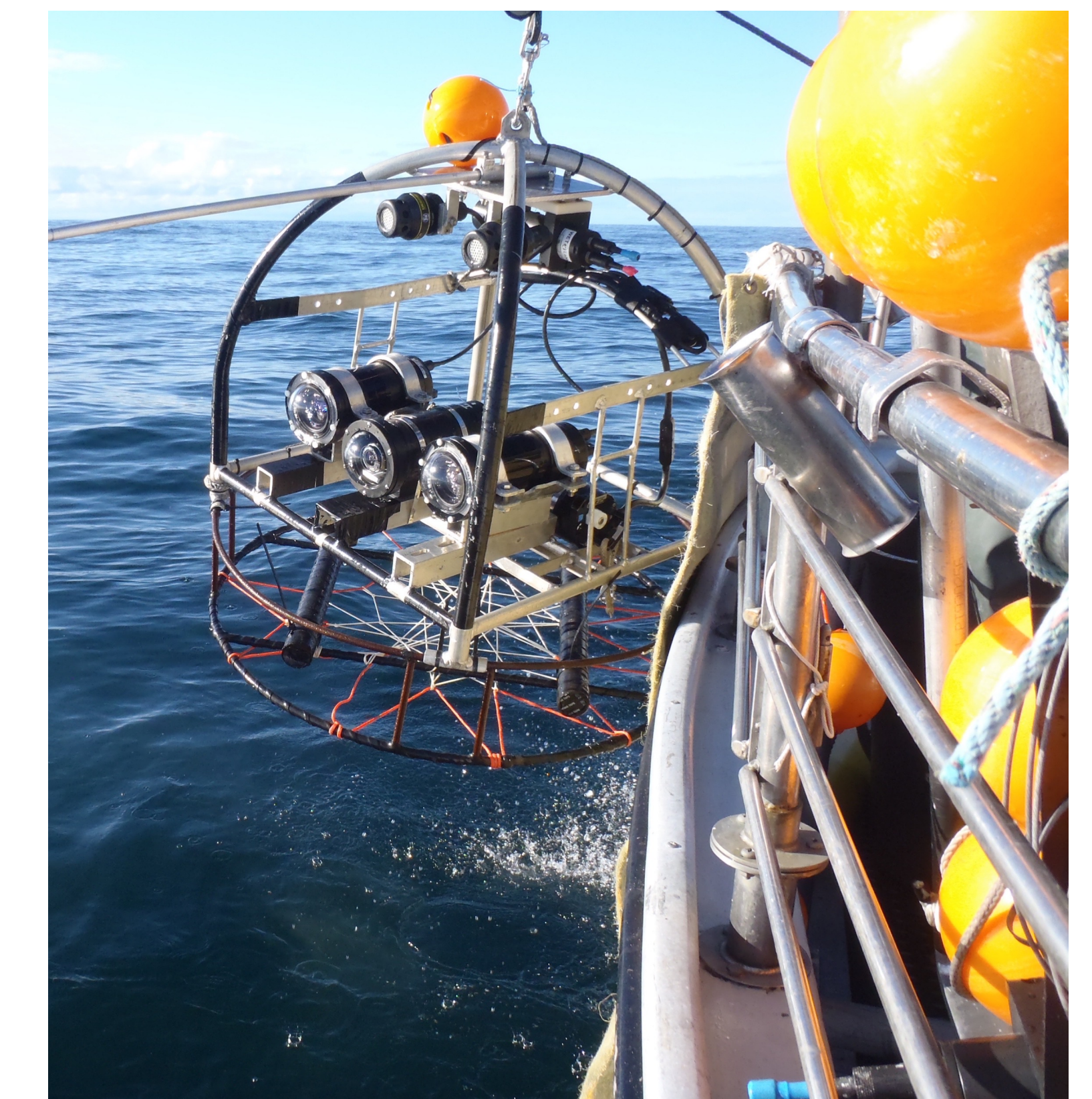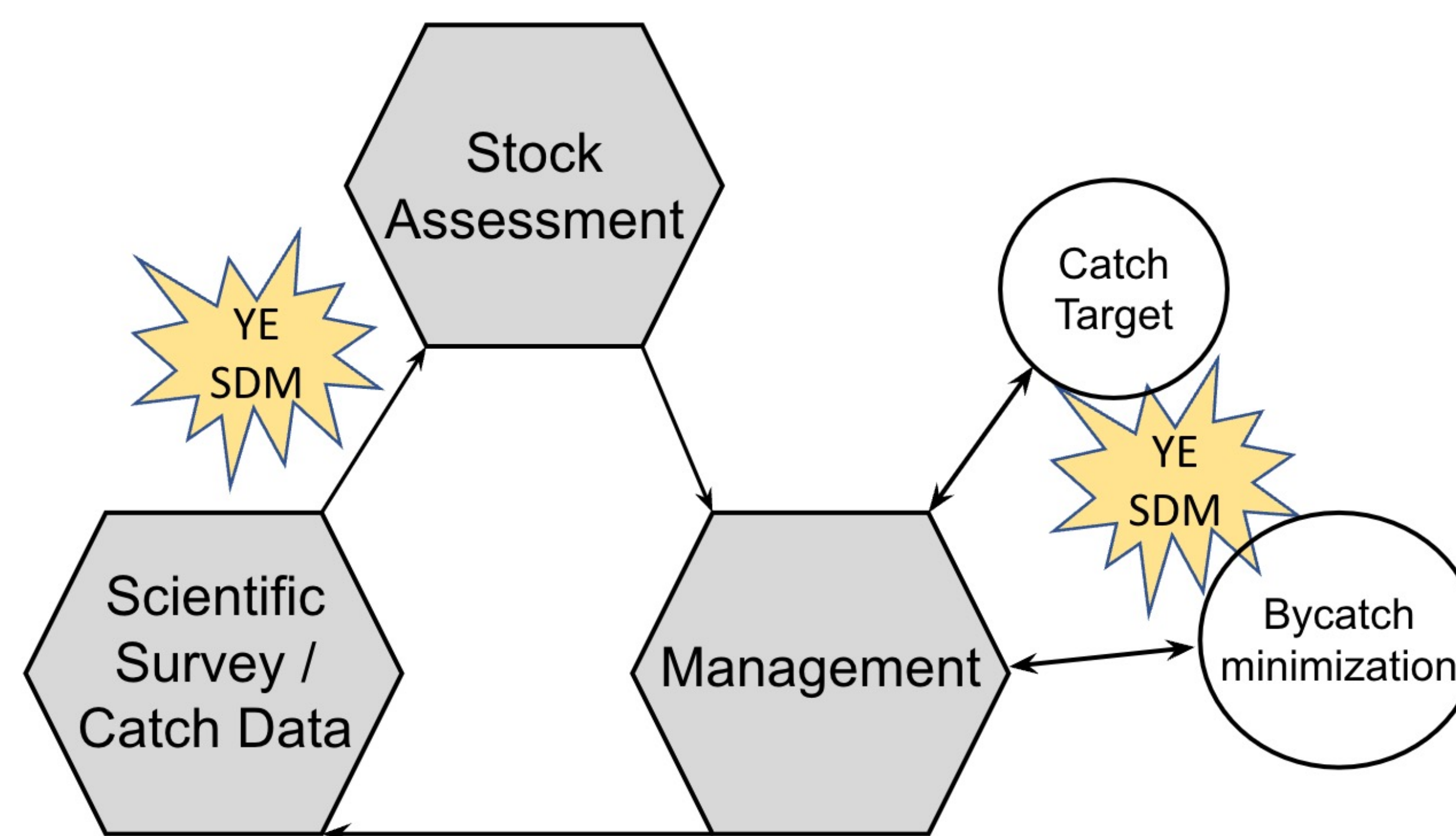- Lightweight design and small size make transportation and deployment fast and efficient.

Figure 3. ODFW Video lander being deployed from charter vessel's winch block. Each deployment takes ~15 minutes.

ANTICIPATED RESULTS

- Produce maps that show habitat "hot spots" for yelloweye.
- Maps will be shared with both managers and stakeholders
- Derived abundance indices may improve accuracy of NOAA 2025 stock assessment.
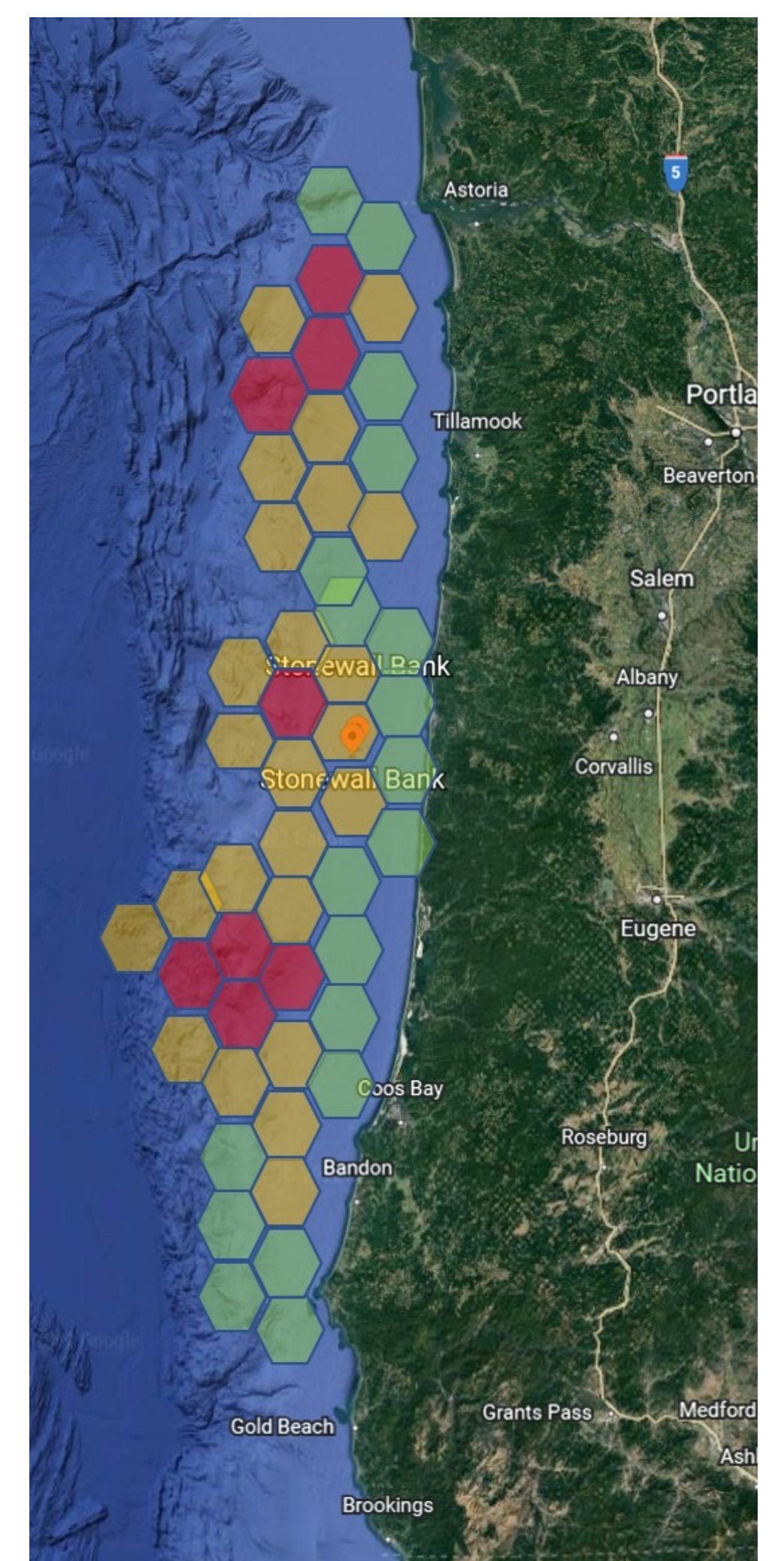
HAVE FEEDBACK?

We'd love to hear from you!

Scan Here

Figure 7. Sample map showing Yelloweye distribution and density that may be distributed to stakeholders. Not to scale.