# Analysis of Habitat Features and Abundance of Young-of-the-year Fishes Off of the Central Oregon Coast

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Introduction

- The Oregon coast is a nursery ground for ecologically and commercially important fishes, including several flatfishes
- To make sound fisheries management decisions, we need to understand:
  - Fish communities and their habitats
  - Environmental conditions
- Collaboration to sample young-of-the-year fishes off of the central Oregon coast
  - Northwest Fisheries Science Center
  - Oregon State University
  - Pacific States Marine Fisheries Commission
- The majority of these samples, collected over multiple seasons and years, are from the historically important Newport Hydrographic (NH) line.
- It is important to understand how representative this sampling line is of the central Oregon coast.
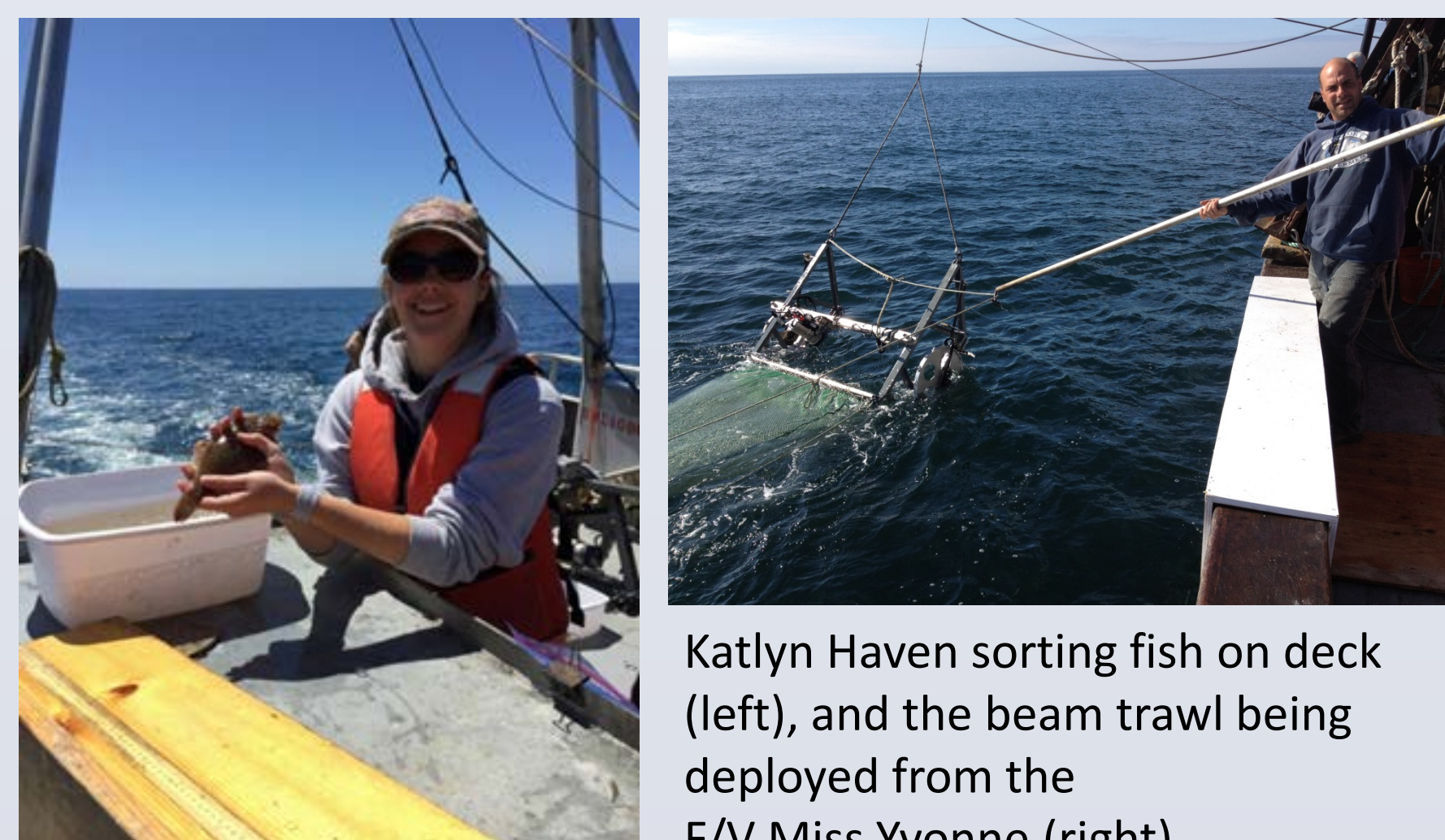
Katlyn Haven sorting fish on deck (left), and the beam trawl being deployed from the F/V Miss Yvonne (right).

Objective
Is the Newport Hydrographic line representative of adjacent transects along the Central Oregon coast?
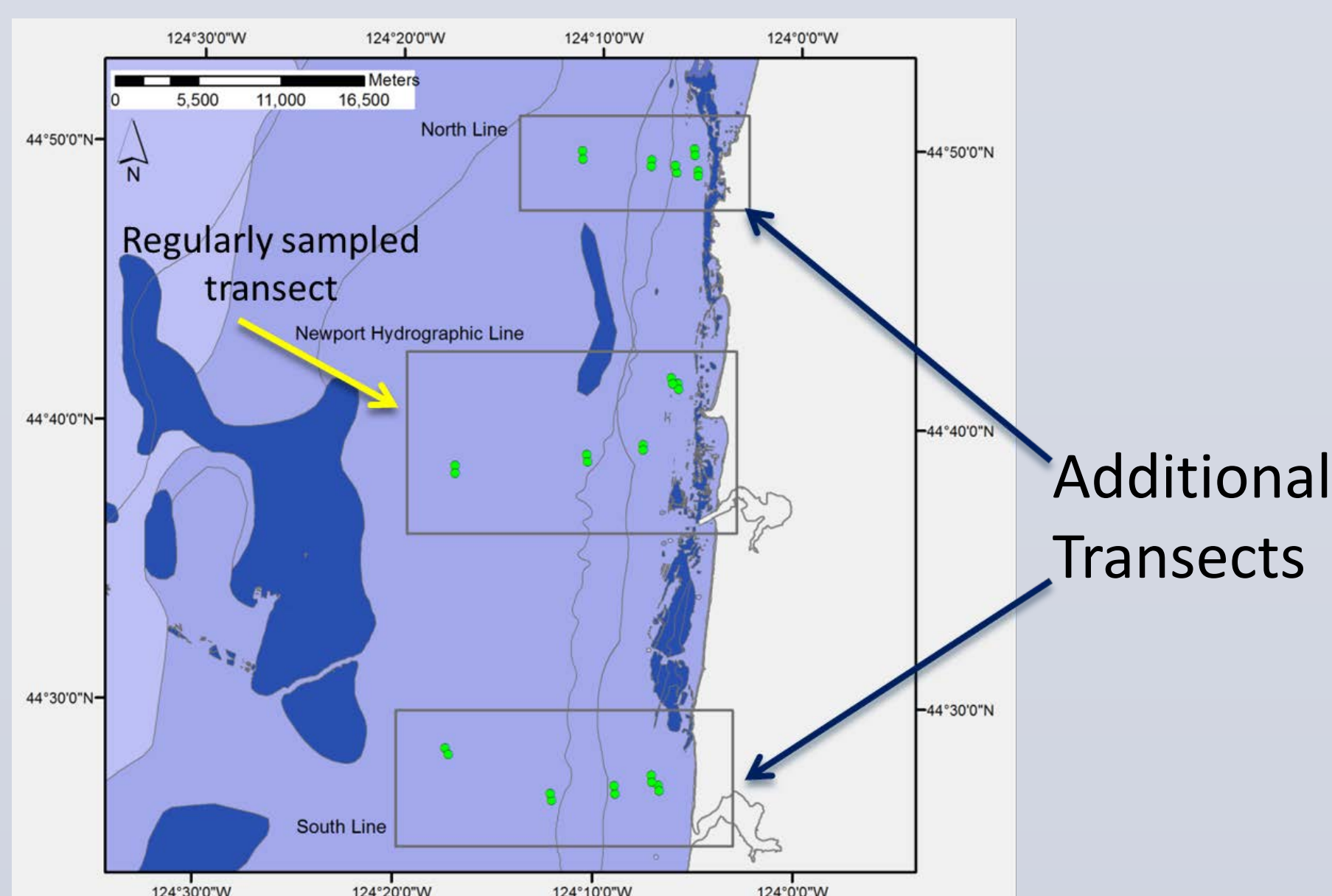

Figure 1. Locations of the three lines of stations sampled in September 2012, including the NH line, a line south of the NH line (S-1), and one north of the NH line (N-1).

Materials and Methods

Sampling procedure
- Six stations based on depth (~30, 40, 50, 60, and 80 m) per sampling line
- Three sampling lines: North (N), Newport Hydrographic (NH), and South (S) (Figure 1)
- Sampled between September 18 and 21, 2012
- Conductivity, Temperature, Oxygen and Depth profile (CTD; Seabird SBE 19+) taken before tow
- Two meter wide beam trawl equipped with 2.5 x 3mm mesh liner, high definition video camera, paired odometer wheel system , and tickler chain (Figure 2)
- Catch sorted at sea
  - Fish >150 mm standard length (SL) identified, measured, and discarded
  - Fish ≤150 mm SL flash frozen at sea, stored at -80°C in lab, and later identified, weighed, and measured

Video and Habitat Analysis
- Habitat characterized from high-definition videos
  - Screenshots taken every 30 seconds of 10 minute tow for total of 20 screenshots/tow
  - Some increments between screenshots shortened when video was less than 10 minutes
- Seven microhabitat categories: Ripples, Depressions, Mounds, Burrows, Biogenic tracks, Shell hash, and Detritus
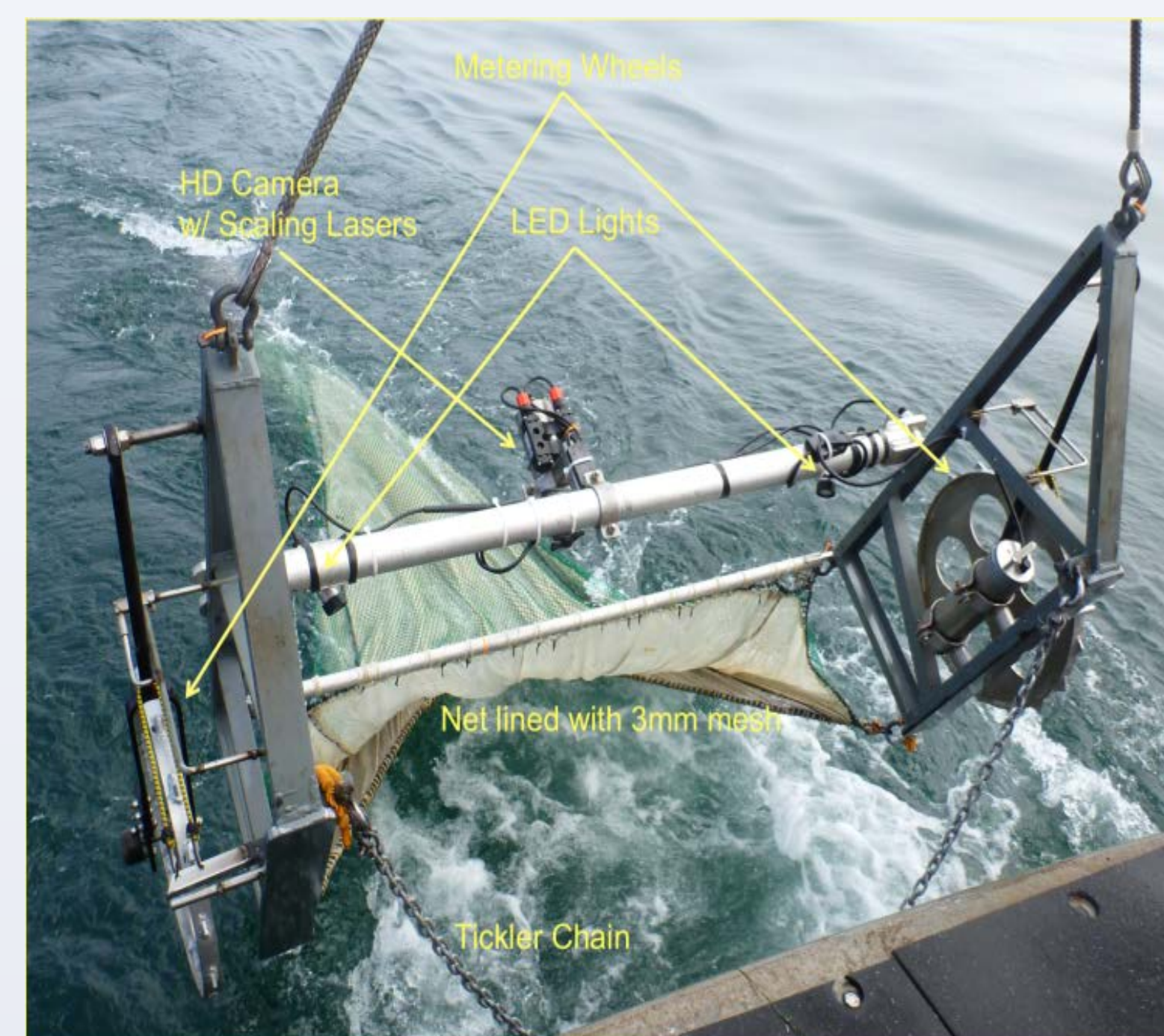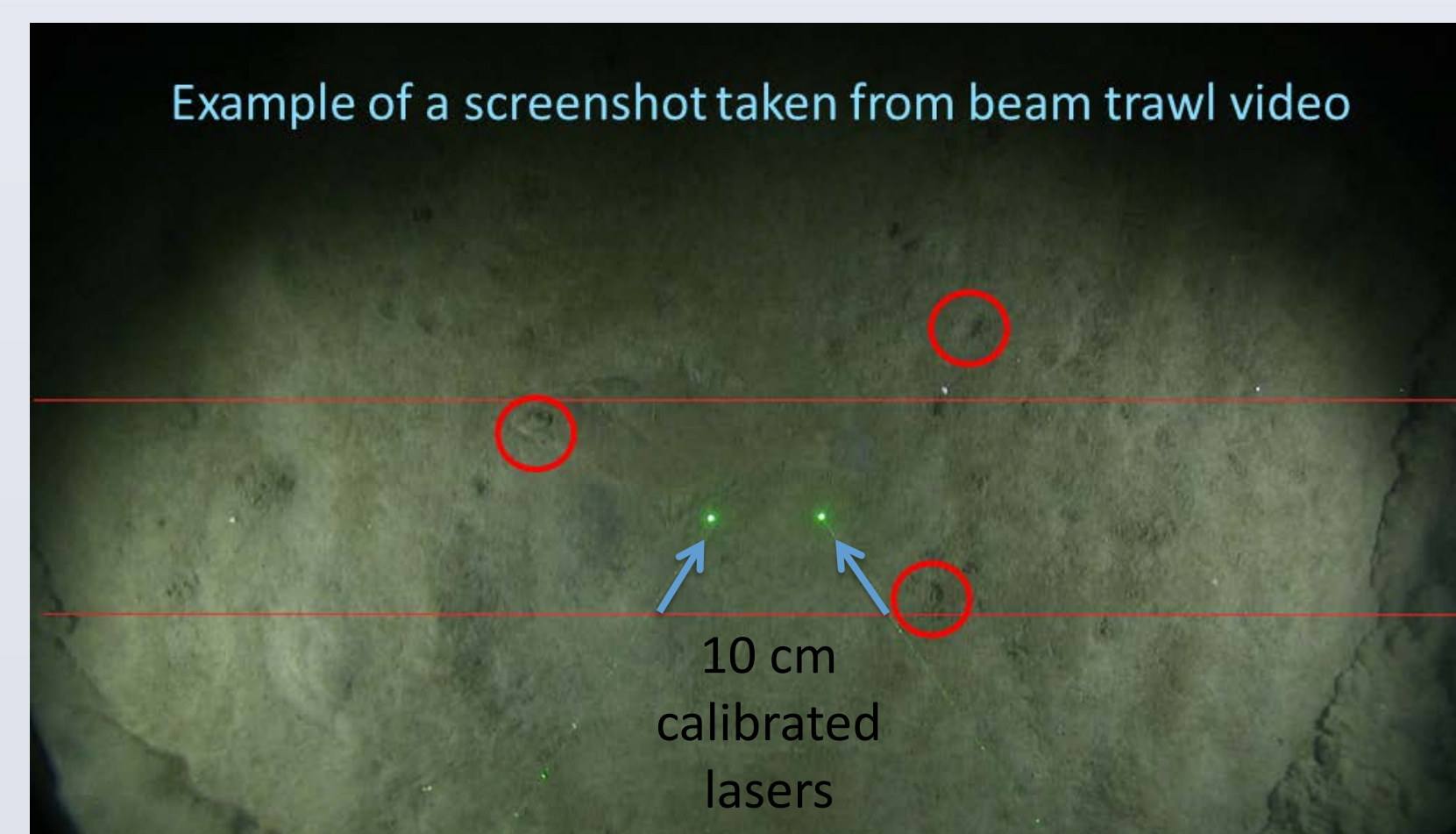- CTD data used to further evaluate habitat and environment

**Figure 2.** Two meter wide beam trawl with highlighted essential components.

Results

Communities and Abundance
- The top five most abundant taxa made up 91% of the total combined catch (Pacific sanddab *Citharichthys sordidus* – 32%, English sole *Parophrys vetulus* – 21%, Pacific tomcod *Microgadus proximus* – 18%, speckled sanddab *Citharichthys stigmaeus* – 14%, slender sole *Lyopsetta exilis* – 6%).
- Multi-response Permutation Procedure (MRPP) analysis showed a significant difference (A-statistic = 0.1612, p-value = 0.011) between the community compositions based on depth.
  - No significant difference among the community compositions between transects.

Environment
- The ANOVA test showed a significant difference in temperature based on depth (F-value = 5.589, p-value = 0.0126).
  - Tukey Post Hoc test determined that temperatures at the 30 meter stations were different from the 50 (adjusted p-value = 0.0508), 60 (adjusted p-value = 0.033), and 80 meter stations (adjusted p-value = 0.0172).

- There was no significance in temperature based on line, and there was no significant difference in dissolved oxygen levels based on depth or line.
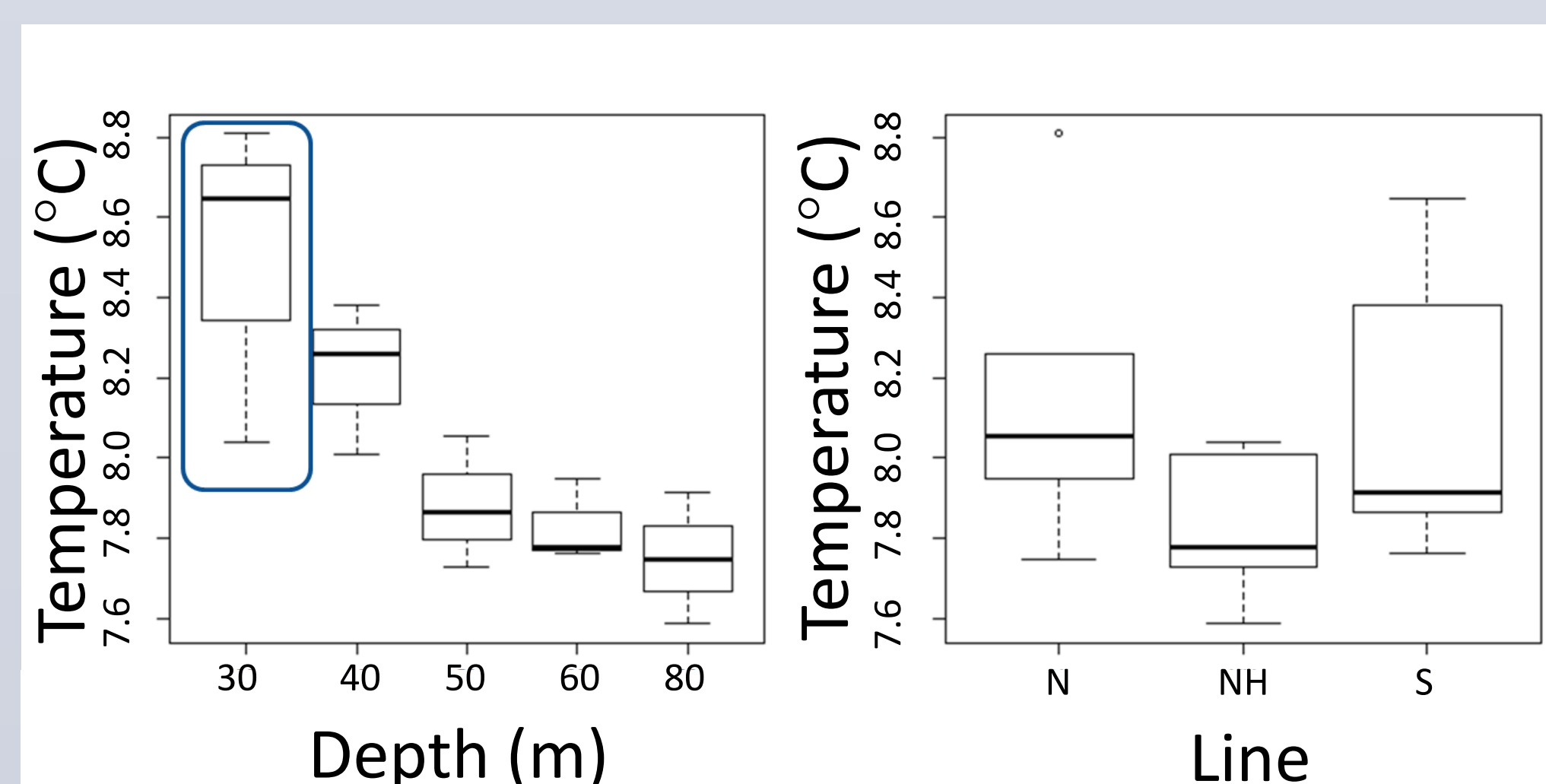
Results Continued

Habitat
- A Kruskal-Wallis test was performed on all seven classifications; all were significant, but no clear pattern could be seen.
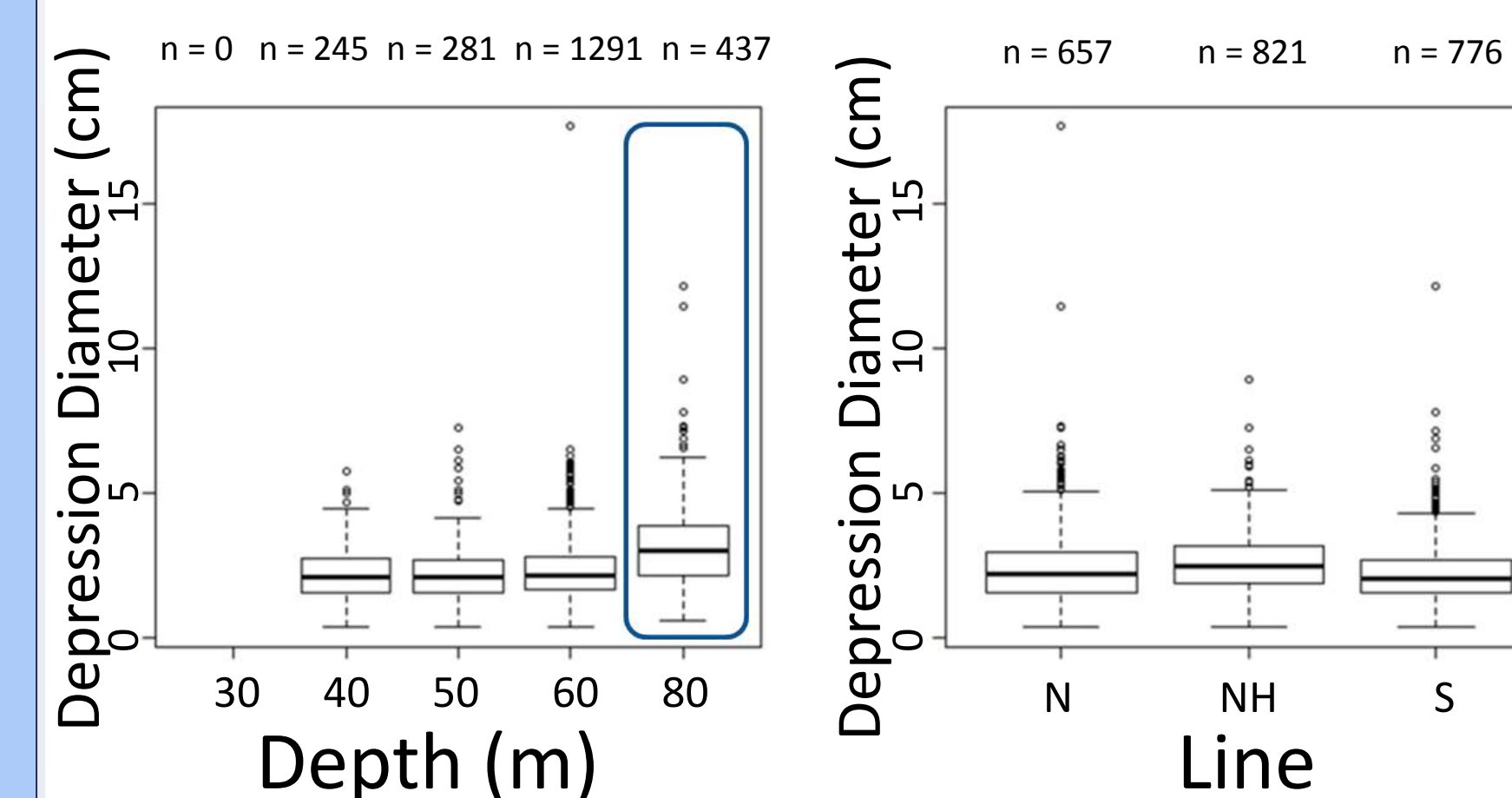
Kruskal-Wallis showed significance based on depth and line. Multiple Comparison test showed a difference in all lines, and that 80 m stations stood alone (p-value < 0.05)

Discussion

- **Significant difference** in fish assemblages and temperature by **depth**
  - Differences in fish assemblages could be due to certain species being associated with different depths, as well as habitat and environmental factors associated with those depths
  - Temperature differences due to cold water being denser than warm water
- **No significant difference** in fish assemblages, dissolved oxygen, or temperature based on **line**
  - **Suggests that studying the NH line is adequate for acquiring a representative sample of the central Oregon coast fish assemblages**
- No clear overall pattern in habitat analysis
- Further analysis should be done to look at interannual and seasonal habitat variations along the NH line.

Further Research
Interannual and seasonal variations in soft-sediment habitat along the Newport Hydrographic line.

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