

Identifying co-occurrence between whales and fishing effort in Oregon to reduce entanglement risk

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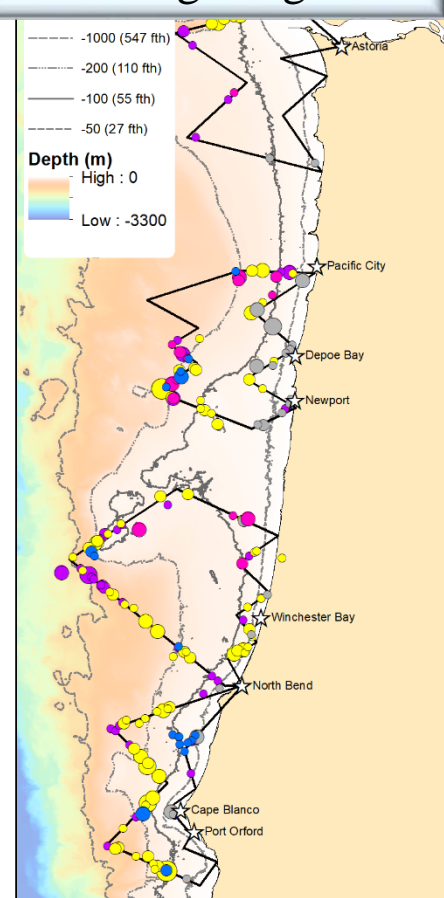
OREGON
Dungeness Crab
COMMISSION

Project steps and objectives

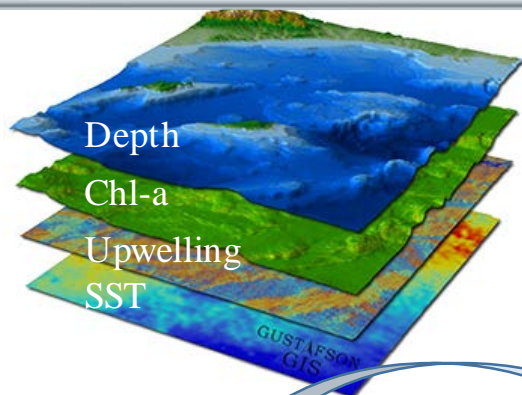
Helicopter Surveys



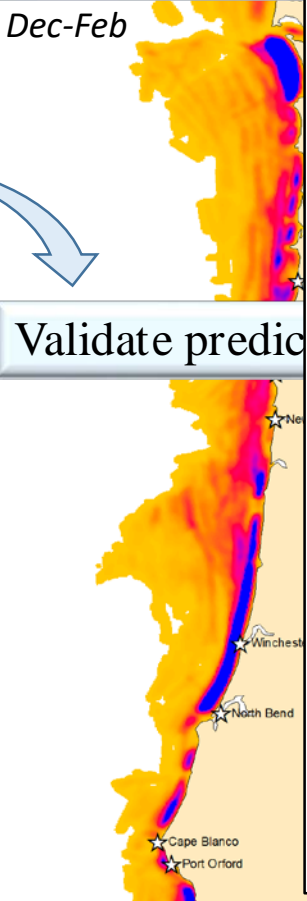
Whale sightings data



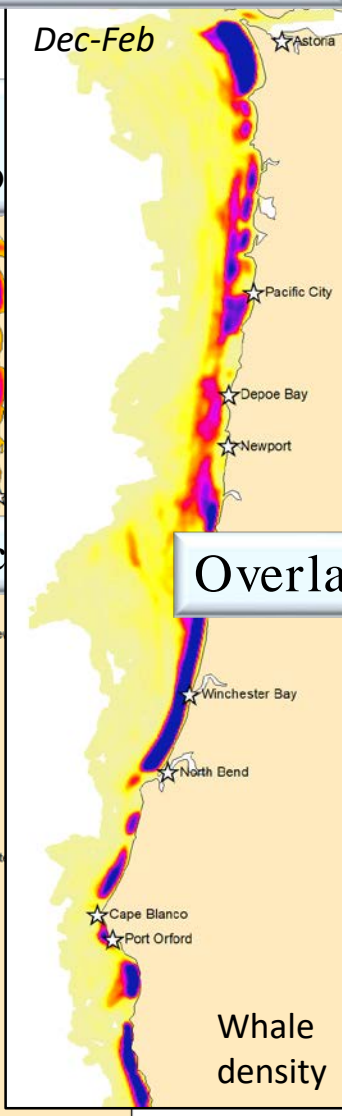
Relate to environmental data:
(a) density distribution models
(b) understand ecology



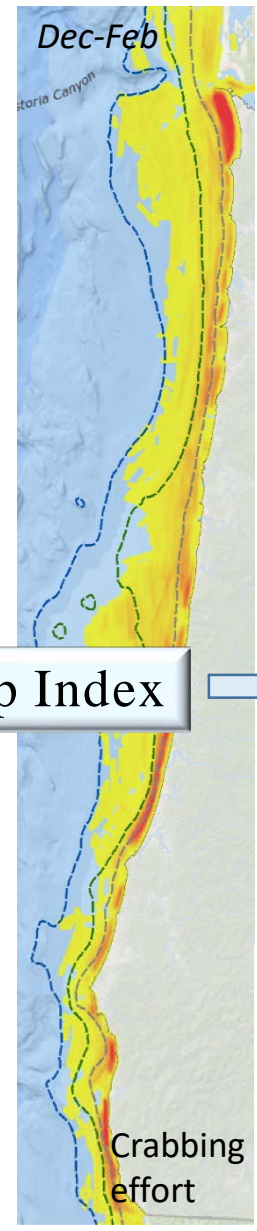
Seasonal whale density prediction



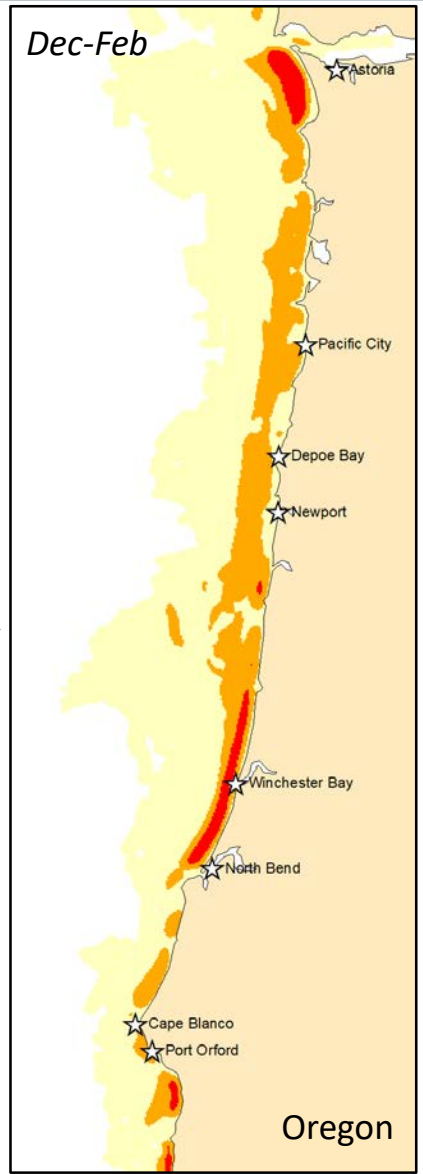
Uncertainty maps & Revise prediction maps



Seasonal fishing effort



Produce seasonal, spatial entanglement risk assessments



Encourage citizen scientist observations



Validate prediction

Overlap Index

Survey tracklines

Limitations

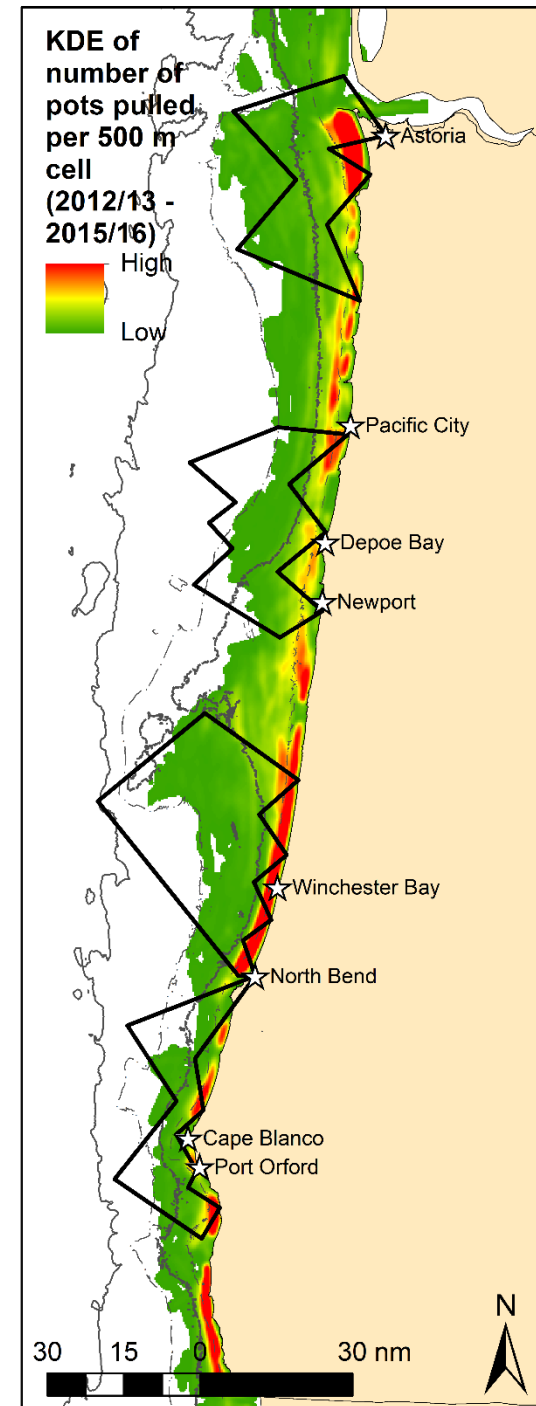
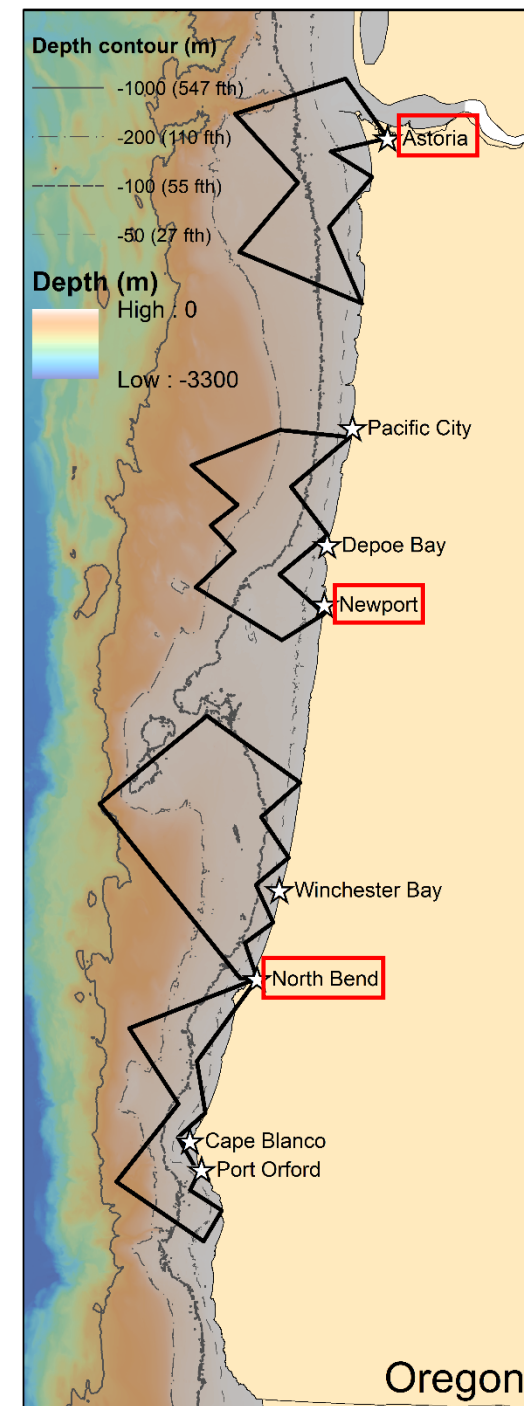
- < 150 nm length
- Return to starting port

Goal

- Mimic sawtooth transect lines
- Survey varied habitat along coast
- Survey areas of high Dungeness crab fishing effort
- Survey each of 4 tracklines once a month

Protocol

- 90 knots
- 500 feet
- One observer / data recorder
- SeaScribe to record survey and sightings data
- Distance sampling methods
- Generally in passing mode, but occasionally break



North Bend sector
"Dolphin"



Columbia River sector
"Jayhawk"



Data

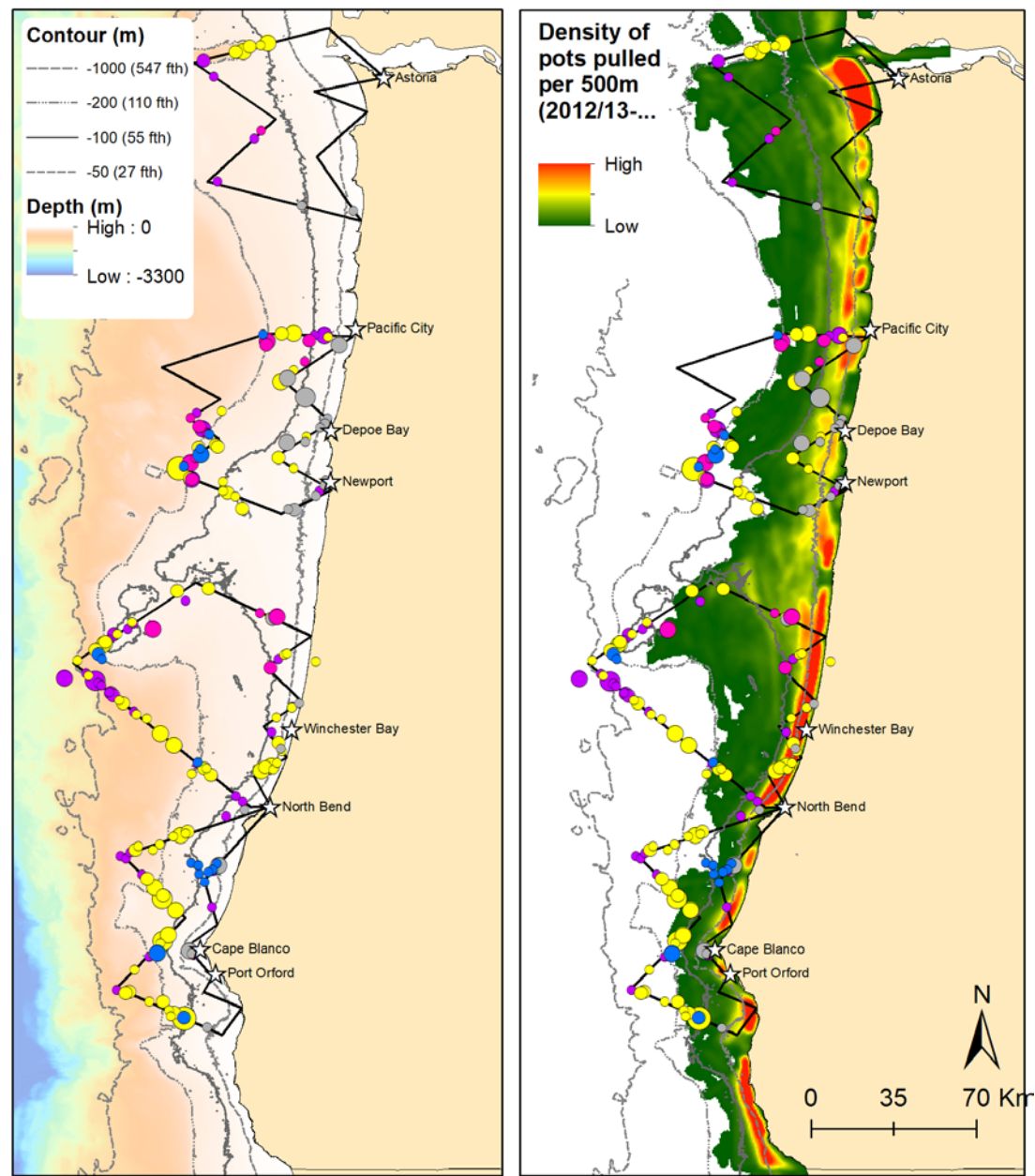
Survey dates: 51 surveys conducted to-date

		NB, South	NB, North	Newport	Astoria
2019	Febraury		22-Feb		
	March	29-Mar	15-Mar & 30 Mar	8-Mar & 20-Mar	7-Mar
	April	13-Apr	12-Apr	18-Apr	18-Apr
	May			28-May	23-May
	June	8-Jun	7-Jun	12-Jun	13-Jun
	July	13-Jul	12-Jul	2-Jul	1-Jul
	August	9-Aug	10-Aug	16-Aug	8-Aug
	September	14-Sep	13-Sep	11-Sep	
	October	11-Oct	12-Oct	14-Oct	30-Oct
	November	22-Nov	22-Nov	21-Nov	7-Nov
	December	30-Dec	13-Dec	24-Dec	5-Dec
2020	January	24-Jan		14-Jan	16-Jan
	Febraury	7-Feb	28-Feb	11-Feb	
	March	COVID-19	13-Mar	10-Mar	COVID-19
	April	COVID-19	COVID-19	COVID-19	COVID-19
	May	COVID-19	COVID-19	COVID-19	COVID-19
	June			17-Jun	COVID-19
	July		3-Jul	3-Jul	

Raw data

- Not standardized by effort
- Sighting conditions not accounted for

Data

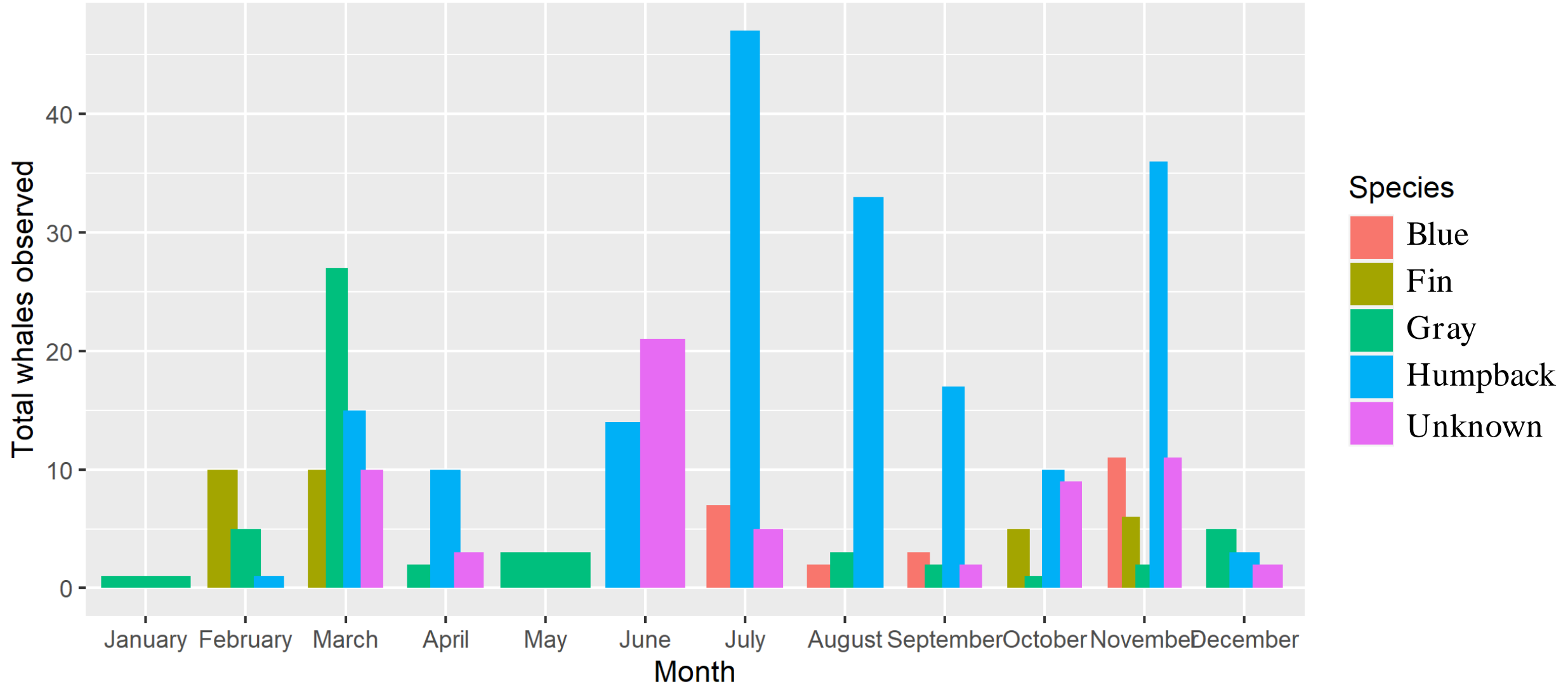


206 sightings recorded
572 individual cetaceans

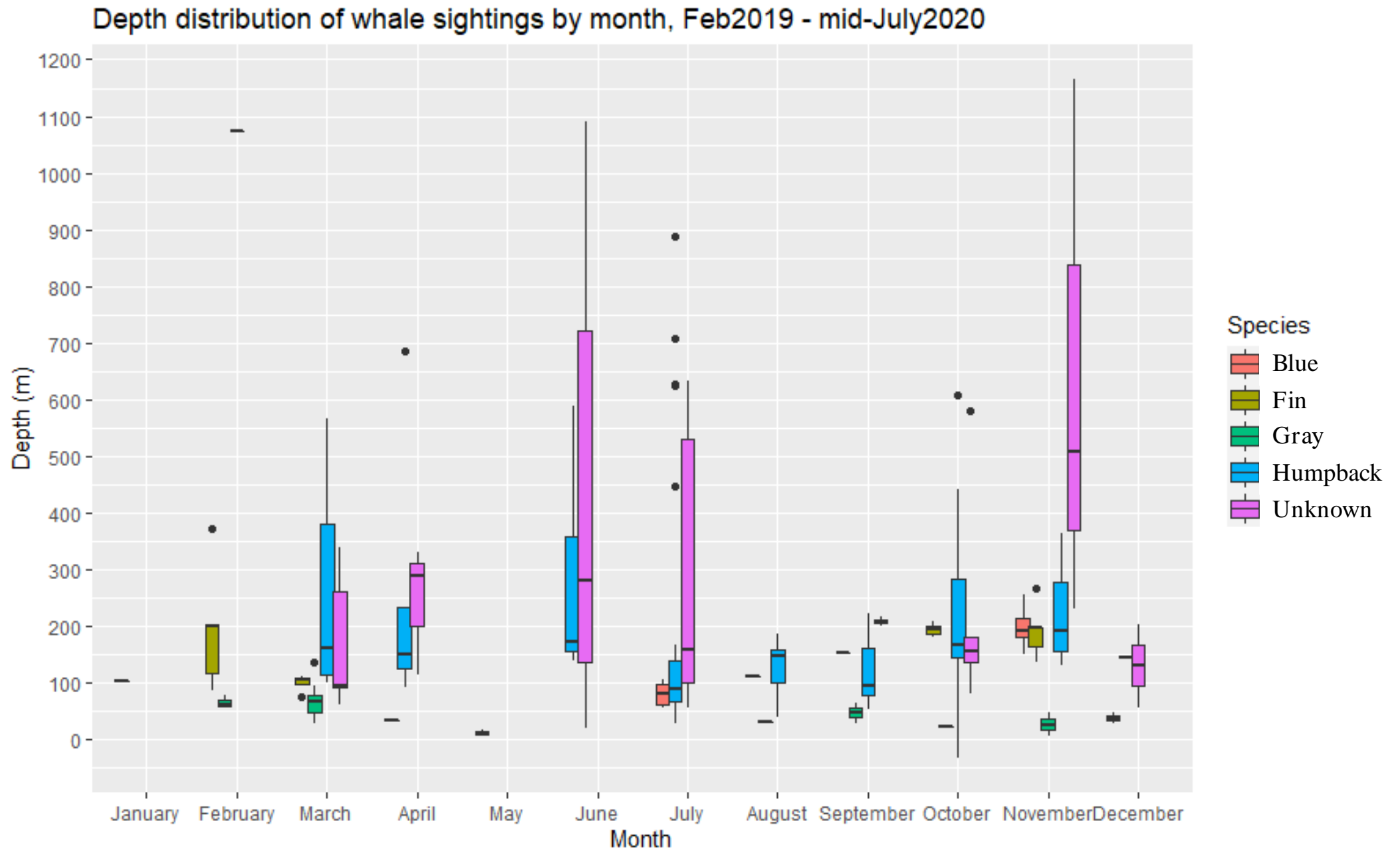


Data

Number of whales sighted by species and month, Feb2019 - mid-July2020



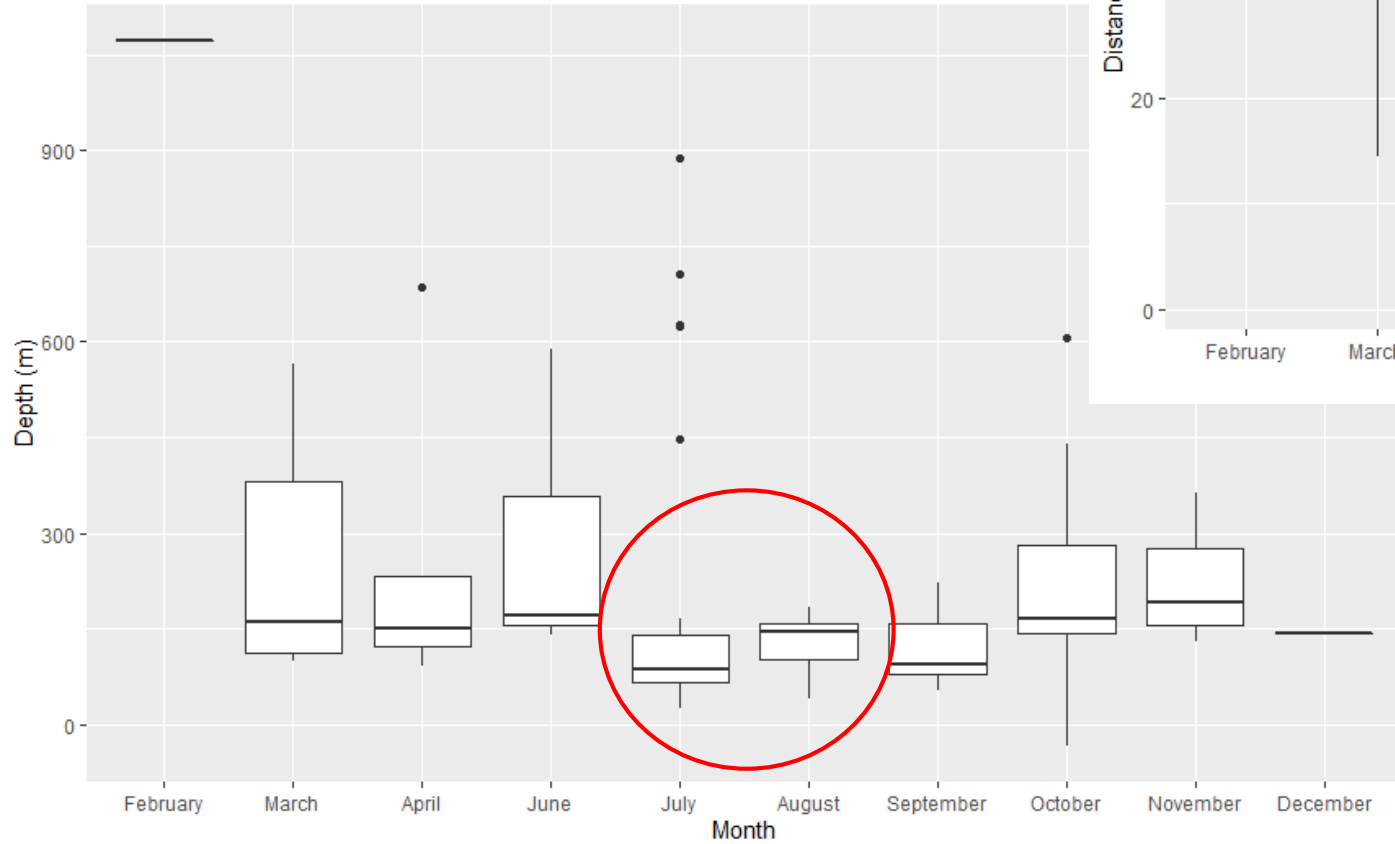
Data



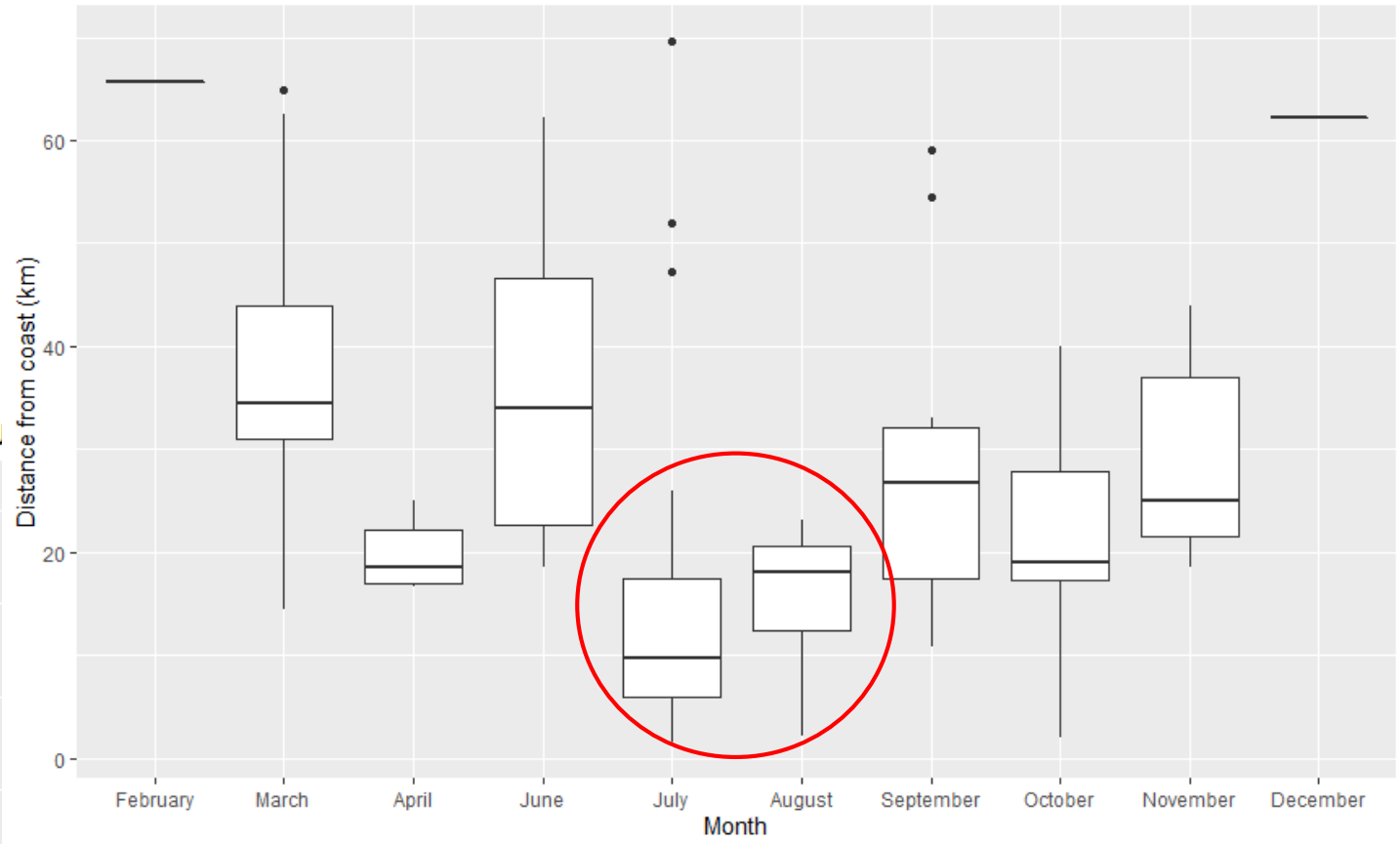
Data

Humpback whale sightings only

Depth distribution of Humpback whales by month sighted Feb 2019 thru mid-J

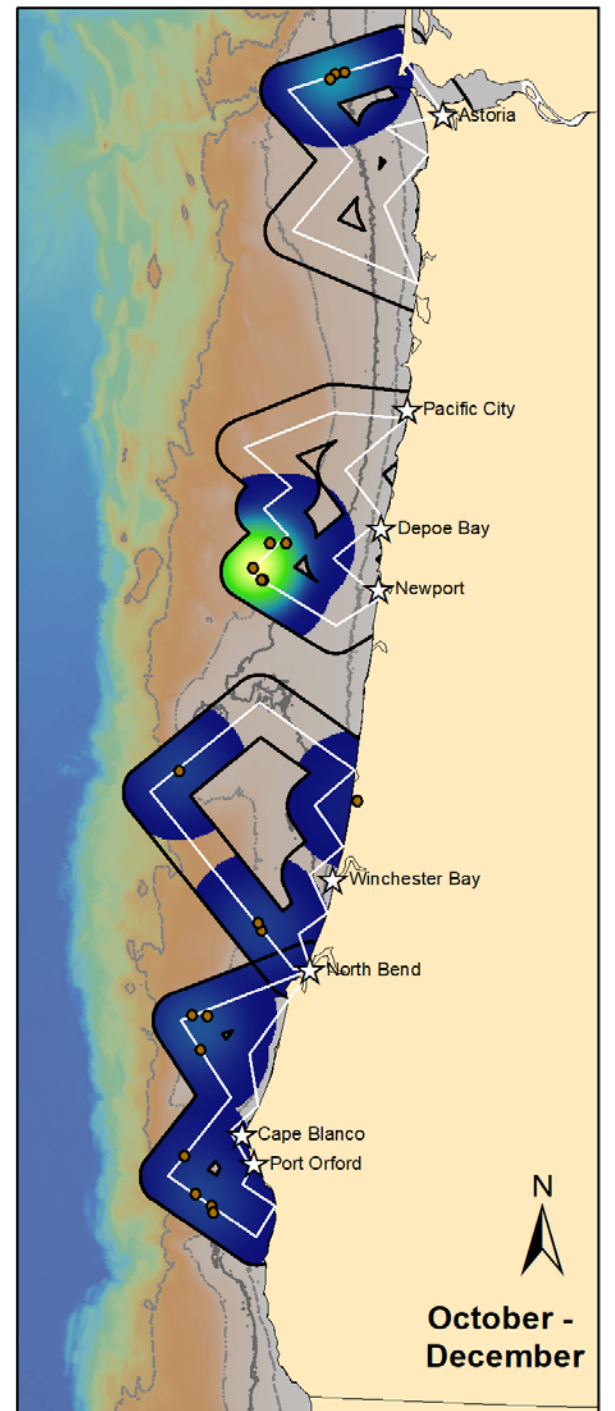
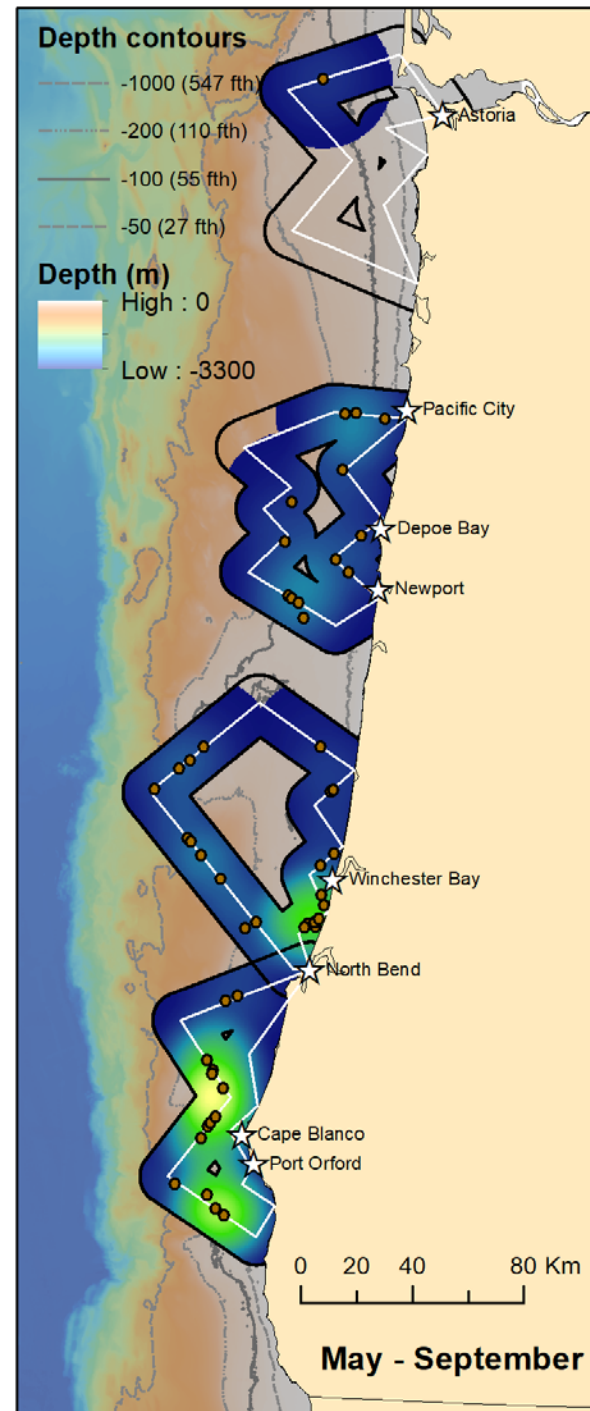
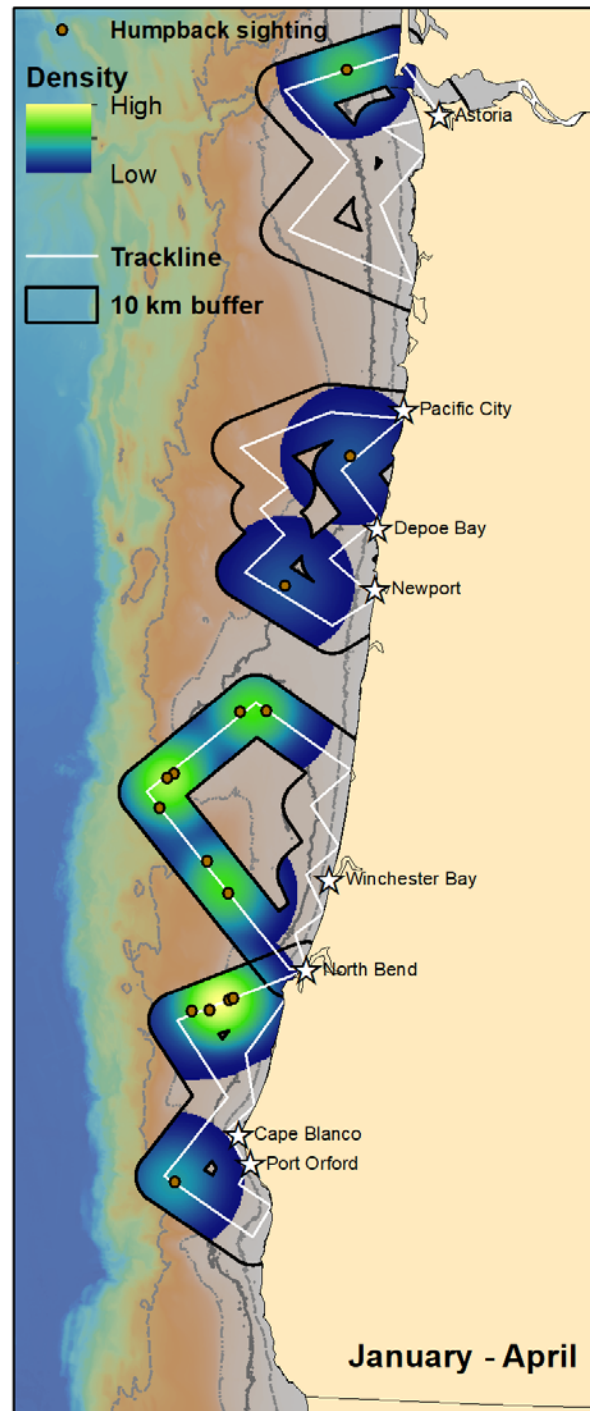


Distance from coast of Humpback whales by month sighted Feb 2019 thru mid-July 2020

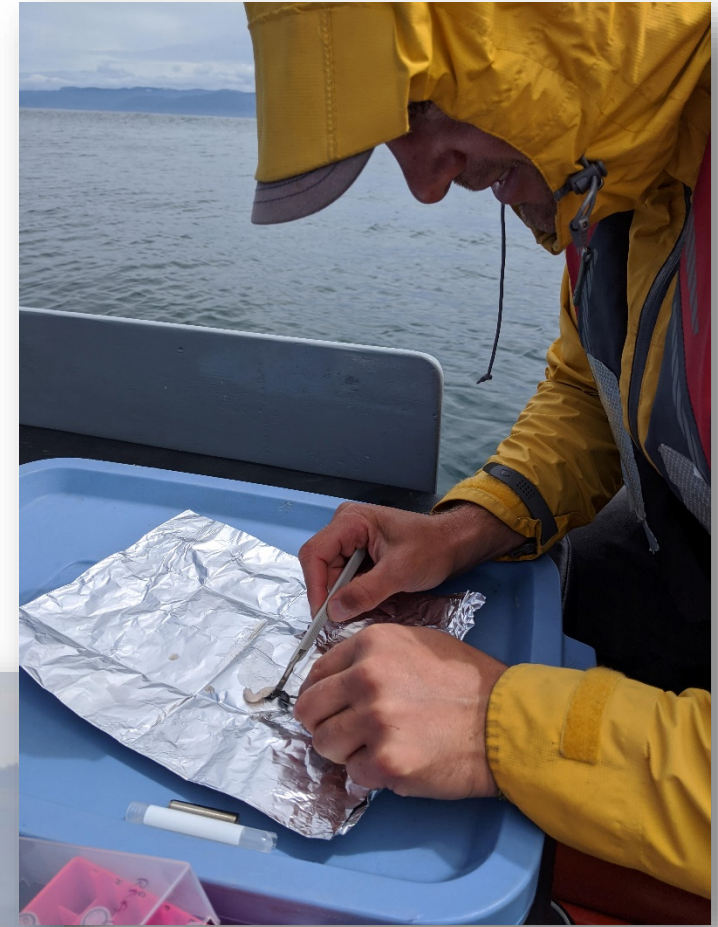


Data

Humpback whale sighting density (weighted by group size)



Vessel-based photo-id and biopsy effort



Data already informing management decisions
through close collaboration between ODFW and science team.

Strong engagement with, and support of, fishing community.

Educating and engaging the public in this collaborative project.

Next steps: Continue surveys, begin data analysis, produce models and predictive maps

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