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Northwest
Fisheries
Science Center
Seattle, WA

Profitability in a multispecies, multigear fishery

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July 10, 2014

Background

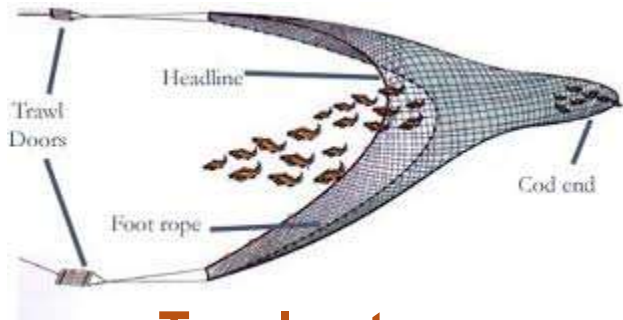
- 2011 – West Coast groundfish trawl fishery became a catch share program (IFQ)
- Quota allocated based on historical participation for 29 different quota stocks
- Gear switching provision
 - Use trawl quota to catch groundfish with fixed gear – longline and pots
 - Sablefish quota split N/S

Research Objectives

- Cost earnings data:
 - How has gear switching impacted how sablefish is harvested?
 - What is the role of lower value stocks?
- Simulation analysis:
 - How do changes in input and output prices affect net revenue?
 - Do quota prices reflect the net revenue observed?

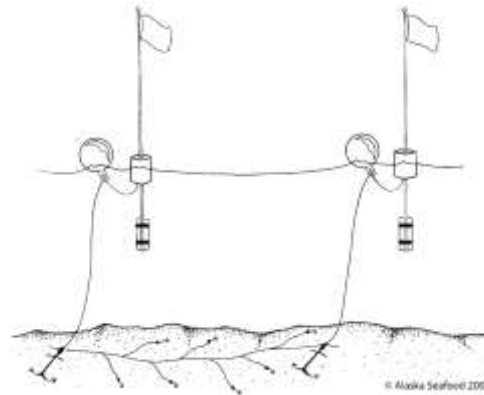


Trawl gear

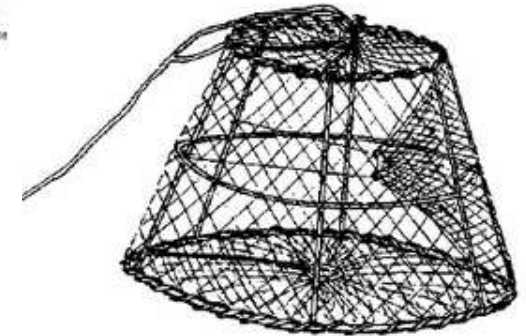


Trawl net

Fixed gear

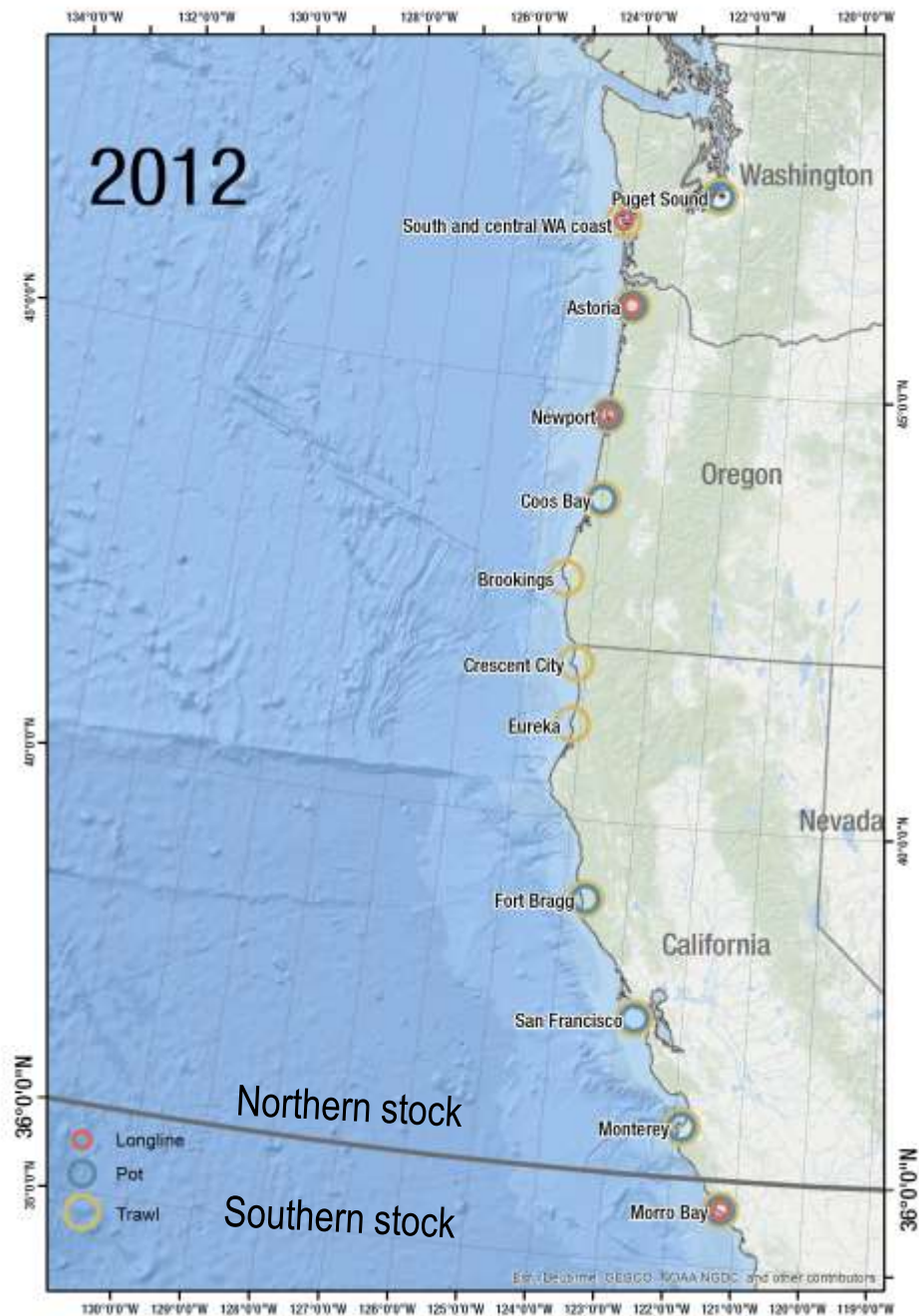
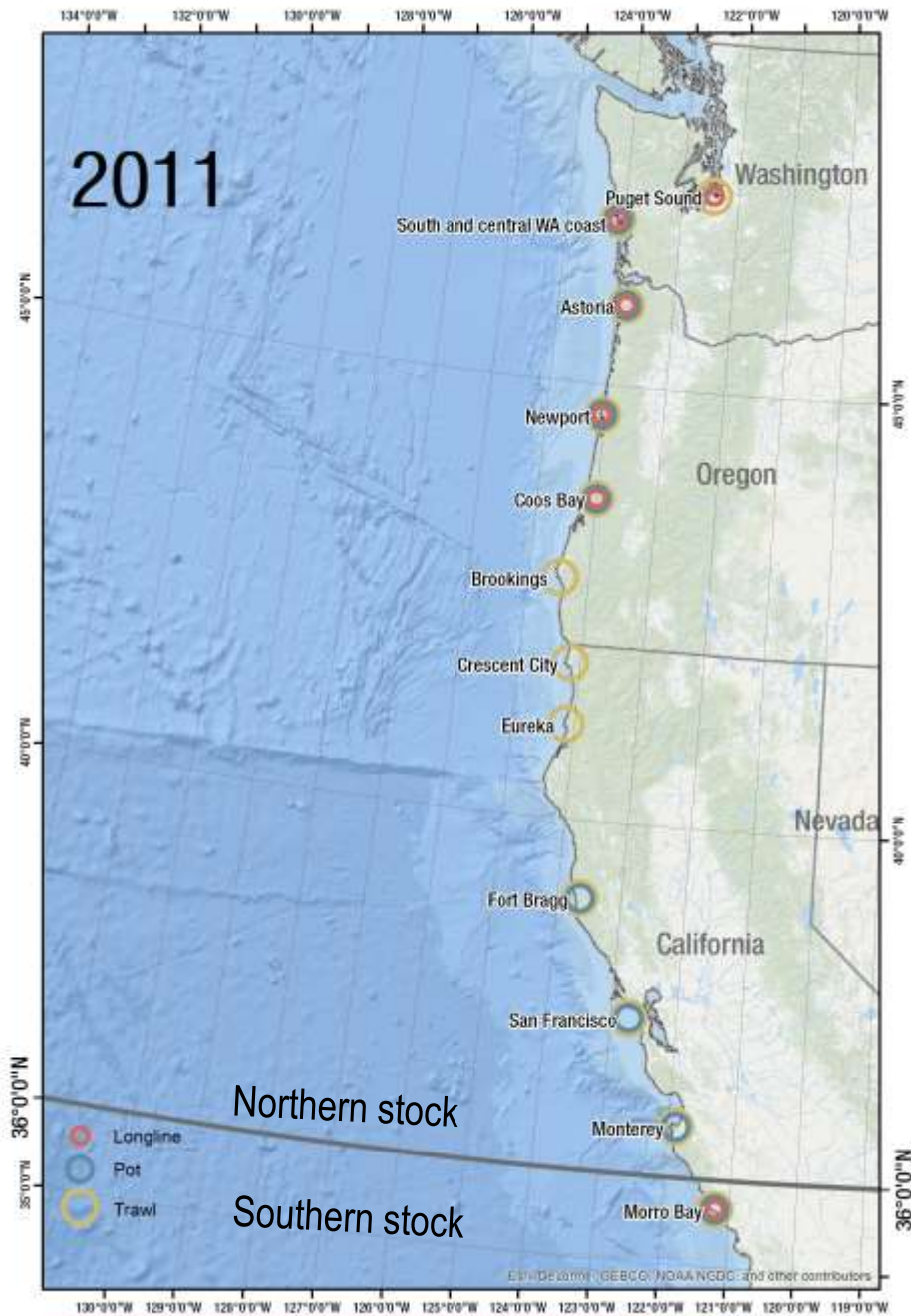


Longline

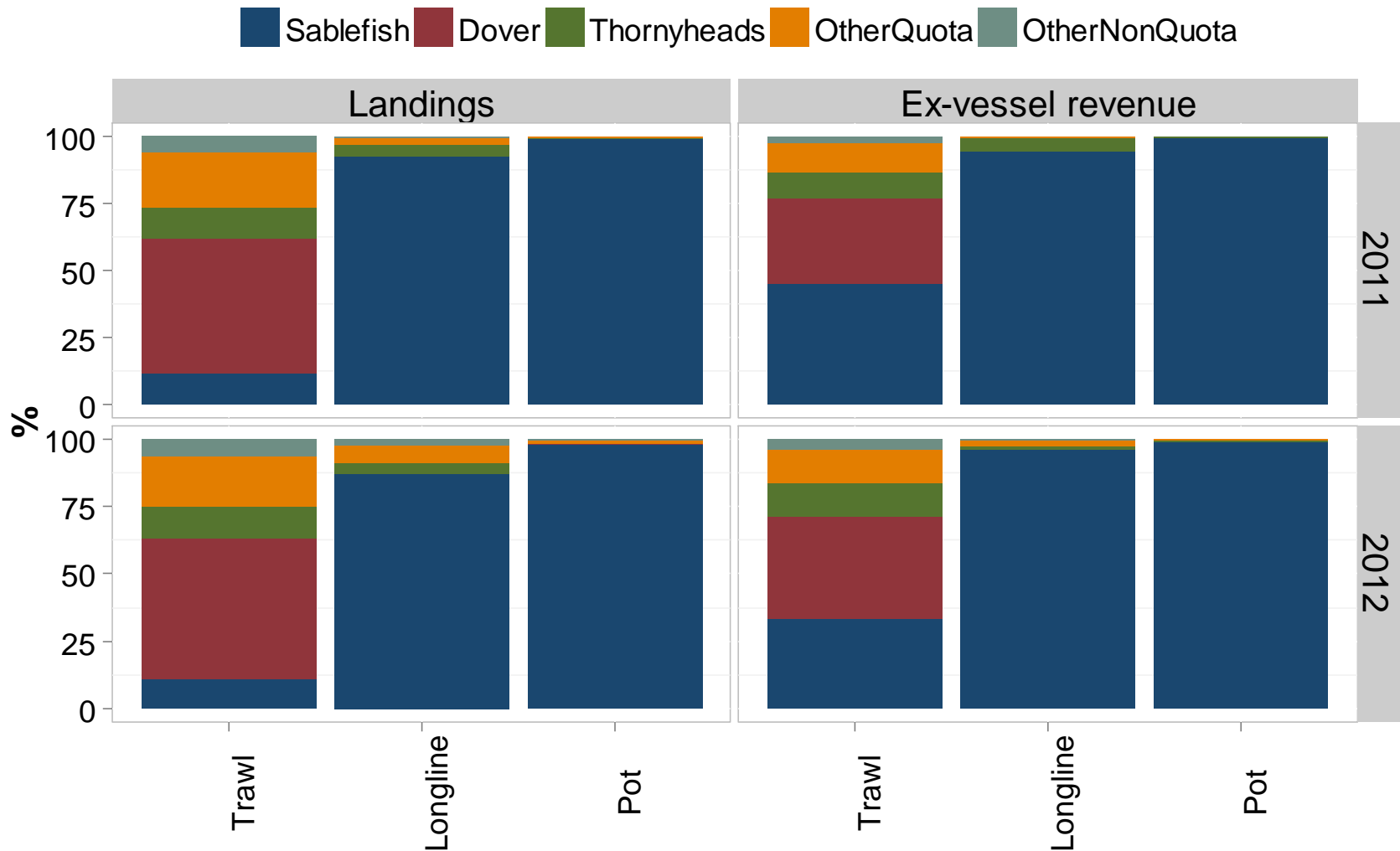


Fish pot

<http://www.localcatchmontereybay.com/>

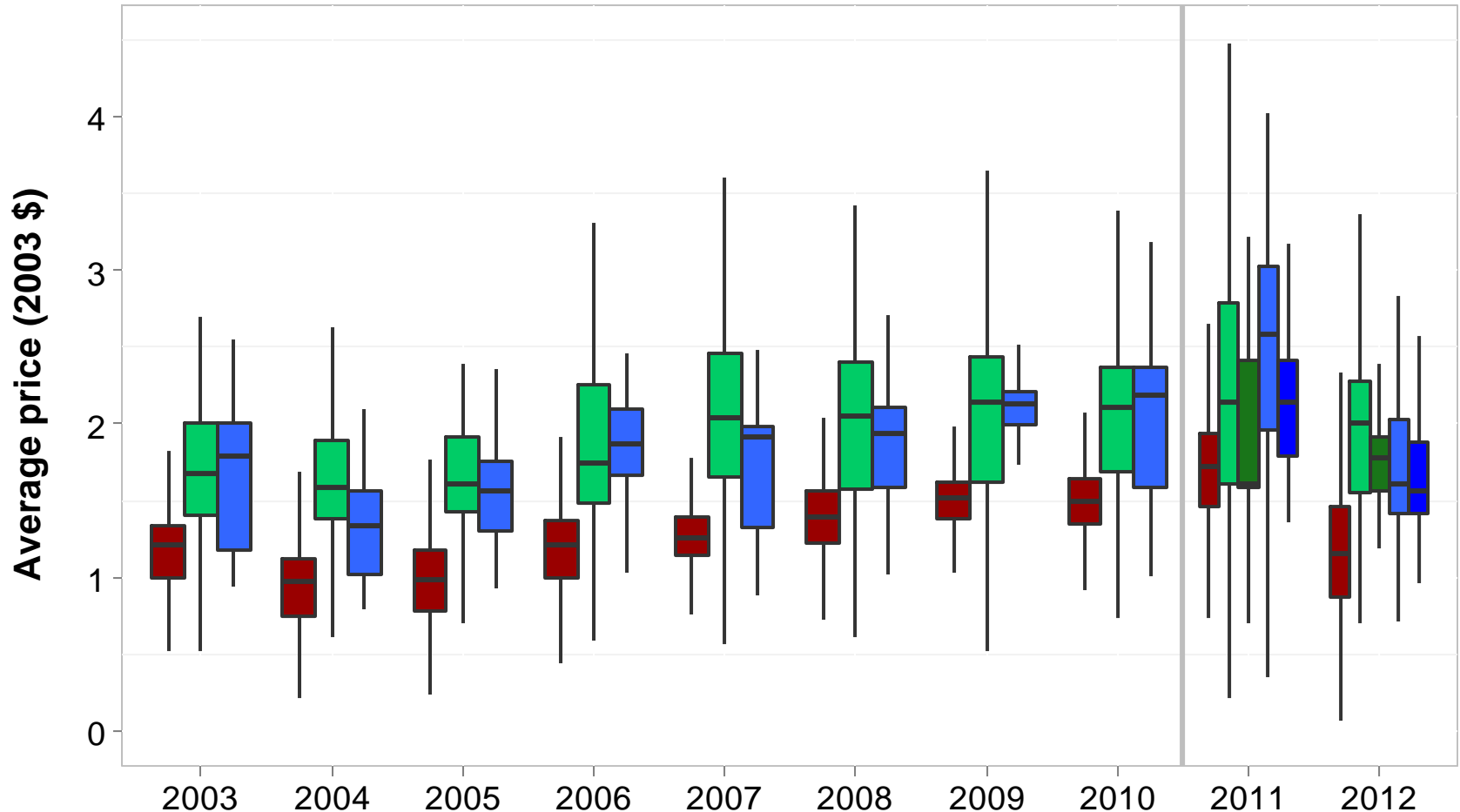


DTS sector of the IFQ fishery



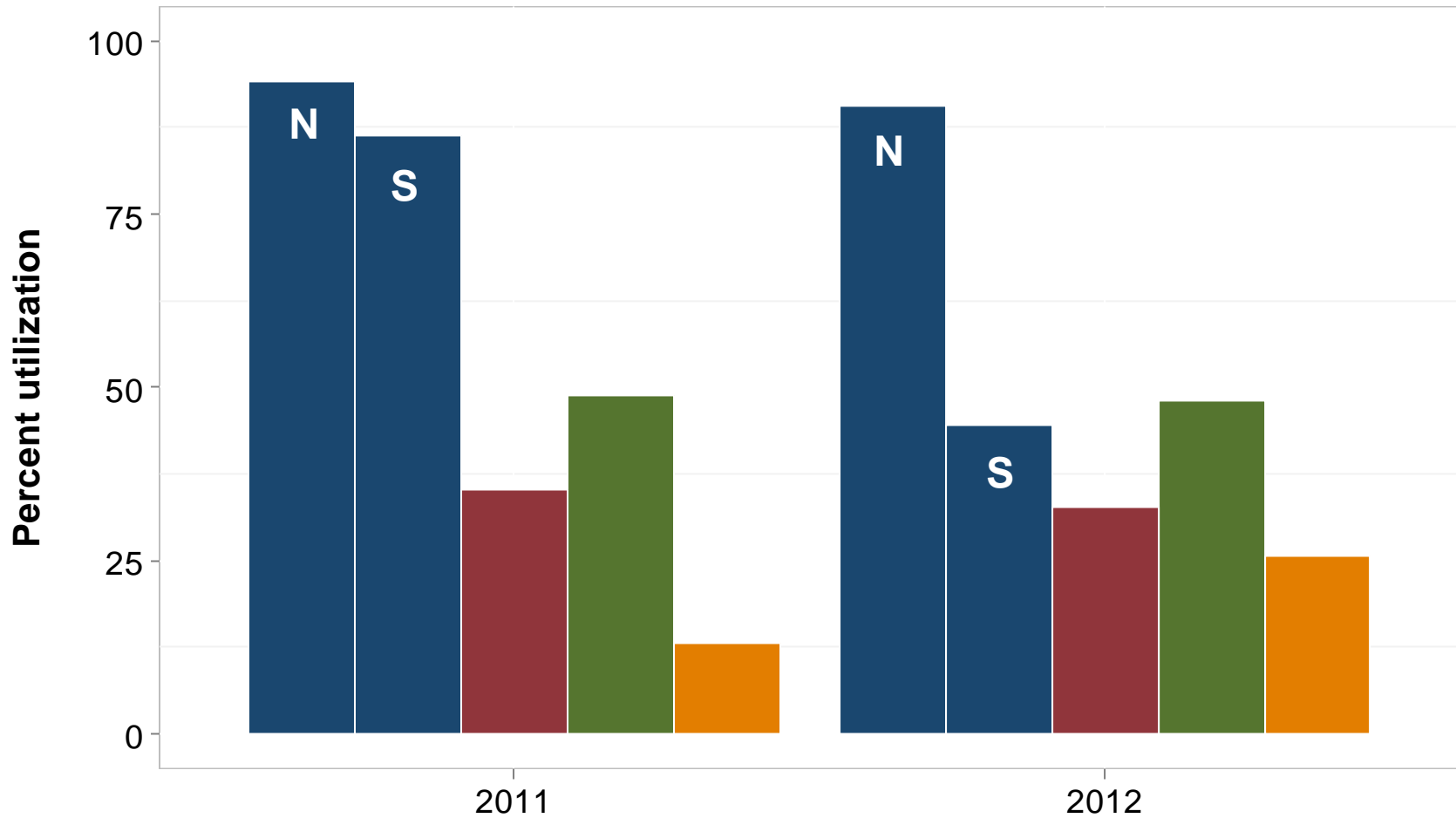
Average sablefish price by fishery

LE or IFQ Trawl LE longline IFQ longline LE pot IFQ pot

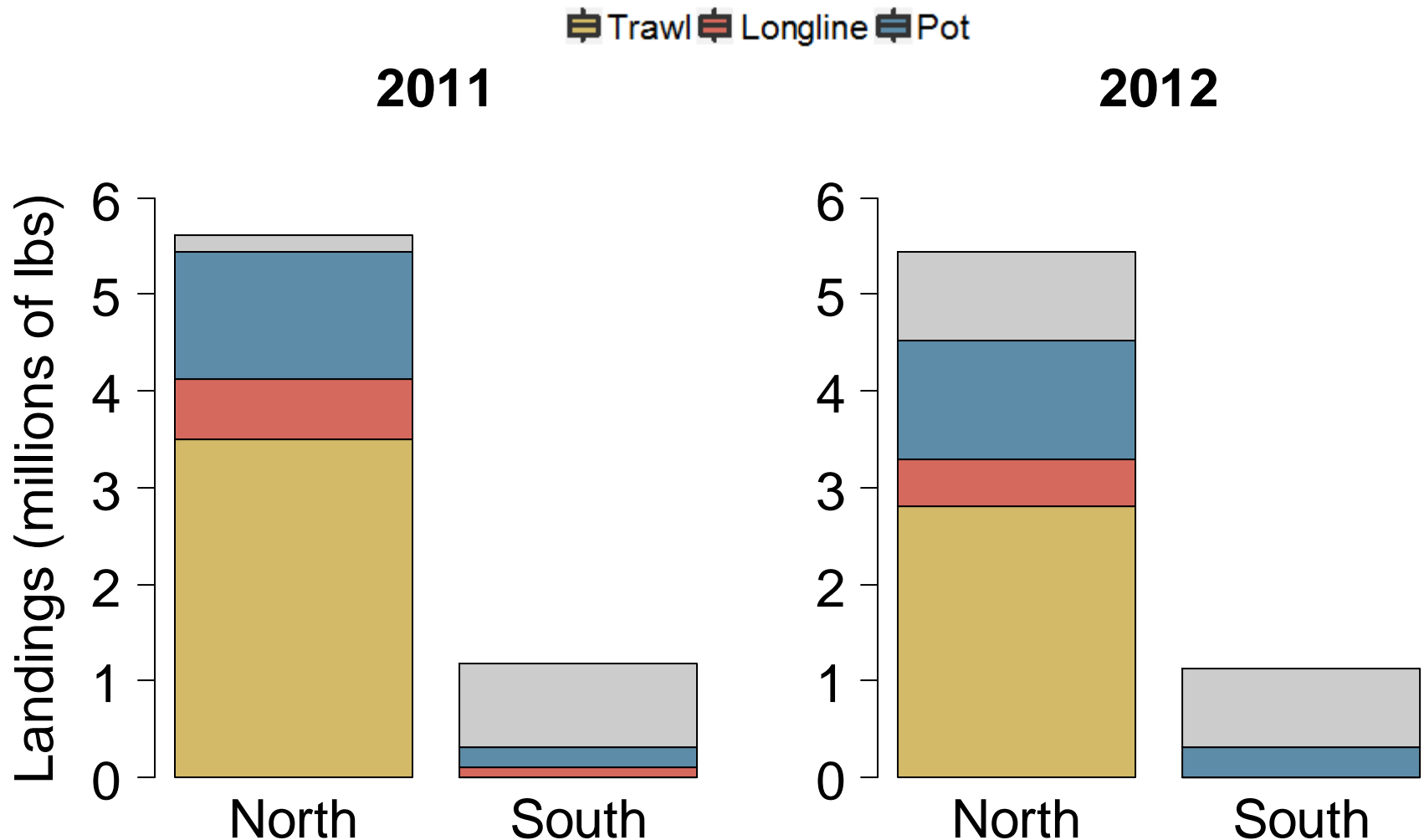


Quota utilization

■ Sablefish North ■ Sablefish South ■ Dover sole ■ Thornyheads ■ Other



Total sablefish landings by gear and quota





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Methods

Calculate net revenue per trip

$$NR_{vtyf} = R_{vtyf} - \bar{C}_{vyf}L_{vtyf}$$

Net revenue per trip

Calculate net revenue per trip

$$NR_{vtyf} = R_{vtyf} - \bar{C}_{vyf}L_{vtyf}$$

Net revenue per trip

Ex-vessel revenue per trip

Calculate net revenue per trip

$$NR_{vtyf} = R_{vtyf} - \bar{C}_{vyf} L_{vtyf}$$

Net revenue per trip

Ex-vessel revenue per trip

Daily costs

Trip length

Calculate net revenue per trip

$$NR_{vtyf} = R_{vtyf} - \bar{C}_{vyf} L_{vtyf}$$

Net revenue per trip

Ex-vessel revenue per trip

Daily costs

- Wages
- Fuel
- Bait
- Gear R&M
- Other

Trip length

Simulate changes in input costs

$$NR_{vtyf} = R_{vtyf} - \bar{C}_{vyf} L_{vtyf}$$

Net revenue per trip

Ex-vessel revenue per trip

Daily costs

- Wages
- **Fuel**
- Bait
- Gear R&M
- Other
- **Quota**

Trip length

Simulate changes in output prices

$$NR_{vtyf} = R_{vtyf} - \bar{C}_{vyf} L_{vtyf}$$

Net revenue per trip

Ex-vessel revenue per trip

- **Sablefish price**
- **Dover sole price**

Daily costs

- Wages
- Fuel
- Bait
- Gear R&M
- Other

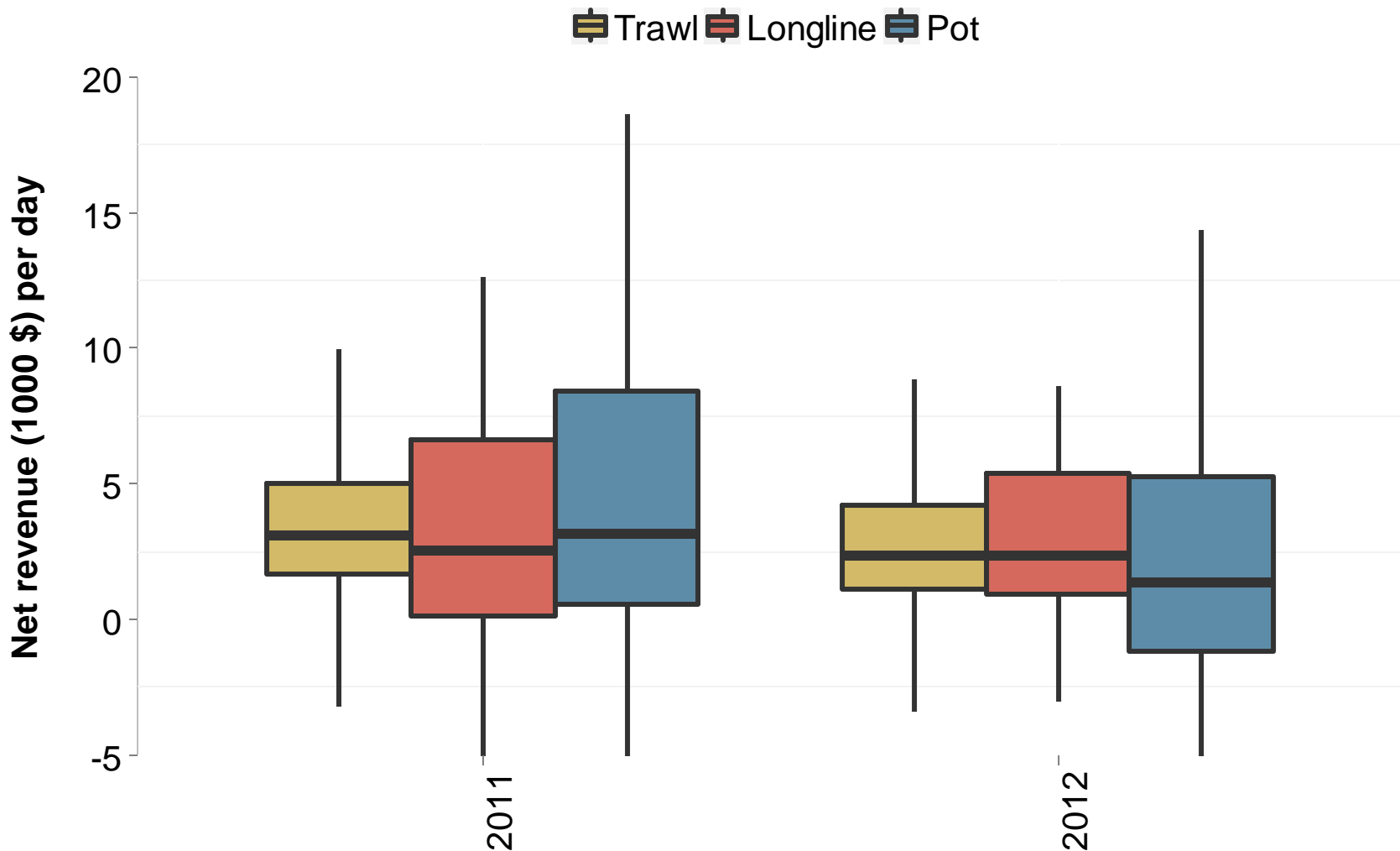
Trip length



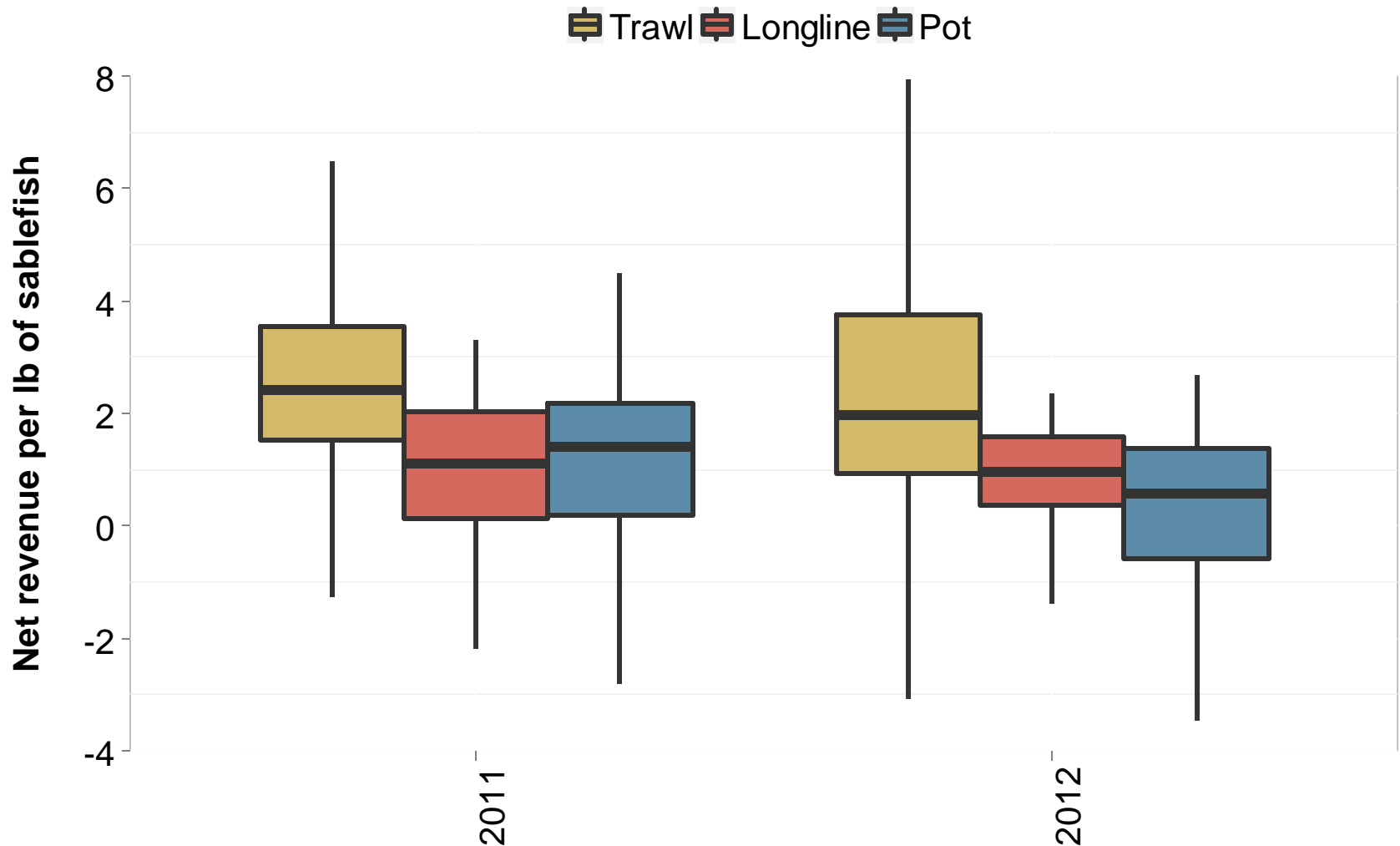
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Results

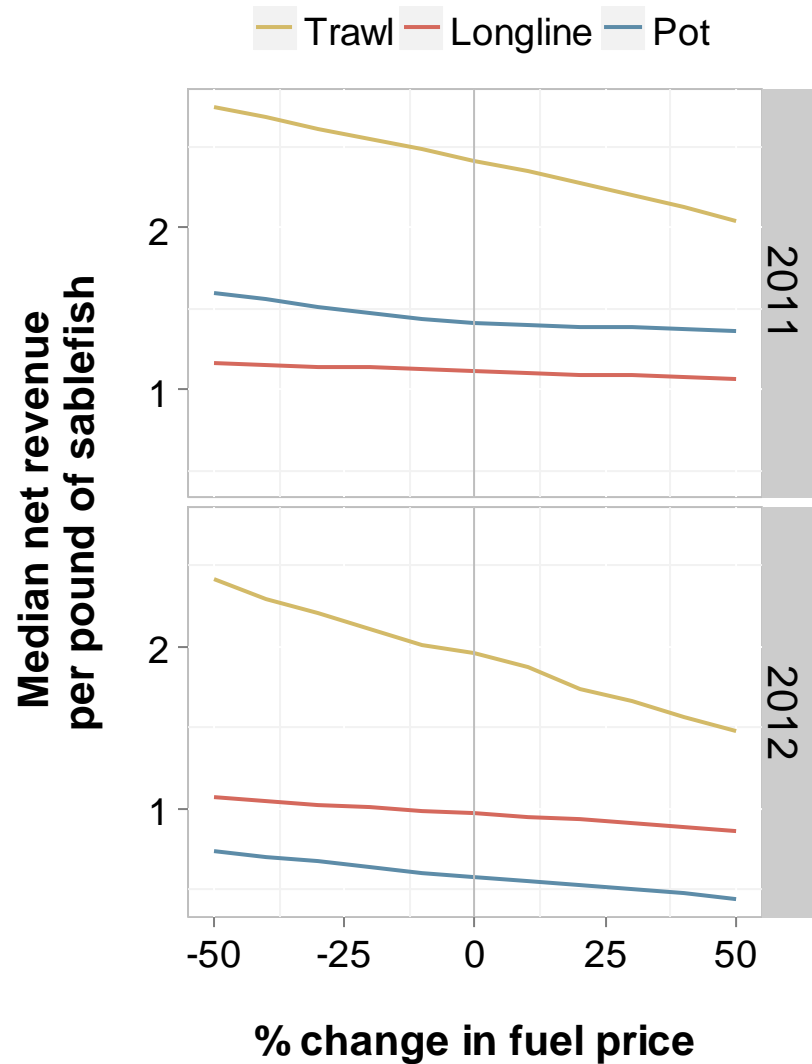
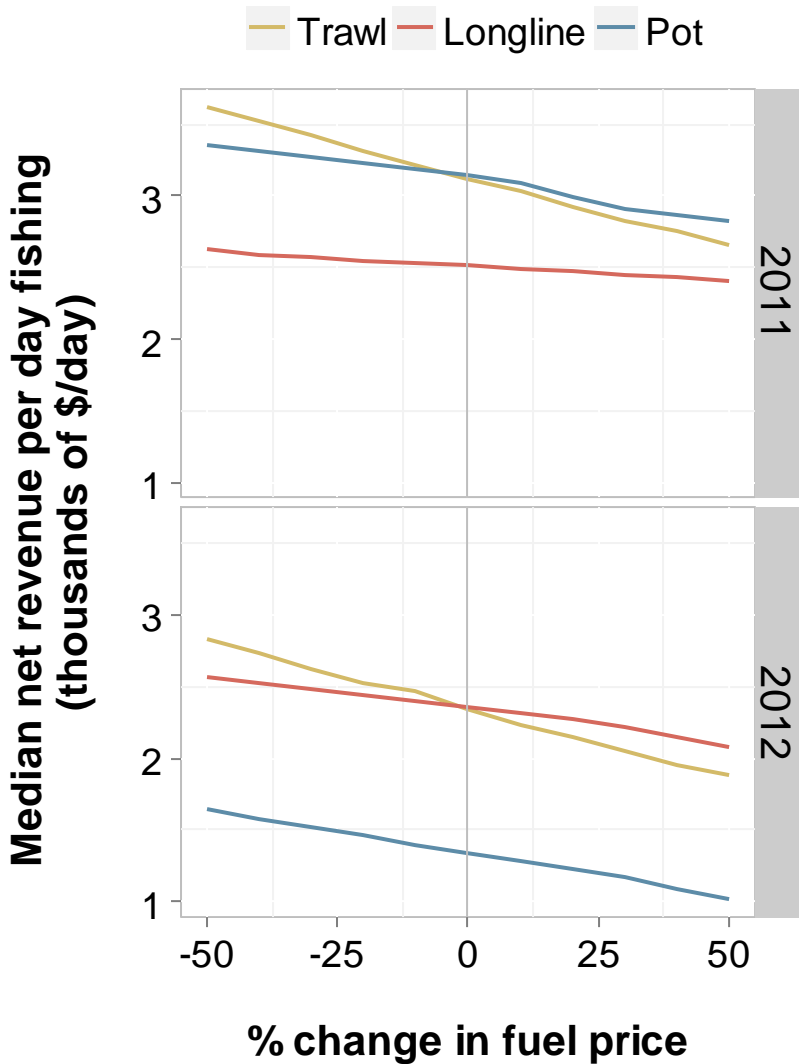
Variability in net revenue per day



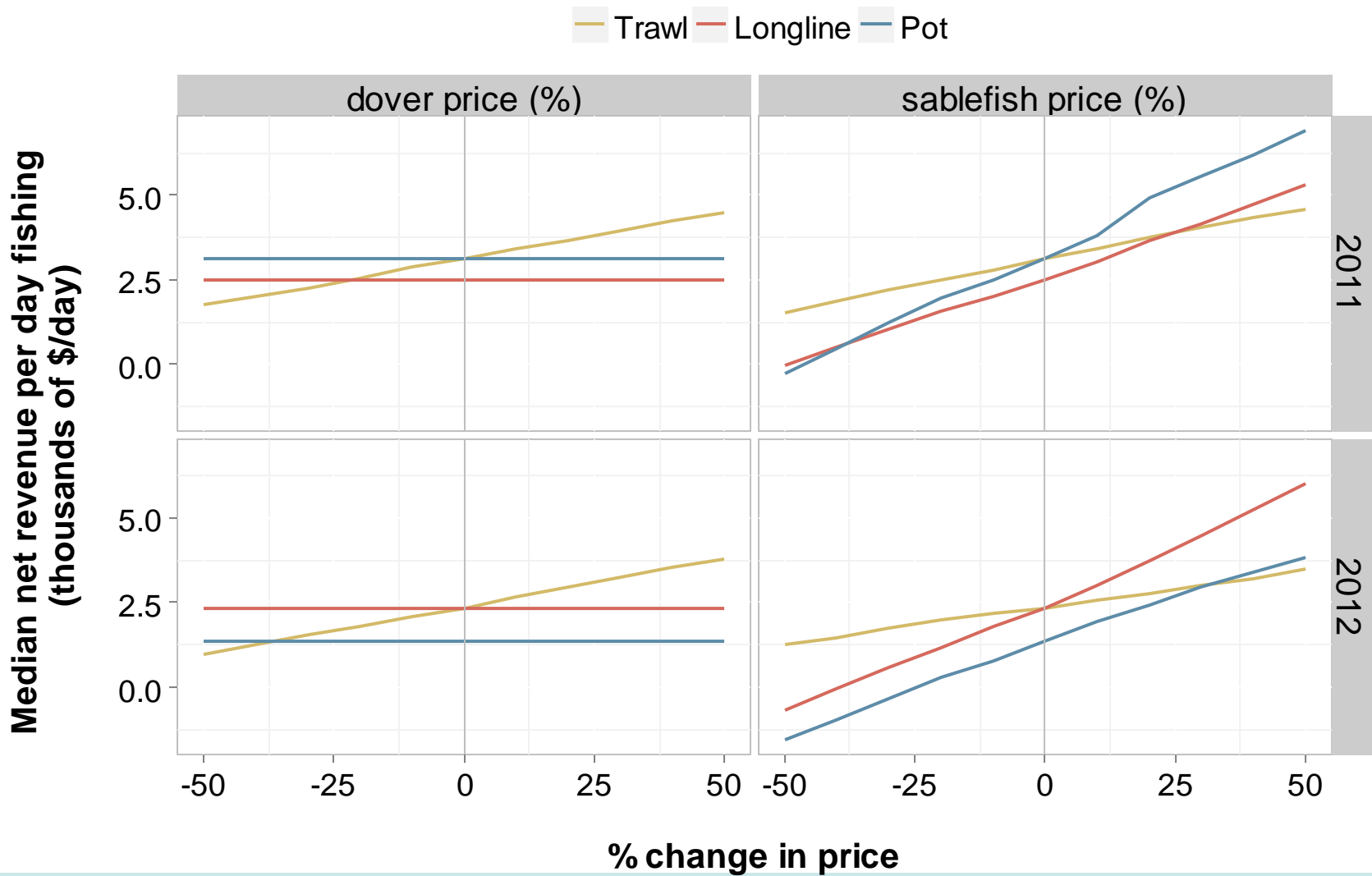
Variability in net revenue per lb of sablefish



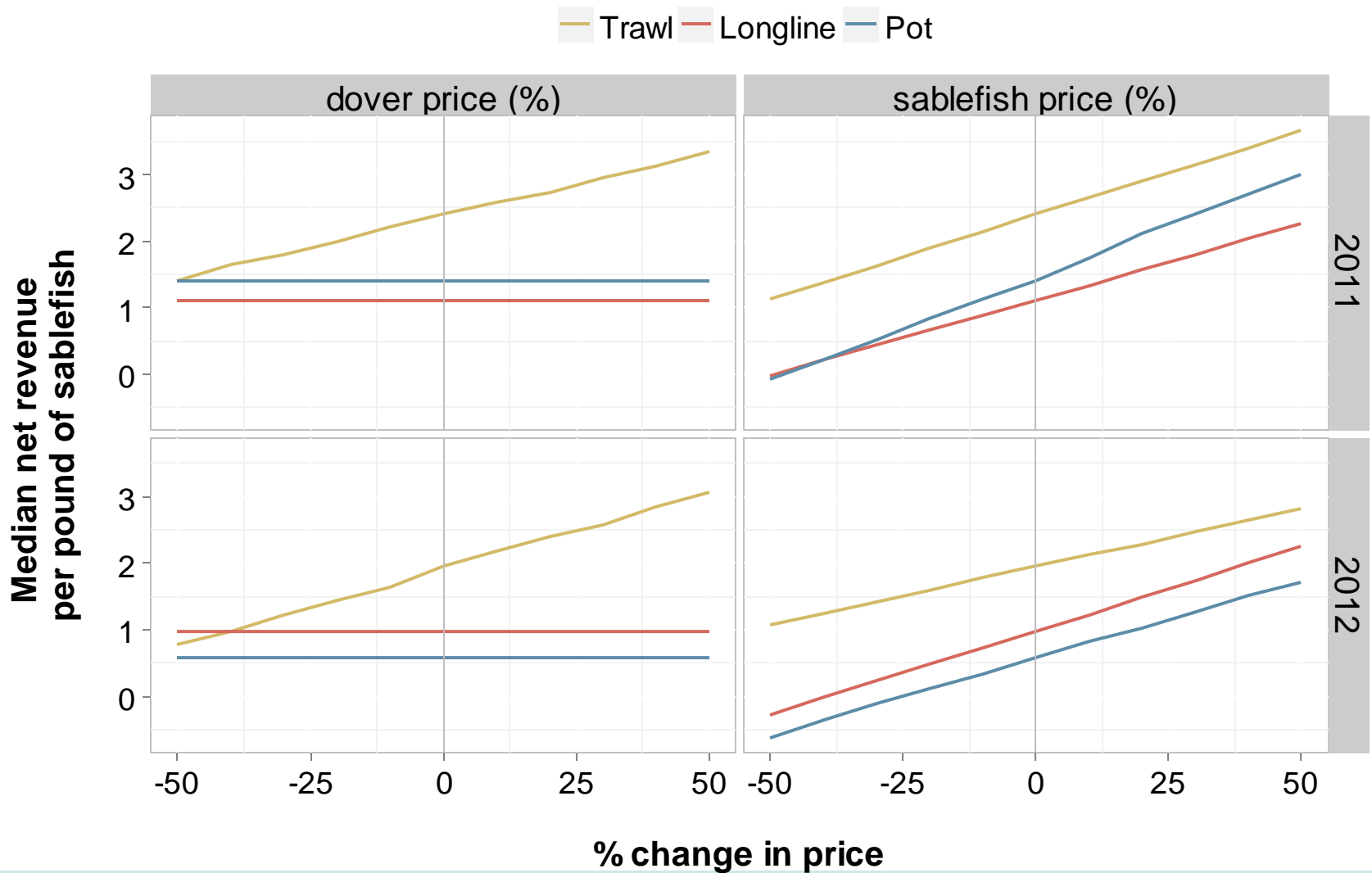
△ Input Price: Net revenue per day and per lb



△ Output Prices: Net revenue per day

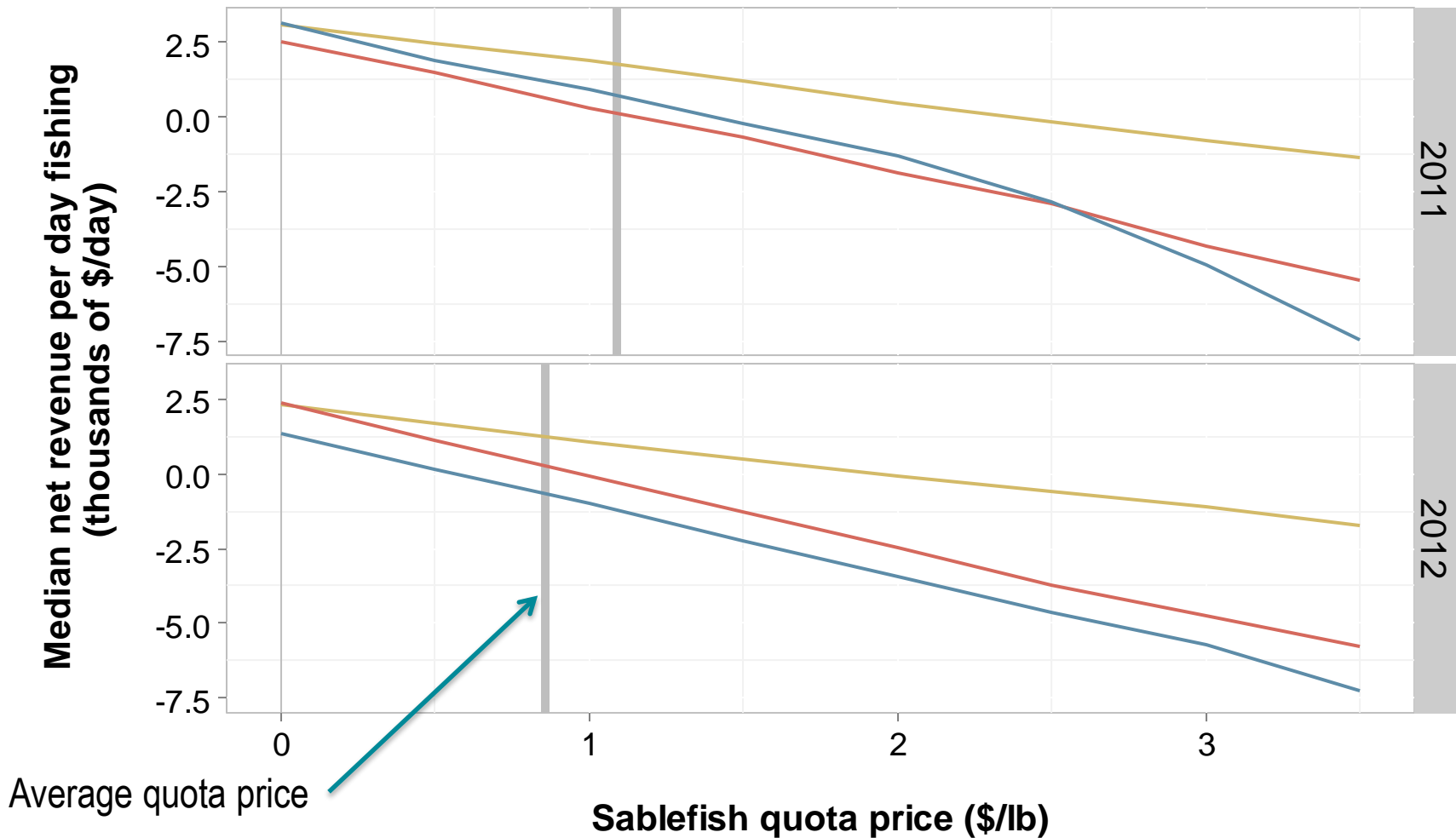


△ Output Prices: Net revenue per lb of sablefish



△ Input Price: Net revenue per day fishing

— Trawl — Longline — Pot



Conclusions

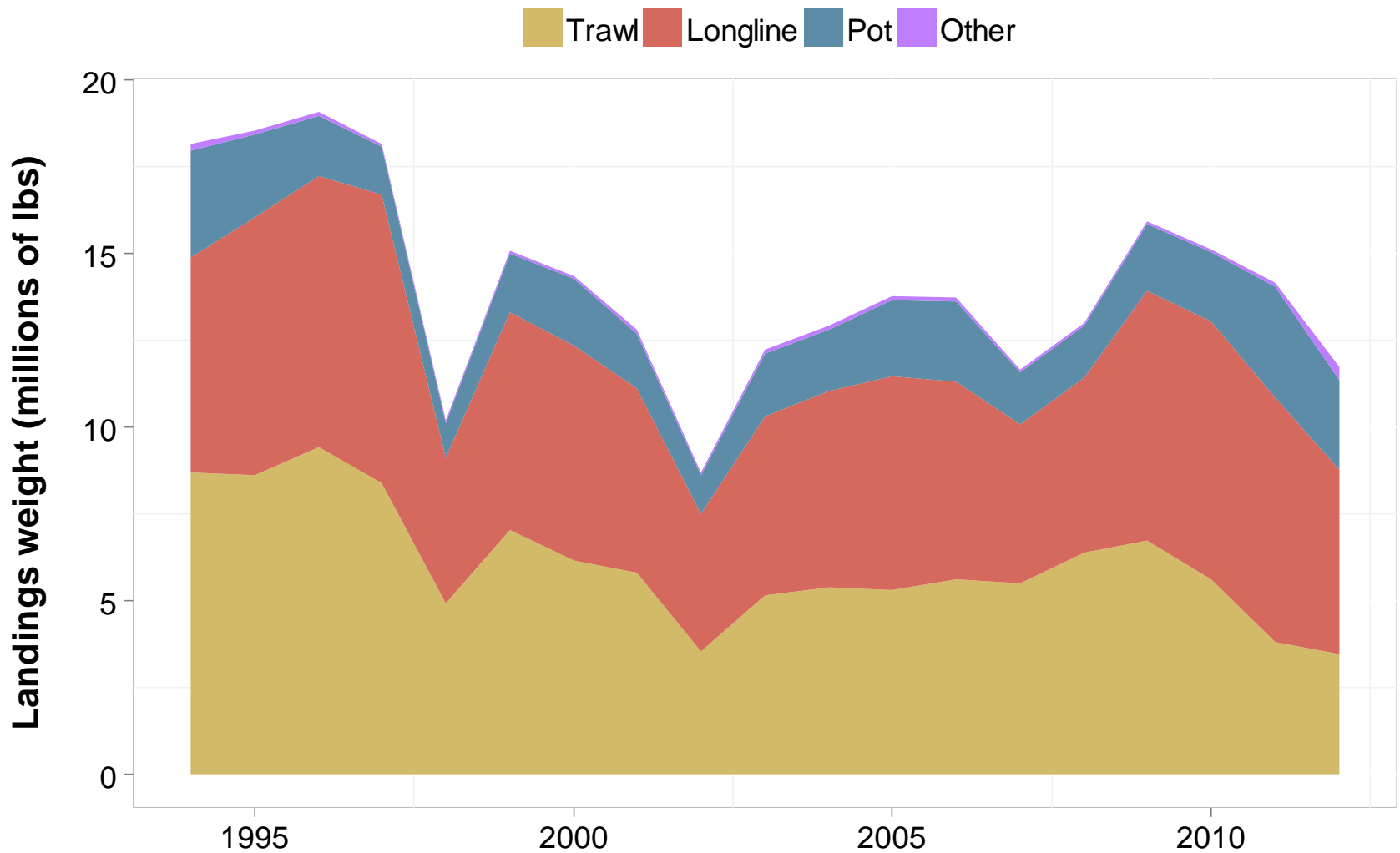
- Although dover sole yields a much lower price and has a limited market, it is an important component of trawl revenue
- Changes in input and output prices could alter the distribution of fishing between the trawl and fixed gear fisheries
- Gear switching exacerbates quota underutilization
- Suggestion that vessels aren't taking into account the opportunity cost of the quota

A large pile of various groundfish species, including salmonids, flatfish, and sculpin, in a wooden crate. The fish are densely packed and show a variety of colors and sizes. The word "Questions?" is overlaid in the top left corner.

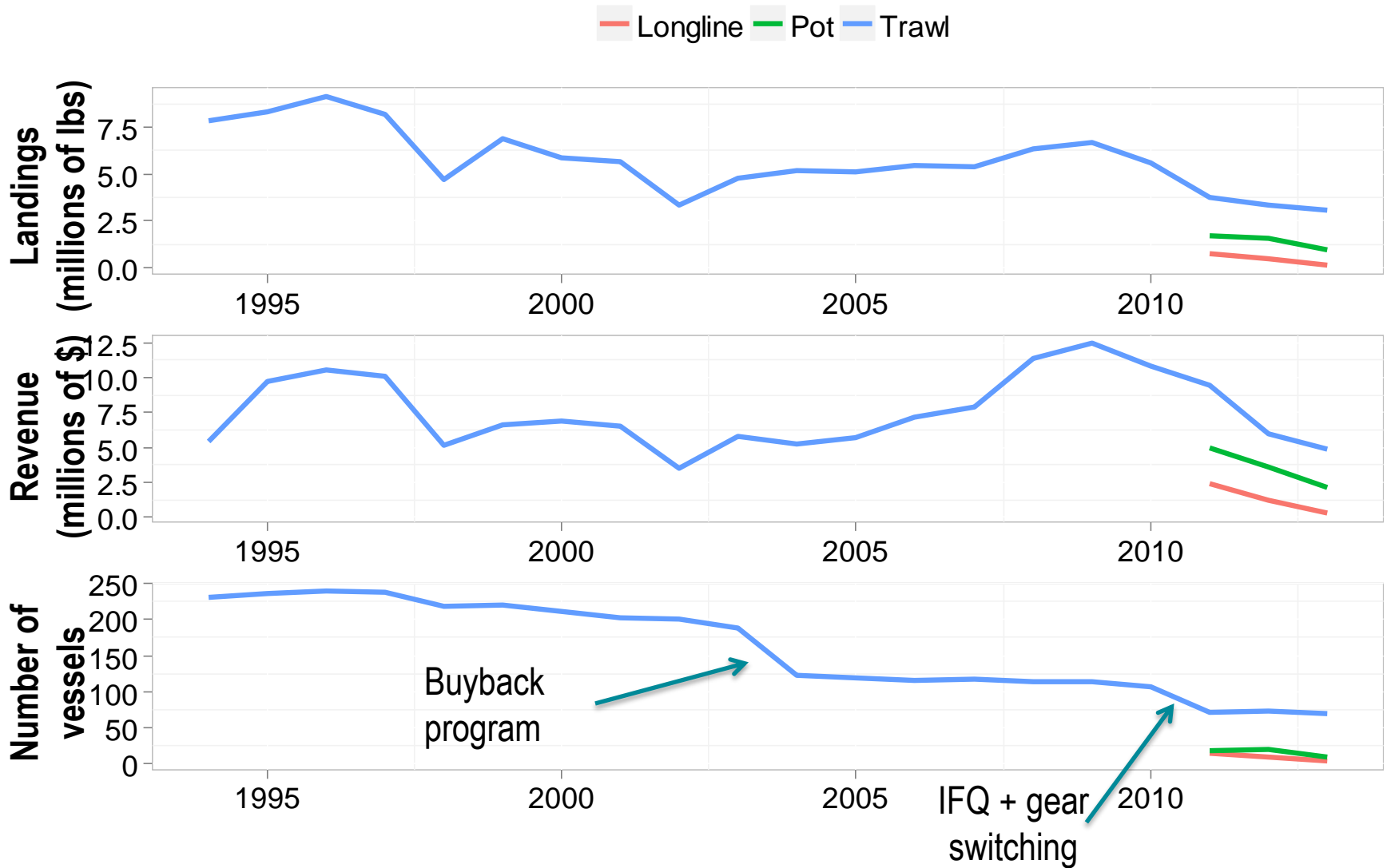
Questions?

Photo: Melissa Head, Groundfish Ecology,
Northwest Fisheries Science Center

Sablefish on the West Coast

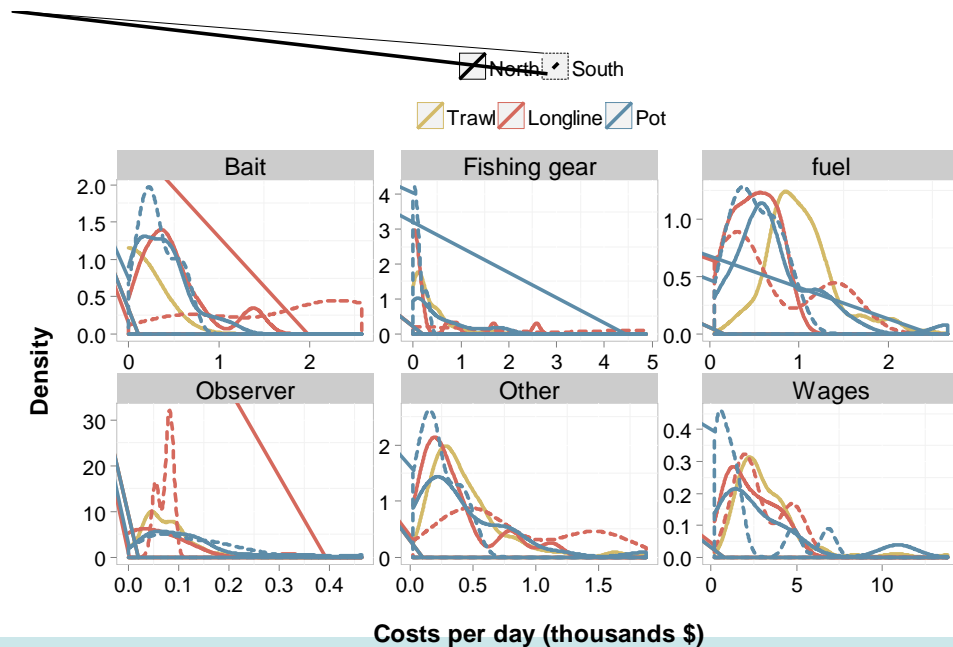


Sablefish catch in the trawl fishery



Variable Profit

- Variable cost net revenue = Ex-vessel revenue – variable costs
- Do we need to say anything else about variable profit?

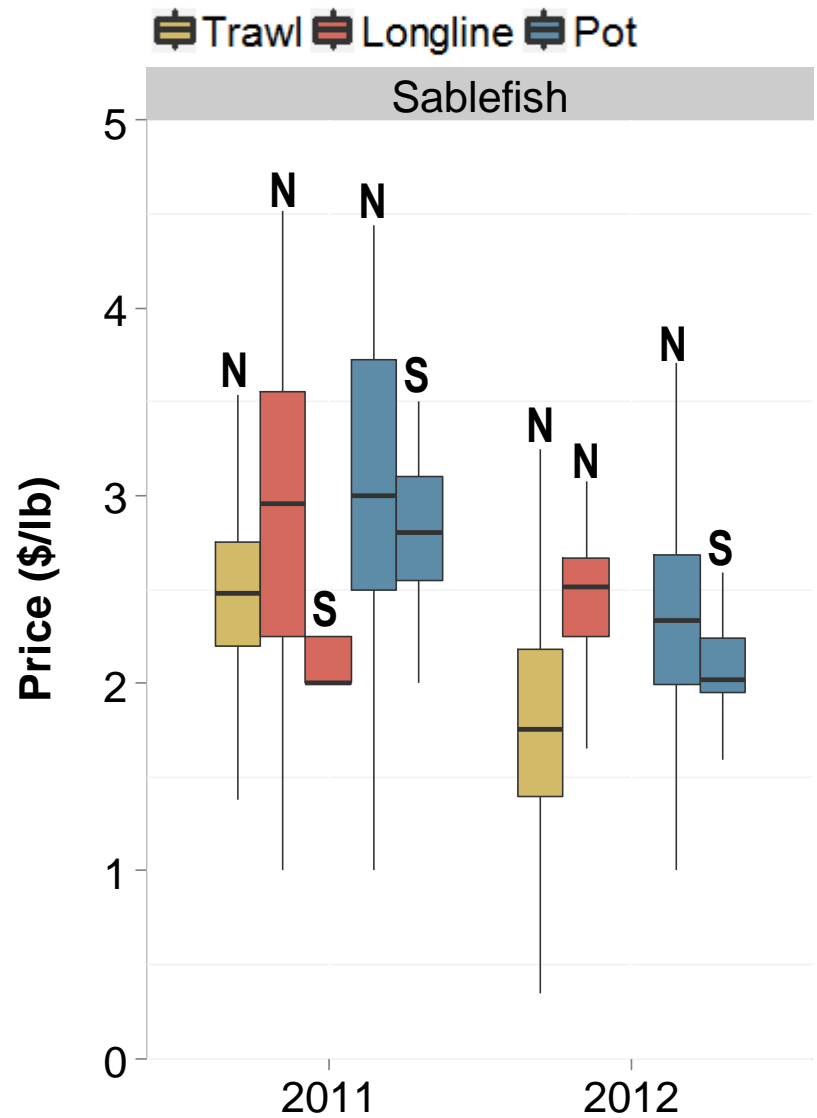
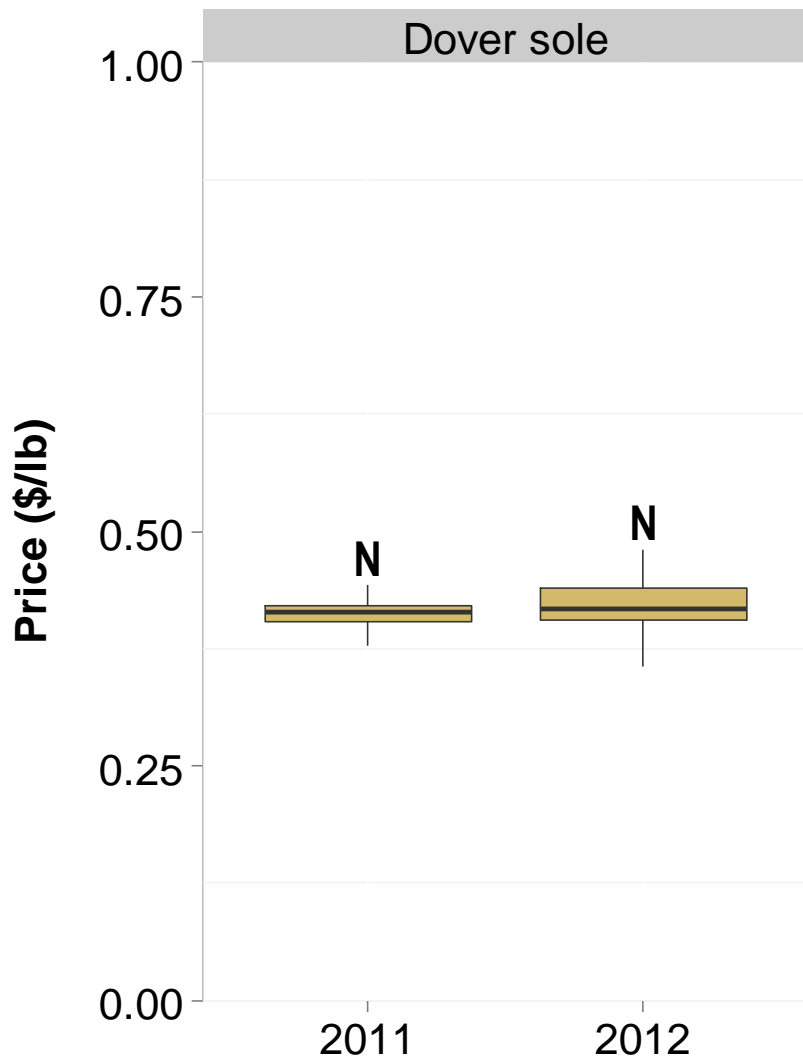


Data

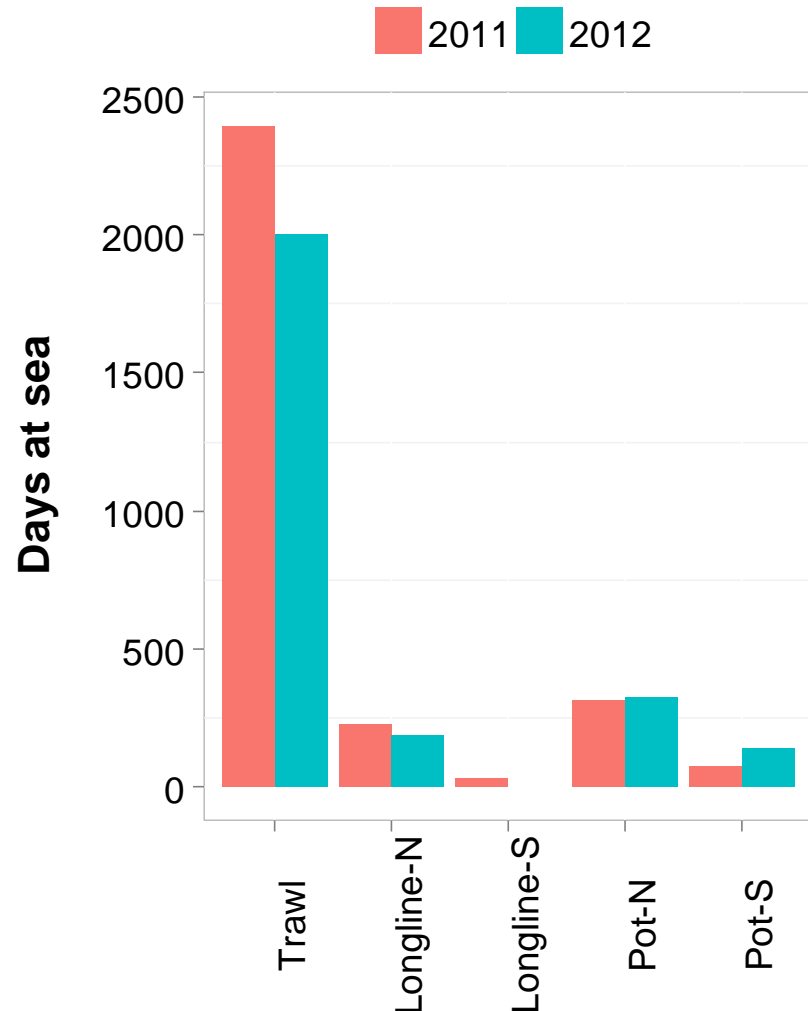
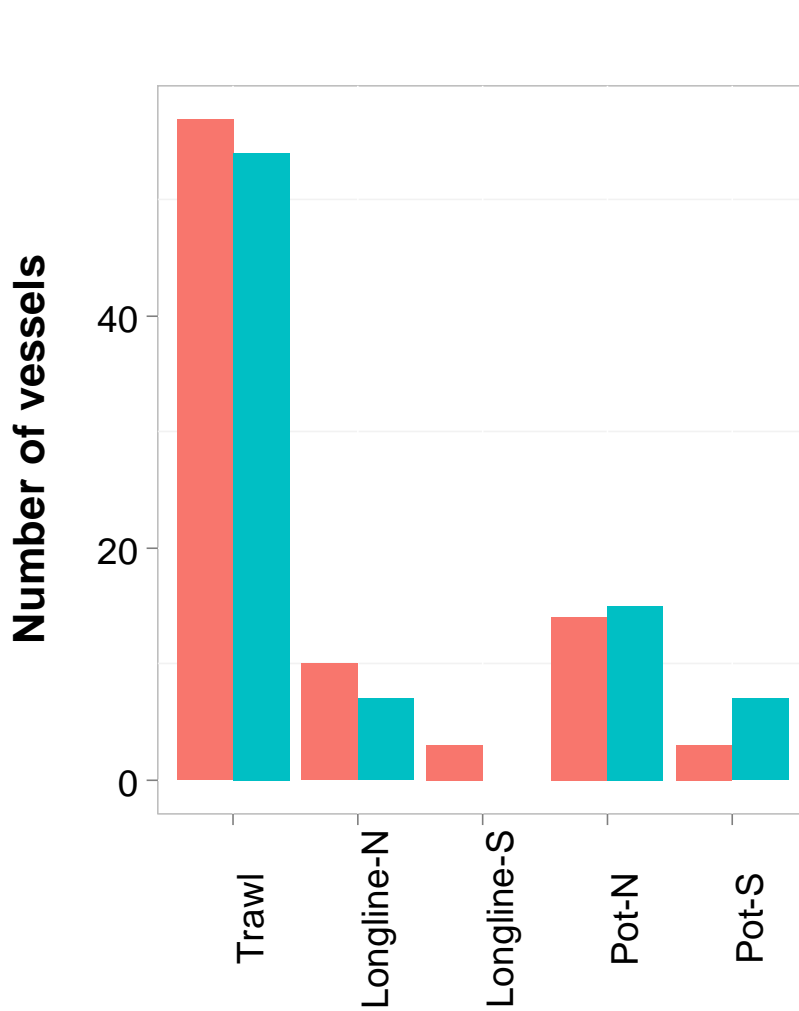
- 2011-12 Economic Data Collection Program
- State fish ticket data
 - Catch and revenue by species
- Observer data (all IFQ trips)
 - Length of trips
- Quota account data

Gear	Year	Vessels	Trips
Trawl	2011	58	767
Trawl	2012	54	640
Pot	2011	13	119
Pot	2012	17	128
Longline	2011	10	66
Longline	2012	8	18

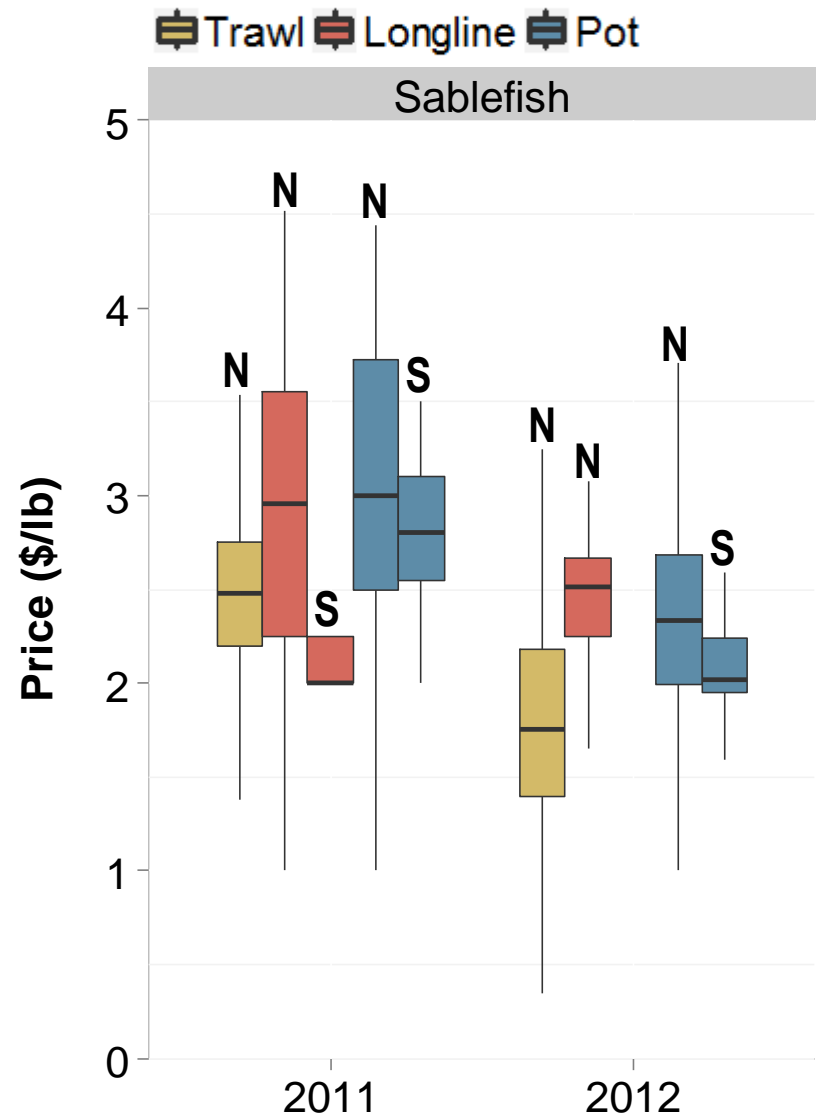
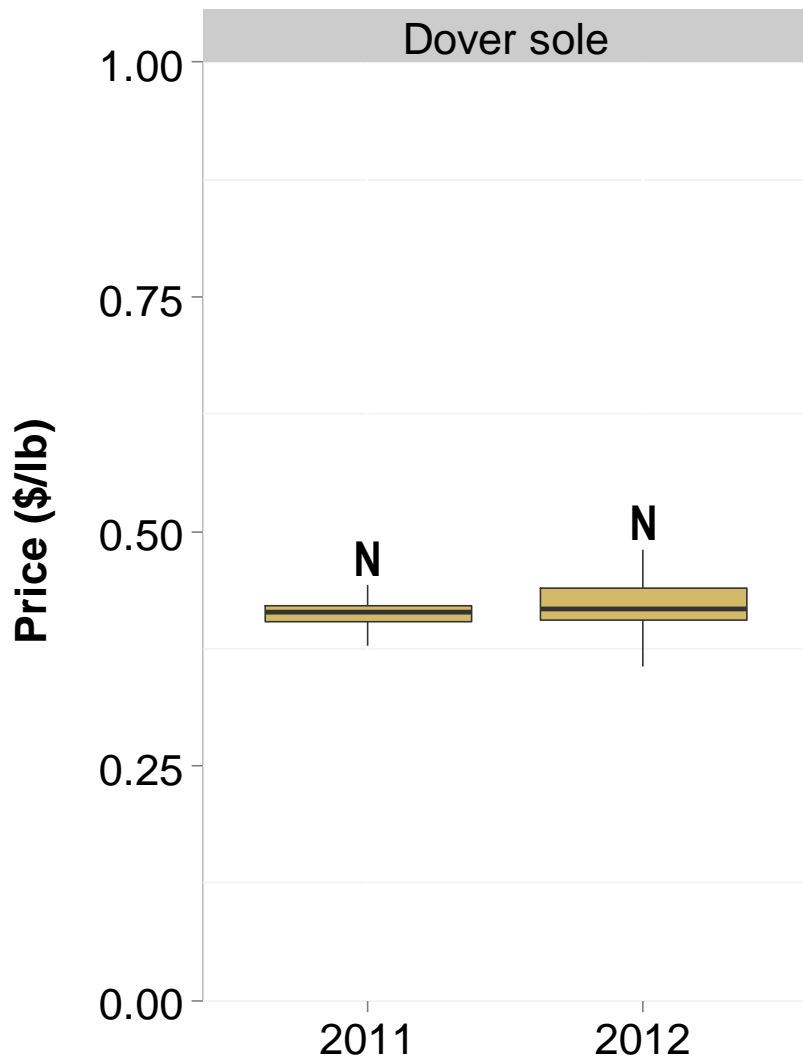
Varying Output prices



Sectors

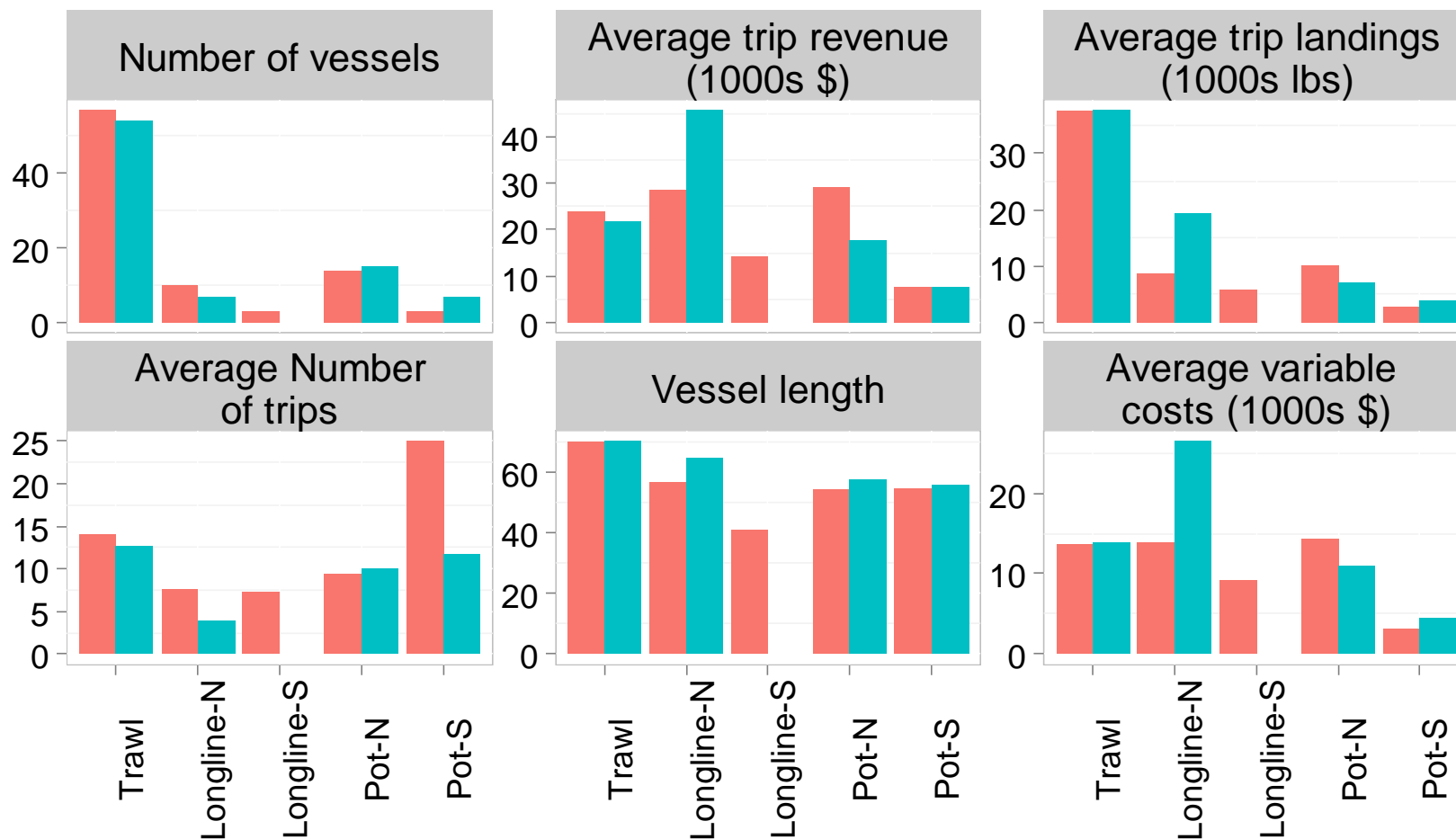


Varying Output prices



Data Summary

2011 2012



Quota Utilization (2011)

