NOAA FISHERIES

Northwest Fisheries Science Center

Effects of "The Blob" on profitability in the West Coast Pacific whiting fishery

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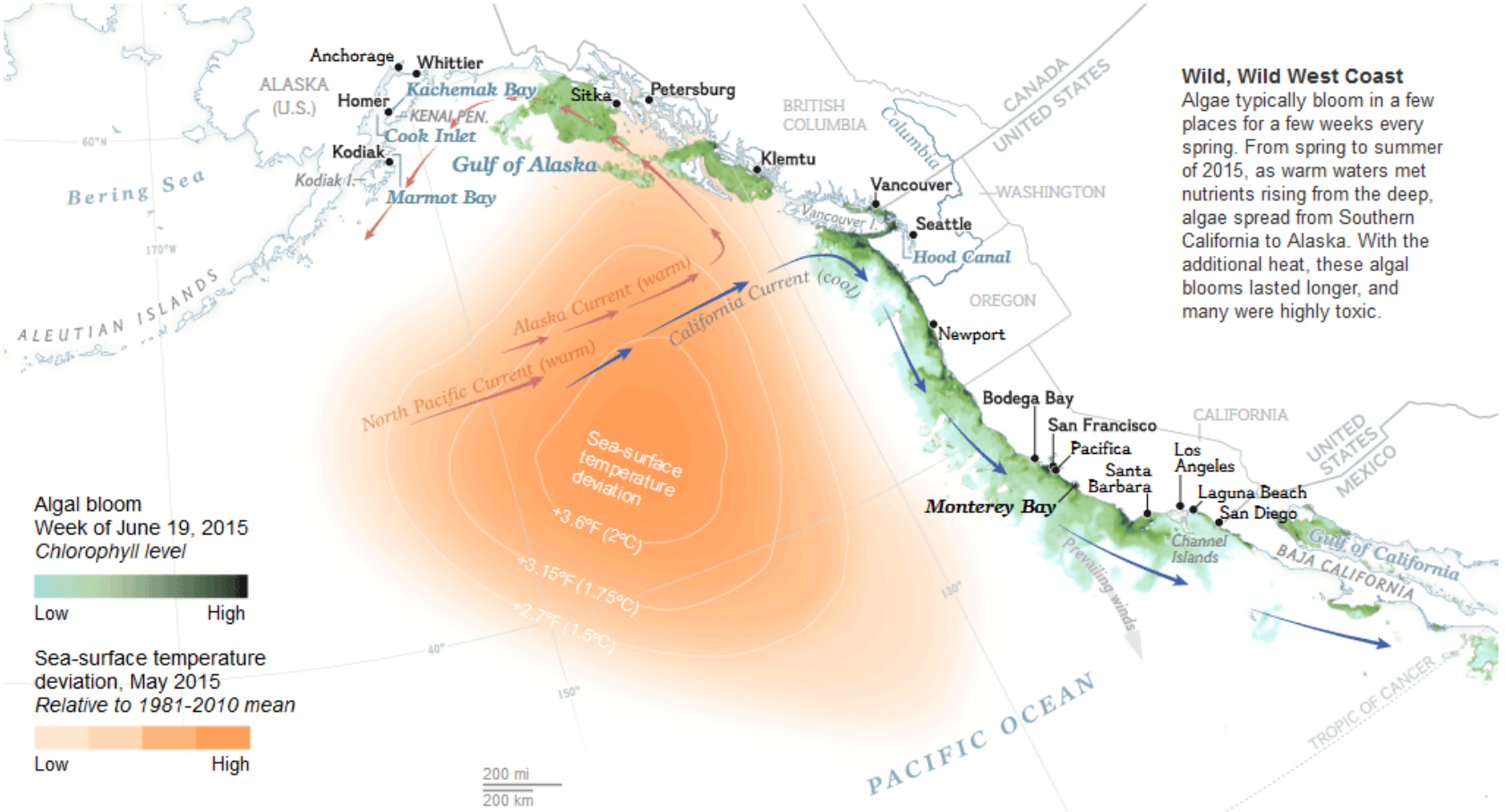
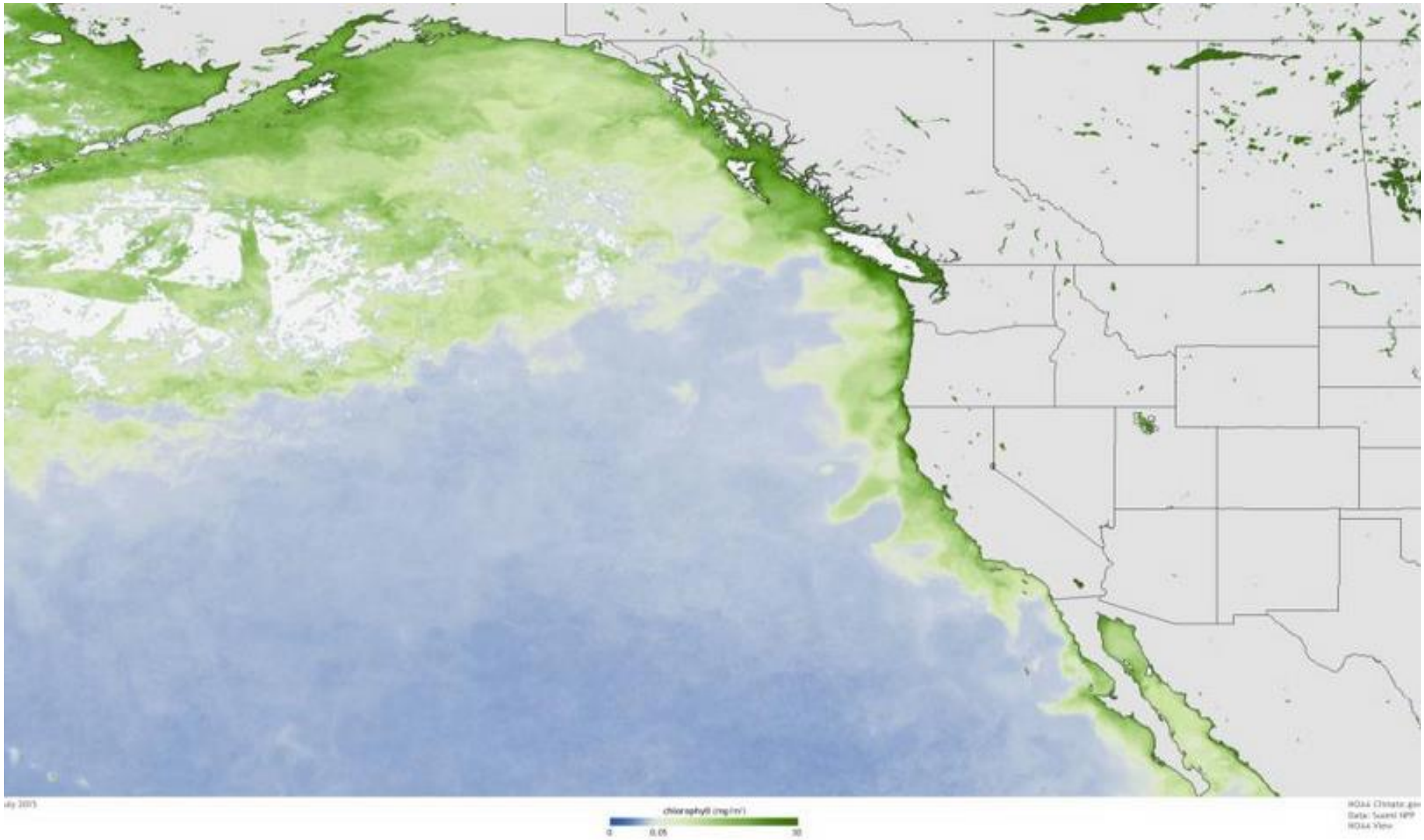
MAGAZINE

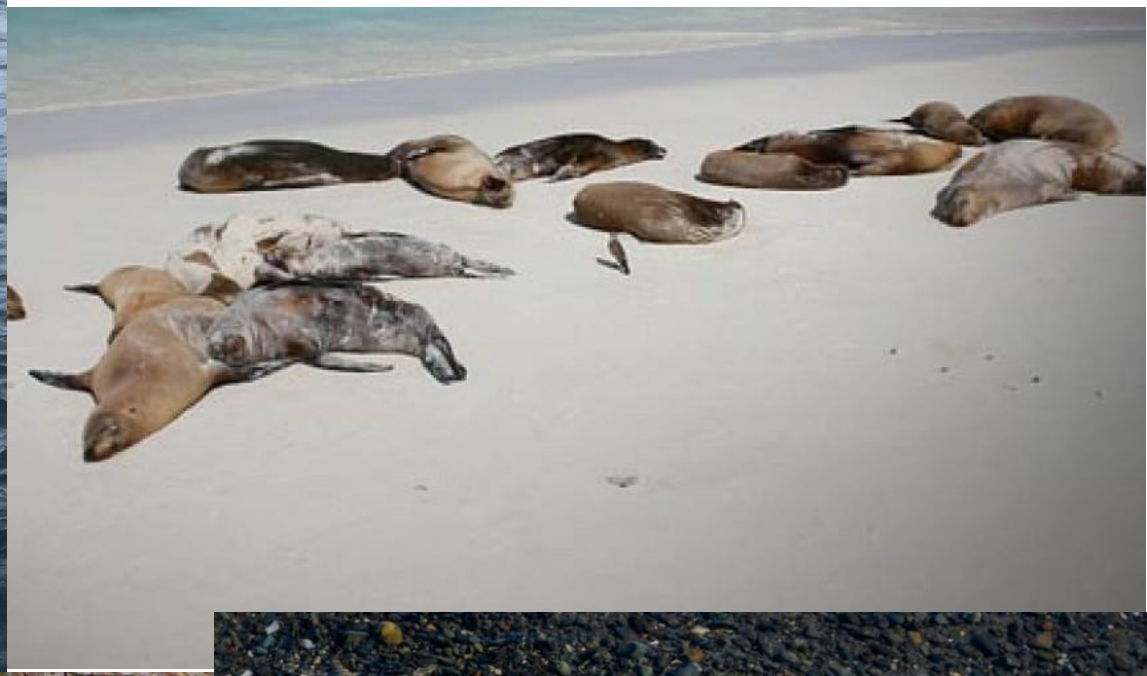
The Blob That Cooked the Pacific

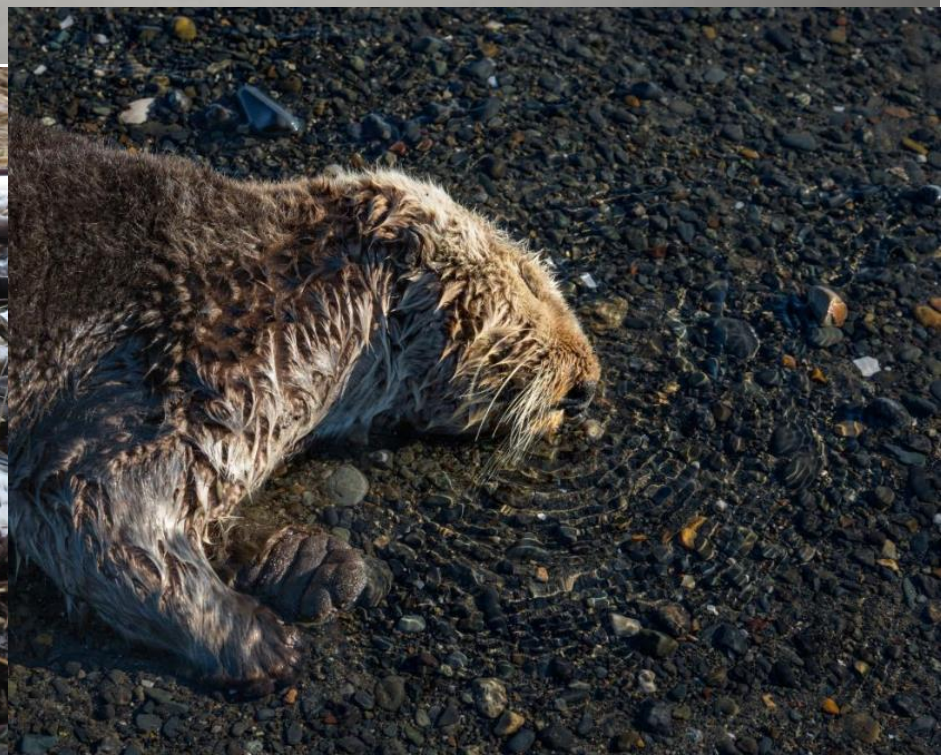
When a deadly patch of warm water shocked the West Coast, some feared it was a preview of our future oceans.



Wild, Wild West Coast
Algae typically bloom in a few places for a few weeks every spring. From spring to summer of 2015, as warm waters met nutrients rising from the deep, algae spread from Southern California to Alaska. With the additional heat, these algal blooms lasted longer, and many were highly toxic.


chlorophyll (mg/m³)
0
0.05
30





The Blob to Blame For Declining Pacific Cod Stocks in Gulf of Alaska, Says NOAA

SEAFOODNEWS.COM [Alaska Public Media] by Aaron Bolton - November 7, 2017

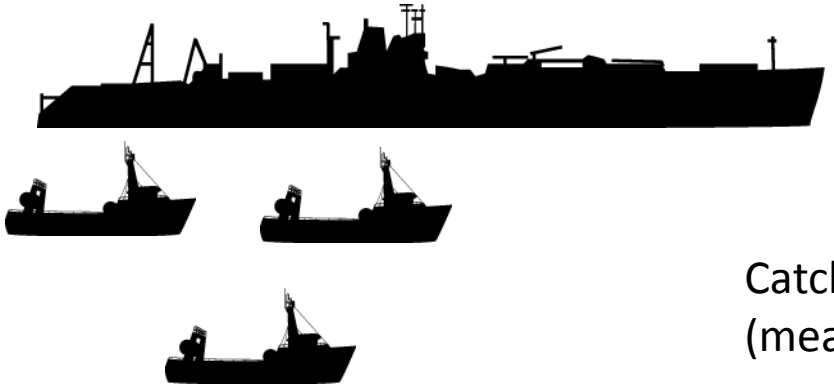
Last month, the North Pacific Fishery Management Council, which regulates groundfish in Alaska and other federal fisheries, received some shocking news. Pacific cod stocks in the Gulf of Alaska may have declined as much as 70 percent over the past two years. That estimate is a preliminary figure,

Anomalous ocean conditions had large and unexpected effect on the West Coast Pacific whiting fishery as well

3 types of vessels

Catcher vessels
(mean length=90 ft)

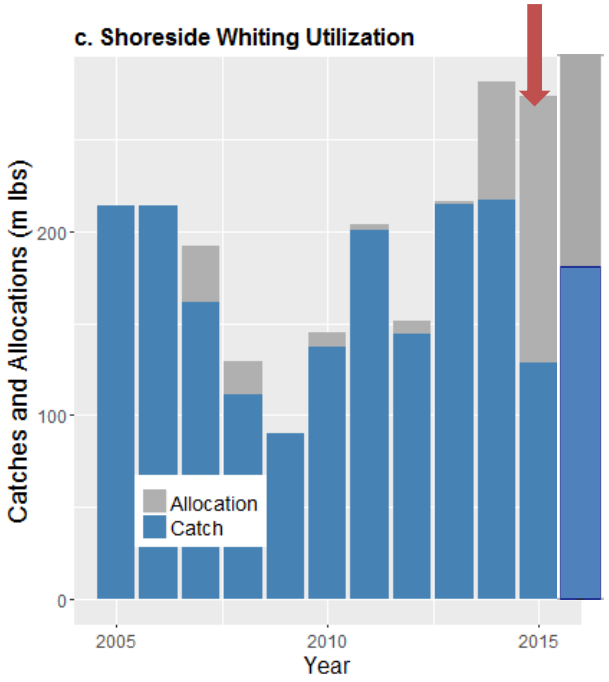
Mothership processors with associated catcher vessels
(mean length=350 ft)



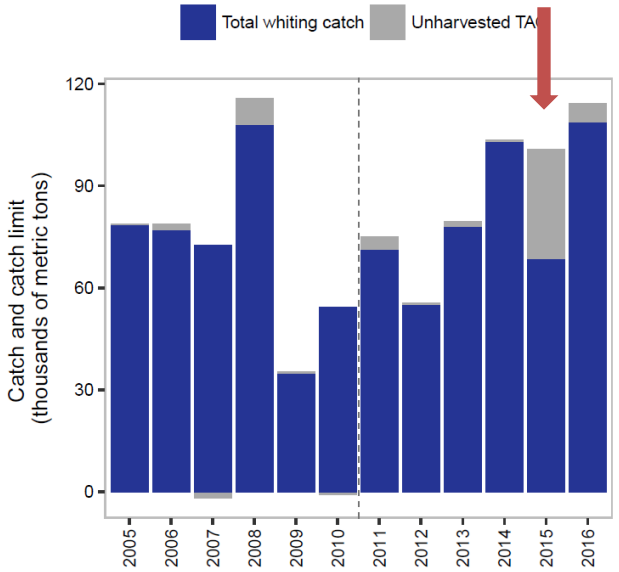
Catcher-processors
(mean length=300 ft)

What were the effects on the whiting fishery on the West Coast?

- Lower catch (Low attainment of the catch limit) in 2015



Catcher Vessels 2015: 47%



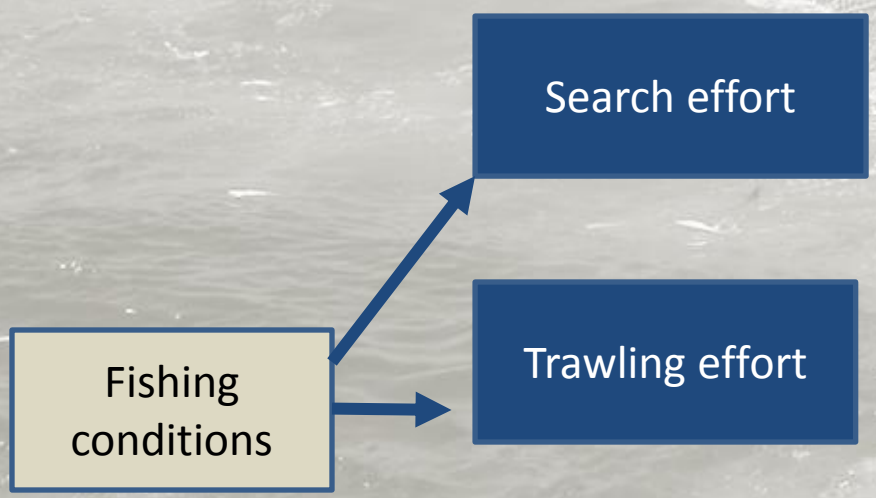
Catcher-processors 2015: 68%

Figure 3-49. Landings and unutilized catch allocations for the (a) catcher-processor; (b) mothership; and (c) shoreside Pacific whiting sectors. The allocation includes any reapportionment among sectors that may have occurred during the season.

What were the effects on the whiting fishery on the West Coast?

- Low attainment of the catch limit
- Revenue (vessel sector) was $60 million lower in 2015 compared to 2014
- Higher “search” effort to find fish
- Lower CPUE
- Average operating profits were over 50% lower

What were the effects on the whiting fishery on the West Coast?



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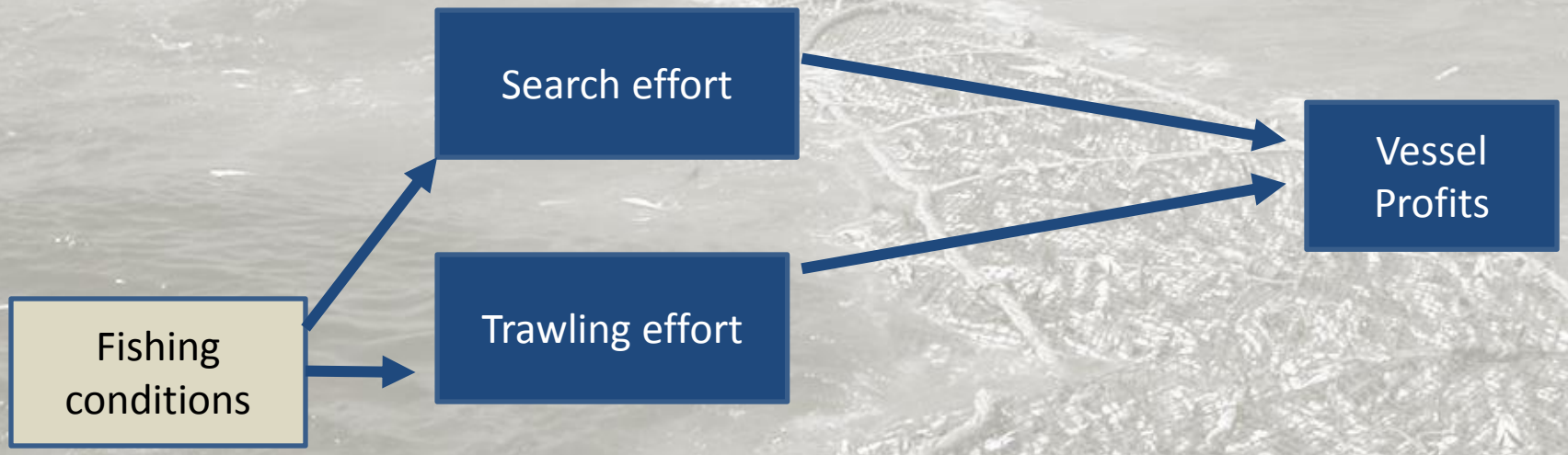

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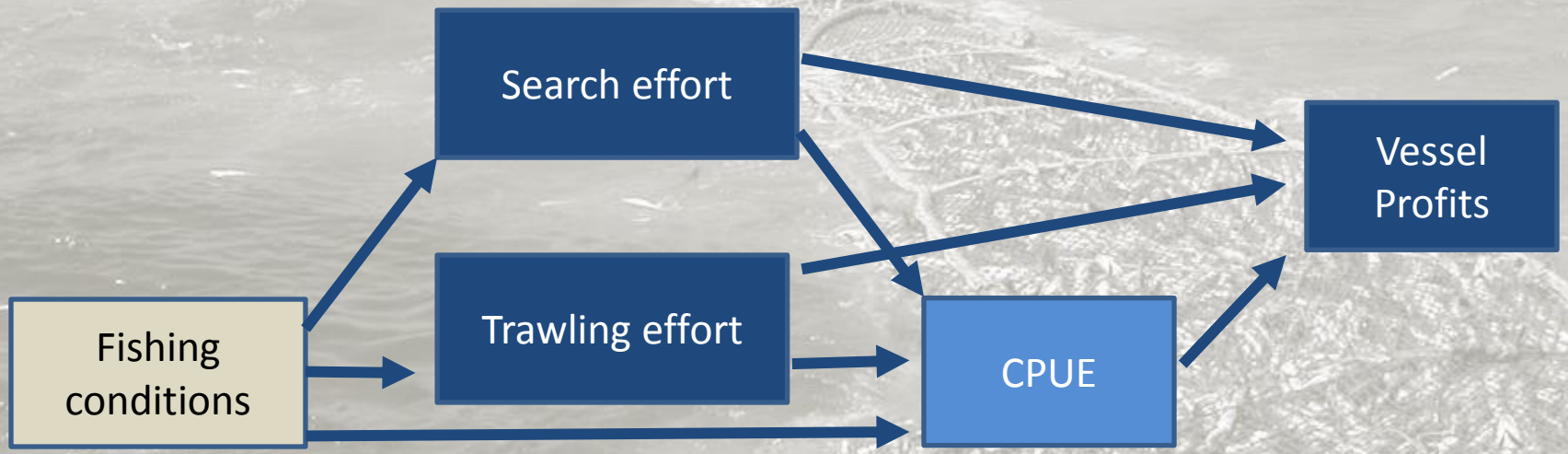
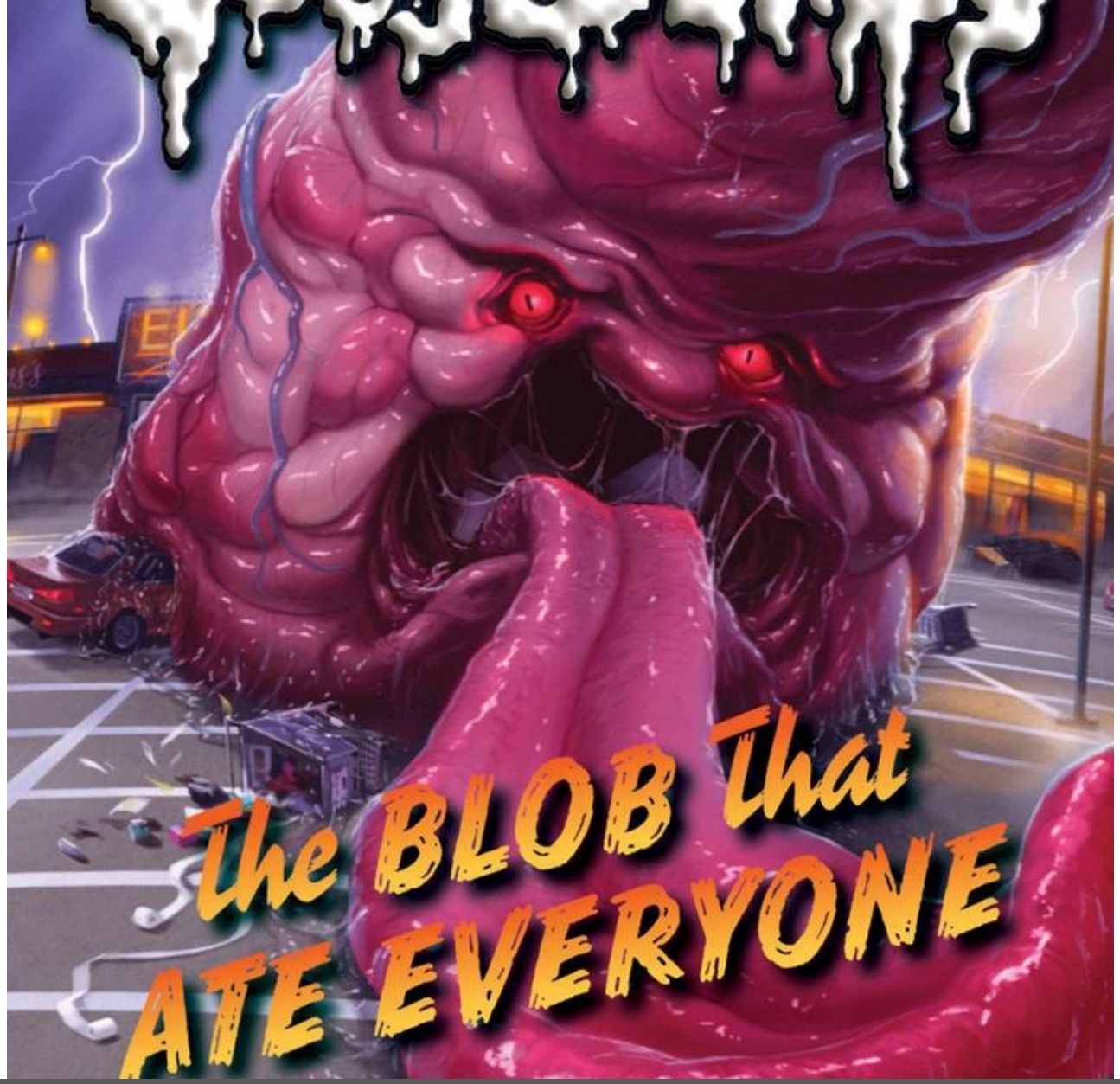


Profit function estimation

- Inputs:
  - Agriculture: labor, fertilizer, irrigation, land (quasi-fixed)
  - Fisheries: labor, days at sea, fuel, vessel size (quasi-fixed)
  - Whiting fishery: hours trawling, hours transiting, annual capital cost (quasi-fixed)

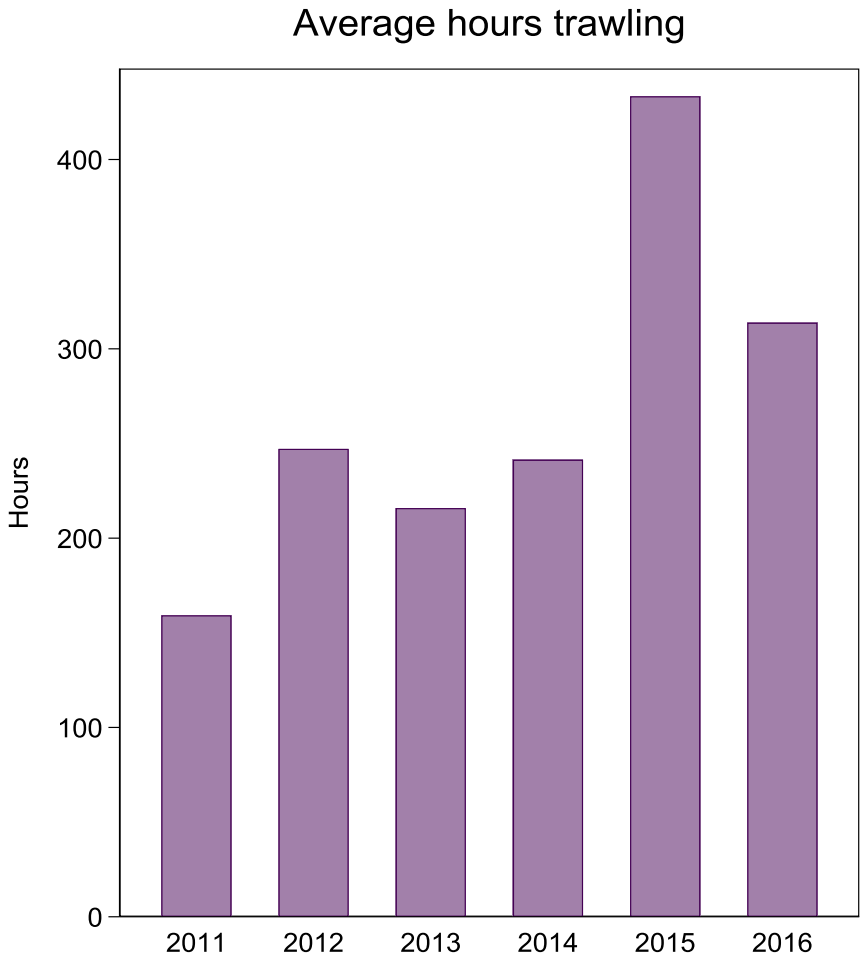


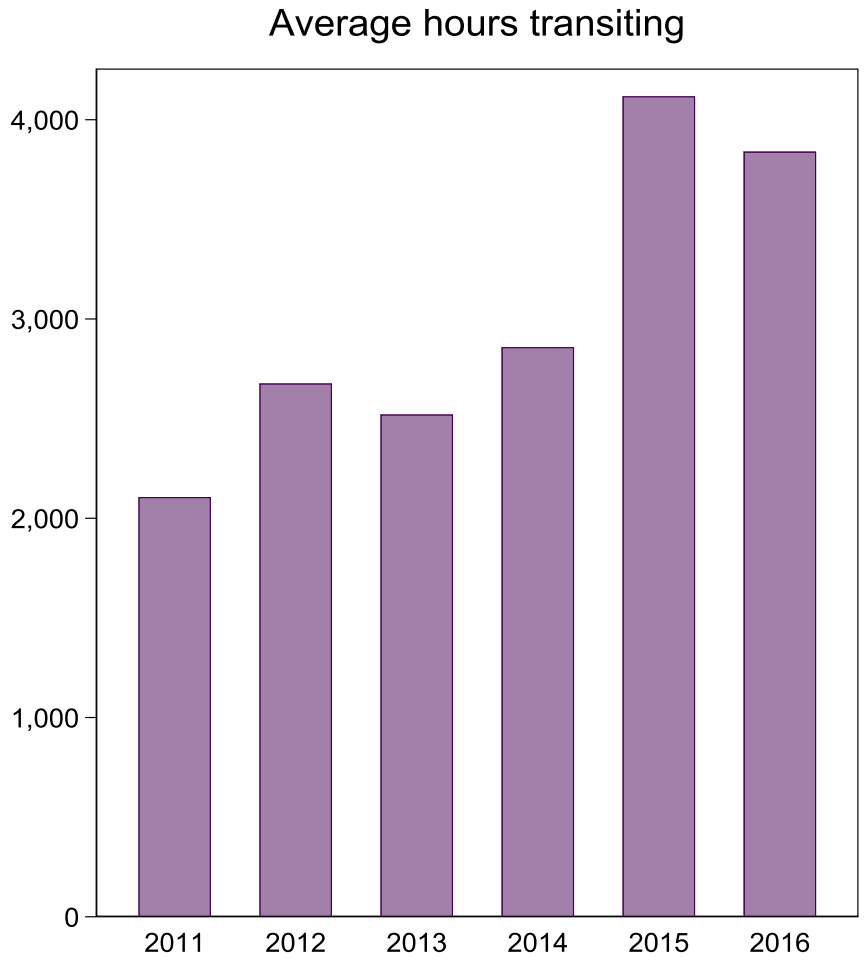
Annual fixed effects measure technical change

Profit function estimation

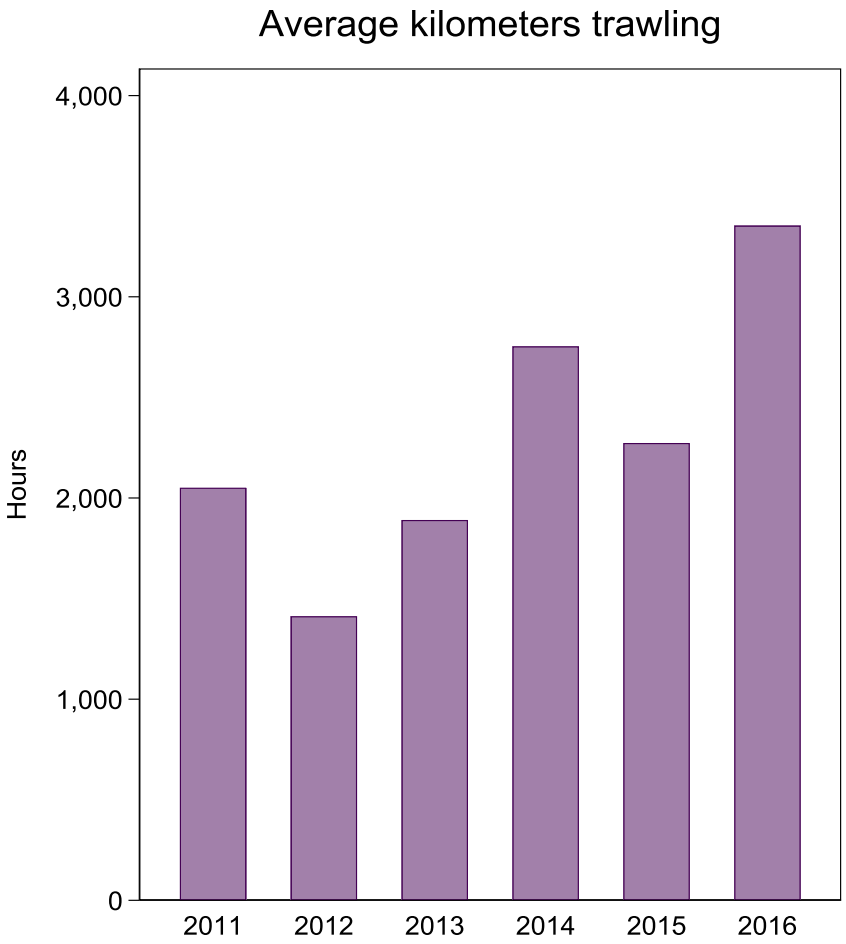
- Data:
  - Annual cost and earnings data from Economic Data Collection (EDC) by NOAA Fisheries
  - Trawl and transit time from Observer data
  - Average fuel use trawling and transiting from EDC
  - Marine fuel prices from PacFIN
  - CPUE from Observer data

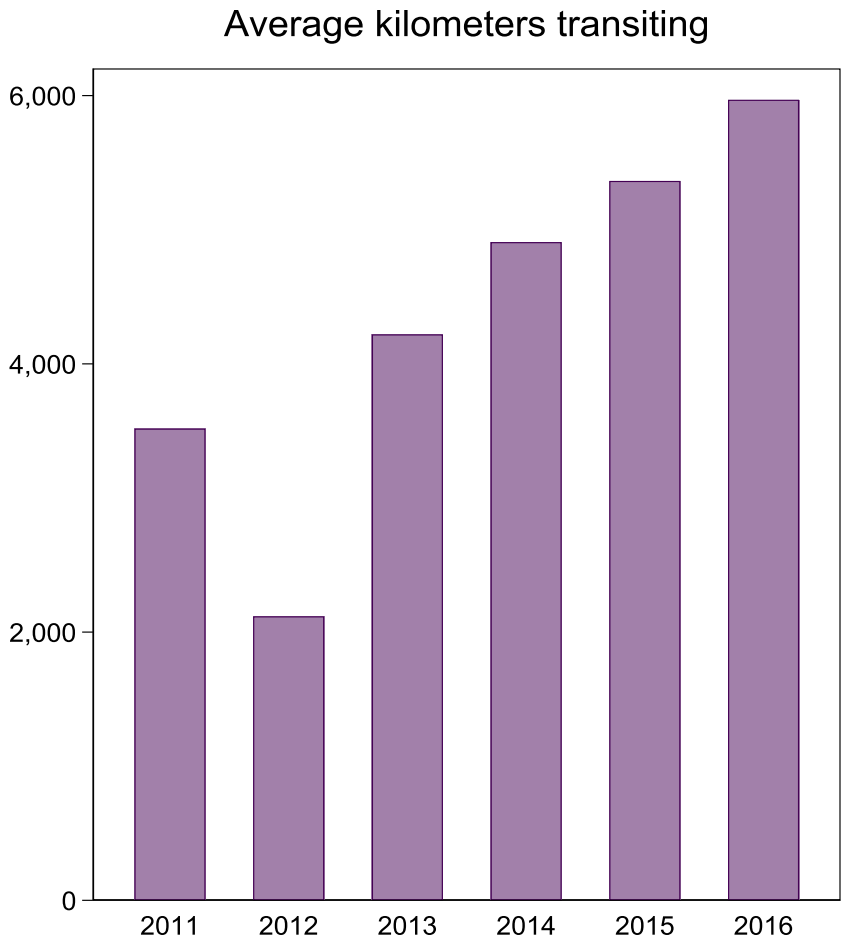
Inputs by catcher vessels





Inputs by catcher processors





From the profit function specification, we get

- Own-price elasticities of demand for inputs:

Inputs	Catcher vessels	Catcher processors
Trawling	-1.2	-0.6
Transit	-2.4	-2.4

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- Elasticity of demand for inputs with respect to output prices:

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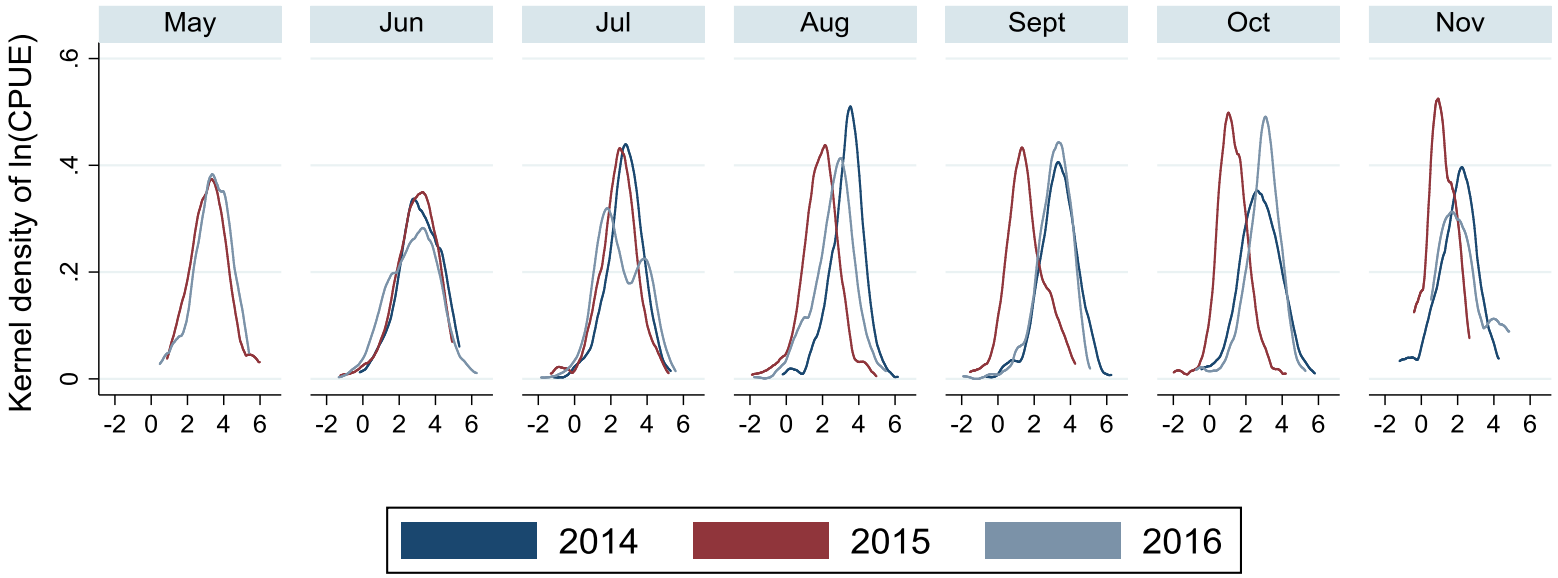
- Rate of technical progress (shift in the production function) in 2015:

RTP	**-22.3%**	**-17.9%**

Catch/hour (ln) and effort over the season



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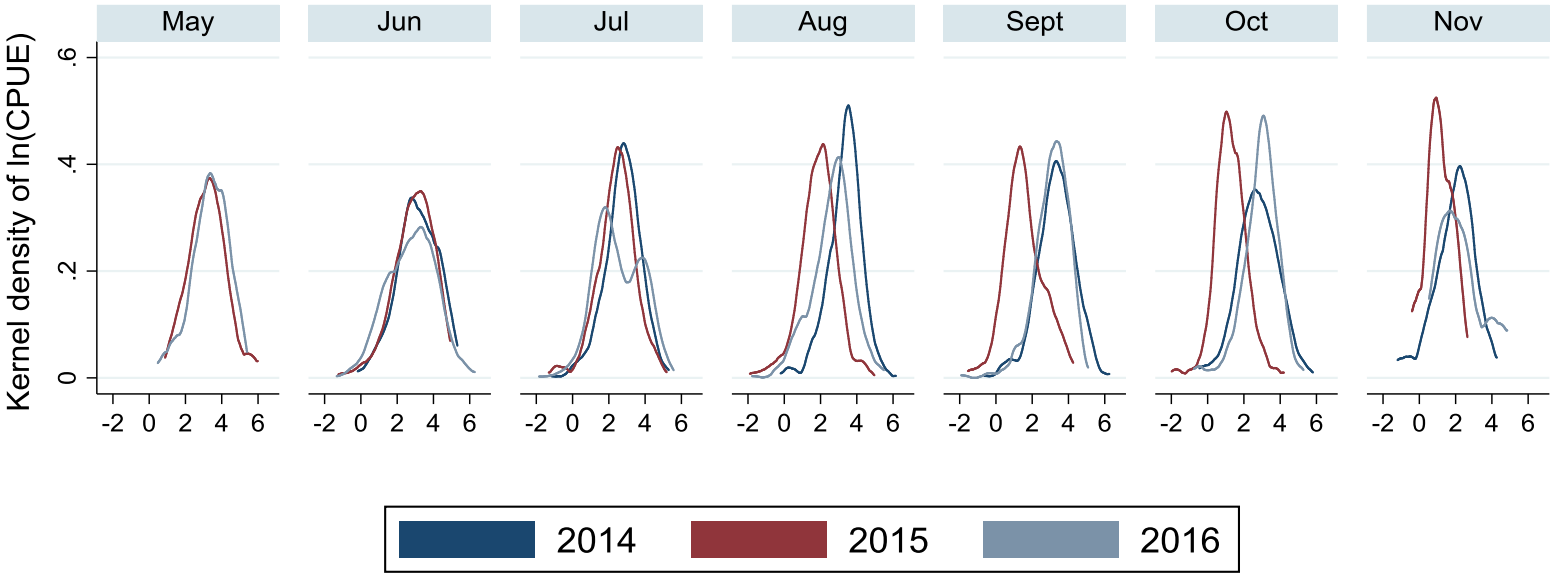

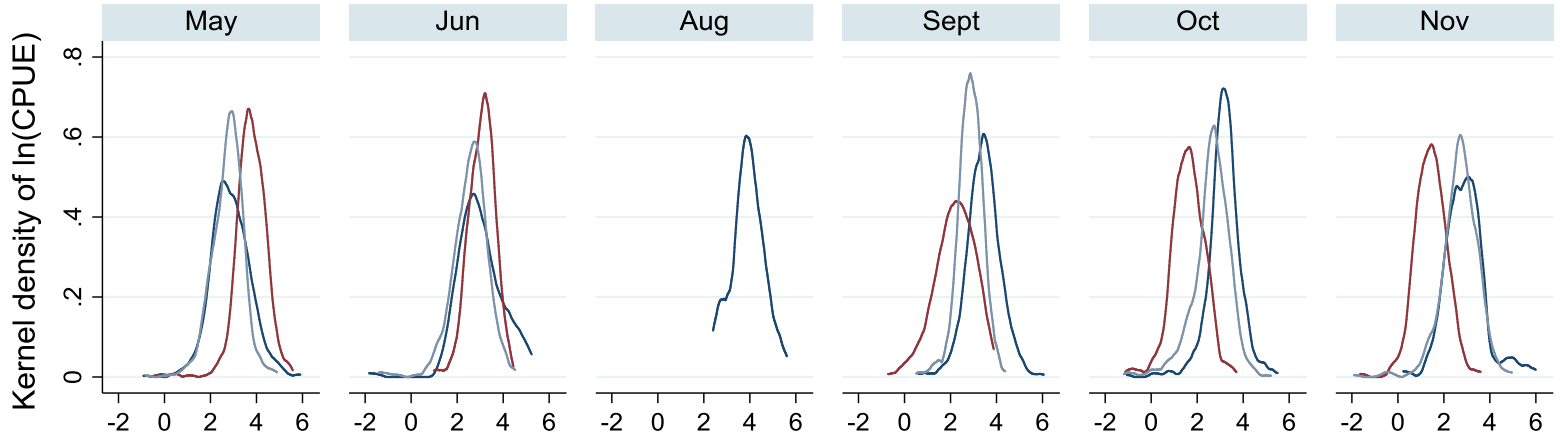

Preliminary Conclusions

- The Pacific whiting fleet experienced lower attainment, lower CPUE, and lower profitability in 2015, concurrent with the "blob"

- "Productivity" decreased by about 20% in 2015

- CPUE suggests that the most dramatic impact was in the 2nd half of 2015

Future work

- Joining extensive margin adjustments
- Incorporating at-sea mothership sector
- Incorporate the shoreside and at-sea processing sectors

- Questions?

Table e. Recent trends in Pacific Hake landings and management decisions.

Year	US landings (t)	Canada landings (t)	Total landings (t)	Coast-wide catch target (t)	US catch target (t)	Canada catch target (t)	US proportion of catch target removed	Canada proportion of catch target removed	Total proportion of catch target removed
2008	248,496	70,251	318,746	364,842	269,545	95,297	92.2%	73.7%	87.4%
2009	121,324	57,359	178,683	184,000	135,939	48,061	89.2%	119.3%	97.1%
2010	171,043	53,072	224,115	262,500	193,935	68,565	88.2%	77.4%	85.4%
2011	231,261	51,137	282,398	393,751	290,903	102,848	79.5%	49.7%	71.7%
2012	160,144	46,627	206,771	251,809	186,036	65,773	86.1%	70.9%	82.1%
2013	233,558	52,249	285,807	365,112	269,745	95,367	86.6%	54.8%	78.3%
2014	264,141	35,113	299,254	428,000	316,206	111,794	83.5%	31.4%	69.9%
2015	154,156	39,678	193,834	440,000	325,072	114,928	47.4%	34.5%	44.1%
2016	262,590	69,740	332,330	497,500	367,553	129,947	71.4%	53.7%	66.8%
2017	354,231	86,713	440,944	597,500	441,433	156,067	80.2%	55.6%	73.8%