Science, Service, Stewardship

# North Pacific Fisheries Data for Productivity Measurement

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# Characterization of the Federal Fisheries Fleets

- Most vessels target multiple species during the year
- Around 20 different major species groupings of groundfish and shellfish are targeted
- Pollock accounts for a majority of landings (56%)
- Flatfish are second (18%)
- Pacific Cod are third (16%)
- Sablefish, rockfish and Atka mackerel (10%)
  - Halibut not managed by feds

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# Characterization of the Fleet

- All fisheries are subject to TACs and (typically) bycatch limits for certain species
  - “Sideboard” allocations restrict spillover into other fisheries
  - “Prohibited species” (such as salmon, crab, halibut) bycatch may not be sold -- even though targeted in other fisheries
  - Species mix reflects targets and bycatch; varies by trip
- Regulations limit fishers’ options into various fisheries
- We have defined a set of around 20 “fleets” based upon gear, target species and location

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# Heterogeneous Fleets

- Wide range of vessel sizes, vessel types, gear types, and targeting strategies
  - Vessel sizes range from <50 feet to > 300 feet
  - Catcher vessels and catcher-processors
  - Trawl, hook and line, jig, pot gear
  - The same gear may be used to catch a range of species
  - The same species may be caught by a wide range of gear
- Hard to argue that the entire fleet shares a similar "technology"
- Need to account for different modes of operation when estimating productivity

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# Management Regimes and Fishing Technologies

- Moratoriums on entry in groundfish and crab
- Followed by LLPs
- Followed by catch share programs
  - Halibut/sablefish ITQs
  - CDQ set asides for Alaska natives
  - AFA co-ops for pollock fishery
  - BSAI crab rationalization program
  - Factory trawlers (flatfish/Amendment 80 fleet)
  - Scallop cooperative
  - Rockfish catch share program
  - Freezer longliner cooperative
- 13 other non-catch share fisheries defined by gear, area or species

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# Available "Effort" Data

- For all fisheries, we know:
  - Days at sea (estimated by start and delivery dates or from fully observed catcher-processors)
  - Vessel characteristics (length, tonnage, horsepower and more from several sources)
- For subset of fisheries (vessels with observers on board), we also know:
  - Trip length (more accurate)
  - Number of hauls and tow duration (trawl)
  - # hooks per set (longline gear)
  - # pot lifts, soak time (pot gear)
  - Federal observer coverage varies by vessel length:
    - 100% coverage for vessels > 125 feet LOA
    - 30% coverage for vessels > 60 feet & < 125 feet
    - No coverage for vessels < 60 feet
- Crew size data available for many fisheries
  - Catcher-processor vessels since (since 1993)
  - Catcher vessels catching groundfish (since 2009)
  - Catcher vessels catching crab (since 2005)

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# Revenue and Cost Data

- Revenue data are collected at the point of delivery and are updated annually to capture post-seasonal adjustments
- Weekly production reports track processing of product form by species for all catcher-processors
- Comprehensive cost data only collected in 2 fisheries
  - Crab, and Trawl Catcher-Processor (AM80) fleet
  - Some of these cost data are problematic
- PSMFC collects data on fuel prices at various Alaskan ports

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# Modeling Considerations

- Two distinct operating modes in our fisheries
  - Regulated common-pool versus rationalized
- Fishing strategies and resulting product quality have changed in rationalized fisheries
  - Fishing rate tends to slow
    - Conserve fuel
    - Smaller tows with trawls to reduce bruising
    - Longer soak time on pot gear
  - Gives appearance of reduced catch/day
    - Can generate confusing productivity measures
- What to do about stock fluctuations in multispecies fisheries prosecuted by several fleets?

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# Modeling Considerations (cont.)

- How to measure productivity gains that are not about input/output conversion but reflect quality increases and cost savings?
  - Insufficient grade and size detail to track product quality changes
  - Can infer quality changes from price changes; hedonic price or market model is required to source changes
  - Don’t have cost data collection for most of our fisheries
- Physical productivity metrics will miss much of the action and potentially confuse the issue
  - For pre- and post-rationalization comparisons
- Revenue-based models will still miss some of the cost issues
  - Profit may rise even if revenue or catch rates drop as long as cost per unit drops more

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# Closing Thoughts

- Lack of cost data makes it difficult to estimate models that rely on cost or profit data
- Different types of effort data are available in various fisheries
- Primal productivity metrics may miss catch share impacts
- How should stock fluctuations be considered?
- Alaskan fisheries are diverse and represent a broad range of fishing technologies, incentives, species, and data availability
- Need to specify different models that incorporate the elements unique to each group
  - Can be a daunting and time consuming task

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# Thanks!!