At Sea Data Collection and Use of Trip-level Economic Data in Pacific Islands Commercial Fisheries

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Presentation Outline

• Cost data collection before the “at sea” data collection programs established
• Program implementations and protocol of the “At Sea” data collection
• Database management
• Data uses
Before “At Sea” Data Collection

- Periodical or *ad hoc* cost-earnings surveys
  - Five years or longer in between
  - Often outdated when the data is available
Drawbacks of Periodical Cost-earnings Surveys

• Long planning time
  ✓ Example of 2012 data for HI longline

- 2011 proposal for funding
- 2012 funded & OMB paperwork reduction act
- 2013 fieldwork (6-10 months)
- 2014 Assessment and report preparing
- 2016 Draft report in center review
“At Sea” (real time) Data Collection implementation and protocol
Established “At Sea” Economic Data Programs in the Pacific Islands

<table>
<thead>
<tr>
<th>Fishery</th>
<th>Program Started</th>
<th>Add-on Vehicle</th>
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</thead>
<tbody>
<tr>
<td>1. Hawaii longline fishery</td>
<td>2004</td>
<td>PIRO observer program</td>
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<tr>
<td>2. American Samoa longline</td>
<td>2006</td>
<td>PIRO observer program</td>
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<tr>
<td>3. Territory - CNMI small boat</td>
<td>2009</td>
<td>WPacFIN creel survey</td>
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<td>5. Territory - Guam small boat</td>
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“At Sea” Data Collection Program
-- the example of the first program

• The will
  ✓ Requirements for economic analysis in NEPA, RFA, EO12866 to understand how regulatory programs affect net benefits to society and profitability of fishing forms

• The example
  ✓ 1995 trip cost data collection at sea at Northeast Fisheries Science Center

• The funding support from HQs
  ✓ The first telephone call from HQs in 2004
“At Sea” Data Collection Program
-- the example of the first program

• The obstacles
  ✓ Fishermen logbook OR observer program
  ✓ Logbook - Need to approval from the council

• Observer program
  ✓ The program was established to observe protected species interactions
  ✓ Managed by the Regional Office
  ✓ Economic data are viewed as personal business data (vs. observable scientific data)

• Implemented in 2004
  ✓ The initial response from the fishermen
  ✓ Prefer a volunteer program
  ✓ 30% response rate in beginning, 60% currently
Advantages of At Sea Data Collection

• Effective from planning to producing data and report
  - Five steps (funding, OMB approval, data, report) simultaneously
  - Real time & continuous
  - Continuous funding to maintain the program
  - OMB approval renew for every three-years
  - Allows for timely publication of data

• Data are in concurrent bases, not “after the fact”
• Allow cost data to be integrated with other observed data
Database Management

- ACCESS database
- Data entry design
  - Interface system
  - QAQC (min & max)
  - Admin role
    - Adjust the min & max
    - Save the data that are out of range
    - Access and edit the main database
Database Management

• Missing data and unknown information at sea
  ✓ Trips with only “fuel and bait”, knowing 77% of the total
  ✓ Estimated the other 23% (non observable and non-known by hired captains)

• Linked with other databases
  ✓ Catch & price for revenue data

• Auto-reporting system
  ✓ Pre-designed query
The Uses of the Data Collected
The Uses of the Data

1. Fisheries development assessment

• Early economics studies focused on productions
  ✓ 1978 The first economic feasibility study on the lobster fishery was conducted (Adams, 1978).
  ✓ 1979 “the economic benefits of potential expansion of Hawaii’s fishing industry” were estimated in terms of landings, value, and employment.
In early years like 2005, swordfish fishing is more profitable. Now Tuna fishing is getting more and more profitable, compared to swordfish fishing.

Bigeye tuna under quotas, so the fishing opportunity is limited.
The Uses of the Data

2. Economic performance indicators

Data source: Chris Boggs. 2016.06.28. Advice on U.S. Longline Bigeye Tuna Catch in Relation to Limits in Effect for 2016.
The Uses of the Data

3. to answer urgent calls

Longline fleet to tie up boats, post FOR SALE signs

Wed, 12/18/2013 - 9:37am | Category: Local News  Show in Skybox

By Samoa News staff

![Image of boats with FOR SALE signs](image-url)
Data show the poor economic performance of the fishery
Data were from the “at sea” data collection program (plus fixed cost)
Council took actions (such as request for tax relief, area exemption…)

* Assuming the fixed costs across years are the same as the fixed costs in 2009
The Uses of the Data

4. Compensation for a Fishery Closure

• Papahānaumokuākea Marine National Monument
• NWHI Bottomfish fishery was closed
The Uses of the Data

4. Compensation for a Fishery Closure

• $6.4 millions in relief of the closure
• How to disburse $6.4 millions?
• NPV of 30 years net income to boat owners

✓ NPV of profit of owners based on 2006 Cost-earnings study

\[
NPV = \sum_{t=0}^{n} \frac{(Benefits - Costs)_t}{(1 + r)^t}
\]

where:
- \( r \) = discount rate
- \( t \) = year
- \( n \) = analytic horizon (in years)
The Uses of the Data
5. Regulatory Impacts Analysis

EXPERIMENTAL PRODUCT
avoid fishing between solid black 63.5°F and 65.5°F lines
to reduce turtle interactions

Sea Surface Temperature: 18Jan2009-20Jan2009
Ocean Currents: 08Jan2009-14Jan2009

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ECOSYSTEMS AND OCEANOGRAPHY DIVISION
2570 Dole Street, Honolulu, HI 96822
http://www.pifsc.noaa.gov/eod/turtlewatch.php
contact: Evan.Howell@noaa.gov
Data provided by Central Pacific CoastWatch node
The Trade-off Analytical Model Built on Observers Collected Economic Data
Summary

• The success of the “At Sea” economic program relies on the collaboration of the existing data collection programs.

• At sea data collection program provides valuable and 
  *timely* information to support fisheries management.

• Database management plays important role in the data quality control and data implications.
Any Questions?
Discussion

• The will – Where are the calls for data collections from?

• The obstacles – Any difficulty for implementing data collection programs?

• The uses – How are used in the fisheries management?
  ✓ Track changes of economic performance
  ✓ Urgent calls
  ✓ Compensation/vessel buy back
  ✓ Impact analysis
Before “At Sea” Data Collection

• Early economics studies focused on productions

![Diagram showing the categorization of NWHI economic research.](image)

- Production economics
- Marketing & price
- Decision support
- Ecosystem valuation
- Cost-earnings
- Efficiency & capacity
- Regulatory impact analysis
- Modeling

✓ Production economics studies/performance indicators
✓ Regulatory impact analysis
Acknowledgments

• The fishermen of the Western Pacific Islands
• PIRO observer program & the other “at sea” data collection program & their local partners in the fields
• Database management support in PIFSC