

BSAI Crab EDR Database: Data Quality Summary

Updated January 30, 2008

AFSC/Economics and Social Science Research Program

The following discussion summarizes the validation and data quality assessment process and findings to date for the BSAI Crab Economic Data Report (EDR) database. These data quality findings have been produced through ongoing validation protocols developed to identify and minimize data quality limitations and produce guidance on use and interpretation of these data.

Data Quality Assessment and Metadata Development

The data quality assessment process for EDR data has focused on submitter feedback and data quality audits. Feedback has been collected by means of detailed comment logs maintained by the data collection agent, Pacific States Marine Fisheries Commission (PSMFC), from the 1998-2004 historical data collection in 2005 to date, as well as submitter interviews and both formal and informal meetings held by NOAA Fisheries Alaska Fisheries Science Center (AFSC) and North Pacific Fishery Management Council (Council) economists. Quantitative assessment of data quality has been conducted through mandatory data quality audits of EDR submissions through the third party data validation audit process, as required by Council motion and federal statute authorizing the BSAI Crab EDR program. Audit results have been published in annual reports and are discussed further below.

Documentation and interpretation of submitter feedback and audit results and data quality findings has been carried out in collaboration with members of the crab industry, through the Pacific Northwest Crab Industry Advisory Committee (PNCIAC), under Council direction. More detailed presentation of data quality issues and constraints, including guidance for data users on use and interpretation of the data, is provided in the BSAI Crab EDR Database metadata documentation (available for download at <http://www.fakr.noaa.gov/sustainablefisheries/crab/rat/edr/default.htm>). Formal review of the metadata document by PNCIAC was conducted during May-June, 2008, with detailed comments submitted to AFSC, and formal replies provided by AFSC economics staff and presented in public meeting in September, 2008. Where appropriate, comments submitted to AFSC were incorporated into the metadata document. This document will continue to be revised and updated as additional annual data collections are completed, further understanding of data quality limitations and appropriate interpretation is gained, and improvements in the data collection methods are implemented. Thorough review of the metadata document should be considered a prerequisite to any authorized user of the EDR database before beginning analysis using these data.

This summary is presented as a brief review of the most important data quality issues described in the EDR metadata document, and to highlight specific data elements or components of the database. These specified data elements should be used for limited purposes and in many cases data quality limitations should be specifically addressed in any published release of analytical results.

Data Validation Audit Results

Detailed audit reviews of EDR records by the accounting firm Aldrich, Kilbride, and Tattone, LLC (AKT) of Portland, OR, have been conducted following completion of the data collection in each year since implementation of the EDR program. The methods and findings of these audits are described in annual reports issued by AKT (Pacific States Marine Fisheries Commission, 2007; Aldrich, Kilbride and Tattone, 2008; available online at http://www.psmfc.org/alaska_crab/). In addition to published reports, AKT provides a database of audit findings to PSMFC, reporting specific findings regarding the accuracy and documentary support provided by individual EDR submitters for each data element included in the audit review. These data are incorporated into the EDR database and provided to AFSC in blind format (i.e., with individual and business identifying information removed). Analysis of the audit results is included in the EDR database metadata, presenting statistical results by individual data element for the number of observations audited, percentage of observations assessed by auditors as adequately supported by documentation, and mean and standard deviation of both per cent error and absolute value of per cent error (detailed methods are included in the metadata document). Figures are also included plotting the values originally reported for each data element against the value determined as correct by the auditors (with the axis scale values omitted to protect confidential data) to provide a visual representation of data accuracy. These figures represent only those reported values for which adequate documentation and support was provided to auditors to permit assessment of the accuracy of the reported values, and do not represent observations which were assessed by auditors as unsupported. For those data elements with relatively high levels of unsupported observations in the audit sample, the reported statistics and figures may be a poor representation of the accuracy of the data element within the dataset as a whole for specific years.

Data and histogram figures are also presented in the metadata describing the categories of documentation or support supplied by submitters to auditors for each data element, and the number of instances that each category of support (including “no support”) was included in materials supplied to auditors. It should be noted that multiple types of support for a particular reported value are often provided to auditors by a submitter and the counts as reported include all types of support provided. As a result, the sum over all counts of support types typically exceeds the number of observations for a given EDR value. Additional notes on interpretation are included in the metadata document.

There has been some misunderstanding among audited EDR submitters and other members of the industry regarding acceptable forms of support provided to auditors and the assessment of a “supported” finding for a particular reported value. A consistent result that auditors have described is that internal monitoring, accounting and documentation methods employed by EDR submitters varies widely in the industry. This has presented perhaps the greatest challenge to both collecting and assessing the accuracy of the data, and has required that audit personnel exercise some judgment regarding the completeness and sufficiency of evidence supplied to support a reported value. Nonetheless, standard audit methods have been employed throughout. Where clear third party documentation in the form of invoices, financial statements, payroll records or other standard accounting records are lacking, less formal evidence may be assessed to be sufficient if it is consistent with other documentation and can be justified to the auditor. That assessment, however, is not revealed to the submitter and there has not been a process yet implemented for the auditor to “reject” the supplied documentation and begin an iterative process to compel more

complete information (i.e., at this point either a “supported” or “unsupported” condition is applied). To date there has been minimal feedback provided to submitters regarding their individual performance in the audit process and minimal enforcement action taken against submitters who have been unable to provide sufficient documentation to support the accuracy and completeness of the EDRs they have submitted (except in cases of gross noncompliance). There is some danger that this lack of feedback has resulted in an impression within the crab industry that complete and credible evidence is unnecessary and virtually any response to the audit request is regarded as sufficient. To the contrary, the auditors have reported, and the metadata show, numerous instances of unsupported EDR values, based on rigorous review of evidence supplied to auditors. How to improve reporting and documentation practices is an issue we plan to address through further consultation with industry and will do so in the context of ongoing efforts to revise the EDR process to improve data quality, to be completed in 2009.

As a final note on the audit results, care should also be taken not to overstate the representativeness of these statistical results to the EDR database as a whole. While the sampling procedures used to select the audit sample for each year have focused on providing a representative sample of the EDR submitter population overall, within individual sectors and individual data elements the number of observations audited is often too small to extrapolate these results. Attempting to gain additional statistical rigor would require substantially greater reporting burden, which has been judged to be inappropriate. Further, given the nature of the phenomena being monitored in the EDR program, without a far more invasive intervention to standardize accounting methods in the industry, it is unlikely that such an attempt would be successful. Nonetheless, the audit process has been and continues to be essential to assessing the quality of EDR data, and to providing insights that will be most useful in improving the effectiveness of economic monitoring in the crab fishery and elsewhere.

PNCIAC Data Quality Review

As a general principal, the purpose of the PNCIAC data quality review has not been to proscribe use of individual variables or entire years in the EDR data series. Rather, the purpose has been to identify data quality limitations, propose interpretive guidance to data users, and identify appropriate measures for addressing data quality limitations in any published analyses using EDR data. The findings are summarized below for specific variables that were determined by consensus to exhibit substantial data quality limitations. To facilitate easier access to information included in the EDR metadata, both for data users as well as readers and reviewers of analyses using EDR data, a rating system has been incorporated into the metadata to classify data elements into three categories ranging from high to low quality, with the latter of limited use requiring data users to document methods used to address the data quality limitations (detailed in the metadata and summarized below) in any published analyses incorporating these data elements. Further detail on these categories is also provided below.

General EDR Data Quality Issues

In addition to ratings and interpretive notes specific to individual data elements, a number of data quality issues that apply to larger groups of data elements have been identified and are

important for data users to recognize and address if using the affected data elements. These include the following:

Multi-year production and sales data elements: The EDR program collects data on an annual, calendar year basis. This is consistent with other annual monitoring programs in state and federally regulated fisheries; however, this is in contrast to the management and execution of the crab fishery, which is conducted on a July-June annual schedule. In most regards, this does not raise serious data quality concerns for the harvest sector. Although there is potential for late post-season settlements to still be pending from quota lease, crab sales and/or labor contracts for the previous calendar year at the time of the EDR submission deadline in late June, there is no evidence that it has significantly affected accurate reporting in the EDR data. Of greater concern are data elements collected in the crab processing (including catcher processor) sector that, in many instances, reflect a multi-year process of receiving raw crab, processing (sometimes in multiple stages), inventory, and first wholesale disposal of finished products. The EDR process captures these activities and associated material use, costs, and revenues on a discrete, calendar year annual basis, despite the reality that the income and material flow is a highly continuous process and breaking the data into discrete annual figures is somewhat artificial. In particular, due to varying lengths of storage periods for crab product inventory, processing data and final sales data generally do not reflect the same initial raw crab inputs. That is, while some volume of crab product is sold at first wholesale in the same calendar year in which it is landed, sales data reported in the EDR can reflect sales of crab from inventory that was initially processed prior to the year for which the EDR is filed, as well as some fraction of the crab landed and processed in the reporting year. As such, processing and sales data reported in the processing sector EDRs are not expected to correspond. Additional detail on data quality and interpretation for data elements that are particularly affected by this dynamic is included in the metadata and summarized below. It is important for analysts and users of published results from these data to understand the nature of the product and income flow in the crab fishery and interpret the data appropriately.

Pro rata methods: Most data elements in the crab EDR are to be reported for the crab fishery exclusively, and in many cases are reported separately for individual crab fisheries. A set of data elements for costs that are incurred for the vessel or plant on an annual basis rather than on an incremental basis for individual fisheries are also reported. While this structure assumes that there is clear differentiation between crab-only costs and annual vessel/plant costs, submitter feedback indicates that in many cases, material usage and associated costs cannot practically be monitored at the level of detail necessary to differentiate between costs and inputs used in the crab fisheries and those associated with other fisheries without substantially increasing the reporting burden placed on EDR submitters. In general, submitters employ a variety of pro rata methods to estimate the amount of material use and cost associated with individual fisheries where internal records do not permit more direct association and reporting. The EDR forms do not effectively control for when pro rata estimation or direct reporting occur or for different pro rata methods that are employed by the submitter.

Data are collected in the EDR forms to permit the construction of indices for prorating data elements that are reported as annual values for various purposes. Each EDR record includes values for total days operating in all fishery-related activity, total

annual harvest and/or product sales volume and revenue, and total labor costs, which, combined with similar data reported for crab fisheries, identify pro rata indices based on days operating, landings and product volume and value, and labor cost. While it is not appropriate in the database documentation to prescribe a particular pro rating method for individual variables, it is recommended that analysts perform sensitivity analyses using different methods to determine the effect of different assumptions on analytical results.

Bering Sea Tanner crab fishery: The Bering Sea Tanner crab fishery was not opened in any of the pre-rationalization years for which reference data were collected in the historical crab EDR, and data from this fishery have been collected only for 2005 and subsequent years. Feedback from submitters indicates that the small number of vessels operating in this fishery have generally co-targeted the species with the Bering Sea snow crab fishery, with Tanner crab being a secondary target. This makes differentiation between these fisheries in reporting fishery-specific data in the EDR particularly difficult, and it is unclear whether harvest activity and labor- and material- input and cost data reported specific to the Tanner crab fishery is concurrent or differentiated from data reported for the snow crab fishery. As such, the Tanner crab fishery data should be used only for limited purposes, and any analysis using these data should present a description of methods for addressing these data quality limitations. Use of data reported for the snow crab fishery by vessels with large landings in the Tanner crab fishery should be carefully examined to determine whether these data can be assumed to reflect the snow crab fishery exclusively. Rules passed by the Alaska Board of Fisheries in 2008 prohibit co-targeting these species starting in the 2008/2009 fishery. This will improve the ability of submitters to distinguish values for this fishery from other crab fisheries, subject to limitations already noted above with regard to prorating in general.

Non-processing crab IPQ holders: Due to the statement of conditions requiring EDR submission by crab processing firms contained in 50 CFR 680.6(f) and (h), processors who hold IPQ and purchase crab but do not process any crab in their own plant in a given year (i.e., processors who contract for custom processing of all their IPQ) are currently exempt from EDR requirements. As such, the EDR data does not represent a full census data collection for the processing sector, and aggregating data across processors in a given fishery will not produce figures that represent the full value for such measures within the processing sector. Data analysts who present results based upon these data must make clear that the results represent only the component of the processing sector that physically processed crab in a given year.

Data elements affected by this include the following:

- Crab Freight costs
- Product Storage Costs
- Tax Cost
- Broker Cost
- Proc Pack Cost
- Other Crab Costs
- Total FOB revenue
- Processed Pounds
- Supplied to Custom Processor Pounds
- Crab Purchased Pounds
- Finished Pounds

Location-specific data elements: Several crab-specific and annual cost elements are reported in the EDR forms by location of purchase. In many cases, location of purchase is unknown by the person completing the EDR form and available documentation is limited to invoice billing address for some costs. Reporting of location of purchase based on this and other types of source documentation likely undercounts amount of sales in Alaska locations that are billed from a separate billing office. This effect is more pronounced for processing plants with complex service and materials sourcing; location of purchase information for harvest vessels is generally accurate as reported.

Variable-Specific Data Quality Limitations

The PNCIAC review process identified a classification system to simplify the characterization of data quality limitations for specific data elements in the EDR database. Each data element identified in the EDR database is coded in the metadata according to the three-letter classification, with separate classification for the 1998-2004 historical data and the 2005 and later data. This index is intended to provide both data users and readers and users of analyses based on these data with a simplified means of navigating the complex structural and data quality information reported in the EDR metadata. The criteria for classifying each data element are the following:

Category A: These data elements have been determined to exhibit minimal known data quality limitations. Users of these data are advised to carefully review the metadata to understand the structure of these data before performing analysis; however, these data as reported in the EDR database are consistent with the variable descriptions included in the EDR forms and detailed in the metadata.

Category B: These data elements are characterized by significant data quality limitations and require careful understanding of the data quality documentation in order to ensure their appropriate use and interpretation. These elements are reliable for use in economic analysis of the crab fisheries, provided adjustments to analytical methods or interpretation are undertaken to overcome the noted data quality concerns. Where possible, the metadata specifies the nature of the adjustment that can or should be utilized.

Category C: These data elements are not reliable for analysis of the economic performance of the crab fisheries. A substantial portion of the data collected is known to contain significant error, which cannot be identified or estimated.

Category B and C data elements are listed below with summaries of the data quality descriptions and interpretive guidance extracted from the metadata document. Unless otherwise noted, those variables in the database not included below have been found to be of sufficient data quality (Category A) that data users/analysts may proceed to use these data without special precautions. In all cases, however, data analysts are advised to carefully review the data structure, year-version changes and data quality notes provided in the metadata document. A full listing of all primary variables in the EDR database and their data quality classification values is provided beginning on page 23 of this document. Of the 155 primary variables in the database (i.e. individual data elements collected in one or more EDR versions, where each variable reported by location, fishery, or other stratification

comprises a single primary variable), 45 (31%) are currently classified as Category A, 54 (37%) are classified as Category B, and 46 (32%) are classified as Category C variables in one or more years.

It should be noted that data quality information and interpretive guidance for category B and C variables will continue to undergo refinement and the data are analyzed and as AFSC, Council staff, and PNCIAC continue collaboration on methods for revising the EDR process to improve the quality of data collected in the future and to better validate existing data to the extent possible. Certain variables currently classified as Category C represent key variables (e.g. IFQ lease prices and fuel costs) and further research is planned to improve the quality of data collected to date.

The following data quality descriptions are organized following the format of the EDR forms, with data elements grouped by EDR data entry table. Individual data elements are listed with the data quality classification codes by year in brackets, followed by references to the EDR relational database table and field names identified in the metadata document. Variables that were not collected in either the historical or post-rationalization (98-04 or 2005-), i.e., were either dropped from or introduced to the EDR after the historical data collection, are coded N/C.

BSAI Crab Activity

days at sea [Rating: 98-04: **C** | 2005-: **N/C**]

days fishing [Rating: 98-04: **N/C** | 2005-: **B**]

days traveling and offloading [Rating: 98-04: **N/C** | 2005-: **B**]

table/field name(s):

crab_activity/days_at_sea

crab_activity/days_fishing

crab_activity/days_travel_offload

Summary: Pre- and post-rationalization data are not directly comparable due to changes in the definition of data elements. The 1998-2004 data were poorly documented in audit results and should be regarded as approximations. Neither *days_at_sea* nor *days_fishing* + *days_travel_offload* include days on strike, days in port working on vessel/gear maintenance, or days steaming between home and departure port, during which time additional costs are incurred for operating in the crab fishery. These data should be supplemented with crab observer program and CFEC fish ticket data to ensure a consistent basis for comparison over the full data series.

Days_at_sea was collected only in the historical data collection; this changed to *days_fishing* and *days_travel_offload* for 2005 and later years. *Days_at_sea* includes travel to/from fishing grounds and excludes travel to/from out-of-state port and days offloading at processors. *Days_fishing* is defined as the number of days operating on fishing grounds. *Days_travel_offload* includes days steaming to/from fishing grounds and days queuing and offloading at processors. All years exclude days traveling to/from out-of-state port; however, this was not explicit in the directions of the 2005 EDR and some observations may be inflated.

Analysts should use caution when comparing *days_at_sea* from 1998, 2001, and 2004 EDR data to 2005 and 2006 data for *days_fishing* and *days_travel_offload*. As collected, these data are not directly comparable. It is recommended that historical data series be

supplemented with estimates of days fishing by fishery from CFEC fish tickets and the state crab observer database to provide a consistent measurement of days fishing through the entire data time series. It should also be noted that short seasons (e.g., 50 hours) in the pre-rationalization period result in the potential for greater proportional measurement error for the *days_at_sea* variable and any statistics calculated on a per day basis using this data.

The validation audit indicated that the documented basis for EDR entries for *days_fishing* is most commonly fish ticket dates. The basis for data entered for *days_travel_offload* is much less consistent and is often estimated. Analysts should also note that days at sea/fishing/traveling and offloading exclude days transiting to/from out-of-state port, days on strike, and days spent on repair and maintenance related to crab fishing.

Days processing [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

crab_activity/days_processing

Days_processing in individual fisheries are not mutually exclusive; summing across multiple fisheries will overcount the total processing days in crab fisheries. Note that *days_processing* measures days on which crab processing occurred.

Pots lost [Rating: 98-04: **C** | 2005-: **N/C**]

table/field name(s):

crab_activity/pots_lost

The *pots_lost* variable was inconsistently reported in the 1998-2004 EDRs and dropped from subsequent data collection. These data are not recommended for any use.

CFEC fish ticket numbers [Rating: 98-04: **C** | 2005-: **C**]

table/field name(s):

fish_tickets/fish_ticket_number

Summary: Fish ticket numbers are inconsistently formatted in the data as entered and are a poor source for computerized linking of EDR records to CFEC records.

The 1998 through 2005 fish tickets as entered did not consistently include the full fish ticket ID with year code. Use of these fields to link to the CFEC database would require extensive editing of data currently in the EDR database. CFEC fish ticket records have been linked to EDR records by database administrators using license numbers in the certification data section of the EDR (visible only to PSMFC). See the *akfin_edr_fish_tickets_v* table in the secondary data fields tab of the metadata document.

BSAI Crab Processing Activity

Generally, the sale of crab product lags behind production for several months depending on the length of time finished product is held in inventory. As such, sales reported in Annual BSAI Crab Sales tables will not correspond completely to production reported in BSAI Crab Processing Activity tables, and sales may reflect production from prior year(s). Analysis of rents will require the multi-year production and sales process to accurately reflect net revenues. Also note that due to the reporting exemption of registered crab receiver (RCR)

permit holders that purchased but did not process crab, the total volume of crab in the processing sector is undercounted in Annual BSAI Crab Sales tables.

Product code [Rating: 98-04: **B** | 2005-: **B**]
Process code [Rating: 98-04: **B** | 2005-: **B**]
Crab size code [Rating: 98-04: **C** | 2005-: **C**]
Crab grade code [Rating: 98-04: **C** | 2005-: **C**]
Box Size [Rating: 98-04: **B** | 2005-: **B**]
Finished Pounds [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

crab_production_out/product_code
crab_production_out/process_code
crab_production_out/crab_size_code
crab_production_out/crab_grade_code
crab_production_out/box_size
crab_production_out/finished_pounds

Summary: *Crab_size_code* and *crab_grade_code* do not support comparison of production quantity by size or grade across processors or time and are not recommended for use in analysis. Use of product code, process code, box size, and finished pounds data should note the lag between production and sales and the EDR-filing exemption of non-processing RCR permit holders.

Crab sizing and grading is not consistent over time for a given processor or across different processors, and varies depending on the intended market for product; the data does not support comparison of production quantity by size or grade across processors or time. For most analytical purposes, data users should aggregate finished pounds values by product form (fishery code, product code, and process code) over all size and grade code values.

Annual BSAI Crab Sales

See the note above regarding the lag between production and sales and the exemption of non-processing RCR permit holders.

Product code [Rating: 98-04: **B** | 2005-: **B**]
Process code [Rating: 98-04: **B** | 2005-: **B**]
Crab size code [Rating: 98-04: **C** | 2005-: **C**]
Crab grade code [Rating: 98-04: **C** | 2005-: **C**]
Box Size [Rating: 98-04: **B** | 2005-: **B**]
Finished Pounds [Rating: 98-04: **B** | 2005-: **B**]
FOB Revenues [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

crab_process_sales/product_code
crab_process_sales/process_code
crab_process_sales/crab_size_code
crab_process_sales/crab_grade_code
crab_process_sales/box_size
crab_process_sales/finished_pounds_sold

crab_process_sales/fob_revenues

Summary: *Crab_size_code* and *crab_grade_code* do not support the comparison of production quantity by size or grade across processors or time and are not recommended for use in analysis. Use of product code, process code, box size, finished pounds sold, and FOB revenue data should note the lag between production and sales and the EDR–filing exemption of non-processing RCR permit holders.

Crab sizing and grading is not consistent over time for a given processor or across different processors, and varies depending on the intended market for product; the data does not support comparison of production quantity by size or grade across processors or time. .For most analytical purposes, data users should aggregate finished pounds values by product form (fishery code, product code, and process code) over all size and grade code values.

BSAI Crab Custom Processing Done For You

See the note above regarding the lag between production and sales and the exemption of non-processing RCR permit holders.

Product code [Rating: 98-04: **B** | 2005-: **B**]
Process code [Rating: 98-04: **B** | 2005-: **B**]
Crab size code [Rating: 98-04: **C** | 2005-: **C**]
Crab grade code [Rating: 98-04: **C** | 2005-: **C**]
Box Size [Rating: 98-04: **B** | 2005-: **B**]
Finished Pounds [Rating: 98-04: **B** | 2005-: **B**]
Processing Fee [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

custom_process_hired/product_code
custom_process_hired/process_code
custom_process_hired/crab_size_code
custom_process_hired/crab_grade_code
custom_process_hired/box_size
custom_process_hired/cust_hired_finished_pounds
custom_process_hired/cust_hired_process_cost

Summary: A large fraction of custom processing services purchased are unreported in the EDR database due to the exemption of non-processing crab buyers. The 1998-2005 *crab_size_code* and *crab_grade_code* data do not support the comparison of production quantity by size or grade across processors or time and are not recommended for use in analysis.. Use of product code, process code, box size, finished pounds, and processing fee data should note the lag between production and sales and the EDR–filing exemption of non-processing RCR permit holders.

Crab sizing and grading is not consistent over time for a given processor or across different processors, and varies depending on the intended market for product; the data does not support comparison of production quantity by size or grade across processors or time. .For most analytical purposes, data users should aggregate finished pounds values by product form (fishery code, product code, and process code) over all size and grade code values.

Raw Crab Purchases from Delivering Vessels

IFQ Code [Rating: 98-04: **N/C** | 2005-: **B**]

Crab size code [Rating: 98-04: **C** | 2005-: **C**]

Crab grade code [Rating: 98-04: **C** | 2005-: **C**]

Raw Pounds Purchased [Rating: **98-04: B** | **2005-: B**]

Gross Payment [Rating: **98-04: B** | **2005-: B**]

table/field name(s):

crab_purchased/ifq_code

crab_purchased/crab_size_code

crab_purchased/crab_grade_code

crab_purchased/pounds_purchased

crab_purchased/gross_cost

Summary: *IFQ_code* was introduced for the SP/FP sector beginning in 2006; CP sector purchases are not differentiated by IFQ type. *Pounds_purchased* data do not include purchases by buyers that do not process crab in a given year and are exempt from reporting. *Crab_size_code* and *crab_grade_code* do not support the comparison of production quantity by size or grade across processors or time and are not recommended for use in analysis.

Note that crab buyers that do not process crab (e.g., those that send all crab for custom processing) are exempt from the EDR requirement and are not represented in the EDR data. Therefore, *pounds_purchased* summed over all processors may not equal the sum of pounds sold by harvesters in a given fishery, and in some cases (e.g. the Eastern Aleutians golden king crab fishery) may diverge by almost 50%.

BSAI Crab Quota/Catcher Vessel Owner Annual IFQ Allocation

Quota harvested (pounds) – by quota type and fishery [Rating: 98-04: **N/C** | 2005-: **C**]

Quota transferred (pounds) – by quota type and fishery [Rating: 98-04: **N/C** | 2005-: **C**]

Quota transferred (revenue) – by quota type and fishery [Rating: 98-04: **N/C** | 2005-: **C**]

table/field name(s):

owner_ifq_allocation/pounds_harvested

owner_ifq_allocation/pounds_transferred

owner_ifq_allocation/revenue_from_transfer

Summary: Data for *pounds_harvested*, *pounds_transferred*, and *revenue_from_transfer* for all fisheries and quota types were poorly documented in the validation audit, reflected highly irregular transaction agreements, and are not regarded as reliable.

Submitter feedback indicates that these data are difficult to interpret given the large number of irregular, non-arms length transactions (i.e. transactions which differ from market rates), including trades between affiliates and in-kind transactions, and differences in the management of distinct pools of quota shares held by a given vessel owner. These data are not reliable representations of quota market transactions.

BSAI Crab Quota/BSAI Crab CDQ and IFQ Lease Costs

Quota leased (pounds) – by quota type and fishery [Rating: 98-04: **C** | 2005-: **C**]

Quota leased (cost) – by quota type and fishery [Rating: 98-04: C | 2005-: C]

Number of crew contributing C-share quota [Rating: 98-04: C | 2005-: C]

table/field name(s):

quota_lease_costs/leased_lb

quota_lease_costs/ lease_cost

quota_lease_costs/ num_crew_contribute

Summary: Data for *leased_lb*, *lease_cost*, and *num_crew_contribute* for all fisheries and quota types were poorly documented in validation audits, reflected highly irregular transactions agreements, and are not regarded as reliable.

Labor Information/Crab Harvesting & Processing Labor Costs

Average Crew Size [Rating: 98-04: B | 2005-: N/C]

table/field name(s):

crab_labor/avg_crew_size

Avg_crew_size was collected in the 1998-2004 catcher vessel EDR and dropped from data collection starting in 2005 due to duplication with e-landings data, which began monitoring crew size at the landing in 2005.

Number of Crew with Pay Determined by Processing Work (CP's only)

[Rating: 98-04: B | 2005-: B]

table/field name(s):

crab_labor/num_processing_crew

Harvest and processing labor are not mutually exclusive; summing *num_processing_crew* and *crew_earning_shares* will overcount total labor to an unknown degree.

Average Number of Crab Processing Positions [Rating: 98-04: C | 2005-: N/C]

table/field name(s):

crab_labor/avg_num_proc_positions

Summary: Numerous sources of variation in methods of reporting these data elements may confound variation associated with changes in processing employment in the crab fishery. These data are not reliable.

Feedback from processors indicates that “crab processing positions” is artificial; values reported by some processors are the average number of crab processing positions (*avg_num_proc_positions*) computed based on total man-hours of crab processing labor at the plant during the year, divided by the number of work-days that the plant operated, assuming a 12-hour work day. Other processors reported the average number of individuals working on the crab processing line during the crab season. Due to unknown variation in reporting, these data should not be considered as reliable.

Labor Information/Labor Payment Details

Other labor-related expense [Rating: 98-04: C | 2005-: C]

table/field name(s):

harv_labor_pay_dtl_other/other_lpd_desc
harv_labor_pay_dtl_other/other_lpd_code
harv_labor_pay_dtl_other/other_lpd_value

These data are reported without specific direction and are not reliably or consistently reported. Lack of a reported value for any or all “other” cost categories in an EDR record may not represent a valid zero value. Further validation is needed to determine the appropriate use of these data. These data cannot be compared among vessels/plants or over time as a reliable measure of vessel or plant economic performance or changes in the fishery.

Labor Information/Revenue Shares

Owner share % [Rating: 98-04: B | 2005-: B]

Crew share % (excluding captain) [Rating: 98-04: B | 2005-: B]

Captain share % [Rating: 98-04: B | 2005-: B]

Processing worker revenue shares; % of net share [Rating: 98-04: C | 2005-6: C]

Processing worker revenue shares; % of product value [Rating: 98-04: C | 2005-6: C]

table/field name(s):

revenue_shares/revshare_owner
revenue_shares/revshare_crew
revenue_shares/revshare_capt
revenue_shares/revshare_procemp_net
revenue_shares/revshare_procemp_prodval

Summary: Numerous sources of variation in methods of reporting these data elements may confound variation associated with changes in crew compensation in the crab fishery. Careful analysis of these data is required to isolate variation in reporting from explanatory effects that can be attributed to these data elements. Processing worker revenue share information is not considered reliable and is not recommended for use in analysis.

The 1998-2005 catcher vessel and catcher processor EDRs labeled the vessel owner share of revenues variable as “Boat Share,” which is inconsistent with the use of the term in other fisheries; this was changed to “Owner Share” beginning in the 2006 EDR to avoid misinterpretation. This is not expected to produce significant error in the data; however, these data can be validated by summing over *revshare_owner*, *revshare_crew*, and *revshare_capt*, which should sum to one (note that *rev_share_capt* is not populated for the 1998-2004 data—see below).

The 1998-2004 CV and CP EDRs defined crew shares as including both the captain and deck crew; comparison of the 1998-2004 *revshare_crew* data to 2005 and later data requires aggregation of captain and crew shares (*rev_share_crew* + *revshare_capt*) in 2005 and later data series. Some observations in the 2005 and later data reported captain and crew share data together; these observations are flagged in the URcode and UR field in the data record and should be censored in analysis focused on the division of shares between captain and crew.

Analysts should note that deductions from crew pay (identified in *harv_labor_pay_detail*) will result in a different basis for share payments and percentages; comparisons across vessels or years cannot be made without controlling for different deductions.

In cases where an owner operates multiple vessels, payments to a particular crew may be based on the **average daily revenue received** by all vessels operated by the same owner. In such cases, differences in share percentages between vessels reflect vessel owners' methods for distributing earnings more equitably among multiple crews rather than differences in actual crew share percentages across vessels under common ownership.

Processing worker revenue shares were included in the EDR data collection for the CP sector from 1998-2005, and were reported as the percentage of net product value or a net share, but were not differentiated between different crab fisheries. Submitter feedback indicates that the standard basis for share payments in the CP sector is "FOB AK" revenues for crab sales, but this was not specified in the form and variation in share basis across vessels selling on different FOB terms is not controlled for; as such, reported revenues may differ among processors according to the different transportation costs associated with different areas. The processing employee revenue share (*revshare_procomp_net*, *revshare_procomp_prodval*) data elements were dropped from the data collection in 2006. Data for CP processing worker revenue shares are not considered reliable for analysis of changes in processing crew compensation.

Labor Information/BSAI Crab Crew Residence/BSAI Crab Crew Licenses

Crew/Employee Residence (City, State, Country) [Rating: 98-04: **B** | 2005-: **B** | 2006-: **N/C**]

Harvest Crew Count, by residence location [Rating: 98-04: **C** | 2005: **B** | 2006-: **N/C**]

Processing Crew Count, by residence location [Rating: 98-04: **C** | 2005-: **B**]

C/P Crew Count, by residence location [Rating: 98-04: **C** | 2005-: **N/C**]

Crew Licenses [Rating: 98-04: **N/C** | 2005: **C** | 2006-: **A**]

Crew Gear Operator Permit [Rating: 98-04: **N/C** | 2005: **C** | 2006-: **A**]

table/field name(s):

crew_residence/location

crew_residence/locate_code

crew_residence/hcrew_res_count

crew_residence/procomp_res_count

crew_residence/labor_res_count

harv_crew_lic_permit_nums/crew_lic_num

harv_crew_lic_permit_nums/crew_gear_permit_num

Summary:

- Crew and processing employee count data are intended to measure counts of individuals that participated in the fishery during some or all of the crab seasons in the calendar year; they are not a measure of crab crew size or exclusively crab processing labor force. Prior to 2006, CV and CP harvest crew and processing employee counts, residence, and crew license data are incomplete and should not be taken to represent a full census of all crew and process employee participants in the crab fisheries. Multiple structural changes in the collection of these data in catcher processor and catcher vessel EDRs occurred over the 1998-2006 period and use of these data in analysis of crew and processing employee participation across

- vessel/plants, or over time, is not supported due to lack of continuity in the time series.
- For all years, aggregating data for CP harvest and processing crew will overcount fishery participation due to CP crews' labor in both harvest and processing activity.
 - For all years, non-Alaska residence information is unverified.
 - Participation of individual processor employees in crab processing is not systematically tracked and counts reported by shoreside and stationary floating processors (*crew_residence/procemp_res_count*) may represent the entire processing labor force of the plant. In some cases, these data substantially overcount crab processing employees by residence and cannot be used to identify magnitude or locational impact of crab processing employment.
 - 2005 harvest crew license and permit data are incomplete; 2006 and subsequent data on harvest crew license and permit numbers are considered accurate and complete.

These labor data elements are structurally complex and most of the data elements have undergone substantial changes in EDR forms from the historical data collection to current EDR forms. Reported place of residence (*location*) acts as a primary key in the relational structure, however, due to incompleteness of reporting in 1998-2004 data, lack of a crew or employee count observation for a given location does not reliably indicate that no crew or process employee from that location participated in the crab fishery. See the EDR metadata for a full description of changes and the relational structure of these data elements.

1998-2004 EDRs for CV harvest crew residence and harvest crew count (*location, hcrew_res_count*), used counts by open-ended location. The 2005 CV EDRs separated reporting for licensed and unlicensed crew, with reporting of commercial crew license number or CFEC gear operator permit and place of residence for each licensed captain or crew member on the vessel during the reporting year. Counts of "employees without crew license" by place of residence were also collected in the 2005 CV EDR; given that unlicensed crew on catcher vessels is prohibited by law, submitter feedback has indicated that these data represent crew with unknown license numbers, and have been aggregated with counts of licensed crew by residence in the database. The *hcrew_res_count* variable for 2005 is considered a complete count of crew who worked on the vessel during the calendar year. As with SP/FP data, counts by Alaska residence are considered reliable; out-of-state residence information is unverified.

The 2006 and later CV EDR form requires only crew license number and/or CFEC permit number; residence information for 2006 and later data can be identified by linking to the ADF&G crew license and CFEC gear permit registry databases. All license/permit numbers are verified and considered reliable starting in 2006.

Data for CP crew residence and crew count (*location, labor_res_count*) collected in 1998-2004 CP EDRs combined counts of harvest and process workers, by residence location. The 2005 CP EDR differentiated between licensed harvest crew and unlicensed employees (*hcrew_res_count, procemp_res_count*) and required reporting the crew license or gear permit and place of residence for licensed crew. The 2006 CP EDR distinguished between harvest crew and processing employee, requiring only license number or gear permit for harvest crew and counts by residence location for processing employees. Submitter feedback indicates that CP crew participate in both harvest and processing labor and *hcrew_res_count* includes crew who participated in processing activity. Aggregating counts

by location for *hcrew_rescount* and *procemp_res_count* may overcount total participation and is not directly comparable to the 1998-2004 CP *labor_res_count* data.

The collection of processing employee counts in SP and FP EDRs by place of residence has remained consistent throughout the EDR program. Participation of individual processor employees in crab processing is not systematically tracked and counts may represent the entire processing labor force. These data substantially overcount crab processing employees by residence and cannot be used to identify the locational impact of crab processing employment. Feedback indicated that there was low confidence in residence information by submitters, particularly regarding foreign workers with nonlocal US residence addresses. Data submitted is frequently a legal address rather than a residence address. Counts of Alaska residence are likely of greater accuracy. Employee place of residence reported is that held on record by the employer and is not verified; however, local and Alaska residency is considered to be accurate where reported due to employer familiarity with local resident employees and state enforcement of Alaska residency requirements for Permanent Fund eligibility.

Vessel & Plant Costs/Costs for BSAI Crab Production Only

Insurance Premiums (Hull, Property and Indemnity, and Pollution) [Rating: 98-04: C | 2005-: C]

Insurance Deductibles [Rating: 98-04: C | 2005-: C]

table/field name(s):

co_cost_general/insurance_prem_cost

co_cost_general/insurance_deduct_cost

Summary: These data do not provide a reliable measure of variation in insurance costs across vessels/plants or over time. Numerous sources of variation in methods of reporting these data elements, terms of insurance contracts, and methods of insurance procurement are likely to confound and may overwhelm any variation associated with changes in insurance costs due to rationalization or further changes in the crab fishery.

Annual insurance premiums are reported separately for 2005 and later EDRs; see *annual_costs_general* table. The 2005 and later EDR directions included cost of insurance pool participation.

Submitter feedback has indicated that P&I insurance costs are determined by numerous factors unrelated to the crab fishery (e.g., the global underwriting market, delayed billing to vessel operators). As such, associating insurance costs with the effects of rationalization or other changes in the fishery cannot be determined with EDR data. Costs reported for a given year largely reflect the costs of insurance claims for previous years and are lagged to an unknown degree.

Crab-only insurance costs as reported are based on either crab fishery-specific premiums or prorating annual insurance costs based on days in fishery. The 98-04 EDRs did not specify treatment of insurance pool costs and these data undercount insurance pool costs to an unknown degree.

The 2005 audit examined crab-only costs (in Table X.X) and excluded annual insurance costs reported in Table 5.2/6.2. Thus, most reporting error found in the audit resulted from a zero insurance cost reported compared to an audit finding of positive insurance cost;

however, other sources of error were not described by auditors and audit-based validation information for 2005 data is incomplete. The 2006 audit results reflect both crab-only and annual insurance cost with findings of a high degree of support and accuracy; however, this should be considered in light of the complexity and variability of insurance premium determination noted above and should not be considered consistent and reliable measures.

Deductible costs are reported by a small number of EDR submitters due to the incidental nature of costs. The validation audit indicates that reporting error is derived from a single observation in the audit sample for each year; where deductible cost is reported, it is generally accurate. It should also be noted that deductible costs are frequently not finalized by the EDR submission deadline for claims entered in the previous year; as such, deductible costs reported in a given year may reflect incidents from a previous year and are lagged similarly to premium costs. Use of this variable in analysis should reflect the probabilistic and incidental nature of this cost element, rather than as an ordinary variable operating cost.

Product Storage Costs [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

co_cost_general/prodstorage_cost

BSAI crab-specific costs; product storage

Product storage costs may include storage of inventory from prior years' crab production; analysts should use caution in year-specific analysis of revenue and costs associated with multi-year inventories. Post-rationalization data does not include crab storage costs for custom-process only crab buyers. These data should not be used to represent total crab processing sector spending on storage costs.

Fisheries Taxes [Rating: 98: **C** | 2001, 2004: **B** | 2005-: **B**]

table/field name(s):

co_cost_general/tax_cost

Large outliers in the 1998 EDR audit indicate a high mean % error. The preferred source for 1998 data is direct calculation based on landing and sales revenue. There are no known data quality concerns for 2001 and subsequent harvest sector data. The post-rationalization data does not include custom-process only crab buyers; aggregate crab tax and fee costs for the processing sector EDR data will undercount the total tax cost in the fishery. Note that *tax_cost* includes non-tax buyback and cost-recovery fees.

Fishing Cooperative Costs [Rating: 98-04: **N/C** | 2005-: **B** | 2006: **A**]

table/field name(s):

co_cost_general/coop_cost

Submitter feedback indicated that some respondents may have incorrectly included arbitration-association dues and excluded intercooperative exchange fees in this cost element. 2006 instructions specified intercooperative fees in the instructions. Arbitration association dues which are not specifically collected but are widely reported as "other" cost in the Other Crab-specific Costs variable (see discussion below).

Re-packing Costs [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

co_cost_general/repack_cost

Repacking costs are not disaggregated in EDR forms by species/fishery, but are not incurred evenly for all species or product types. As such, prorating to separate species/fisheries by relative product volume will distort analysis of fishery-specific quasi-rents to an unknown degree. Repacking costs are also incurred while product is in inventory and may not be paid in the same year that crab was landed. As with all crab processing data, analysts should be attentive to the multi-year stream of processor costs and revenues for crab landed in a given year.

Broker Fees and Promotions for BSAI Crab Sales [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

co_cost_by_fishery/broker_cost

Brokerage costs are incurred at the time of product sale. As with final sales, analysts should be attentive to the multi-year stream of processor costs and revenues for crab landed in a given year.

Water, Sewer and Waste Disposal Costs

table/field name(s):

co_cost_general/waste_cost [Rating: 98-04: **B** | 2005-: **B**]

Audit findings and submitter feedback indicate that invoicing of these costs includes costs for plant operation and on-site housing facilities that are partially deducted from processing employee pay. Approximate pro-rata methods are used by submitters to identify crab-processing share, and there is likely substantial variation in reporting among processor EDRs. Variation in this cost element as measured may be only weakly associated with the scale of crab processing at a plant.

Crab Pots Purchased for Use in BSAI Crab Fishery, by Location [Rating: 98-04: **C** | 2005-: **C**]

Line and Other Crab Gear Purchases, by location [Rating: 98-04: **C** | 2005-: **C**]

table/field name(s):

co_cost_by_location/pots_count

co_cost_by_location/pots_cost

co_cost_by_location/hgear_cost

Summary: Pot and gear costs are incurred for both crab fishing as well as other fisheries and are not solely attributable to crab; where reported data represent pot and gear purchases for crab and non-crab fisheries, quantity and cost of these inputs for crab fisheries is biased upwards to an unknown degree. These data are not reliable for analysis of crab fishery costs.

The pre-2005 EDRs reported the pot cost and line and gear cost data elements as crab fishery aggregate; the 2005 and later forms reported these data by location. Pot and gear costs may not be attributed solely to the crab fishery and may apply to the cod fishery as well. It is unknown whether submitters prorated these costs or reported the total costs of pots and other gear. Where not prorated, cost is biased upward. Also note that new pot purchases are low after 2005 and costs of used pots may include refurbishment, or may

separate refurbishment cost as repair and maintenance reported in *rnm_costs* in the *annual_costs_by_location* table. Similarly, respondents were unsure of the difference between *hgear_cost* and *rnm_cost*.

Processing and Packaging Materials, Equipment, and Supplies [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

co_cost_by_location/location

co_cost_by_location/proc_pack_cost

Location of purchase information is of limited quality, particularly for FPs and SPs. In many cases, location of purchase is unknown and documentation is limited to invoice billing address. This undercounts the amount of sales in Alaska locations that are billed from separate billing office. For processors with a large number of invoices, feedback indicated that approximation methods were used to associate costs with locations. Analysts are cautioned to state these limitations in any reporting of results.

Submitter feedback indicated that processing and packaging materials are more closely attributed to crab fisheries than equipment. Approximate pro-rata methods are used by submitters to identify crab-processing share, and there is likely substantial variation in reporting among processor EDRs.

Bait used in BSAI crab fishery, by type and location [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

co_cost_bait_detail/pounds

co_cost_bait_detail/cost

Summary: Internal records on bait purchasing and use do not support reporting at the level of detail required in the EDRs and these data represent estimates based on various pro rata methods. Volume and costs for bait harvested by the vessel are not included in these data, which therefore do not reflect the total quantity or cost of bait used in the crab fishery.

Bait costs were differentiated by bait type in 2005 and later EDRs. 1998-2004 bait costs are reported by fishery, but not by bait species. Prior to 2006, EDR directions did not specify how to report bait caught by the vessel or purchased in the prior year. The 2006 EDR directed submitters to report only pounds and cost of bait purchases during the reporting year.

The 1998-2004 audit results indicated that bait use and cost details were difficult to document at the level of detail required. The 2005 and later data are better supported and generally more accurate. However, for vessels operating in multiple fisheries, a variety of pro rata methods are used in some cases to allocate bait costs to different fisheries.

Audit findings and submitter feedback indicate that bait invoices often do not include quantity of bait purchased; pounds reported in EDRs were based on calculations using available bait price information. Purchased bait costs are expected to be accurate, but are not a complete representation of bait usage or costs incurred for bait caught by the vessel. Analysts should use caution in fishery-specific analysis of bait costs.

Lubrication and Fluids Cost in BSAI Crab Fishery [Rating: 98-04: **C** | 2005-: **N/C**]

Fuel Cost in BSAI Crab Fishery [Rating: 98-04: **C** | 2005-: **C**]

Fuel Quantity Used in BSAI Crab Fishery [Rating: 98-04: **C** | 2005-: **C**]

table/field name(s):

co_cost_fuel_detail/lube_cost

co_cost_fuel_detail/fuel_lube_flag

co_cost_fuel_detail/fuel_gal

co_cost_fuel_detail/fuel_cost

Summary: Numerous sources of variation in methods of reporting these cost elements may confound variation associated with fuel market trends and operational changes in the crab fishery. These data should not be considered reliable for use in analysis of vessel or fishery economic performance.

Several structural changes in the collection of fuel, lubrication, and fluids data have occurred over the 1998-2006 period and users are cautioned to study the structural information in the metadata carefully. Lubrication and fluids cost (*lube_cost*) and fuel cost were reported separately in the 1998-2004 CP and CV EDRs only; following submitter feedback, lubrication and fluids were merged with the fuel cost data element in 2005 and later EDRs, with directions to indicate whether reported costs included or excluded lubrication costs.

Prior to 2006, EDR directions did not specify treatment of fuel gallons/costs incurred for steaming to/from home port before/after crab season. The 2006 EDR form directed that these costs be recorded in the annual vessel costs table, not in the crab-specific cost table; some observations in 2005 and earlier data may include these costs in reported gallons/costs.

Submitter feedback following the 1998-2004 EDRs indicated that lubrication and fluids costs were difficult to separate from fuel costs due to invoicing; *lube_cost* should be summed with *fuel_cost* to maintain consistency of treatment of these costs through time series.

Feedback comments indicate that, in general, fuel purchased is used over multiple fisheries and the amount used in a given fishery is often not monitored, and reported costs and quantity used in individual crab fisheries is approximated using various methods, including prorating by days at sea. Timing of fuel purchases for tax purposes may also influence reporting of fuel costs between successive calendar year EDRs. Vessels that do not deduct fuel costs in a crew settlement may report fuel cost in the year of purchase instead of the year fuel was used.

Audit findings are based on documentation of total fuel costs and appropriateness of approximation for by-fishery gallons/costs reporting. Invoices often did not include quantity of fuel purchased, and gallons reported were based on calculations using available fuel price information.

Other Crew Costs [Rating: 98-04: **C** | 2005-: **C**]

Other Crab-specific Costs [Rating: 98-04: **C** | 2005-: **C**]

table/field name(s):

co_cost_other_crew_detail/other_crew_cost

co_cost_other_crab_detail/other_crab_cost

Summary: These data are reported without specific direction and are not reliably reported. Lack of a reported value for any or all "other" cost categories in an EDR record may not

represent a valid zero value. Further validation is needed to determine appropriate use of these data. Without more detailed analysis, it is not recommended that these data be used on the same basis as other cost data and cannot be compared among vessels/plants or over time as a reliable measure of vessel or plant economic performance or changes in the fishery.

The 1998-2004 EDRs elicited “Other Crew Costs” as a single variable; the 2005 and later EDRs elicited multiple “Other Crew Costs” with space for open-ended descriptions of crew cost elements.

Vessel & Plant Costs/Annual Vessel & Plant Costs

Data elements reported in the annual vessel/plant cost table include a check box to indicate whether the reported cost is attributable to operations in crab fisheries exclusively, or reflect operations in additional fisheries. For costs reported as crab operations only, reported data may be based on various methods of prorating annual costs or, for vessels or plants that operate exclusively in the BSAI crab fishery, these data are directly reported. Additional analysis to isolate sources of variation in these data should be employed to improve accuracy.

Location of purchase information is of limited quality. In many cases, location of purchase is unknown and documentation is limited to invoice billing address. This undercounts the amount of sales in Alaska locations that are billed from a separate billing office. For processors with a large number of invoices, feedback indicated that approximation methods were used to associate costs with locations. Analysts are cautioned to use location of purchase information carefully and state limitations in any reporting of results.

Insurance premium costs [Rating: 98-04: **N/C | 2005-: **B**]**

table/field name(s):

annual_costs_general/ins_cost

Summary: These data do not provide a reliable measure of variation in insurance costs across vessels/plants or over time. Numerous sources of variation in methods of reporting these data elements, terms of insurance contracts, and methods of insurance procurement are likely to confound and may overwhelm any variation associated with changes in insurance costs due to rationalization or further changes in the crab fishery.

Crab-only and annual insurance premium costs are reported separately for the 2005 and later EDRs only. Prior to 2005, insurance cost for vessels was collected specifically as a crab-only cost, but submitters were directed to enter annual premiums that could not be attributed solely to crab fishing in the annual “other costs” section (insurance costs are the most common entry the annual “other costs” fields). However, the descriptions of types of insurance reported in annual “other costs” are inconsistent across 1998-2004 EDRs. To improve consistency in reporting, insurance costs were added as a specified annual cost element in 2005 and subsequent CV and CP EDRs.

See the previous (p. 15-16) description of data quality limitations in reported insurance premium costs under Vessel & Plant Costs/Costs for BSAI Crab Production Only

Salary costs [Rating: 98-04: **B** | 2005-: **B**]

Number of Salaried employees [Rating: 98-04: **B** | 2005-: **B**]

annual_costs_general/salary_cost
annual_costs_general/salary_num

For costs reported as crab operations only, variation in reported data may be based on different prorating methods.

Investments in Vessel, Plant, and Equipment [Rating: 98-04: **B** | 2005-: **B**]

Repair and Maintenance for Vessel, Plant, and Equipment [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):
annual_costs_by_location/capinv_cost
annual_costs_by_location/rnm_cost

Summary: It is recommended that analysts sum pre-2006 capital investment and repair and maintenance cost data elements in data analysis and include these costs as a single cost category in any reported analytical results.

The validation audit for 1998-2005 found that substantial capital investment costs were unreported in a small number of instances in the historical (1998-2004) data; these may have been reported as repair and maintenance or “other” costs. Submitter feedback from the same period confirmed that there was confusion regarding differentiation between capital investment and repair/maintenance costs. Improved instructions in the 2006 EDR form and more consistent record keeping resulted in better differentiation, and the 2006 data audit found no significant errors in repair and maintenance costs; the audit included capital investment costs in the error calculation, but the effect on overall % error was small. It is recommended that analysts sum pre-2006 capital investment and repair and maintenance costs in data analysis and include these costs as a single cost category in any reported analytical results.

Other Vessel-specific Costs [Rating: 98-04: **C** | 2005-: **C**]

table/field name(s):
annual_costs_other_detail/other_ac_cost

Summary: These data are reported without specific direction and are not reliably reported. Lack of a reported value for any or all “other” cost categories in an EDR record may not represent a valid zero value.

Annual Totals for All Fisheries

Total Days at Sea [Rating: 98-04: **C** | 2005-: **C**]

table/field name(s):
annual_totals/ total_days_at_sea

Summary: The 1998-2005 data for total days at sea do not reliably measure changes over time or across vessels. Inconsistent and incomplete definition of days at sea in the 1998-2004 and 2005 EDRs likely resulted in under-reporting of this variable for these years, particularly for 1998-2004. Use of these data are not recommended for pro rata indices without further validation against other data sources.

Error in reporting of total days at sea in the 1998-2005 EDRs is indicated by both submitter feedback and audit results. Additional instructions were added to the 2005 and 2006 EDR forms to better define activities included in days at sea; the 2005 EDRs specified inclusion of chartering and tendering and the 2006 EDRs additionally specified inclusion of transiting to/from home port. Further work should be performed to validate these data against CFEC data, logbook data, and other available data sources.

The 2006 audit review found total days at sea data were well supported and accurate.

FOB Revenues [Rating: 98-04: **B** | 2005-: **B**]

Finished Pounds Processed [Rating: 98-04: **B** | 2005-: **B**]

table/field name(s):

annual_totals/total_fob_revenue

annual_totals/*total_fob_locate*

annual_totals/finished_pounds_processed

Total FOB revenue is generated from sales of inventory, while finished pounds processed reflects processing activity but not final sales. These data should not be combined to calculate figures for average revenue per pound sold and should be compared to crab and total processing activity on a multi-year basis.

The 1998-2004 data may include shipping costs to Seattle for processors using Seattle as FOB port. However, feedback indicated that most processors either specified FOB port or converted to FOB Alaska revenue; 2005 EDRs allowed submitter to specify FOB port as Seattle or Alaska (*total_fob_locate*). Comparison over time should convert FOB Seattle revenue to FOB Alaska.

These data do not include revenue for non-crab processing crab buyers—see COAR reports for total fishery figures.

References

Aldrich, Kilbride and Tattone. 2008. Alaska Crab Economic Data Report Data Validation (Prepared for Pacific States Marine Fisheries Commission); 2006 Calendar Year. January 2008.

Pacific States Marine Fisheries Commission. 2007. Alaska Crab Economic Data Report Validation; 1998, 2001, 2004, 2005. May 2007.

APPENDIX: Data elements included in EDR database, by Data Quality Classification**Table A: Data Quality Summary, Primary Variables**

table	variable_id	description	data quality classification		
			98-04	2005	2006
annual_costs_by_location	fuel_coflag	annual costs; fuel, electricity, lubrication and fluids, crab-only cost indicator	A	A	A
annual_costs_by_location	fuel_cost	annual costs; fuel, electricity, lubrication and fluids, cost	A	A	A
annual_costs_by_location	fuel_lube_flag	annual costs; fuel, electricity, lubrication and fluids, lubrication and fluids included indicator	A	A	A
annual_costs_general	salary_coflag	annual costs; wages and salaries, crab-only cost indicator	A	A	A
annual_totals	round_pounds_caught	annual totals for all fisheries, round pounds caught and retained (excludes discards)	A	A	A
annual_totals	total_days_processing	annual totals for all fisheries, processing days	A	A	A
annual_totals	total_gross_land_revenue	annual totals for all fisheries, landings, gross revenue	A	A	A
annual_totals	total_labor_costs	annual totals for all fisheries, labor costs	A	A	A
co_cost_by_fishery	observ_cost	BSAI crab-specific costs; observer costs, by fishery	A	A	A
co_cost_fuel_detail	citystate	location(s) of fuel purchases	A	A	A
co_cost_general	crew_food_cost	BSAI crab-specific costs; food and provisions for crew	A	A	A
co_cost_general	gearstorage_cost	BSAI crab-specific costs; storage, wharfage, and delivery costs for crab harvest gear	A	A	A
co_cost_general	supply_freight_cost	BSAI crab-specific costs; freight costs for supplies to the plant	A	A	A
crab_activity	begin_date	dates covered from, first period	A	A	A

table	variable_id	description	data quality classification		
			98-04	2005	2006
crab_activity	end_date	dates covered to, first period	A	A	A
crab_labor	captain_share_payment	crab harvesting labor, captain's labor payment, by fishery	A	A	A
crab_labor	crew_earning_shares	crab harvesting labor, no. of paid harvest crew, by fishery	A	A	A
crab_labor	crew_share_payment	crab harvesting labor, total crew labor payment, by fishery	A	A	A
crab_labor	proc_man_hrs	crab processing labor, total man-hours, by fishery	A	A	A
crab_labor	total_proc_labor_payment	crab processing labor, total processing labor payment, by fishery	A	A	A
crab_process_sales	affiliated_sale_flag	identifier for sales to affiliated entities; 0=not affiliated/1=affiliated	A	A	A
crab_process_sales	box_lb_kg	box size units (kg or lb)	A	A	A
crab_process_sales	fob_port	port of lading for FOB value; Seattle or Alaska	A	A	A
crab_production_out	box_lb_kg	box size units (kg or lb)	A	A	A
crab_production_out	box_size	box size	A	A	A
crab_production_out	cust_proc_flag	custom processed flag; indicates raw crab was processed for other licensed registered crab receiver	A	A	A
crab_raw	processed_pounds	pounds of raw crab processed (purchased or landed by the vessel if CP) by the vessel/plant	A	A	A
crab_raw	supplied_to_custom_pounds	pounds of raw crab sent for custom processing	A	A	A
custom_process_hired	box_lb_kg	box size units (kg or lb)	A	A	A
custom_process_hired	box_size	box size	A	A	A
custom_process_hired	process_code	process code; See Metadata Appendix A, Table 8 for code values	A	A	A
custom_process_hired	product_code	product code; see Metadata Appendix A, Table 7 for code	A	A	A

table	variable_id	description	data quality classification		
			98-04	2005	2006
		values			
custom_process_provided	custom_process_pounds	pounds processed, by fishery and product/process	A	A	A
custom_process_provided	custom_process_revenue	revenue received for custom processing the specified product process code; See Metadata Appendix A, Table 8 for code values	A	A	A
custom_process_provided	process_code	product code; see Metadata Appendix A, Table 7 for code values	A	A	A
custom_process_provided	product_code	values	A	A	A
harv_labor_pay_detail	bait	vessel costs treated in crew payment, bait	A	A	A
harv_labor_pay_detail	cdq	vessel costs treated in crew payment, CDQ lease costs	A	A	A
harv_labor_pay_detail	food	vessel costs treated in crew payment, food and provisions	A	A	A
harv_labor_pay_detail	freight	vessel costs treated in crew payment, freight costs	A	A	A
harv_labor_pay_detail	fuel	vessel costs treated in crew payment, fuel and lubrication costs	A	A	A
harv_labor_pay_detail	gear	vessel costs treated in crew payment, lost gear costs	A	A	A
harv_labor_pay_detail	ifq	vessel costs treated in crew payment, IFQ lease costs	A	A	A
harv_labor_pay_detail	ipq	vessel costs treated in crew payment, IPQ lease costs	A	A	A
harv_labor_pay_detail	observ	vessel costs treated in crew payment, observer program costs	A	A	A
harv_labor_pay_detail	tax	vessel costs treated in crew payment, fish taxes	A	A	A
harv_labor_pay_detail	travel	vessel costs treated in crew payment, travel costs	A	A	A

table	variable_id	description	data quality classification		
			98-04	2005	2006
annual_costs_by_location	capinv_coflag	annual costs; capital investment, crab-only cost indicator	B	B	B
annual_costs_by_location	capinv_cost	annual costs; capital investment cost	B	B	B
annual_costs_by_location	rnm_coflag	annual costs; repair and maintenance, crab-only cost indicator	B	B	B
annual_costs_by_location	rnm_cost	annual costs; repair and maintenance cost	B	B	B
annual_costs_general	salary_cost	annual costs; wages and salaries of employees not engaged in harvest or processing, including foremen and managers	B	B	B
annual_costs_general	salary_num	number of salaried employees not engaged in harvest or processing, including foremen and managers	B	B	B
annual_totals	finished_pounds_processed	annual totals for all fisheries, finished pounds processed	B	B	B
annual_totals	total_fob_locate_code	annual totals for all fisheries, product sales, FOB port location code	B	B	B
annual_totals	total_fob_revenue	annual totals for all fisheries, product sales, FOB revenue	B	B	B
co_cost_bait_detail	bait_species_desc	open-ended description of bait species/type	B	B	B
co_cost_bait_detail	citystate	BSAI crab-specific costs; open-ended descriptions of location(s) of purchase	B	B	B
co_cost_bait_detail	cost	total bait cost, by species/type	B	B	B
co_cost_bait_detail	pounds	bait pounds, by species/type	B	B	B
co_cost_by_fishery	broker_cost	BSAI crab-specific costs; brokerage and promotions costs for crab sales, by fishery	B	B	B
co_cost_by_location	citystate	BSAI crab-specific costs; open-ended descriptions of location(s) of	B	B	B

table	variable_id	description	data quality classification		
			98-04	2005	2006
		purchase			
co_cost_by_location	proc_pack_cost	BSAI crab-specific costs; packaging, materials, equipment and supply costs for crab processing	B	B	B
co_cost_general	allbroker_cost	BSAI crab-specific costs; brokerage and promotions costs for crab sales for all fisheries	B	B	B
co_cost_general	crab_freight_cost	BSAI crab-specific costs; freight and handling costs for crab and crab products	B	B	B
co_cost_general	repack_cost	BSAI crab-specific costs; crab product re-packing costs	B	B	B
co_cost_general	waste_cost	BSAI crab-specific costs; water, sewer, and waste disposal	B	B	B
crab_activity	days_processing	crab processing days	B	B	B
crab_labor	avg_crew_size	average number of crew members on vessel during the fishery, including captain	B	N/C	N/C
crab_labor	avg_num_proc_positions	crab processing labor, average no. of crab processing positions, by fishery	B	B	B
crab_labor	num_processing_crew	crab processing labor, no. of crew with pay determined by processing work, by fishery	B	B	B
crab_process_sales	box_size	box size	B	B	B
crab_process_sales	finished_pounds_sold	finished pounds sold for product form identified by code values	B	B	B
crab_process_sales	fob_revenues	total revenues for finished pounds of product form identified by code values	B	B	B
crab_process_sales	process_code	process code; See Metadata Appendix A, Table 8 for code values	B	B	B

table	variable_id	description	data quality classification		
			98-04	2005	2006
crab_process_sales	product_code	product code; see Metadata Appendix A, Table 7 for code values	B	B	B
crab_process_sales	spp_code	crab species code; see Metadata Appendix A, Table 11 for species code values	B	B	B
crab_production_out	finished_lbs	finished pounds for product form identified by code values	B	B	B
crab_production_out	process_code	process code; see Metadata Appendix A, Table 8 for code values	B	B	B
crab_production_out	product_code	product code; see Metadata Appendix A, Table 7 for code values	B	B	B
crab_purchased	gross_cost	total gross cost of raw crab purchased, by crab grade and size	B	B	B
crab_purchased	pounds_purchased	total pounds of raw crab purchased, by crab grade and size	B	B	B
crew_residence	location	identifies Alaska city of residence, state of residence if not Alaska, and country of residence if not US	B	B	N/C
custom_process_hired	cust_hired_finished_pounds	finished pounds of specified product produced by custom processor	B	B	B
custom_process_hired	cust_hired_process_cost	total cost paid for specified product produced by custom processor	B	B	B
cv_crab_landing_revenue	pounds	pounds sold, by fishery	B	B	B
cv_crab_landing_revenue	revenue	gross revenue from ex-vessel sale, by fishery	B	B	B
revenue_shares	revshare_capt	captain's percentage of net share, by fishery	B	B	B
revenue_shares	revshare_crew	harvest crew percentage of net share, by fishery	B	B	B
revenue_shares	revshare_owner	vessel owner's percentage of net share, by fishery	B	B	B

table	variable_id	description	data quality classification		
			98-04	2005	2006
annual_costs_other_detail	other_ac_coflag	BSAI crab-specific costs; other crab related expense, cost	C	C	C
annual_costs_other_detail	other_ac_cost	BSAI crab-specific costs; other crab related expense, cost	C	C	C
annual_costs_other_detail	other_ac_desc	BSAI crab-specific costs; other crab related expense, open-ended description	C	C	C
annual_totals	total_days_at_sea	annual totals for all fisheries, days at sea	C	B	B
co_cost_by_location	hgear_cost	BSAI crab-specific costs; other crab harvest gear cost	C	C	C
co_cost_by_location	pots_cost	BSAI crab-specific costs; cost of pots purchased	C	C	C
co_cost_by_location	pots_count	BSAI crab-specific costs; quantity of pots purchased	C	C	C
co_cost_fuel_detail	fuel_cost	BSAI crab-specific costs; cost of fuel used, by fishery	C	C	C
co_cost_fuel_detail	fuel_gal	BSAI crab-specific costs; gallons of fuel used, by fishery	C	C	C
co_cost_fuel_detail	lube_cost	BSAI crab-specific costs; lubrication and fluids	C	N/C	N/C
co_cost_general	insurance_deduct_cost	BSAI crab-specific costs; insurance deductible fees	C	C	C
co_cost_general	insurance_prem_cost	BSAI crab-specific costs; insurance premiums	C	C	C
co_cost_general	prodstorage_cost	BSAI crab-specific costs; product storage	B	C	C
co_cost_general	tax_cost	BSAI crab-specific costs; total of fisheries taxes and fees			
			98: C		
co_cost_other_crab_detail	other_crab_code	BSAI crab-specific costs; other crab related expense, classified	01,04: B	B	B
			C	C	C

table	variable_id	description	data quality classification		
			98-04	2005	2006
		description			
co_cost_other_crab_detail	other_crab_cost	BSAI crab-specific costs; other crab related expense, cost	C	C	C
co_cost_other_crab_detail	other_crab_desc	BSAI crab-specific costs; other crab related expense, open-ended description	C	C	C
co_cost_other_crew_detail	other_crew_code	BSAI crab-specific costs; other crew-related expense, classified description	C	C	C
co_cost_other_crew_detail	other_crew_cost	BSAI crab-specific costs; other crew-related expense, cost	C	C	C
co_cost_other_crew_detail	other_crew_desc	BSAI crab-specific costs; other crew-related expense, open-ended description	C	C	C
crab_activity	days_at_sea	days at sea	C	N/C	N/C
crab_activity	pots_lost	pots lost	C	N/C	N/C
crab_process_sales	crab_grade_code	crab grade code; see Metadata Appendix A, Table 10 for code values	C	C	C
crab_process_sales	crab_size_code	crab size code; see Metadata Appendix A Table 9 for code values	C	C	C
crab_production_out	crab_grade_code	crab grade code; see Metadata Appendix A, Table 10 for code values	C	C	C
crab_production_out	crab_size_code	crab size code; see Metadata Appendix A Table 9 for code values	C	C	C
crab_purchased	crab_grade_code	crab grade code; see Metadata Appendix A, Table 10 for code values	C	C	C
crab_purchased	crab_size_code	crab size code; see Metadata Appendix A, Table 9 for code values	C	C	C

table	variable_id	description	data quality classification		
			98-04	2005	2006
crew_residence	hcrew_res_count	count of harvest crew with city, state, or country of residence as identified by location or locatocode	C	B	N/C
crew_residence	labor_res_count	combined count of processing workers and harvest crew with city, state, or country of residence as identified by location or locatocode	C	N/C	N/C
crew_residence	procemp_res_count	count of processing workers with city, state, or country of residence as identified by location or locatocode	C	B	B
custom_process_hired	crab_grade_code	crab grade code; see Metadata Appendix A, Table 10 for code values	C	C	C
custom_process_hired	crab_size_code	crab size code; see Metadata Appendix A Table 9 for code values	C	C	C
fish_tickets	fish_ticket_number	CFEC fish ticket numbers, by fishery	C	C	C
harv_labor_pay_dtl_other	other_lpd_code	harvest labor pay detail description; other, classified description	C	C	C
harv_labor_pay_dtl_other	other_lpd_desc	harvest labor pay detail description; other description; open-ended description	C	C	C
harv_labor_pay_dtl_other	other_lpd_value	harvest labor pay detail value; see data structure notes	C	C	C
owner_ifq_allocation	pounds_harvested	vessel owner's quota harvested on vessel, pounds harvested by fishery and quota permit type	N/C	C	C
owner_ifq_allocation	pounds_transferred	vessel owner's quota leased/transferred to another vessel, pounds leased, by fishery and quota permit type	N/C	C	C

table	variable_id	description	data quality classification		
			98-04	2005	2006
owner_ifq_allocation	revenue_from_transfer	vessel owner's quota leased/transferred to another vessel, revenue, by fishery and quota permit type	N/C	C	C
quota_lease_costs	lease_cost	quota leased for use on vessel, total cost, by fishery and permit type	C	C	C
quota_lease_costs	leased_lb	quota leased for use on vessel, pounds leased, by fishery and permit type	C	C	C
quota_lease_costs	num_crew_contribute	number of crew (including captain) contributing IFQ C class shares	N/C	C	C
revenue_shares	revshare_procemp_net	processing worker revenue shares; percentage of net share	C	C	C
revenue_shares	revshare_procemp_prodval	processing worker revenue shares; percentage of product value	C	C	C

* Variables that were not collected in either the historical or post-rationalization (98-04 or 2005-), i.e., were either dropped from or introduced to the EDR after the historical data collection, are coded N/C.