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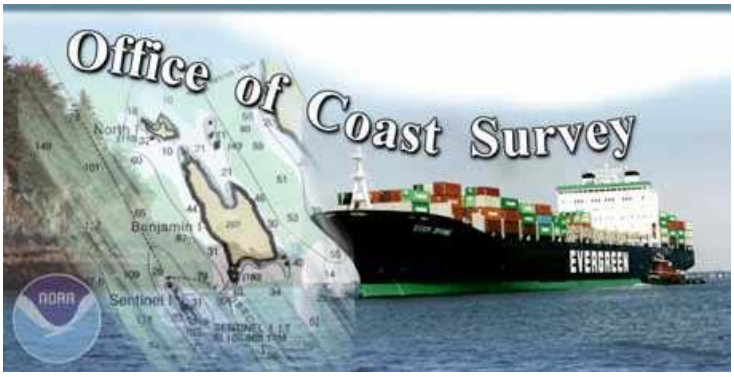

Cost Analysis of Hydrographic Surveys in Alaska and the Gulf of Mexico

Final Report

September 21, 2001

KPMG Consulting

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September 21, 2001

Ms. Kathryn Ries
NOAA/NOS Office of Coast Survey (N/CS)
SSMC#3 Station #6145
1315 East-West Highway
Silver Spring, MD 20910-3282

Subject: Contract GS23F9796H, Order Number 40AANC1A9074, "Consulting Services in support of Hydrographic Surveys in Alaska and Gulf of Mexico."

Dear Ms. Ries:

KPMG Consulting is pleased to submit our final report addressing Tasks 1-4 of the subject contract. If you have any questions regarding the information contained in this proposal, please do not hesitate to call David Romola at (703) 747-4416 or me at (703) 747-4212.

Very truly yours,

KPMG Consulting

Gene R. Benton
Managing Director

Restriction Against Disclosure

(excerpted from the Contract)

A. The contractor agrees, in the performance of this contract, to keep the information furnished by the Government and designated by the contracting officer's technical representative in the strictest confidence. The contractor also agrees not to publish or otherwise divulge such information in whole or in part, in any manner or form, not to authorize or permit others to do so, taking such reasonable measures as are necessary to restrict access to such information while in the contactor's possession, to those employees needing such information to perform the work provided herein, i.e., on a 'need to know' basis. The contractor agrees to immediately notify the contracting officer in writing in the event that the contractor determines or has reason to suspect a breach of this requirement.

B. The contractor agrees that it will not disclose any information described in subsection A. to any person or individual unless prior written approval is obtained from the contracting officer. The contractor agrees to insert the substance of this clause in any consulting agreement or sub-contract hereunder.

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Executive Summary

The results of this analysis are estimates of the cost per square nautical mile of conducting hydrographic surveys in Alaska and in the Gulf of Mexico, under three scenarios:

- Utilizing NOAA vessels and staff;
- Contracting for hydrographic survey services and related activities; and
- Chartering a survey vessel, including staff and equipment, with limited NOAA personnel on-board.

The Alaska surveys are divided into shallow and deep water regions; deep water refers to depths of greater than 100 feet (30 meters). The results of the analysis are as follows:

Cost per square nautical mile ($/SqNM), thousands of dollars			
	In-house	Contractor	Time Charter
Alaska - Shallow	$24.17	$58.38	$18.89*
Alaska - Deep	$12.18	$35.62	
Gulf of Mexico	$17.40	$19.70	$21.59

* Costs of the time charter for Alaska did not differentiate between deep and shallow water surveys.

This report details the methodology, assumptions, and data sources used to create these estimates, as well as additional information related to the cost of conducting hydrographic surveys under each of the above scenarios.

Objective

The purpose of this analysis was to analyze the costs associated with conducting hydrographic surveys in Alaska (both shallow and deep water regions) and in the Gulf of Mexico, under three scenarios: (1) utilizing National Oceanic and Atmospheric Administration (NOAA) Government-owned and operated vessels; (2) contracting for hydrographic survey services and related activities; and (3) time chartering a survey vessel with necessary scientific equipment and crew to operate the vessel and equipment, with limited NOAA personnel on-board. The analysis was to include all support costs associated with conducting surveys under each scenario, including planning, source evaluation boards (SEBs), contracting, tide analysis, supplies, and final data processing.

Background

Currently, more than 95% of U.S. foreign trade by weight travels by sea, and approximately one half of this traffic carries oil or hazardous materials. Additionally, the size of vessels has increased dramatically in recent years. The potential environmental and economic impacts resulting from damage to one of these ships are substantial. Adequate surveying of coastal waters and the resulting marine charts are the principal measure to prevent such accidents.

In 1807, President Thomas Jefferson established the Survey of the Coast to promote safe and efficient navigation of the waters of the United States. Today, this responsibility is managed by the Office of Coast Survey (OCS), part of the National Ocean Service (NOS). The primary charters for performing coastal surveys are the Coast and Geodetic Survey Act of 1947 and the Hydrographic Services Improvement Act (HSIA) of 1998.

In 1994, NOAA identified over 43,000 square miles, primarily coastal shipping lanes and approaches to major U.S. ports, as critical areas requiring updated hydrographic survey data. Over the past 8 years, this critical survey backlog has been reduced to approximately 29,600 square nautical miles, nearly 75% of which are in Alaska and the Gulf of Mexico. Additional surveying efforts must be applied to these areas in a reasonably rapid fashion to ensure the safe and efficient movement of goods through U.S. ports over the next two decades. There are also over 500,000 additional square nautical miles that are "navigationally significant" and in need of surveying, nearly 80% of which are in Alaska or the Gulf of Mexico.

In 1995, NOAA published a brochure on the modernization of the nation's navigation services, *Safe Passage into the 21st Century*. Testimony on these services was presented before the Fisheries Conservation, Wildlife, and Oceans Subcommittee of the House Resources Committee in 1997 and on July 27, 2000. In May 1999, NOAA provided a *Long-Term Hydrographic Data Acquisition Plan* to its House and Senate authorizing and appropriation committees. The documents report on NOAA's efforts to address the backlog of surveying requirements, to evaluate required capabilities, and to plan for the retention of operational expertise into the future. On September 13, 2001, NOAA testified regarding progress in navigation services, and specifically its record on contracting for hydrographic surveying, before the House Resources Subcommittee on Fisheries Conservation, Wildlife and Oceans.

The Office of Coast Survey strives to promote safe navigation and minimize environmental risk while maximizing the utilization of the nation's surveying capacity. This study is undertaken to support that intent by providing cost estimates for three methods of acquiring hydrographic data to help determine the most efficient use of survey resources.

Appendix A displays various organization charts for the National Ocean Service and Office of Coast Survey.

Appendix B is a glossary of terms and acronyms used in this report.

Methodology, Assumptions, and Data Sources

General Methodology

In response to the requirements identified in the Statement of Work and the contract (GS23F9796H, Order Number 40AANC1A9074), the KPMG Consulting approach combined a format for organizing, planning, and conducting successful analyses, while providing the flexibility to react to the unique aspects of this project. KPMG Consulting performed this cost analysis in accordance with Office of Management and Budget (OMB) Circular No. A-76 cost accounting principles (although we fully recognized this was not an A-76 study). KPMG Consulting analyzed the costs associated with conducting hydrographic surveys in Alaska and the Gulf of Mexico under three distinct scenarios:

- Utilizing NOAA's Government-owned and operated vessels;
- Contracting for hydrographic survey services and related activities; and
- Chartering a survey vessel with necessary scientific equipment and crew to operate the vessel and equipment, with some Government personnel on-board to supervise survey operations.

For these scenarios, the reporting unit is cost per square nautical mile of hydrography, and includes all direct and indirect costs. Surveys in Alaska were categorized as shallow water or deep water for more appropriate comparison between scenarios.

The most challenging component of this analysis was gathering all the data associated with hydrographic surveys. Information was collected by conducting interviews with personnel from the activity responsible for the cost. KPMG Consulting reviewed records and documentation provided by NOAA personnel, and verified data with NOAA personnel. Based on that data, KPMG Consulting created an Excel model to accumulate all the historical and estimated costs for each survey. KPMG Consulting also worked with NOAA to develop and confirm a variety of assumptions. Assumptions used in this study were developed primarily in situations where the lack of availability of information limited the ability to identify discrete, low-level costs. The NOAA accounting system is not designed to separate costs by individual projects. Therefore, precise historical accounting data were not available for all cost elements. In these situations, assumptions were developed as a tool for creating the best estimates of cost elements, and to simplify the cost estimating process. Specific methodology and assumptions associated with the model are discussed below for each cost area. Once the model was developed, a copy was made for each survey, as well as for an Alaska and Gulf of Mexico charter. The model was populated with the data specific to each survey. Finally, the results of each model were combined into a single summary spreadsheet.

In any study, there is uncertainty associated with study factors and assumptions. Certain factors can significantly impact study outcomes if varied slightly; these factors must be explored to measure the impact that variance has on analysis results. This exploration, or sensitivity analysis, increases confidence in the reliability of the analysis. In this study, essentially all cost elements involved are linear (i.e., increasing a cost element increases the total cost by the same amount). As such, there are no single drivers that will significantly vary the total cost estimates beyond the variance of the single cost element. However, KPMG Consulting has identified

several factors and assumptions that, if changed, could impact the results of this analysis. These factors are discussed in the *Sensitivity Analysis* portion of *Cost Analysis* section below.

General Assumptions and Data Sources

- Survey years indicated are U.S. Government fiscal years.
- All costs associated with surveys are considered to have occurred during the same fiscal year as the survey, unless specifically otherwise noted. In some cases, costs were provided based on calendar years, and in some cases, it was unclear whether the year provided was a calendar year or a fiscal year. In these cases, the costs were assumed to have occurred in the associated fiscal year (e.g. CY99 or 1999 costs were assumed to have been incurred in Fiscal Year 1999).
- All surveys were inflated into 2001 costs to allow for comparison. This inflation was calculated using historical inflation rates from the Bureau of Labor Statistics (BLS) website (www.bls.gov). Inflation rates used are assumed to be valid for inflation (normalization) of costs to a common fiscal year.
- Some surveys – particularly contracted surveys – took place over more than one year. In these cases, costs from multiple years were inflated or deflated into a single-base year, and then inflated into 2001 costs (see previous bullet).
- For several combinations of survey method and area (e.g. contract surveys in shallow water regions in Alaska), data for more than one survey were provided. In these cases, the cost per square nautical mile ($/SqNM) used in the results is simply the average of each of these costs within the combined category. For example, data for two shallow water contract surveys for Alaska were provided. The resulting figure for these surveys in Alaska is simply the average $/SqNM of these two surveys.
- No "conversion costs," as described in the A-76 supplemental handbook, have been included in this analysis. These are costs associated with converting to or from in-house, contract, or inter-service support agreement (ISSA) performance of an activity.
- OMB Circular A-76 also addresses the issue of taxes (supplement chapter 3, paragraph G):
  - "1. When developing the Government's cost of contract performance, the potential Federal income tax revenue should be considered. Since contract performance would provide the contractor with income subject to tax, an estimated amount of such taxes is an appropriate deduction from the net cost to the Government, unless the prospective contractor is a tax-exempt organization.
  - "2. To simplify the tax computation, Appendix 4, prepared by the Internal Revenue Service, provides, by types of industry, appropriate tax rates in relation to business receipts. The industry groupings conform to the Enterprise Standard Industrial Classification issued by the Department of Commerce. To determine the amount of estimated Federal income tax, the contract price (Line 7 of the GCCF) for each performance period will be multiplied by the applicable tax rate. The estimated amount of Federal income tax will be entered on Line 12 as a deduction, i.e. negative, reducing the cost of contracting."
  - The estimated tax amount, which was calculated based on the contract value multiplied by the appropriate tax rate, was deducted from the contract cost.
  - There is no specific tax rate provided in the referenced Appendix, so the rate for "Miscellaneous services, not elsewhere classified" was used. This rate is 0.5%.

- There is also discussion of insurance issues in OMB Circular A-76 (supplement chapter 2, paragraph D.2):
  - Property (assets) insurance.
    - "a. Operation of any Government activity involves risks and potential costs from property losses (fire, flood, accident, etc.) and liability claims. These risks are normally covered by insurance included in any commercial cost estimate.
    - "b. To the extent assets are not provided to the contractor or to the extent that property losses may be assessed against a contractor who uses Government space, facilities or equipment, in-house casualty premiums must be computed. Generally, the Government's casualty premium equivalent cost will be computed by multiplying .005 times the net book value of Government's equipment and/or facilities, plus the average value of material and supplies.
    - "c. Insurance to be computed on assets will depend on the requirements of the Performance Work Statement (PWS). If the contractor or ISSA provides special casualty insurance on all Government furnished assets, compute insurance for *all* assets used by the activity under study. If the contract does not require the contractor to furnish special casualty insurance, e.g., the Government will self indemnify, compute casualty insurance on *only* those assets to be used by the activity under study that would not be provided to the contractor or ISSA provider, as appropriate."
    - For this analysis, property insurance costs were added to the estimates for in-house surveys. This was done using the following methodology:
      - The estimated market value of the RAINIER and the WHITING was determined:
        - RAINIER: the NOAA Ship MT MITCHELL – which was the sister ship to the RAINIER – was sold in 1997 for $262K. Estimated cost of equipment on the RAINIER is $6M. Estimated cost per launch is $250K (four launches = $1M). The total of these three figures is $7,262,000.
        - WHITING: the NOAA Ship DAVIDSON – which was comparable to the WHITING – was sold in 1998 for $112K. Estimated cost of equipment on the WHITING is $2.5M. Estimated cost per launch is $250K (two launches = $500K). The total of these three figures is $3,112,000.
      - These market value figures were multiplied by 0.005, as prescribed above, to reach the estimated annual insurance cost for the vessels.
      - The annual insurance costs were allocated to surveys based on the ratio of survey sea days to ship sea days in the survey year.
        - Survey days-at-sea include days spent transiting to and from the survey site
  - Personnel insurance.
    - "d. Personnel liability losses will be computed by multiplying .007 times the Government's total personnel-related costs on Line 1. Additional liabilities assigned to the contractor or ISSA provider by the PWS that are not associated with personnel will also be computed by applying the standard .007 factor to the estimated liability ceiling identified in the PWS and included in the in-house cost estimate."
    - For this analysis, personnel insurance costs were added to the estimates for all surveys. This amount was calculated by multiplying the total labor costs for all in-house activities (associated with in-house, contractor-performed, and time charter surveys) by 0.007.

Overhead/Distribution Rates

- Distribution rates were applied to direct labor costs (hours) based on the methodology prescribed in Chapter 9 of the NOAA Finance Handbook. This includes application of the following rates/costs:
  - Leave surcharge;
  - Employer's contribution surcharge;
  - Future Retired Pay of Commissioned Officers (FRPCO; NOAA Corps only);
  - NOAA Support (overall NOAA overhead); and
  - GSA Rent (formerly called SLUC).
- The Chapter 9 methodology could only be applied where low-level data (hours or base pay) were provided. In some cases, fully burdened cost for an activity was all that was available. In these cases, it was assumed that the appropriate methodology was used to burden the costs.

Civilian Pay

- Pay rates for 1997 through 2000 are based on figures found on the Office of Personnel Management (OPM) website (http://www.opm.gov/oca/payrates/index.htm). Pay rates for 1996 were not available on the OPM website.
  - Pay rates for 1996 used in this analysis were based on the 1997 rates, divided by 1.023 to reflect the 2.3% general schedule increase from 1996 to 1997.
- Locality rates for Silver Spring personnel are based on Washington, DC.
- Locality rates for Pacific personnel are based on Seattle, WA.
- Locality rates for Atlantic personnel are based on Norfolk, VA (this includes Gulf of Mexico activities).

NOAA Corps and Wage Marine Pay

- The following years of service were assumed for each NOAA Corps Officer rank:

Grade	Years of Service	Years of Service used for Pay Tables
O1	Less than 2 years	Less than 2 years
O2	2-6 years	Over 4 years
O3	6-12 years	Over 10 years
O4	12-17 years	Over 16 years
O5	17-23 years	Over 20 years
O6	23-30 years	Over 24 years

- The following additional assumptions were used in determining pay rates for NOAA Corps officers:
  - All pay rates are based on "With Dependents."
  - No sea pay was earned in Washington, DC or Silver Spring, MD.
  - No personnel qualified for increased pay rates based on prior enlisted experience.
  - No Hazardous Duty, Imminent Danger, or Flight Pay was earned.
  - No Standard Utility Maintenance Expenses were applied.
  - Locality rates for Pacific personnel are based on Seattle, WA.

- Locality rates for Atlantic personnel are based on Norfolk, VA (this includes Gulf of Mexico activities).
  - NOAA Corps pay rates are on a per month basis, and are modeled as such. In situations where the unit of time was less than one month, it was assumed that there are 22 working days per month, and 8 working hours per day. For example, two hours of work would be equivalent to 0.0114 months (2 hours x 1 day/8 hours x 1 month/22 days).
- Costs associated with wage marine personnel are included in the OMAO costs provided for operation of NOAA hydrographic survey vessels. These costs are fully-burdened, and include benefits, overtime, and overhead costs.

Historical Costs Methodology, Assumptions, and Data Sources

Hydrographic Surveys Division (HSD)

- HSD other direct costs (ODCs) include object classes 25xx (contractual services), 26xx (supplies and materials), and 31xx (equipment).
  - Costs for each year were allocated to surveys based on the total number of projects performed during that year.
    - For example, in 1998, total ODCs for HSD were $769,100 and there were 19 projects.
    - Each survey conducted primarily in 1998 was allocated $40,479 (769,100/19).
  - ODCs were only allocated to a survey in the primary year the survey was performed. If a survey was conducted primarily in 1997, with a few months in 1998, ODCs were only applied to 1997.
  - Other direct costs, as well as the number of surveys in each year, were provided by HSD staff.
  - ODCs were applied to in-house and contractor surveys, as well as time charters.
    - The figure for time charters is based on the 2000 ODCs cost.

Project Planning

- Labor costs were based on rates for a GS-12, Step 5, in the Washington, DC area.
- 700 hours for project K171-KR were allocated to three contractors under that contract based on survey size.
- Year of activity provided was based on duration of survey activity. It is assumed that this is incorrect, and project planning took place during the same year as the Source Evaluation Board (SEB).
- Estimates were in hours; thus all project planning allocations are 100%.
- Hours estimates were provided by HSD staff.

Source Evaluation Board (SEB)

- In cases where the SEB was conducted in the year prior to the performance of the survey, the SEB costs were recorded on a separate sheet and inflated forward into the survey performance year (see *General Assumptions and Data Sources* above).
- The basis of estimates for hours spent on a typical SEB was accounting system bi-weekly payroll accumulation.
- Allocation estimates for SEB costs were provided by HSD staff.
  - There was a single SEB for K171, with three contracts awarded.
    - Each contract was allocated one-third of the SEB cost.
  - P353 was the first survey in a four-year contract.

- P353 was allocated one-fourth of the SEB cost.

Contracting Officer's Technical Representative (COTR)

- COTR costs were allocated based on a two-part process:
  - Percentage of time an individual spent on COTR activities; and
  - Percentage of COTR time spent administering the contract for a particular survey.
  - Allocation percentages were based on estimates provided by HSD staff.
- COTR other direct costs (travel, rentals, supplies, equipment) were also included.

Contracts

- Contract costs were provided by HSD staff in the form of a Contract Registry.
- The Contract Registry displayed the cost associated with completion of individual "smooth sheets" under each contract, by year of completion. A smooth sheet is an archivable graphic and digital record of the survey.
  - Accordingly, contract costs for each survey were applied during the year in which each smooth sheet was completed.
  - Costs incurred in years other than the base year were inflated/deflated to the base year using the methodology described in *General Assumptions and Data Sources* above.

Physical Scientists

- Detailed hour and grade information was not provided. Cost information provided was considered to be unburdened (simply hours times rates), and was burdened accordingly within the model.

Final Processing

- Final processing includes those hours/costs required to produce a final smooth sheet.
- Final processing for several surveys has yet to be completed. In these cases, estimates to complete were used.
- Unless specifically otherwise noted, final processing took place during the same fiscal year as the actual survey.
- For contract surveys that were completed during more than one year, final processing costs are applied to the year in which the smooth sheet was produced by the contractor. Smooth sheet completion dates were provided on the Contract Registry, and final processing hours were provided for each sheet. Thus the final processing costs were applied to the year in which the smooth sheet was completed.
- Data provided were in hours; thus all final processing allocations are 100%.
- Final processing hours were provided by the Pacific Hydrographic Branch (PHB) and the Atlantic Hydrographic Branch (AHB) for Alaska and Gulf of Mexico surveys, respectively.
- Pre-acceptance refers to those hours/costs associated with review of survey data prior to final processing.

Office of Marine and Aircraft Operations (OMAO)

NOAA Vessel Operations

- Costs (labor and non-labor) for operating survey vessels are only available as annual totals. Therefore, total costs associated with each ship were allocated to individual surveys based on

the ratio of project sea days to vessel sea days in a given year. These costs include the following:

- Vessel labor and benefits;
- Marine center labor and benefits;
- OMAO/ONCO labor and benefits (ONCO is the predecessor organization to OMAO);
- Additional health care costs for NOAA Corps;
- Future Retired Pay of Commissioned Officers (FRPCO);
- NOAA Common Services costs;
- Travel and per diem;
- Supplies;
- Fuel;
- Maintenance & Repair; and
- Miscellaneous.
- All labor costs include the appropriate overhead costs (see *Overhead/Distribution* Rates above).

Ship Depreciation

- Both the RAINIER and the WHITING have exceeded the standard 30-year useful life used to calculate depreciation. Calculation of depreciation in this analysis was based on guidance from the OMB Circular No. A–76 Revised Supplemental Handbook (paragraph 2.D.2.b), which states "if an applicable asset is fully depreciated…extend the life of the asset through the end of the performance period. The cost of depreciation is then recalculated using the extended life and original acquisition cost." Depreciation for each ship was based on a useful life that extends through fiscal year 2000.
- The Ships' annual depreciation costs were allocated to surveys based on the ratio of survey sea days to ship sea days in the survey year.
  - Survey sea days include days spent transiting to and from the survey site.

Equipment Depreciation

- All equipment depreciation is based on a five-year useful life. This is shorter than the prescribed period in the A-76 Revised Supplemental Handbook, but is deemed to be a more accurate representation of useful life, according to NOAA personnel.
- Costs for CO-OPS equipment (portable tide gauges) were provided for Atlantic and Pacific Field Operations Divisions:
  - Atlantic costs were allocated evenly to the WHITING, RUDE, and BAY HYDROGRAPHER.
    - The RUDE and BAY HYDROGRAPHER are East Coast vessels that were not involved in the surveys examined in this analysis.
  - Pacific costs were allocated entirely to the RAINIER.
- Ships' equipment costs were allocated to surveys based on the ratio of survey sea days to ship sea days in the survey year.
  - Survey days-at-sea include days spent transiting to and from the survey site.
- No equipment costs were incurred by contract surveys.

Hydrographic Systems and Technology Program (HSTP)

- A portion of the total Hydrographic Systems and Technology Program (HSTP) effort provides direct support to in-house hydrographic surveys. Present accounting methods, however, do not identify costs separately for surveys. In addition, there was a reorganization in FY2000 that moved personnel from the HSD to the HSTP. For these reasons, it was necessary to use a multi-step approach to allocate HSTP costs to individual surveys.
  - Various percentages of multiple organizations' labor and travel costs were identified as supporting hydrographic surveys:
    - 2000: 50% of NJ1100 (HSTP); including one LT and one LCDR.
    - 1999 and prior: 40% of NJ1100, including one LT; 100% of NJ3200 (Systems Support Branch), including one LCDR.
  - After this distribution, the HSTP costs supporting hydrographic surveys are allocated to each ship based on that ship's percentage of total fleet ship costs in that year. For example, in 1999 the NOAA Ship RAINIER incurred costs of $6,137K; total hydrographic vessel costs (RAINIER, WHITING, and RUDE) in 1999 were $12,098K. Thus 49.9% (6,137/12,098) of the costs were allocated to the RAINIER.
  - Next, HSTP costs for each ship were allocated to individual surveys based on the percentage of survey days-at-sea to total days-at-sea. For example, for survey P342-RA, the RAINIER was at sea for 30 days in 1999. The RAINIER was at sea for a total of 195 days in 1999. Thus, 15.4% (30/195) of the RAINIER's HSTP costs for 1999 were allocated to survey P342-RA.
    - Survey days-at-sea include days spent transiting to and from the survey site.
  - HSTP costs were unavailable prior to 1998. For the one survey that was performed prior to 1998 (G342-WH, 1996), civilian salary costs were based on 1998 costs, deflated based on Government-wide raise percentages. The "deflation" percentage was 2.3% for both years, to reflect the 2.3% general schedule increase from 1996 to 1997 and from 1997 to 1998. Travel costs for 1996 and 1997 were similarly derived.
- Although HSTP research benefits the general hydrographic community, it was impossible to quantify this benefit to contractors and time charter vendors. Accordingly, no HSTP costs were applied to contracts and time charters.

Center for Operational Oceanographic Products and Services (CO-OPS)

- All CO-OPS costs were provided by CO-OPS staff.
- Most data provided were in hours; thus most allocations are 100%.
- In cases where surveys were conducted over multiple years (primarily contract surveys), CO-OPS costs were evenly distributed to each of the years during the survey. Exceptions are SEB and contract data evaluation (see below under SEB and RDD/OET, respectively).

Source Evaluation Board (SEB)

- CO-OPS SEB costs were based on an estimate of 56 hours (GS-13, step 5, Washington, DC) per contract.
- CO-OPS SEB costs were assumed to have been incurred in the same year as the main SEB costs.

Requirements and Development Division, Hydrographic Planning Team (RDD/HPT)

- Hours and grades were provided, but not steps (with the exception of some grades listed as 12.5). Grades listed as 12.5 were assumed to be step 5. Otherwise, step 1 was assumed.

Requirements and Development Division, Operational Engineering Team (RDD/OET)

- One GS-14/5 did inspection work on contractor surveys in Alaska; approximately three weeks. These costs were allocated evenly to the three contractor surveys in Alaska (P367-KR, P385-KR, and P353-KR). For surveys that spanned multiple years, this cost was assumed to have been incurred in the final year of the contract.
- Additional RDD/OET hours were provided for various surveys; assumed as a GS-13/7.

Field Operations Division (FOD)

- Costs for FOD were provided already extended (no detail for hours and grades). These extended costs were burdened in the same manner as all other costs.
- FOD travels costs are also included.

Products and Services Division (PSD)

- Hours for PSD were provided for four areas, and extended based on GS-11/5 and GS-12/5 labor rates.

Remote Sensing Division (RSD)

- The Remote Sensing Division often performs acquisition of shoreline data for in-house and contracted hydrographic surveys. However, these costs are based on the physical geography of the shoreline, and not the size of the survey area. A relatively small survey area may have complex shoreline, and a large survey could have very simple shoreline. Further, the cost of acquiring shoreline data varies depending on the previous existence of useful data. Due to the inconsistencies in shoreline costs, to avoid skewing the overall cost of conducting surveys, the cost of shoreline has not been included in this analysis.

Survey-Specific Assumptions and Data Sources

G342-WH

- Survey G342-WH was conducted near Charleston, SC. NOAA has not conducted any in-house surveys in the Gulf of Mexico in the last five years. This survey was considered to be the most comparable to a Gulf of Mexico survey due to similarities in the geophysical landscape.

P353-KR

- This survey included some shoreline work conducted by the contractor. Since shoreline costs are not being included in this analysis, the cost associated with this work was removed from the contract cost. The cost for the shoreline was $17,425. The original contract cost was $5,252,486. The contract cost used in the analysis was $5,235,061.

K171-KR

- K171-KR comprised work by three contractors: SAIC, C&C, and JECA.
- 700 project planning hours were allocated to three contractors under this contract, based on survey size.

- The Source Evaluation Board (SEB) and project planning took place in FY97. CO-OPS, contract, and final processing costs were incurred in FY98 and FY99. COTR costs were incurred FY98, FY99, and FY00.
- CO-OPS Data Acquisition and Processing (Products and Services Division) hours were provided at the contract level. These hours were allocated evenly among the three contracts.

Time Charter Methodology, Assumptions, and Data Sources

No historical data were available for time charters for hydrographic survey operations. Cost estimates were provided by three vendors for the two survey types – main vessel operations in the Gulf of Mexico and largely launch operations in Alaska. The cost estimates for the Gulf of Mexico are likely based on experiences with similar size vessels utilized in the Gulf offshore oil business, and have a low expected margin of error. However, the lack of experience with operating a four-launch, two small boat vessel operation in remote areas of Alaska lends a great deal of uncertainty to the vendor cost estimates for Alaska. This issue is addressed further in the *Sensitivity Analysis* portion of *Cost Analysis* section below. Estimates of internal NOAA costs associated with supporting and conducting surveys are also included.

- All labor costs were based on FY2000 rates.
- Some costs were computed using the average hours/cost of performing an activity, and multiplying that figure by the estimated number of surveys to be performed in a year.
  - 20 surveys/year in Alaska; and
  - 10 surveys/year in the Gulf of Mexico.
  - For example, if the average hours spent planning an Alaska survey is 100, then the estimated hours for planning surveys in one year on a charter in Alaska is 2000 (20 x 100).
- Costs were summed to determine the total in-house cost of conducting surveys for a one-year period using a charter vessel.
- Costs were then inflated into 2001 costs using the methodology described in *General Assumptions and Data Sources* above.
- The actual contract cost for the time charter – which is based on 2001 quotes – was added to determine the total in-house cost of conducting surveys for a one-year period using a charter vessel.
- Cost per SqNM was calculated by dividing that total figure by the estimated SqNM to be surveyed in each geographic region in a year.
  - 650 SqNM for Alaska; and
  - 500 SqNM for the Gulf of Mexico.
- No side-scan sonar was requested for the time charter in Alaska. While it is anticipated that side-scan will occasionally be required, this will be paid for on a daily basis. As such, these costs are not included in this analysis.

Time Charter

Costs for the actual contracted time charter were based on quotes provided by three vendors. The Navy's Military Sealift Command (MSC) agreed to conduct a market survey seeking quotes for charters in both Alaska and the Gulf of Mexico. HSD provided equipment specifications, which can be found in Appendix C, and staffing requirements. KPMG Consulting and HSD worked to answer additional questions posed by MSC, which in turn helped to create the most

accurate and useful market survey possible. Three quotes were provided for both geographic regions. The median of the three values for each region was used in estimating total costs associated with surveying using a time charter.

The potential use of University National Oceanographic Laboratory System (UNOLS) fleet vessels was also considered for time charters. It was determined that UNOLS is a more research-focused organization, and would not be capable of or interested in providing vessels for use in hydrographic surveying. Therefore, UNOLS was not considered as a possible source for time charters.

Internal NOAA Requirements

Hydrographic Surveys Division (HSD)

- Planning costs were estimated using planning hours for actual in-house surveys
  - Alaska:
    - The average of the two in-house Alaska surveys (80 and 120) was 100 hours.
    - 100 hours multiplied by the estimated 20 surveys/year results in 2000 hours/year.
  - Gulf of Mexico:
    - The one in-house Gulf of Mexico survey required 160 hours of planning.
    - 160 hours multiplied by the estimated 10 surveys/year results in 1600 hours/year.
- The SEB is anticipated to require the following:
  - Five personnel, average grade of GS-13/5; and
  - Two months per time charter.
- COTR is expected to require full-time attention of one GS-13/5 for the entire year.
- Program Support for logistics is expected to require full-time attention of one GS-7/5 for the entire year.
- Scientific staff is expected to comprise three crews, rotating between shipboard service and processing at the hydrographic branches.
  - Alaska crew (5):
    - Chief Hydro – O-4;
    - Three (3) Physical Scientists – GS-11/5; and
    - Computer Specialist – GS-12/5.
  - Gulf of Mexico crew (3):
    - Chief Hydro – O-4;
    - Physical Scientist – GS-11/5; and
    - Computer Specialist – GS-12/5.
  - Estimates also include the cost of travel associated with rotating the crew, as well as overtime and sea pay costs associated with personnel at sea.
  - Allocations for each of these items (labor and travel) incorporate a 300% factor, to account for the three rotating crews.
- Costs for final approval of smooth sheets are also included:
  - Alaska: 5 hours per survey multiplied by 15 surveys equals 75 hours per year.
  - Gulf of Mexico: 4 hours per survey multiplied by 10 surveys equals 40 hours per year.
- Other direct costs were also included based on the cost allocated to in-house surveys in 2000.

Center for Operational Oceanographic Products and Services (CO-OPS)

- CO-OPS costs were determined using historical CO-OPS costs:

- The average costs per SqNM of surveys in Alaska ($297.09) and the Gulf of Mexico ($101.88) were calculated.
- These figures were multiplied by the estimated annual square miles to be surveyed in a year in each region (Alaska – 500, Gulf of Mexico – 650) to reach the estimated total annual cost associated with CO-OPS for time charters.

Cost Analysis

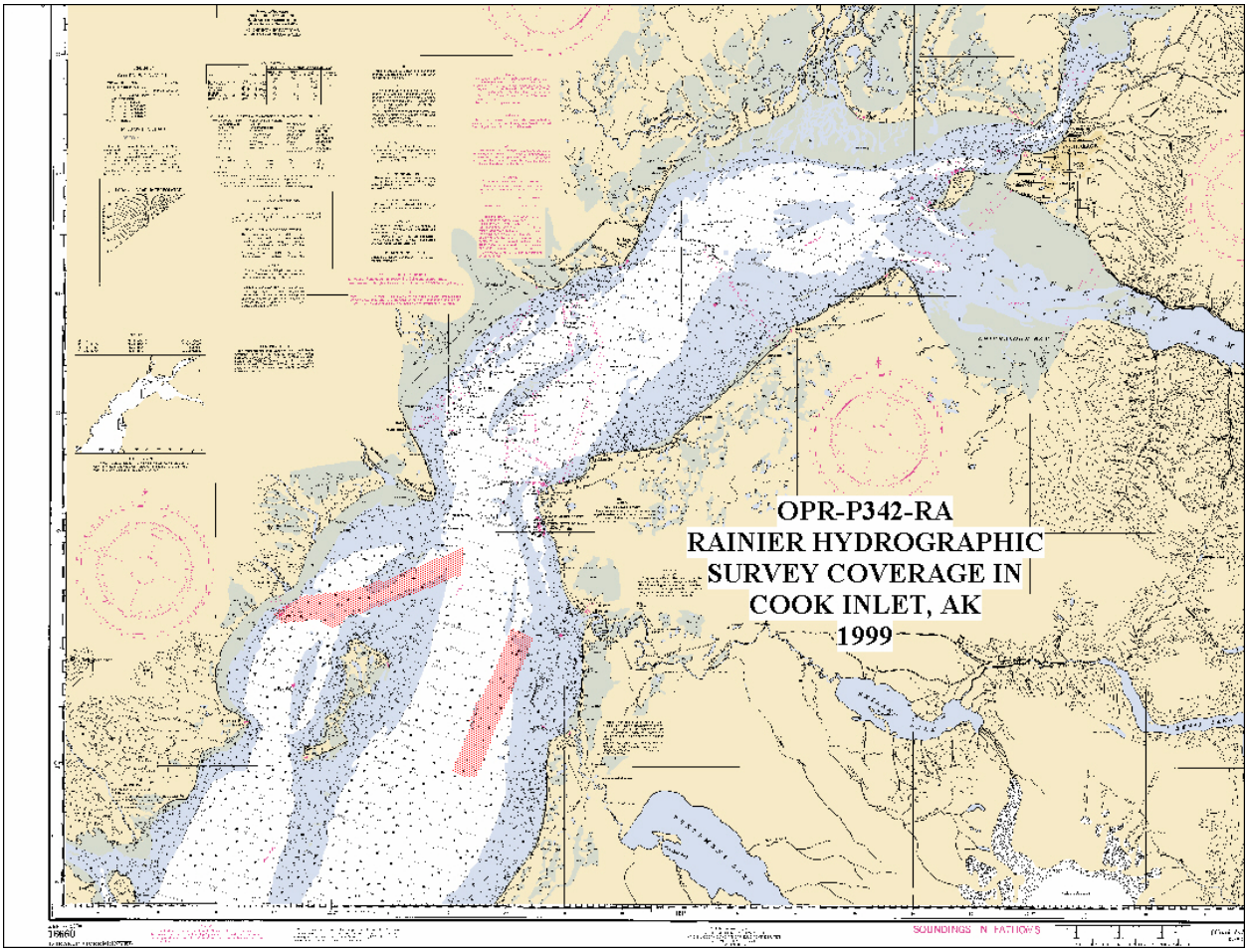
NOAA In-house Surveys

Three in-house surveys were examined for this analysis:

- Alaska, shallow water:
  - P342-RA, a 1999 survey of Cook Inlet conducted on the NOAA Ship RAINIER.
- Alaska, deep water:
  - P139-RA, a 2000 survey of Prince William Sound conducted on the NOAA Ship RAINIER.
- Gulf of Mexico:
  - G342-WH, a 1996 survey of Charleston, South Carolina, conducted on the NOAA Ship WHITING (used as representative of the costs of surveying in the Gulf of Mexico).

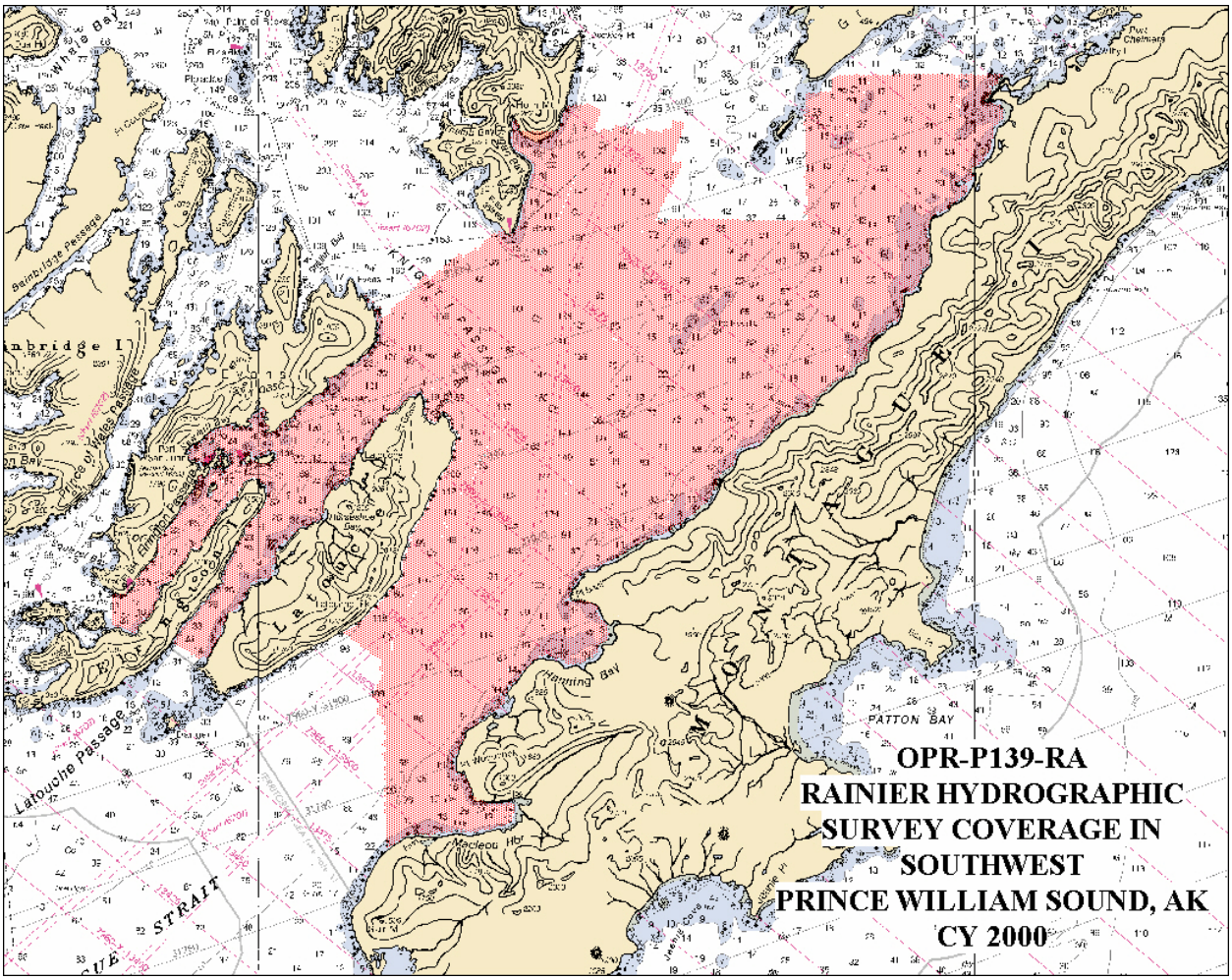
The tables on the following pages reflect the results of modeling the costs associated with each in-house survey. The tables are broken out by the organization (HSD, OMAO, HSTP, and CO-OPS) and the type of cost: labor, other direct costs (ODCs), and contract/charter. The costs are in thousands of 2001 dollars.

Alaska Shallow Water Surveys



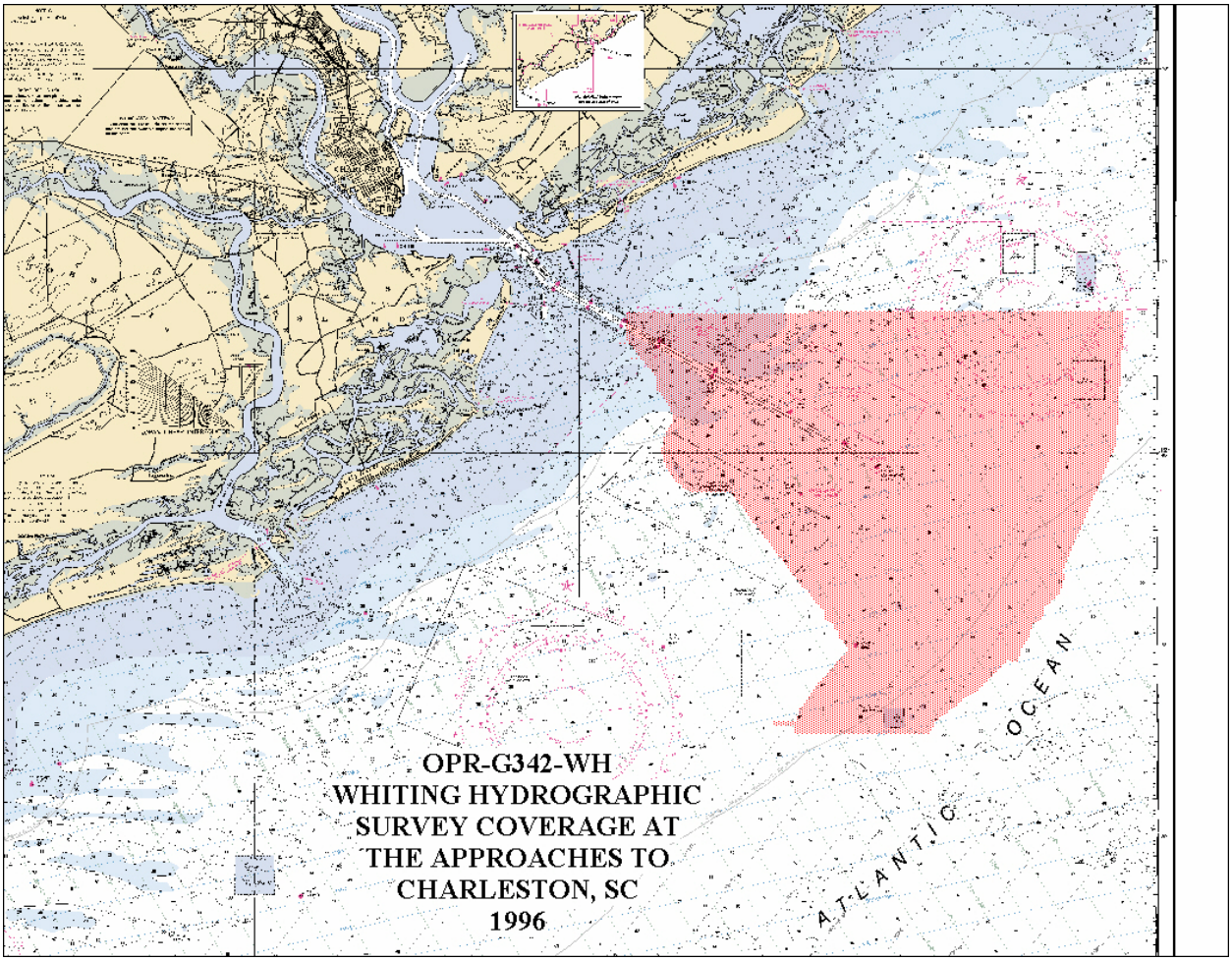
Survey Cost, thousands of 2001 dollars				
P342-RA	Cook Inlet, AK	57.2 SqNM	RAINIER	1999
	Labor	ODCs	Contract/Charter	Total
HSD	$51.5	$66.8	-	$118.3
OMAO	$826.3	$300.6	-	$1,126.8
HSTP	$114.8	$3.6	-	$118.4
CO-OPS	$17.2	$1.5	-	$18.8
Total	$1,009.8	$372.5	-	$1,382.3
Cost/SqNM	$17.65	$6.51	-	$24.17

Alaska Deep Water Surveys



Survey Cost, thousands of 2001 dollars				
P139-RA	Pr. Wm. Sound	188.6	RAINIER	2000
	Labor	ODCs	Contract/Charter	Total
HSD	$216.8	$13.8	-	$230.6
OMAO	$1,319.6	$532.6	-	$1,852.2
HSTP	$191.1	$3.6	-	$194.7
CO-OPS	$16.3	$3.7	-	$20.0
Total	$1,743.7	$553.7	-	$2,297.4
Cost/SqNM	$9.25	$2.94	-	$12.18

Gulf of Mexico Surveys



Survey Cost, thousands of 2001 dollars				
G342-WH	Charleston, SC	80.2	WHITING	1996
	Labor	ODCs	Contract/Charter	Total
HSD	$30.4	$153.7	-	$184.1
OMAO	$805.4	$268.4	-	$1,073.9
HSTP	$128.1	$4.7	-	$132.8
CO-OPS	$3.3	$1.5	-	$4.8
Total	$967.2	$428.4	-	$1,395.6
Cost/SqNM	$12.06	$5.34	-	$17.40

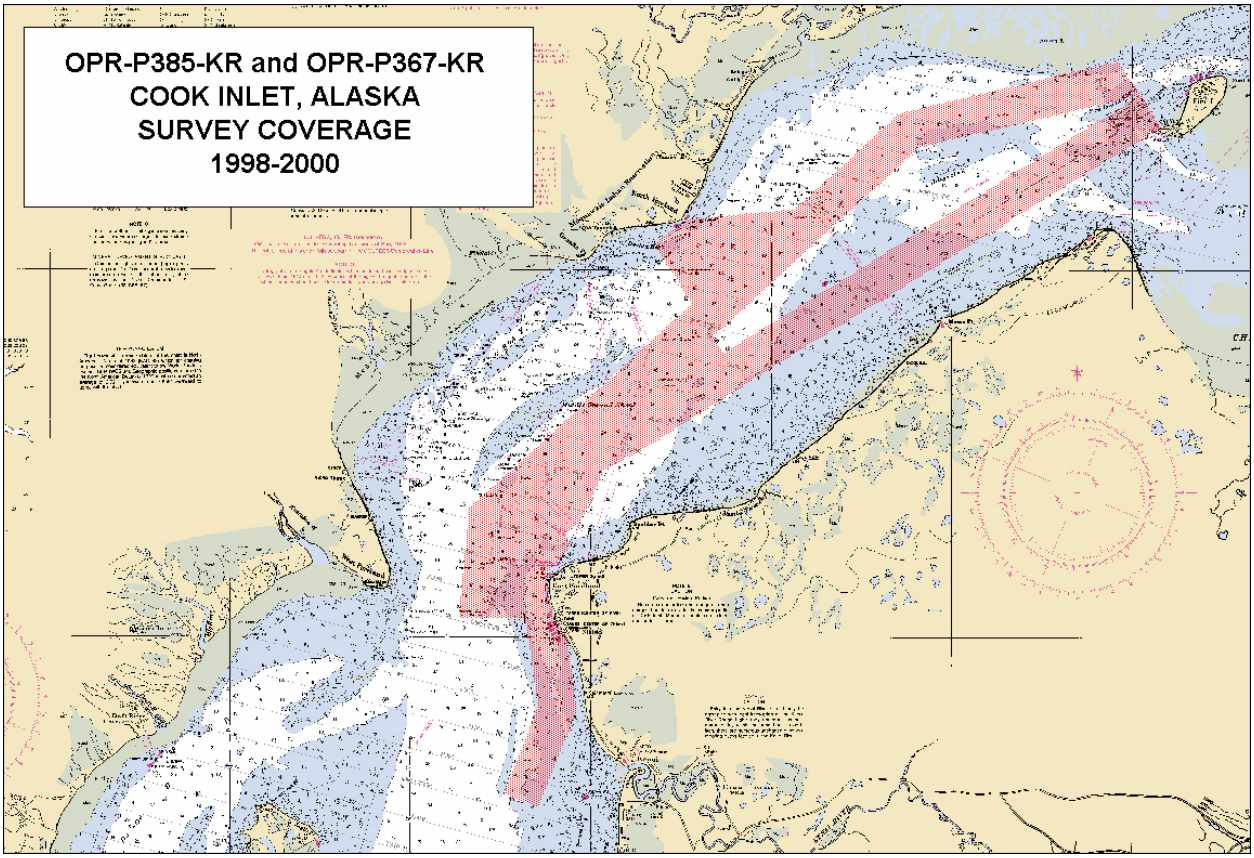
Contractor-performed Surveys

Six contractor surveys were examined for this analysis:

- Alaska, shallow water:
  - P367-KR, a 1998-1999 survey of Cook Inlet conducted by Terra Surveys; and
  - P385-KR, a 1999-2000 survey of Cook Inlet conducted by Racal.
- Alaska, deep water:
  - P353-KR, a 2000 survey of Harris Bay/Aialik conducted by Racal.
- Gulf of Mexico:
  - K171-KR, a survey of the Gulf of Mexico by three contractors:
    - SAIC, 1998-1999;
    - C&C, 1998-1999; and
    - JECA, 1998-2000.

The following tables reflect the results of modeling the costs associated with each contractor-performed survey. The costs are in thousands of 2001 dollars.

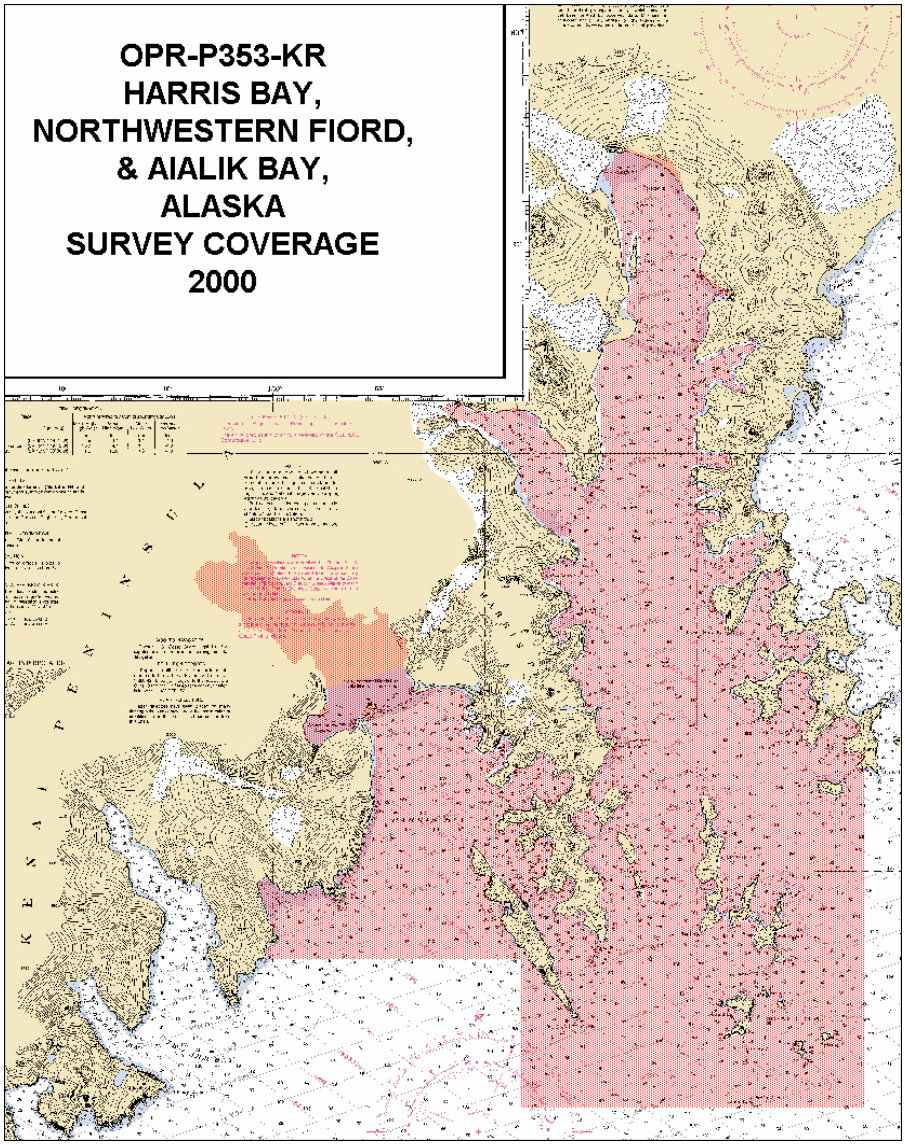
Alaska Shallow Water Surveys



Survey Cost, thousands of 2001 dollars				
P367-KR	Cook Inlet, AK	54.0 SqNM	Terra Surveys	1998-1999
	Labor	ODCs	Contract/Charter	Total
HSD	$348.1	$128.1	-	$476.2
Contract	-	-	$2,992.9	$2,992.9
CO-OPS	$28.0	$7.4	-	$35.4
Total	$376.1	$135.5	$2,992.9	$3,504.5
Cost/SqNM	$6.96	$2.51	$55.43	$64.90

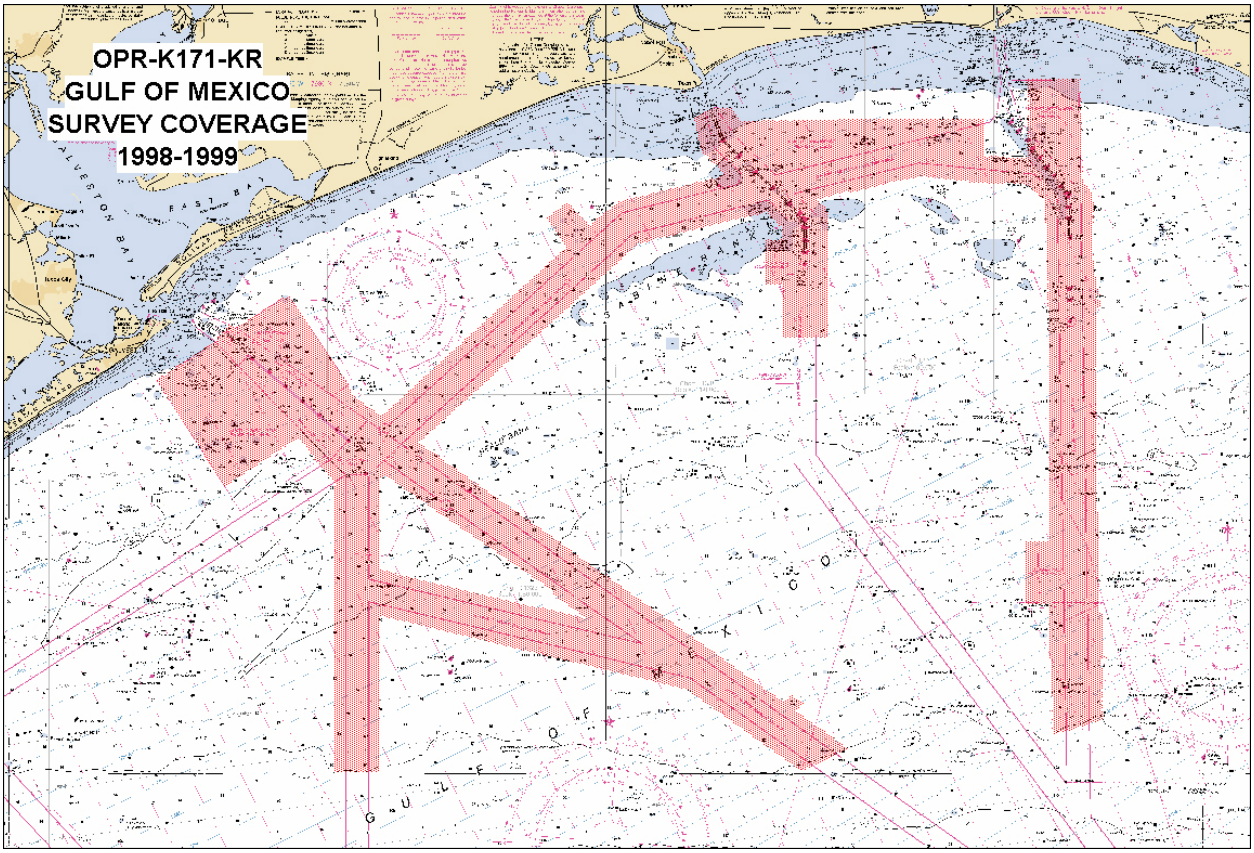
Survey Cost, thousands of 2001 dollars				
P385-KR	Cook Inlet, AK	180.8 SqNM	Racal	1999-2000
	Labor	ODCs	Contract/Charter	Total
HSD	$244.9	$137.2	-	$382.1
Contract	-	-	$8,932.2	$8,932.2
CO-OPS	$61.2	$2.6	-	$63.7
Total	$306.0	$139.8	$8,932.2	$9,378.0
Cost/SqNM	$1.69	$0.77	$49.40	$51.87

Alaska Deep Water Surveys



Survey Cost, thousands of 2001 dollars				
P353-KR	Harris/Aialik	156.1 SqNM	Racal	2000
	Labor	ODCs	Contract/Charter	Total
HSD	$121.6	$47.5	-	$169.2
Contract	-	-	$5,369.2	$5,369.2
CO-OPS	$22.1	$0.2	-	$22.3
Total	$143.7	$47.7	$5,369.2	$5,560.6
Cost/SqNM	$0.92	$0.31	$34.40	$35.62

Gulf of Mexico Surveys



Survey Cost, thousands of 2001 dollars				
K171-KR	Gulf of Mexico	584.1 SqNM	SAIC	1998-1999
	Labor	ODCs	Contract/Charter	Total
HSD	$447.4	$107.2	-	$554.6
Contract	-	-	$10,284.1	$10,284.1
CO-OPS	$41.8	$0.3	-	$$42.1
Total	$489.1	$107.5	$10,284.1	$10,880.8
Cost/SqNM	$0.84	$0.18	$17.61	$18.63

Survey Cost, thousands of 2001 dollars				
K171-KR	Gulf of Mexico	386.7 SqNM	C&C	1998-1999
	Labor	ODCs	Contract/Charter	Total
HSD	$377.8	$106.7	-	$484.6
Contract	-	-	$6,473.8	$6,473.8
CO-OPS	$41.8	$0.3	-	$42.1
Total	$419.6	$107.0	$6,473.8	$7,000.5
Cost/SqNM	$1.09	$0.28	$16.74	$18.10

Survey Cost, thousands of 2001 dollars				
K171-KR	Gulf of Mexico	265.0 SqNM	JECA	1998-2000
	Labor	ODCs	Contract/Charter	Total
HSD	$321.4	$106.3	-	$427.7
Contract	-	-	$5,454.3	$5,454.3
CO-OPS	$41.8	$0.3	-	$42.1
Total	$363.2	$106.6	$5,454.3	$5,924.1
Cost/SqNM	$1.37	$0.40	$20.58	$22.36

Summary of Contractor-Performed Survey Costs

The following tables summarize the results of each contractor-performed survey, for both Alaska (shallow and deep water) and the Gulf of Mexico, and display the average cost for scenarios with multiple surveys. These figures are in dollars per square nautical mile.

Summary of Contractor-Performed Survey Costs – Alaska Shallow Water				
Cost per square nautical mile ($/SqNM), thousands of 2001 dollars				
	Labor	ODCs	Contract/Charter	Total
P367-KR	$6.96	$2.51	$55.43	$64.90
P385-KR	$1.69	$0.77	$49.40	$51.87
Average	$4.33	$1.64	$52.41	$58.38

Summary of Contractor-Performed Survey Costs – Alaska Deep Water				
Cost per square nautical mile ($/SqNM), thousands of 2001 dollars				
	Labor	ODCs	Contract/Charter	Total
P353-KR	$0.92	$0.31	$34.40	$35.62

Summary of Contractor-Performed Survey Costs – Gulf of Mexico				
Cost per square nautical mile ($/SqNM), thousands of 2001 dollars				
	Labor	ODCs	Contract/Charter	Total
K171-KR – SAIC	$0.84	$0.18	$17.61	$18.63
K171-KR – C&C	$1.09	$0.28	$16.74	$18.10
K171-KR – JECA	$1.37	$0.40	$20.58	$22.36
Average	$1.10	$0.29	$18.31	$19.70

Surveys utilizing Time Charter Vessels

As previously mentioned, three vendors provided quotes for time charters. The quotes are for a one-year charter. This information is summarized in the table below, in millions of dollars:

	Vendor 1	Vendor 2	Vendor 3	Median
Alaska	$9.75M	$9.50M	$8.16M	$9.50M
Gulf of Mexico	$9.60M	$9.00M	$6.77M	$9.00M

The following tables reflect the results of modeling the costs associated with surveys in Alaska and the Gulf of Mexico using time charters. The costs are per square nautical mile of hydrographic surveying, in thousands of dollars.

Survey Cost, thousands of 2001 dollars				
	Alaska	650.0 SqNM	Time Charter	2001
	Labor	ODCs	Contract/Charter	Total
HSD	$2,550.2	$73.7	-	$2,623.9
Charter	-	-	$9,452.5	$9,452.5
CO-OPS	$199.1	$1.4	-	$200.4
Total	$2,749.3	$75.1	$9,452.5	$12,276.9
Cost/SqNM	$4.23	$0.12	$14.54	$18.89

Survey Cost, thousands of 2001 dollars				
	Gulf of Mexico	500.0 SqNM	Time Charter	2001
	Labor	ODCs	Contract/Charter	Total
HSD	$1,729.2	$49.4	-	$1,778.7
Contract	-	-	$8,955.0	$8,955.0
CO-OPS	$61.9	$0.4	-	$62.4
Total	$1,791.2	$49.8	$8,955.0	$10,796.0
Cost/SqNM	$3.58	$0.10	$17.91	$21.59

Summary of Results

The following table, which is also displayed in the Executive Summary, reflects the total cost per square nautical mile for each survey area and methodology. These costs are for FY2001.

Cost per square nautical mile ($/SqNM), thousands of dollars			
	In-house	Contractor	Time Charter
Alaska - Shallow	$24.17	$58.38	$18.89*
Alaska - Deep	$12.18	$35.62	
Gulf of Mexico	$17.40	$19.70	$21.59

* Costs of the time charter for Alaska did not differentiate between deep and shallow water surveys.

Sensitivity Analysis

For the most part, all cost elements involved with these surveys are linear (i.e., increasing a cost element increases the total cost by the same amount). As such, there are no single drivers that will significantly vary the total cost estimates beyond the variance of the single cost element. The main cost element for each survey method is the survey vessel and the cost of its operations. For the in-house surveys, that cost falls under OMAO. For the contract and charter surveys, that cost is included in the contract/charter cost. The estimates for the in-house and contract surveys were based largely on historical costs (and actual contract amounts), and therefore involve little uncertainty. The costs for time charters are based on estimates provided by vendors, as well as estimates for NOAA costs associated with charters. These figures involve slightly more uncertainty.

There are also several assumptions that, if changed, would impact the results:

- The assumed number of square nautical miles that would be surveyed by the time charter vessels:
  - If these figures were to be significantly increased, then the cost per square nautical mile of the time charter would significantly decrease, and vice-versa.
- The number of launches on each vessel:
  - It is conceivable that a ship could operate using more or fewer launches than prescribed by the vessel specifications. This could change the ship cost in the contractor and time charter scenarios.
- Should NOAA operations, contracts, or time charters realize increased efficiencies in the future, the cost of each survey would be reduced.
- Asset insurance costs for in-house surveys were based on the estimated market value of the vessels, launches, and equipment. This is considered to be the most representative value for the vessels to be used for estimating insurance costs. However, should the estimated replacement value of the vessels be used instead of the estimated market value, the insurance costs will vary.
  - Estimated replacement values for the two vessels:
    - RAINIER – $50M; and
    - WHITING – $40M.

- Changing the vessel cost to these values impacts the allocated insurance cost for the three in-house surveys as follows:
  - P342-RA: increases from $5,586.15 to $43,846.15.
  - P139-RA: increases from $9,420.97 to $73,945.95.
  - G342-WH: increases from $3,641.70 to $50,319.15.
- In turn, the impact on the total cost per square nautical mile of each survey would be as follows:
  - P342-RA: increases from $24,166 to $24,878/SqNM.
  - P139-RA: increases from $12,182/SqNM to $12,534/SqNM.
    - Average for in-house Alaska surveys increases from $18,174/SqNM to $18,706/SqNM.
  - G342-WH: increases from $17,401/SqNM to $18,059/SqNM.
- It should be noted that in each case, using the replacement value in estimating insurance costs only effects a 2.9% increase in the total cost per square nautical mile for in-house surveys.

- Similarly, if the cost of replacement vessels were to be used in lieu of the depreciation figures used for existing vessels, the bottom-line costs for the in-house surveys would be altered:
  - Estimated replacement values for the two vessels:
    - RAINIER – $50M:
      - Depreciated value over 30 years would be $1.67M.
    - WHITING – $40M:
      - Depreciated value over 30 years would be $1.33M.
  - Changing the vessel depreciation to these values impacts the allocated depreciation cost for the three in-house surveys as follows:
    - P342-RA: increases from $25,131.02 to $256,410.26.
    - P139-RA: increases from $42,383.12 to $432,432.42.
    - G342-WH: increases from $15,229.21 to $312,056.74.
  - In turn, the impact on the total cost per square nautical mile of each survey would be as follows:
    - P342-RA: increases from $24,166/SqNM to $28,474/SqNM.
    - P139-RA: increases from $12,182/SqNM to $14,313/SqNM.
      - Average for in-house Alaska surveys increases from $18,174/SqNM to $21,394/SqNM.
    - G342-WH: increases from $17,401/SqNM to $21,588/SqNM.
- Variances in the estimates provided by vendors for time charters would also have a significant impact on the cost per square mile of time charter surveys.
  - Assume the quotes for annual time charter costs are increased as follows:
    - Alaska: increases from $9.5M to $12.0M.
    - Gulf of Mexico: increases from $9.0M to 10.5M.
  - This increase would have the following impact on time charter cost per square mile:
    - Alaska: increases from $18,888/SqNM to $22,714/SqNM.
    - Gulf of Mexico: increases from $21,592/SqNM to $24,577/SqNM
- As the previous two bullets demonstrate, the estimated cost of the vessel and its operations is the primary driver behind each of the survey methodologies. Should that cost change

considerably, the cost of performing the surveys under each scenario would also significantly change.

Additional Comments

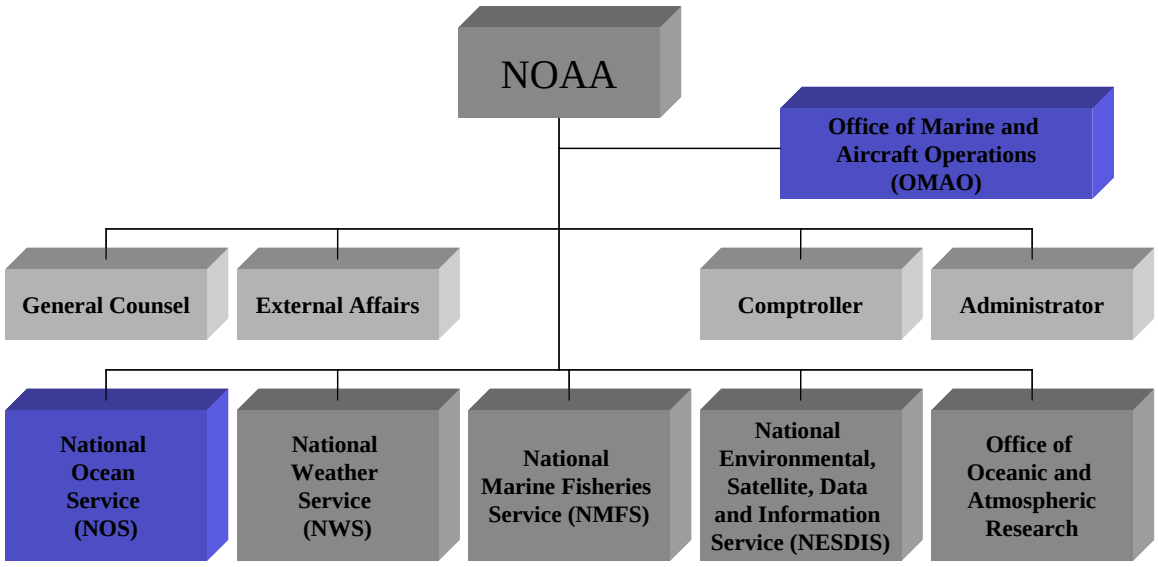
- One vendor also provided time charter annual costs associated with three- and five-year charters in Alaska:
  - One-year charter – $9.75M;
  - Three-year charter – $8.25M; and
  - Five-year charter – $7.25M.
  - Government funding restrictions make it difficult, if not impossible, to contract for multi-year charters. However, it is clear that multi-year agreements would be financially advantageous to the Government.
- Anticipated cost reductions associated with increased efficiencies were impossible to quantify. It is estimated that some reductions in future costs would be realized (for in-house surveys and potentially for contractor surveys as well).
- Contracting methodologies:
  - NOAA uses Brooks Act (Public Law 92-582, 1972) contracting for the contract surveys (also known as architectural & engineering or A&E contracting). In this process, contracts are awarded based on technical capabilities, and then costs are negotiated with the most qualified offeror.
  - Time charter contracts would be awarded based on normal procurement regulations, which would allow for cost considerations in contracting decisions.
- Contractors work under firm-fixed price contracts for each area to be surveyed and therefore must assume all the risk associated with contingencies for weather, adequate spare parts, etc. These risks are covered by higher negotiated contract costs. A time charter only ensures the availability of a properly equipped and staffed vessel and does not guarantee a specific level of production of data meeting NOS standards.
- The figures for the Alaska contractor-performed surveys are substantially higher than the Alaska in-house and Alaska charter amounts. The largest cost component for these surveys is the contract cost. Contract confidentiality clauses prevented the release of detailed contract information to KPMG Consulting, so thorough analysis of the contract costs was not possible. However, there are several possible explanations for the high Alaska contract costs:
  - The NOAA vessels used for the surveys examined in this analysis are over thirty years old. Therefore, the depreciation cost is minimal compared to the contractors' expense for obtaining or leasing a data acquisition platform.
  - The survey platform costs are significantly higher in Alaska due to simple supply and demand. Suitably sized vessels are often in competition with the fishing industry. Large survey vessels capable of supporting 4 launches and 2 small survey support boats are simply not available. This unavailability of a large vessel limits the amount of work that can be done in acceptable survey conditions due to the relatively short survey season in Alaska (limited by weather and darkness). Contractor procurement of a large vessel is simply not cost-effective without a long-term, guaranteed contract from the government.
  - Mobilization and demobilization costs for contractor surveys in Alaska are quite high due to the distance from the population centers of the lower 48 states. This is exacerbated by

the short survey season, which limits the number of surveys over which to spread these expenses.

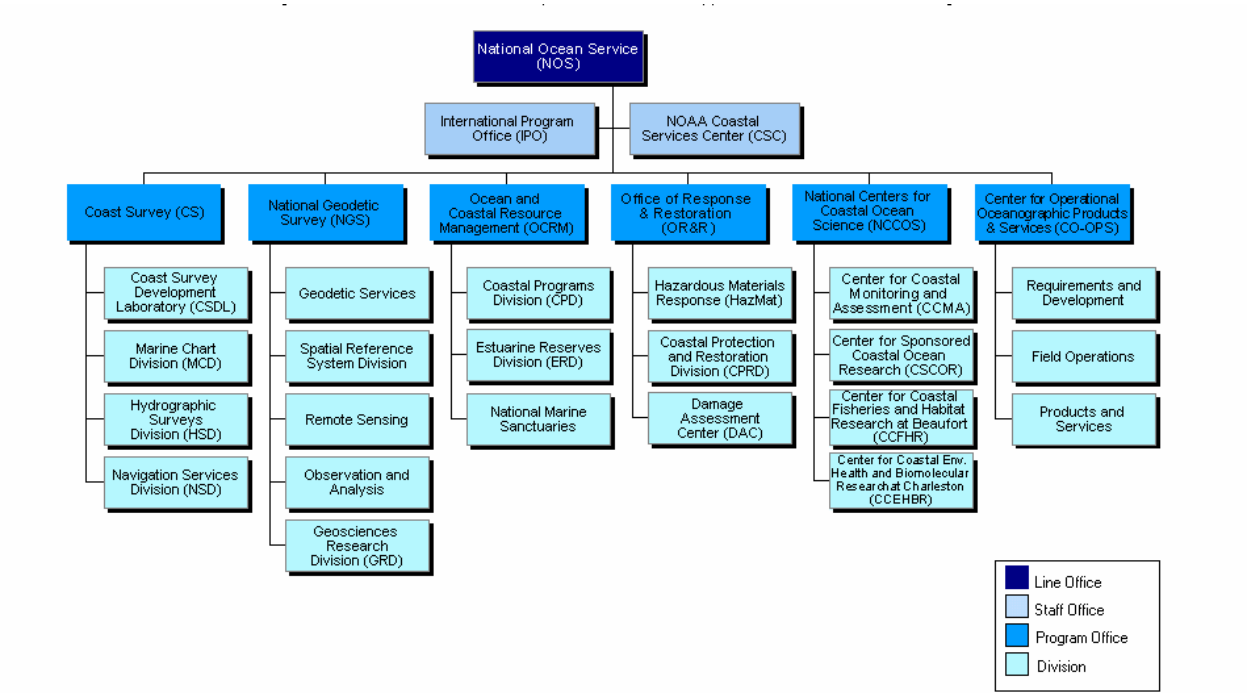
- Contractors must amortize their vessels and equipment over a period of time, and charge their customers to recover these costs. Whereas the time charter quotes used herein allow for a full-year to charge for these amortized costs, the contractors can only charge for these costs during the survey. For this reason, they may charge more for the equipment than a time charter vendor.
  - In the Gulf of Mexico, there is substantial other survey work to be done, for oil exploration companies and telecommunications companies seeking to lay underwater cable. Contractors in the Gulf, if more fully utilized, would be able to spread their vessel and equipment amortization costs across multiple customers.
- Contractor personnel are often rotated during the survey field season, and the contracting company covers the travel costs of personnel, usually to non-Alaska (more expensive) destinations. Crews on NOAA hydrographic vessels are not rotated unless the field season is unusually long.

Appendix A – Organizational Charts

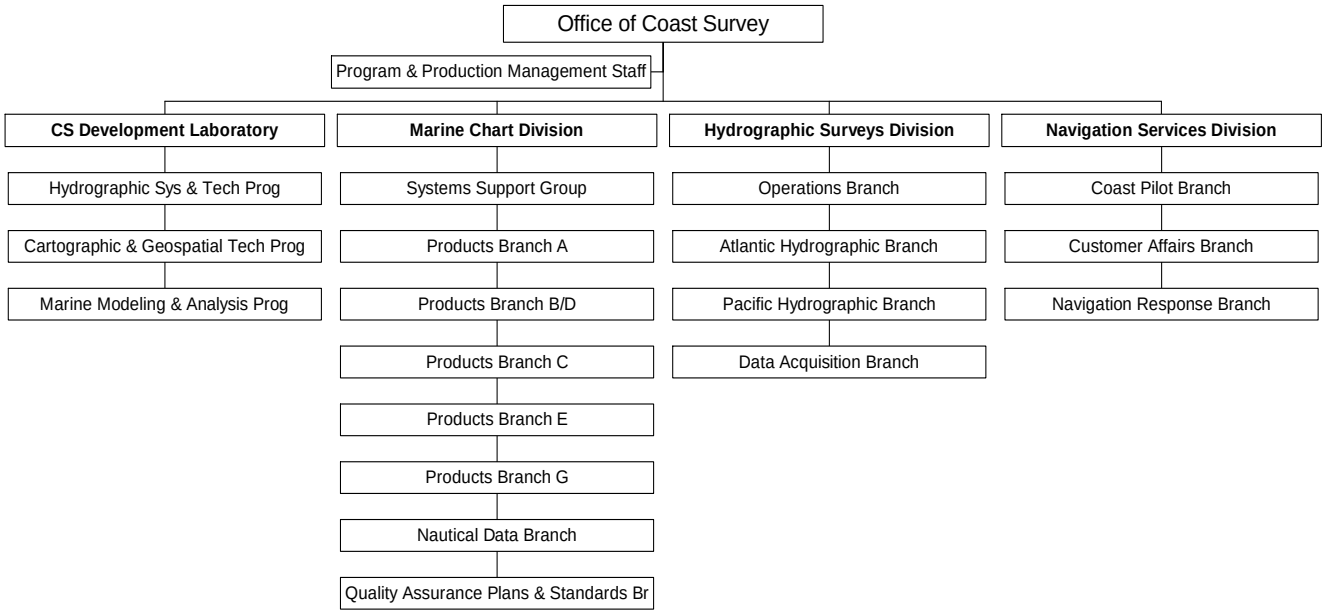
National Oceanic and Atmospheric Administration (NOAA)



National Ocean Service (NOS)



Office of Coast Survey



Appendix B – Glossary of Terms and Acronyms

A&E contracting – refers to contracting for "architectural and engineering services under the Brooks Act.

AHB – Atlantic Hydrographic Branch.

BLS – Bureau of Labor Statistics.

Brooks Act – Public Law 92-582 (1972) which allows for "architectural and engineering services" contracts to be award based on the highest technical competence, with cost negotiation to follow.

Chart – A special purpose map intended primarily for navigational use. A small chart may be called a chartlet. See Nautical Chart.

CO-OPS – Center for Operational Oceanographic Products and Services

COTR – Contracting Officer's Technical Representative, provides oversight for contractor hydrographic survey operations.

CSDL – Coast Survey Development Laboratory, a division of OCS, is responsible for providing and integrating the tools and improved technologies and techniques used to carry out the mission of OCS.

CY – Calendar Year, begins January 1.

Deep water – refers to areas with depth of greater than 100 feet, or 30 meters.

DOC – Department of Commerce.

FOD – Field Operations Division, a division of CO-OPS.

FRPCO – Future Retired Pay of Commissioned Officers.

FY – Fiscal Year begins October 1.

Geodesy – The science of determining the size and shape of the earth by such direct measurements as triangulation, leveling, satellite and gravimetric observations; which determines the external gravitational field of the earth.

Geodetic – Of or pertaining to geodesy.

Geodetic Survey – A survey that takes into account the shape and size of the earth. It is used for the precise location of basic points suitable for controlling other surveys.

GOM – Gulf of Mexico.

GPS – Global Positioning System, is a satellite based positioning system funded and operated by the DOD, but available to civilian users. Civilian positional accuracy with a single receiver is guaranteed to be better than 100 meters, 95% of the time.

HSD – Hydrographic Surveys Division, a division of OCS, coordinates the acquisition and processing of data to update NOAA's nautical charts. HSD is responsible for the quality assurance of all such data that is obtained by both NOAA field units and companies under contract for hydrographic surveying services.

HSIA – Hydrographic Services Improvement Act of 1998.

HSTP – Hydrographic Systems and Technology Program, a division of the CSDL.

Hydrographer – One who studies and practices the science of hydrography.

Hydrographic Expertise – The body of knowledge sufficient to understand and supervise all activities related to hydrographic surveying.

Hydrographic Services – The management, maintenance, interpretation, and certification and dissemination of bathymetric, hydrographic, geodetic, and tide and current information including the production of nautical charts, nautical information databases, and other products derived from hydrographic data; and the development of nautical information systems; and related activities.

Hydrographic Surveys – The principal objective of most Hydrographic Surveys conducted by NOS is to obtain basic data for the compilation of nautical charts with emphasis on the features that may affect safe navigation. This involves obtaining comprehensive depth data and searching for and accurately positioning all surface and subsurface hazards to navigation.

Hydrography – The science that deals with the measurement and description of the physical features of the oceans, seas, lakes, rivers, and their adjoining coastal areas, with particular reference to their use for navigation.

ISSA – Inter-Service Support Agreement.

MCD – Marine Chart Division, a division of OCS, is responsible for maintaining the marine navigational database used to construct, maintain, produce and distribute nautical charts, Coast Pilot volumes, and related marine products.

MOC (Atlantic) – Marine Operations Center (Atlantic) in Norfolk, VA, is the support facility for NOAA's vessels operating on the east coast of the U.S. and in the Gulf of Mexico.

MOC (Pacific) – Marine Operations Center (Pacific) in Seattle, WA, is the support facility for NOAA's vessels operating on the west coast of the U.S.

MSC – Military Sealift Command, a U.S. Navy organization.

Multibeam Sonar – A system that uses an array of transducers to form a fan of narrow beams on the seafloor that results in simultaneous depth measurements in a swath that varies as a function of system type and water depth. A typical swath may be 2 to 5 times the water depth.

Nautical Chart – A representation of a portion of the navigable waters of the earth and adjacent coastal areas on a specified map projection, and designed specifically to meet requirements of marine navigation. Included on most nautical charts are; depths of water, characteristics of the bottom, elevations of selected topographic features, general configuration and characteristics of the coast, the shoreline dangers, obstructions, aids to navigation, limited tidal data, and information about magnetic variation in the charted area.

Navigation – The process of planning, recording, and controlling the movement of a craft or vehicle from one place to another.

NGS – National Geodetic Survey, a program office of NOS.

NOAA – National Oceanic and Atmospheric Administration.

NOS – National Ocean Service, a main line component of NOAA.

OCS – Office of Coast Survey, a program office of NOS. OCS collects and evaluates marine hydrographic and other navigational data; determines requirements for and conducts a national program of nautical charting; constructs and maintains nautical charts, Coast Pilots, and related marine products for the nation. It directs field programs for ship- and shore-based hydrographic survey units; develops hydrographic survey specifications; conducts technological development and application programs to increase efficiency in survey data acquisition, data processing, and chart production; and carries out research to develop techniques and methods for accomplishing these objectives.

ODC – Other Direct Cost.

OMAO – Office of Marine and Aviation Operations, is the component of NOAA that manages the NOAA fleet of ships and aircraft.

OMB – Office of Management and Budget.

ONCO – Office of NOAA Corps Operations; predecessor to OMAO.

OPM – Office of Personnel Management.

PHB – Pacific Hydrographic Branch.

PSD – Products and Services Division, a division of CO-OPS

PWS – Performance Work Statement

RDD/HPT – Requirements and Development Division, Hydrographic Planning Team, an activity within CO-OPS.

RDD/OET – Requirements and Development Division, Operational Engineering Team, an activity within CO-OPS.

RSD – Remote Sensing Division

SEB – Source Evaluation Board

Sidescan Sonar – A specialized sonar system for searching and detecting objects on the seafloor. The sidescan system creates an ‘image’ of the ocean bottom where objects that protrude from the bottom create a dark image with shadows. While objects can be found, most sidescan systems do not provide depth information.

SLUC – Standard Level User Charges

Smooth Sheet – A smooth sheet is the final, neatly drafted, accurate plot of a hydrographic survey. Following inspection and administrative approval, a smooth sheet becomes the official permanent graphic record of a survey and is the principal authority for hydrographic data to be charted.

SqNM – Square Nautical Mile

SWMB – Shallow Water MultiBeam is a high frequency multibeam sonar designed to operate in shallow (less than 100 meter depths) areas, generally near shore.

Towfish – Refers to the sidescan sonar unit that is towed behind the survey vessel.

T-AGOS – Class of Navy ship originally built for ocean surveillance work, 224 feet long, 15 foot draft. Two have been converted for NOAA use.

T-AGS – Class of Navy oceanographic and hydrographic survey ships. The PATHFINDER class are 329 feet in length with a 19 foot draft. The MCDONNELL class are 208 feet in length with a 14 foot draft.

UNOLS – University National Oceanographic Laboratory System

U.S. – United States

Appendix C – Vessel Equipment Specifications

Specifications for proposed time charters in the Gulf of Mexico and Alaska

Both main vessels shall have multibeam sonar (with heave, roll, pitch sensor and autopilot), towed side scan sonar, sound velocity (CTD) casts, bottom sampling, data acquisition and processing computer equipment, and tide gauges. The vessel and all equipment shall be provided and operated by the contractor under the direction of government personnel.

A one-year time charter with option years is the probable duration.

The following information is general characteristics and equipment of each vessel and launch. All equipment listed is to define functionality only. Specific equipment is not required, comparable functionality is required:

Gulf of Mexico Vessel Characteristics

Main Vessel

Length:	Estimated 150 feet (must be adequate for launch requirements)
Launches:	Qty Two (2)
Small Boat:	Qty One (1)
Equipment:	High Speed High Resolution digital Side Scan Sonar, Klein K5500
	50 kHz 3000 meter range multibeam sonar acquisition system, Reson 8160
	Inertial navigation system with RTK input for attitude/positioning, SeaPath 200
	Direct measurement or conductivity/temperature/depth sound velocity sensors
	Single/dual beam echosounder with paper recording, Ross 875
	Single beam data acquisition software, Coastal Oceanographic HYPACK MAX
	Windows NT based sonar data processing hardware
	Sonar data processing software, CARIS HIPS/SIPS
	GPS/RTK positioning system, Trimble MS750 or DSNP Sercel MK5000
	Data management solution (LTO tape/RAID5 drive arrays)

Launches

Length:	30 feet
Equipment:	High Speed High Resolution digital Side Scan Sonar, Klein K5500
	200-300 kHz Shallow Water Multibeam Sonar acquisition system, Reson 8101
	Inertial navigation system with RTK input for attitude/positioning, SeaPath 200
	Direct measurement or conductivity/temperature/depth sound velocity sensors
	Single/dual beam echosounder with paper recording, Ross 875
	Single beam data acquisition software, Coastal Oceanographic HYPACK MAX
	Windows NT based sonar data processing hardware
	Sonar data processing software, CARIS HIPS/SIPS
	GPS/RTK positioning system, Trimble MS750 or DSNP Sercel MK5000

The vessel shall have the following capabilities:

Endurance:	Minimum 18 days at sea

Range:	5500 nautical miles
Transit Speed:	Minimum 10 knots
Towing Speed:	Approximately 4 knots
Operating Sea State:	Beaufort Force 5 for ship; Beaufort Force 4 for launches

The vessel shall have space for three (3) government personnel to provide operational control and oversight. Berthing shall be equivalent to junior officers and capable of accommodating male and female personnel. Meals shall be provided along with the ship's crew and the government personnel shall dine in the officer's mess.

Operating scenario is projected to be 80% underway, 10% on station, and 10% in port. Vessel may be expected to work out of the following ports: New Orleans, Galveston, Freeport, Corpus Christi, and Pensacola. The vessel shall be capable of supporting 24 hours/day operations.

Alaska Vessel Characteristics

Main Vessel

Length:	Estimated 225 feet (must be adequate for launch requirements)
Launches:	Qty Four (4)
Small Boats:	Qty Two (2)
Equipment:	50 kHz 3000 meter range multibeam sonar acquisition system, Reson 8160 Inertial navigation system with RTK input for attitude/positioning, SeaPath 200 Direct measurement or conductivity/temperature/depth sound velocity sensors Single/dual beam echosounder with paper recording, Ross 875 Single beam data acquisition software, Coastal Oceanographic HYPACK MAX Windows NT based sonar data processing hardware Sonar data processing software, CARIS HIPS/SIPS GPS/RTK positioning system, Trimble MS750 or DSNP Sercel MK5000 Data management solution (LTO tape/RAID5 drive arrays)

Launches

Length:	30 feet
Equipment:	200-300 kHz Shallow Water Multibeam Sonar acquisition system, Reson 8101 Inertial navigation system with RTK input for attitude/positioning, SeaPath 200 Direct measurement or conductivity/temperature/depth sound velocity sensors Single/dual beam echosounder with paper recording, Ross 875 Single beam data acquisition software, Coastal Oceanographic HYPACK MAX Windows NT based sonar data processing hardware Sonar data processing software, CARIS HIPS/SIPS GPS/RTK positioning system, Trimble MS750 or DSNP Sercel MK5000

The vessel shall have the following capabilities:

Endurance:	Minimum 21 days at sea
Range:	5500 nautical miles
Transit Speed:	Minimum 10 knots
Towing Speed:	Approximately 4 knots

Operating Sea State: Beaufort Force 5 for ship; Beaufort Force 4 for launches

The vessel shall have space for five (5) government personnel to provide operational control and oversight. Berthing shall be equivalent to junior officers and capable of accommodating male and female personnel. Meals shall be provided along with the ship's crew and the government personnel shall dine in the officer's mess.

Operating scenario is projected to be 20% underway, 70% at anchor with launches deployed, and 10% in port. Vessel may expected to work out of the following ports: Kodiak, Seward, Dutch Harbor, Sitka, Valdez, Ketchikan, and Juneau. The vessel shall be capable of supporting 24 hours/day operations.