

ALASKA LEGISLATURE SPECIAL COMMITTEE/SUBJECT FILE 8672  
1843 SCOMM 74: SEN. SPEC. COMM. ON DOMESTIC & INTL. FISH., 1991-92..60

Please Give this to Molly McCammon  
From Jeff Hartman

Progress Report on Gauss version of CBA model sent by John Boyce.  
by Jeff Hartman  
3-11-93

Jim Blick (a biometrician in comm fish) and I have spent considerable time to purchase software and get the CBA model running. We have had (2) 1 day work sessions on the CBA software over at the regional office. Initially had problems getting it to run because Boyce used a different and incompatible version of GAUSS. We then updated a version that Comm Fish had and now can fully run, edit the models, and reproduce the outputs generated in the CBA study. We have uncovered several programming questions and plan further review. To answer those questions we plan to send a list of the questions to John Boyce and then request a conference call with him. All that we can do is ask for the conference call, we have no guarantee that he will provide it. If he does, then I would not hesitate to notify you (Molly McCammon) that Boyce has fully responded to the Legislatures request for usable software and documentation. I think that Boyce, unlike Herrmann has made a sufficient effort to try to finish this specific part of his RSA/RFP obligation.

Address for Keith Criddle

Keith Criddle, Ph. D.  
Associate Professor  
Department of Economics  
101 Bunnell Bldg.  
University of Alaska Fairbanks  
Fairbanks, Alaska, 99775

3-23.

questions have not been sent.

THE FOLLOWING DOCUMENT MAY NOT FILM  
LEGIBLY BECAUSE OF THE POOR QUALITY OF THE  
ORIGINAL

# STATE OF ALASKA REIMBURSABLE SERVICES AGREEMENT

AMENDMENT NUMBER

1

|                                                            |                                          |                                       |                                       |
|------------------------------------------------------------|------------------------------------------|---------------------------------------|---------------------------------------|
| REQUESTING DEPARTMENT<br><b>LEGISLATIVE AFFAIRS AGENCY</b> | DIVISION<br><b>LEG. OPERATING BUDGET</b> | SECTION<br><b>SENATE OPER. BUDGET</b> | LOG NUMBER (ADN)<br><b>3127109-07</b> |
| SERVICING DEPARTMENT<br><b>DEPT. OF FISH &amp; GAM</b>     | DIVISION<br><b>COMMERCIAL FISHERIES</b>  | SECTION<br><b>ENTRY COMMISSION</b>    | LOG NUMBER (ADN)<br><b>11-2-0381</b>  |

I. The servicing agency agrees to provide the requesting agency with the following service(s):

PROJECT OR PROGRAM TITLE

**LEGISLATIVE ANALYSIS OF THE STATEWIDE SALMON ENHANCEMENT PROGRAM**

DESCRIPTION OF SERVICE(S) TO BE PROVIDED IF THIS IS AN RSA AMENDMENT, ALSO DESCRIBE SPECIFIC PURPOSE OF AMENDMENT.

TO CONDUCT IN-DEPTH ECONOMIC ANALYSES FOR THE SENATE SPECIAL COMMITTEE ON DOMESTIC AND INTERNATIONAL COMMERCIAL FISHERIES AS PART OF THE COMMITTEE'S EXTENSIVE REVIEW OF THE ALASKA SALMON ENHANCEMENT PROGRAM. SPECIFICALLY, THE RESEARCH WILL INCLUDE A WORLDWIDE DEMAND ANALYSES FOR ALASKA SALMON (\$18,000), A SALMON FISH COST ANALYSIS (\$20,000), AND A PUBLIC POLICY SIMULATION MODEL (\$10,000) AS SPECIFIED IN THE REQUEST FOR PROPOSALS DEVELOPED BY THE COMMITTEE. RESULTS OF THE RESEARCH WILL ASSIST THE LEGISLATIVE IN ITS REVIEW OF THE ENHANCEMENT PROGRAM.

II. Terms and mechanics of reimbursement:

Billing Address:

☒ Payment upon receipt of interagency billing☐ Payment upon completion of service(s).☒ Other (Specify):

\$25,650 UPON RECEIPT OF INTERAGENCY BILLING.

\$22,350 UPON COMPLETION OF SERVICES.

DATE WORK TO COMMENCE

12/10/91

COMPLETION DATE

10/30/92

BILLING RD CODE: 31070

PHONE: 465-3852

III. Schedule of maximum costs to be incurred by the Servicing Agency:

|                   | ORIGINAL AGREEMENT | PREVIOUS AMENDMENTS | THIS AMENDMENT | TOTAL           |
|-------------------|--------------------|---------------------|----------------|-----------------|
| Personal Services | \$ 3,300           | \$ -                | \$ -           | \$ 3,300        |
| Travel            | \$ -               | \$ -                | \$ -           | \$ -            |
| Contractual       | \$44,700           | \$ -                | \$ -           | \$44,700        |
| Supplies          | \$ -               | \$ -                | \$ -           | \$ -            |
| Equipment         | \$ -               | \$ -                | \$ -           | \$ -            |
| Land & Buildings  | \$ -               | \$ -                | \$ -           | \$ -            |
| Grants            | \$ -               | \$ -                | \$ -           | \$ -            |
| Other (Itemize)   | \$ -               | \$ -                | \$ -           | \$ -            |
| <b>TOTAL</b>      | <b>\$48,000</b>    | <b>\$ -</b>         | <b>\$ -</b>    | <b>\$48,000</b> |

IV. Budgeting and accounting information:

|                                                                                                |                                                                                                                                            |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| REQUESTING AGENCY                                                                              | 1. This agreement is documented in FY 92 Capital/Operating budget <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes page |
| 2. Financial coding to be charged 31922059                                                     | Continuing funds <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Authority                                             |
| 3. Encumbrance document number RS 3127107                                                      | Continuing funds <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Authority                                             |
| 4. Date funds lapse 6/30/93                                                                    |                                                                                                                                            |
| 5. Federal Funds <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Amount \$ |                                                                                                                                            |
| Federal Agency / Program / CFDA No. / Grant or Contract No.                                    |                                                                                                                                            |

|                  |                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| SERVICING AGENCY | 1. This agreement is documented <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes in FY Capital/Operating budget page |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|

V. Approvals & Certification: The requesting agency and servicing agency agree to the terms and conditions above. In addition, the requesting agency certifies that sufficient funds are encumbered to pay this obligation or that there is a sufficient unencumbered balance in the appropriation cited to cover this obligation. I am aware that to knowingly make or allow false entries or alterations on a public record, or knowingly destroy, mutilate, suppress, conceal, remove, or otherwise impair the verity, legibility or availability of a public record constitutes tampering with public records punishable under AS 11.56.815-820. Other disciplinary action may be taken up to and including dismissal.

|                                                                     |                                                    |                 |
|---------------------------------------------------------------------|----------------------------------------------------|-----------------|
| REQUESTING AGENCY AUTHORIZED SIGNATURE<br><i>Warren W. Endicott</i> | NAME PRINTED<br>WARREN W. ENDICOTT, EXEC. DIRECTOR | DATE<br>6/19/92 |
| SERVICING AGENCY AUTHORIZED SIGNATURE<br><i>Robert R. (Dor)</i>     | NAME PRINTED<br>ROBERT R. (DOR)                    | DATE<br>6-19-92 |
| OMB AUTHORIZED SIGNATURE<br><i>David H. (Dor)</i>                   | NAME PRINTED<br>DAVID H. (DOR)                     | DATE<br>6-30-92 |

## STATE OF ALASKA

## ROUTE SLIP

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                    |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------|
| TO: Mail Station                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Department <i>Legislature</i>      | Division <i>Legislative</i> |
| Attention <i>Molly McCann</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                    |                             |
| <input type="checkbox"/> Approval<br><input type="checkbox"/> Signature<br><input type="checkbox"/> Comment<br><input type="checkbox"/> Contact Me<br><input type="checkbox"/> Prepare Reply<br><input type="checkbox"/> For Your File <input type="checkbox"/> Note & Return<br><input type="checkbox"/> Initial & Return<br><input type="checkbox"/> Return as Requested<br><input type="checkbox"/> Return for Approval<br><input type="checkbox"/> Necessary Action<br><input type="checkbox"/> For Your Information |                                    |                             |
| Remarks: <i>Molly - My suggestions for a final request from the rescinding by the Legislature on page 7.</i>                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |                             |
| FROM: Mail Station                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Department <i>Executive Branch</i> | Division <i>LFMD</i>        |
| By <i>Jeff H. L...</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Date <i>3-31</i>                   |                             |

02-002 (REV 3-84)

MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

TO:: Jeff Koenings  
Director  
Commercial Fisheries Management and Development  
Department of Fish and Game

DATE: March 24, 1993

FILE NO:

TELEPHONE NO: 465-4160

SUBJECT: Clearing up misconceptions  
from Dr. Herrmann's 2nd letter  
to the Legislature.

FROM: Jeff Hartman *JH*  
Economist  
Commercial Fisheries Management and Development  
Department of Fish and Game

As you are aware, Dr. Mark Herrmann, an economist with the University of Alaska, Fairbanks, has sent at least 2 letters to the Alaska State Legislature laden with inflammatory statements about the Department of Fish and Game involvement in the Hatchery Research Study. In fact, Dr. Herrmann has blamed us for nearly every difficulty that he has experienced in this study. I have reviewed his two letters, the official RSA (housed in the contracts section of the Division of Administration), and the ADF&G memos which fully documented our involvement. Many of the statements that Dr. Herrmann presents as fact, are not factual, and the approach he suggests for completing this study are not, in my opinion, reasonable for the State of Alaska to accept. My response follows other clarifications and corrections that I have pointed out in Dr. Herrmann's previous letter of March 2, 1993. This previous letter was intentionally not distributed to anyone outside of FRED Division because I believed that Herrmann's criticisms were too far fetched to be taken seriously. The accumulative affects, generated this second volley, do deserve a response. My response to Herrmann's first letter, dated March 18, 1993 (attached), should be read prior to this one. I also include some recommendations for encouraging the UAF team to finish the RSA.

1. The uncooperative tone of Dr Herrmann's letter is based on his misconception that he has not been paid for his work.

From pg. 7 (letter of March 9, 1993) Herrmann states: "Until the salmon enhancement contract is fulfilled and the money is paid I am not willing to do any work or answer any additional questions regarding the project which was not specific on the accepted proposal."

Also from page 7: However, I am personally responsible for the money that has not been received by the School of Management and feel insulted that after all this work we have done and the obstacles we faced were put in place by FRED, that the State is claiming we are negligent in fulfilling the contract."

How could Herrmann be personally responsible for any of these funds when UAF received its final payment for this project over 1 month ago? According to the ADF&G Division of Administration (see attached) the final payment was made on February 13, 1993 and the check cashed by UAF on March 3, 1993.

Also, Ms. Molly McCammon made it clear in her March 10, 1993 letter to Herrmann that "we are not holding up the final payment on the contract". I do not understand his persistence in this line of reasoning. Either the communication channels between UAF accounting and the researchers must be very poor, or Herrmann is not being straight forward with Ms. McCammon.

2. Herrmann states: "The contract that I had and continue to have on the salmon enhancement project is with the Alaska State Legislature. This is clearly stated on page 2 of the RSA."... and any attempt on FRED's part to negotiate or alter the remainder of this contract is unethical and illegal."

On March 23, 1993 I obtained a copy of the official RSA that was sent to the University of Alaska. As a matter of record, Page 2 of the official RSA (log number 1121091) clearly states that the Requesting Department for this contract is the Dept. of Fish and Game, not the Alaska State Legislature as Herrmann suggests. I do not know which "page 2" Mark is looking at. On page 1 of the RSA, CFEC is identified as the payment agency. As a practical matter, all of us involved in this project know that this is the Legislature's project and that the Project Manager and contact for the researchers has been Ginny Fay. The attachments to the official RSA make this clear.

I am not sure how Herrmann concludes that FRED Division is going to "alter" the contract. The idea that some one in FRED would try to tamper with the RSA documents is simply nutty. According to Jenifer Childress (the ADF&G RSA specialist in charge of administering the RSA payments), it would be impossible for any person other than CFEC to alter the contract between CFEC and UAF. They have been under lock and key in the ADF&G Division of Administration since early in 1992. Also, according to Childress, the Alaska State Legislature can consult with anyone that they want in the course of formulating an RSA or obtaining review of the work products (as long as that person isn't a potential competitor for the RSA). She could see no legal liability or ethical standard compromised by the Legislature discussing the studies with ADF&G staff. The Legislature has stated in numerous

documents that it intended the software and other work products from this study to be designed to be useable by ADF&G. It is reasonable and ethical that they would communicate with us about this study.

3. Pg 1, last paragraph of Herrmann's March 9 letter states. "I want to state that despite FRED's lack of jurisdiction in the project that we were very liberal with the amount of influence that FRED had in the project including using their suggestions on how to form future estimates of wild salmon harvests, etc."

Herrmann implies that FRED Division suggested the approach that was finally used for estimation of wild stock numbers for this project. Nothing could be further than the truth. FRED Division has openly and formally criticized the approach used to estimate wild stock background catches. Our suggestions for a testing of different probable levels of wild stock harvests date back to the beginning of this project and are stated as a requirement in the RSA. We suggested that this deviation from the original RSA be noted in the researchers report, in the December 11, 1992 letter to Ms. Molly McCammon from Jeff Koenings.

"The original RFP/RSA explained that some simulations would be made with the assumption of a 10-, 15-, and 20-year mean background harvests of wild fish. The contractors requested the use of one background level of catches to achieve their deadline. The report should note that the project manager released them from this prior obligation and set background catches for non-intensively modeled sites at the 10- year mean."

In the September 22, project meeting at the University of Fairbanks, I voiced concern over the dropping of the three levels of background wild catch the case studies, as well as selecting the single point that represented the highest 10 year average of wild stock harvests in history. My concerns were overruled by the project manager in the interest of getting the project completed quickly. It was entirely within the project manager's authority to make this decision, but it is misleading and false for Dr. Herrmann to imply that ADF&G's suggestions in this matter have been followed. Other FRED comments such as the February 2, 1993 memo from Jeff P. Koenings to the Senate Special Committee on International and Domestic Fisheries, clearly demonstrate our concerns about the treatment of the wild stock sensitivity testing, when Director Koenings stated:

"Deviating from the original RSA's requirement for a 10, 15 and 20 year mean for background wild catches in the non-intensively modeled fisheries, leaves too many unanswered questions about how the models would behave under the likely range of future salmon population sizes.

4. Mark Herrmann states on page 2 of his March 9 letter: "The remaining contract that is binding is the November 4th, 1991 proposal written by Herrmann and Greenberg entitled "An International Supply and Demand Equilibrium Model for Alaska Salmon." He goes on to state "...the proposal was the binding contract (if accepted) and that the original RSA was not."

Mark Herrmann is **wrong** in his claim that their proposals invalidated or supplanted the 30 page RSA.

The official and final RSA logged with the ADF&G contracts section includes the specific sections that Herrmann claims are not valid. On March 23, 1993, I requested a copy of the official RSA documents sent to University of Alaska, Fairbanks from the ADF&G contract staff. This first attachment in the official RSA is called Reimbursable Services Agreement Contract Specification and Request for Proposals Software Development and Policy Analysis of A benefit-Cost Analysis of the Statewide enhancement Program (I will call this the "original RSA"). According to Jenifer Childress, the original 30 page RSA was a legitimate part of the full RSA. She was never notified that any part of it was invalid, and the Department of Fish and Game, Audit and Receivables Routing Slip says that CFEC "wanted the whole packet (including the original RSA) to be sent off to UAF". I also, had the FRED administrative officer review the contract, and she agrees with Childress that the original RSA is a binding document in the full RSA. Her conclusion is based on a reading of the Boyce and Herrmann proposals which are respectively the 3rd and 4th attachments in the packet. Jacki Sanders points out that in Mark Herrmann's memo he never makes any statement indicating that his proposal invalidates the original RSA.

She noted that Herrmann and Boyce specifically acknowledge in their proposals that they will make the best effort possible to adhere to the RSA.

Herrmann States:

"I cannot promise the successful modelling of all the areas that the RSA/RFP asks for. However, I believe that Greenberg and I can make as good of an effort to meet as much of the specific objective outlined in the RSA as any researchers can."

Boyce States:

The only part of the RFP which I feel cannot adequately be addressed is the section dealing with estimation of long run marginal fishing costs..

There are sections of the proposals that note deviations to the RSA/RFP both from Herrmann and Boyce. The inclusion of their proposals in the full RSA package implies that these deviations were accepted as part of the RSA, but does not imply that other requirements of the original RSA, not mentioned in the deviations or elsewhere in the contractors proposals would also become void. There is no other evidence in the RSA file to indicate that the original RSA is void. Even the project manager could not void it without some formal notice to the contracting officer in the Division of Administration. It would have been extremely poor procedure for the Project Manager to try to void the original 30 page RSA verbally, without some point by point substitute. I seriously doubt that what Dr. Herrmann offers as evidence for the original RSA not being valid itself would hold water if we were to show this to the AG's office.

5. Herrmann presents a few reasons on pg 5 for withdrawing his verbal commitment to have a tutorial of the simulation in lieu of the RSA's requirement for clear documentation and user friendly software when he states "I now do not believe that it is possible to work directly with them (FRED) due to the conflict of interest that I mentioned in my last letter."

- a. Herrmann's first argument for withdrawing his commitment is that he was unfairly required to carry out these steps to receive final payment. "However, I did not realize that the rest of the money on the contract would be held back until this was completed." This reason is inconsistent with the facts. Firstly, Molly McCammon did not tie the development of the software to his final payment. She, as previously noted, in her March 2, letter that she was not holding back the payment.
- b. Another argument he presents is that FRED did not try to run the simulation models or promptly respond reply to Herrmann's transmitting of the electronic files and explanations. Neither of these statements are true.

I tried, in January, unsuccessfully to run the simulation models. The reason our trials were unsuccessful, is that (1) that his code was so poorly documented with hand scribbled notes that they were not readable by anyone but Mark Herrmann and Josh Greenburg, and (2) we had a fax of the so called "documentation" for the instructions, which was also unreadable. I have included a copy of it to show how utterly illegible it actually is. Shortly after receiving the code for the models I looked it over with a David Ackley. It had a few scribbled notes, and some of the input file names were not consistent with the labels. Ackley and I could not begin to unravel it. I contacted Herrmann in Late January or early February, and suggested the tutorial solution. Ironically, my suggestion was intended to help Dr. Herrmann fulfill this part of this part of the contract without having to invest a great deal of time in documentation. He has always prefaced his conversations with me on this subject, by explaining how busy he is (how many credits he is teaching and how many hours of work he is doing a week). In February, I suggested to Molly McCammon that she ask for a clean, copy (not faxed) of the December 6, 1992 memo from Herrmann which contains the unclear documentation. Herrmann has of course refused to send it or discuss it as indicated in his most recent March 9 transmittal.

I can only conclude from my interactions to date, that Dr. Herrmann has had little interest in producing the documentation.

- c. Herrmann final reason offered is that: "I also did not know at the time that the FRED division would take such an adversarial position to the research, distancing themselves from the research in which, to a large extent, they directed and over saw".

I describe in my March 18, 1993 letter why I do not think that ADF&G owes anyone an apology for responding to formal requests for its comments made during the technical review team process on this project. It would have been illegal for us to withhold this type of public information, and the comments of the technical review team are framed in a professional manner. In contrast with Dr. Herrmann's reaction to these comments, most economists who carry out new studies are anxious to have free and open discussion about technical aspects of their analysis.

None of these "reasons" seem valid for refusing to answer basic software questions and providing user guidance required for ADF&G to operate the Demand Model software. Since FRED staff, are the only persons in the State of Alaska who have expressed interest in operating the models, Herrmann's refusal to interact with us further, effectively blocks ADF&G from a reasonable ability to ever operate the software. It also effectively blocks the State of Alaska from using the software, and I suspect that Herrmann is aware of this.

6. Herrmann states on pg. 7 of the March 9 letter: "I do not understand why this contract degenerated so quickly into such a legal matter". He previously states on page 6: "Because of your memo dated February 25, 1993 I desire a new contract, that voids my old proposal, stating the terms to fulfilling objective #12 and, therefore, the demand portion of the analysis. I believe this is best for the protection of both parties. When this is drawn up I will exercise my right to run it by the University lawyer."

In one breath Herrmann express dismay that this has degenerated into a legal matter and in the previous breath proposes to bring his legal council into yet another separate RSA. The only mention of legal advice relating to the RSA have been brought forward by Dr. Herrmann himself. Both his first letter and now the March 9 letter indicate that he wishes to bring attorneys into this matter. Molly McCammon's previous letters make no mention of obtaining legal advice and even appears to defuse the need for a second contract. I also believe that Herrmann's suggestion to develop a new RSA is not a good idea, as the first RSA is sufficiently binding and clear. He is free to choose to not complete some portions of it, or to make it unusable for others to operate.

7. Herrmann states: "After the project was finished I realized that the SAS simulations were unbelievably complicated. I also realized that they were very difficult to run. I was worried that, under the current situation, it would be very difficult to document them, as they existed, into "easy use".

I do not understand how Mark can make this statement at this time. The programming and simulations for this study was completed prior to Mark Herrmann's answer letter to Ginny Fay of December 6, 1993. At this time he had fully exercised the models, run 17 simulations, answered numerous questions about the results, and had to be aware of how easy or difficult they were to run. Yet in his letter of December 6, 1992 he states that he will be glad to refine the models and make them user friendly for our use.

Herrmann states: "I do plan to make the model much more user friendly. I also plan to rewrite the larger report with the new model's results for Sea Grant. I would be willing to give you the new models which should be immensely easier to run. I plan to have it done in the next six months or so".

I find it very puzzling that it is now too complex and troubling to create the software in a useable form and eventually guide me through its use. I do not doubt that the simulation procedures are complex and require some baby sitting to run. If Herrmann chooses not to answer our questions about the simulation models and not to present a tutorial, I do not think that we will be able to

duplicate the original enhancement cases or test any different cases. This is unfortunate since we have already gone to considerable trouble and expense to get the CBA model software running in GAUSS that was provided by John Boyce. The original RSA refers to the simulation software for the demand models, the cost model, and the overall CBA procedures as a single package. It was not envisioned that Mark would isolate his part of the simulation software development from the remainder of the software development. By refusing to make his work product as useable as John Boyce has tried to do, Herrmann has rendered the whole CBA software system virtually unusable to anyone in the State of Alaska.

### **My Recommendations:**

Should Molly McCammon ask for suggestions of how the matter of the incomplete RSA should be resolved, I have summarized my recommendations as follows:

Herrmann's two letters were generated from McCammon's request letter of Feb 25 which asks for some reasonable output and input data and simulation software. Since the contract has been paid, I believe that **the legislature is completely within their rights reiterate the February 25 information request from Molly McCammon**, so that Herrmann understands what is requested from him. I would note that the legislature has considered and rejected the proposal for a second RSA. The original RSA and the proposals are still considered to be valid and the researchers should provide the materials requested in the February 25, 1993 letter to Herrmann from McCammon (with the following exceptions).

**The following recommendations correspond with the points from Molly McCammon's letter of February 25, 1993.**

1 and 2. State that, ADF&G has completed their review of the GAUSS program, and that it is an acceptable substitute for the SAS program. ADF&G will forward some questions through Molly McCammon and it would be appreciated if you would answer them in their understanding of the models. *and assist them*

3. Please complete as noted. Perhaps the spread sheet that Dianne Bischak developed for the input data will show how the data was aggregated on the hatchery production data. If so, an electronic file of it would be acceptable.

4. Please complete as noted.

5. Previously sent by UAF and received. Thank you.

6. Please complete as noted. We need a clean final version of this, not a faxed version.

7. Please complete as noted.

8. Please complete as noted.

9. You did not respond to this request, in your letter of March 9. We are still interested in obtaining information related to the estimation procedures. Additionally, an electronic SAS or lotus readable file with all of the quarterly input data used for the estimation procedures should be included. This would include all economic and biological variables and be tied to the appropriate quarter for that observation.

10, 11, and 12. Please complete as noted. We do not think that the problems that you pointed out in your March 9 memo are sufficient to prevent communications with the staff at ADF&G. We again request that you respond to questions on the software sent by ADF&G on February 28, 1993. If technically possible arrange for tutorials at their travel expense. I know of no other agency in the State of Alaska who is willing to commit the staff time to learning the software. They have already demonstrated a commitment to operate the GAUSS software. Mr. Hartman continues to express an interest in obtaining answers to his software questions and in obtaining a tutorial when you have sufficiently completed the programs.

13. Previously answered, thank you.

14 and 15. Please complete as noted.

16. Please complete as noted.

17. Please complete as noted.

Sending a reiteration of Molly's original request to both Mark Herrmann and John Boyce would also address Boyce's complete lack of response to the McCammon's transmittal. If the researchers refuse to respond to this, I am not aware of much beyond these actions that the Legislature can do.

cc:

Robert Burkett  
Kevin Duffy  
Johnny Holland

MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

TO: Jeff Koenings  
Director  
FRED Division  
Department of Fish and Game

DATE: March 18, 1993

FILE NO:

TELEPHONE NO: 465-4160

SUBJECT: Setting the Record Straight on  
FRED involvement in the  
UAF economic Study

FROM: Jeff Hartman *JH*  
Economist  
Division of FRED  
Department of Fish and Game

I would like to clear up some misinformation about FRED Divisions involvement in the UAF economic study. The confusion was generated by Mark Herrmann in his March 2, 1992 memo to Molly McCammon.

1. Dr. Herrmann stated in the last section of his letter. " I am also concerned of any continued FRED participation in this project. I have just heard that they widely distributed a long list of criticisms of the project. If this is the case than they have clearly displayed a bias about the project. I would find it extremely difficult to work with them as we have throughout the study."

My reply:

The Alaska Department of Fish and Game has responded to only two formal requests for its technical comments that were made during the numerous technical review sessions on the UAF CBA model. We have not "widely distributed" these comments as Dr. Herrmann states. These same comments were originally forwarded to Ms. Ginny Fay in several memorandum during the 3 month review period at her request. As you probably recall, ADF&G served on an in-house technical review committee for the UAF study which included Ben Muse, Ginny Fay and Kurt Schelle. It was our job to produce good technical review comments. Many of these comments were not even raised by ADF&G but pointed out by the other members of the technical review team. Ms. Fay has stated several times that she forwarded all ADF&G comments to the researchers. This is the first time that I have heard Mark Herrmann complain about our technical and editorial comments.

Our comments have been framed and supplied to requesters, in a professional manner. We have not rushed to the press, nor have we written any cavalier press releases about these studies. I think that Dr. Herrmann has wrongly accused staff of this Division of bias. We have a deeply rooted

interest in the health of Alaska's salmon industry and believe that it is in the best interest of the industry for professional dialogue between researchers like Dr. Herrmann and ADF&G to remain open. I am concerned that Dr. Herrmann might use this as an excuse to not further interact with this Department on this project. I am hoping that he will reconsider his stated reluctance to deal with the staff of FRED Division.

While I feel that Dr. Herrmann has unfairly blasted us, I plan to keep communication channels as open as he will allow. With this in mind, I am forwarding my set of Demand model comments to Molly McCammon, which asks some questions about SAS code that Dr. Herrmann provided to FRED Division. To fulfill the ADF&G obligation to obtain the capability to run recent versions of the demand model, it would be helpful if she would encourage him to talk to us about this. I have received no response from him regarding the questions that pertain to the running of the simulation software that he sent us.

Incidentally, I would like to note that the software that we received from Dr. Boyce for the overall CBA model appears to be clear, and he evidently put some effort into making it understandable. He also has responded to one of our questions regarding the running of the program. We have to purchase a \$1,200 piece of software to run the program and are investing no small amount of staff time in learning a new software package. It is highly likely that the GAUSS version of the model will substitute for the SAS version requested in the RSA. I have now been able to get a full simulation of the model to run, but several questions remain about the code. I will be finalizing these questions for Dr. Boyce as soon as the detailed review of the code is completed.

2. Dr. Herrmann has stated in his letter that: "I was promised comments by Kurt Schelle and Jeff Hartman well in advance of this due date. I talked to Kurt on the phone and his comments were minimal. Jeff Hartman did not send me his comments until March 1, 1993. He specifically told me well in advance of the due date for the complete report that he would get them to me. He did not make the due date. He also had promised me earlier, an article on forecasts of aquacultured salmon numbers. I was going to update the model with them. I asked him three times for these. He never sent them. Given that one of the criticism of this study was that it was not peer-reviewed I find it very disturbing that the FRED division would not follow up on their promise for an initial peer review after it was offered. It would have been helpful to have their review before our report went out as promised. I am not now willing to incorporate FRED's criticisms and redo the report."

My reply:

This outburst originates from Molly McCammon's 5th question in the February 25th letter to Dr. Herrmann, which simply asks him if it is ok for him to send the final report by March 1. The letter says nothing about any obligations for Herrmann to respond to any previous comments made on the final report nor does it say anything about requiring him to re-estimate the demand model equations with new farmed salmon data. I don't know why Mark is relating the request for the final report that he said would be complete in Mid February to my comments.

A. In January of 1993, Ginny Fay told me that any comments that I or CFEC made to any of the researchers from January on would specifically be professional to professional, and not binding through the contract. I was surprised when Marks reply indicated that he might need to incorporate

these comments to be in compliance with the RSA. As you can see, my technical comments were on the demand model were very minor, and benign. I would certainly not call them "criticisms". I sent them to Mark later than I would have liked to, and even indicated that it was possible that they may arrive after he completed his final report. I thought the comments may still be useful for other reports that he may develop in the future, and that it was better to send late than never. I simply fail to see the connection between McCammon's reasonable request for a due date for Dr. Herrmann's technical report and Marks angry response on timing of my March comment letter.

B. I have searched, and have not been able to locate, a complete copy of the article on farmed salmon production projections that Herrmann mentions in his letter. During our phone conference last fall, I even told him which magazine it came from. Since our phone conference between the researchers and the technical review team was voluntarily recorded, **I actually have my citation of the magazine that was given to Dr. Herrmann on audio tape.** Following the conference call, **I sent FRED Division technical comments to Ginny Fay that specifically included a section in my comments on the issue of the Northern Aquaculture Magazine that contained the article.** My 6 page comment memo, dated November 17, 1992 is attached and the citation is on page 2, comment #3. Ginny Fay told ADF&G that she sent all comment memos directly to the researchers. If this is the case, perhaps Herrmann never bothered to read any of the ADF&G comments. If it was so critical to his finalizing of the report, why couldn't he have just called the library? Mark never indicated to me that it was somehow holding up his re-estimation of the models, and I never received so much as a Fax telling me that he urgently needed it. Here is the title page (all I have been able to locate) of the infamous article.

# Alaska State Legislature

Representative Carl E. Moses

CHAIRMAN  
HOUSE RULES COMMITTEE

CHAIRMAN  
HOUSE SPECIAL FISHERIES COMMITTEE

MEMBER  
FINANCE SUBCOMMITTEES  
FISH AND GAME  
PUBLIC SAFETY



SESSION:  
CAPITOL BUILDING, ROOM 204  
JUNEAU, ALASKA 99801-1182  
PHONE: (907) 465-4451  
FAX: (907) 465-3445

INTERIM:  
P.O. BOX 109  
UNALASKA, ALASKA 99685  
PHONE: (907) 581-1234  
FAX: (907) 581-2875

February 25, 1993

John R. Boyce, Ph.D.  
Mark Herrmann, Ph.D.  
Center for Fisheries Economics  
Department of Economics  
University of Alaska Fairbanks  
Fairbanks, AK 99775

Dear Drs. Boyce and Herrmann:

I would first of all like to thank you both for your efforts in assisting the Legislature with its review of the state's salmon enhancement program. Those of us directly involved in the project, realize --and appreciate-- how much work it has entailed.

I will be acting as the contact for the Legislature to receive the final work products covered under the Reimbursable Services Agreement on A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. While the Final Report for the overall benefit-cost study has been distributed, the RSA calls for some additional work products that have not been received in final form by the Legislature. Without them, our accounting division will not authorize final payment. The purpose of this transmittal is to describe the missing work products and due dates as I understand them, and discuss and reach agreement with you on a description and final due date for each one. Some of the work products which are inappropriate to keep in the Legislative archives may be housed with the Commercial Fisheries Entry Commission.

The following list describes the work products and due dates for various input and output data files, computer code, documentation and technical reports that we have not received. The list is as complete as possible, but there may be some additional information requests that we cannot anticipate at this time. The summary tables and technical reports should be mailed and not sent by fax.

## Summary of work products requested by the Alaska State Legislature.

1. Overall CBA Model: While the RSA calls for the overall CBA software in SAS, ADF&G has received the copy in GAUSS and will be reviewing it over the next 2 weeks to determine if it is sufficient in lieu of the more familiar software. We understand that you encountered some difficulty in reprogramming the GAUSS code into SAS. By the second

ADAK - AKUTAN - AMCHITKA - ATKA - ATTU - BELKOFKI - CHERNOFSKI - CHIGNIK - CHIGNIK LAGOON - CHIGNIK LAKE  
COLD BAY - DUTCH HARBOR - EGEKIK - ERWOK - FALSE PASS - IVANOF BAY - KING COVE - KING SALMON - KOLIGANEK - LEVELOCK - NAKNEK  
NELSON LAGOON - NEW STUYAHOK - NIKOLSKI - PEDRO BAY - PERRYVILLE - PILOT POINT - PORT HEIDEN - PORT MOLLER - SAND POINT  
TUEKVA - TULUW HARBOR - SOUTH NAKNEK - ST. GEORGE ISLAND - ST. PAUL ISLAND - UGASHIK - UNALASKA - UNGA

week of March, they will inform us if it is usable. In the interim, we request that you assist ADF&G with answering any questions about the GAUSS version of the model.

2. Overall CBA Model: We understand that there are comment statements and some operating instructions in the recent CBA simulation model that you sent to Mr. Hartman. If ADF&G can operate the model, and edit the files without a hands-on tutorial, then the existing software and documentation will be sufficient. If they cannot unravel the documentation sufficiently, we request a half or full day hands-on tutorial for the overall CBA simulation model in Juneau or Fairbanks. ADF&G would consider paying travel costs for a tutorial, and we would not ask that any travel costs be born by the researchers. If for some reason, the GAUSS version turns out to be totally unworkable, we will reserve the right to ask for a SAS version at some reasonable date set early in March 1993.

- \* 3. Overall CBA Model: Input files and tables for the CBA simulations in the 17 cases.

•Include a hardcopy of annual tables for hatchery production (harvest) in numbers of fish and pounds by species and region used in the simulations. We do not want just the aggregated wild and enhanced catch. The only production input data we have seen so far are a fax of aggregate production numbers in the output tables for the Thirty year Present Values by Region, by Cases sent to Ginny Fay on November 2, 1992.

•Hardcopy of all other annual input variables such as production costs for state and PNP hatcheries for each year not listed in the CBA report.

- \* 4. Overall CBA Model: Output files for the CBA simulations in the 17 cases.

•Include a readable hardcopy of the final version of the Thirty year Present Values by Region, by Case sent to Ginny Fay on November 2, 1992. This set of tables summarized gross benefits, gross costs, and net benefits. We believe that the earlier version was supplanted by a later simulation. If this is not the case, we still need a clean version to be mailed.

- \* 5. Demand Model: Detailed technical report for the demand model. Mark Herrmann stated in his memo of December 16, 1992 to Ginny Fay that the technical report for the demand model would be completed by Mid-February. We will assume that it can be sent by March 1, 1993, but the Legislature's primary interest is in receiving a completed and clear technical report, within the next month. Please let me know if the completion date of March 1, 1993 is workable.

- \* 6. Fishing Cost Model: Detailed final technical report for the model. It is our understanding that the author was going to make further editorial changes in this report and also provide us with a final by mid-February. Please let me know if the completion date of March 1, 1993 is workable.

- \* 7. Demand Model: We would like to have a hardcopy of the file that you used to convert numbers of wild and enhanced fish in non-intensely modeled sites to pounds. We want to see the mean weights used for these and know where they came from.

- \* 8. Demand Model: A cleaner copy of the response memo from Mark Herrmann to Ginny Fay of December 6, 1992. The faxed copy is unreadable.

9. Demand Model: The Legislature should have access to the GAUSS code and SAS log file for the estimation procedures used in the demand model. We may not ultimately need to ask you for the estimation code if the Final Technical Report provides sufficient

information on the estimation procedures. Any estimation code for models and functional forms that Mark tested, and did not work, would not be requested. At this time, we want to reserve our rights to the final model estimation procedures only if needed. I would be happy to discuss this further.

10. Demand Model: Mark Herrmann's memo of December 6, 1992 states that he will be working on a final simulation model over the next six months. We assume that it would be completed in May 1993. The memo also says that he plans to provide us with a more user friendly version of the simulation model at that time. Since the existing software that you sent to Jeff Hartman does not have sufficient comment statements or documentation for ADF&G SAS users to easily duplicate, we would like to accept your offer for the more thoroughly documented version that you indicate will be available in May. Would this be available by May 31 1993?

11. Demand Model: ADF&G will be reviewing the SAS code for the simulation models and trying to get them to run in the first 2 weeks of March. We request that you assist them by answering any questions that are generated during that review. Prior to the review, ADF&G would like to obtain a copy of the SAS log printout from one simulation of the model.

12. Demand Model: If you are going to be rewriting the simulation software to be more user friendly anyway, it would help if there were clearer comment statements in the SAS code for the simulation model. The comments are mostly difficult-to-read handwritten notes.

13. Demand Model: Please give a rough estimate of the amount of time required to run one case with the demand model simulation software, and note the speed of the computer that you are using.

14. Please supply the remaining files for data required to run remaining 11 simulations. The Base case was previously sent. It would be helpful to receive this by mid-March.

15. Demand Model: In lieu of a detailed users' instructions for the SAS simulation model, we request a one day hands-on tutorial for the Demand model in Fairbanks or Juneau. ADF&G would like to arrange for this following the completion of the more user friendly version in May (the completion date that Mark Herrmann noted in his December 6, 1992 memo).

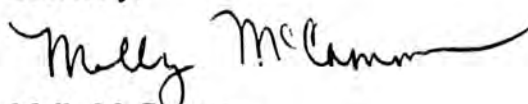
16. Fishing Cost Model: Please send an electronic file of the GAUSS code used to edit the fish ticket file into daily observations for the final regressions used in the fishing cost study. This does not need to have comment statements. This should be sent by March 31, 1993.

17. Fishing Cost Model: Electronic copies of aggregated and final data sets for the cost model need to be sent to CFEC. ADF&G has expressed interest in paying for reasonable file transfer, storage and shipping costs for this data. Please contact me for an estimate.

Finally, my intent here is to make sure that all of the requirements of the RSA funded by the Alaska State Legislature are completed. Our requests for the final work products should, however, be reasonable for the researchers to respond to. I need to be contacted at 465-6848 by March 1, 1993 to discuss any questions you may have about the final work products or associated due dates.

The House Special Committee on Fisheries, chaired by Representative Carl Moses, intend to hold hearings on your report in early April. However, we would also like to see further technical and peer reviews completed before that time, and these will probably depend on how soon we can get all of the above products. I would appreciate your assistance with this. Please let me know as soon as possible if you foresee any problems with this. Again, thank you for all your efforts in this project.

Sincerely,

A handwritten signature in cursive script that reads "Molly McCammon". The signature is fluid and extends to the right.

Molly McCammon

cc: Dianne Bischak  
Joshua Greenberg  
Keith Criddle  
Jeff Koenings  
Kurt Schelle

# MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

TO: Ginny Fay  
Legislative Staff  
Committee on International  
and Domestic Salmon Fisheries

DATE: November 17, 1992

FILE NO:

THRU:

TELEPHONE NO: 465

FROM: Jeff Hartman *JH*  
Economist  
Division of FRED  
Department of Fish and Game

SUBJECT: Comments on CBA  
of Enhancement

I have constructed some preliminary comments on the 5 manuscripts that you have provided relating to the CBA of fishery enhancement in Alaska. I think it will take some time to sort out what the studies mean, but hopefully this will assist you in your interactions with the contractors.

## General Comments on the work products.

1. I feel that it is essential that UAF be required to supply the software for the models in SAS, and appropriate documentation indicated in the RFP.

My experiences with simulation models are that it is difficult fully understand what they mean until you operate the software for a while. For this reason, UAF needs to complete the requirements of the RFP and produce a workable simulation software for us to experiment further with. From my conversations with John Boyce, who indicated that individual simulations of the entire combined model (SAS and Gauss) can be run in a matter of a few hours, I believe that the models are not too complicated for you or I to learn how to operate. I am not sure that the "users" version of the simulation model needs to have all of the regression statistics. I believe that I can learn more about the models with a Monte-carlo approach to sensitive testing anyway.

2. All of the RFP's that I was asked to review and comment on, made it clear that final simulation models must be in SAS. John Boyce explained to me in the last month or two that he has not rewritten the equations for the cost model from GAUSS into SAS. Certain criteria in the RFP were relaxed during the model development, so that the contractors could complete the work within the scheduled period. I do not think that John was released from the obligation to create combined model software as promised.

NAPLEX -- arrival price of h-v salmon

NAME

NAPUSA -- Norway price of Atlantic salmon exported to U.S.

NAPNOR -- Norway price of Atlantic salmon exported to NEC

NCPT -- NEC cpi

NY -- NEC income

JY1 -- Japan income

UCPI2 -- U.S. cpi

UY2 -- U.S. income

JPOP -- Japan pop

JCW12 -- Japan cpi

UPCV -- U.S. pop

KPOP -- NEC. pop

FOURCU -- Exchange rate = kroner/ecu

FOURDA -- Exchange rate = ecu/dollar

JAPUSA -- Exchange rate = yen/dollar

FOURDA -- Exchange rate = kroner/dollar

FP42P -- Japanese tuna price

FP42P -- Japanese squid price

JAPDISC -- Japanese discount rate

STAX -- NEC tariff on fresh/frozen salmon

Next are indicator variables

DQ1 DQ DQ3 D4 G DQPT90 DEARS1 JTAX UTAX D66 D89 D87 D4T  
DISMSE D8.

Once SIM1.SAS is run you will get output that should be identical to SIM1.LST. The hard copy of SIM1.LST, that I sent you, is just a small portion of the one you will get. The only valid statistics are the output prices, quantities, and revenues for the five species modeled for the five species. The goodness of fit stats are invalid because this is the forecasting program, not the historical simulation program. I have written on the hard copy of the output how to read the output.

To prepare the output to run in John's Gues program, he will need to tell you how it is to be formatted. I gave him files that looked like X. You will eventually need to duplicate this entire file to be sure that you have the final results stored in John's program.

The tricky thing here is to pick the prices from the file to be read into GAMES. There are five price series in the file. The first two are for the worst case scenarios only. They do not reflect the "I case". (The ones that are 0.25 strength between chum and pink salmon). To get cross-price substitution effects between pink and chum do the following.

**Example.**

If you run scenario 5 -- eliminate peak program -- then you must not use the predicted chain prices for this run. What you need to do is to take the predicted chain prices from SIMI.SAS, subtract off the predicted chain prices from SIMI.SAS, multiply them by 0.25 then add them back onto the prices from SIMI.SAS. In this way you will get the prices found in JOHN1.LST.

I again apologize for the program being so hard to run but I was pushing the deadline for the grant to be finished and the last thing I was worrying about was making the program easy to run. As I state in the letter, I believe that I will put continued resources into the program's fine tuning of the predictive capabilities before I worry about making it more user friendly.

## MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

TO: Ginny Fay  
Legislative Staff  
Committee on International  
and Domestic Salmon Fisheries

DATE: November 17, 1992

FILE NO:

THRU:

TELEPHONE NO: 465-4160

FROM: Jeff Hartman   
Economist  
Division of FRED  
Department of Fish and Game

SUBJECT: Comments on CBA  
of Enhancement

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3. Some of the requirements in the original RFP that the contractors were released from are included the following, these should be noted somewhere in the report.

- Collie did not have to carry out initial simulations in SAS.
- Collie did not have to write a final report, only a summary.
- Boyce did not have to carry out the simulations for the policy analysis in SAS, but did have to make final model in sas.
- The UAF team was told that they could truncate the change in annual net present value at 15 years instead of estimating the model using the production data provided from 16 years to 30 years as called for in the RFP.

#### Comments on "A Benefit-Cost Analysis of the Alaska Salmon Hatchery Program"

1. There is no complete summary of all of the values that are used in the exogenous variables in the combined simulations. We need to see annual variable tables for (1) production of enhanced and wild harvests, (2) production of other north America wild and ranched harvests, (3) production of farmed salmon by country and species, (4) income, (5) exchange rates, (6) population, and (7) cost of production. We need to these numbers somewhere in an appendix to be sure that this part of the analysis is consistent with the agency data provided, and so we can understand how the changing of the input variables affects the output prices, change in revenue, change in fishing cost and change in NPV.

2. The 30 year NPV of the entire Alaska salmon is quite large compared with some of the changes in NPV that are simulated in the cases. For example the total NPV for the current case (\$2,329.91 million) is a 10.4% decrease over the NPV for the elimination of the pink salmon program of (\$2,602.34 million). Contrasting all cases, this is the second largest change in the value of the hatchery program revealed in any of the simulations. The largest one, elimination of the entire hatchery program was deemed to be unreliable by the authors. Giving that total NPV is only changing by 10%, how dependable are the results for policy analysis?

Article →  
3. I assume that the trajectory (used in the simulations) for farmed salmon production from 1993 to 2022 uses a starting point from 1991, this would be a production level of 314,300 tones. The 1992 survey of operators published in Northern Aquaculture Sept/Oct 1992, projects that the farmed salmon production is projected to fall by 1/4 of this amount to 266,000 tones by 1993. The authors also describe the existence of some constraints to future Chilean production. Are these differences in production significant enough to affect the outcome of the projected net present values?

4. The assumptions for the production related variables came from several sources, including (1) the original RFP (for example I believe the RFP explained that some simulations would be made with the assumption of a 5, 10, and 20 year mean background harvests of wild fish), (2) ADF&G (such as estimates of change in harvests of the production from state owned hatcheries), (3) Jeremy Collie, (4) PNP operators, (5) Mark Herrmann (from interviews with other farmed salmon producers and agency people familiar with the wild and ranched production of other countries), and (6) the project manager for this study (for example from September meeting with contractors where production numbers of non-intensively models wild stock catches were set at the 10 year mean). I do not think the current document makes it clear where each of the sets of production assumptions originated from. These will be important issue for the readers of this study, and the origin of the assumptions should be accurate and occur in 1 location in the report.

5. Jeremy Collie generated production harvest forecasts for the "planned" enhancement case. Operators of the PNP and State Hatcheries also generated production estimates for this case and the other cases. Who's numbers were used for the planned case? Are there any cases that the operators numbers were used. I expressed concern that the operators numbers should be used in some of these cases in the September 1992 meeting in Fairbanks. This was the first time that I understood that operator projections would not be used in any cases.

6. The sensitivity testing for different levels of probable wild catches was dropped out of the RFP when the contractors revealed that they did not have sufficient time to meet the deadline. How much of an effect on the NPV occurs if the means harvests for wild fish are used that do not fall within the highest recorded harvests in the history of the salmon fishery.

7. Some simplifying assumptions were made on enhancement program costs because it was not possible to survey all possible cost combinations. Costs of decreasing productions were assumed to be equal to increment from increasing production by 15%

8. The cost of total 15% increase in production costs for the case that increases across all species is assumed to be sum of 15% increase in production costs by species.

9. There are several sources of cost of production data used in this study, the origin of each major piece should be noted. Some came from FRED, Commfish, Operators etc.

10. There is no rationale given for using the real interest rates specified in the text. I agree that 4% and 7% are reasonable alternatives, but there should be some explanation of why these were used instead of say 3% and 6%.

11. Pg 7. footnote. The text and footnote say that the ending revenues at year 15 are too high so the authors estimated a mean from year 10 to 15. Why the mean used here? I never remember any discussion along these lines. Even if revenues were higher at the end of the 15 year period, that is what happens with some enhancement programs in the broodstock development process. Which way does this bias results? The footnote says that the rankings from highest to lowest NPV may not be affected with this assumption but I believe that the total NPV may be. If revenues are expressed as a mean shouldn't costs also be? This is a fairly significant departure from what I thought the contractors had initially proposed to use for projecting year 16 to 30 NPV in our September meeting, and from what seems to make sense based on my understanding of the operators production plans.

12. There are a number of syntax errors in the manuscript that make it difficult to understand and detracts from the overall study. These should be corrected.

13. There are several misstatements about the statewide enhancement program in the recommendation section, particularly with respect to funding sources. The largest sources of funding for the statewide enhancement program is now financed by cost recovery and enhancement taxes.

14. Pg. 15 "The cost per fish of the hatchery program" In this section some production cost generalizations are made from data accumulated across 30 years of production. The text refers to the current case in reference to an event that occurred in a previous year. The comparisons being made do not involve equivalent years or assumptions about costs of production. In 1991, pink salmon were produced by hatcheries at ~~some~~ production cost incurred generally in 1990. We don't know what those production costs were, but you cite the projections made by operators as though they are the

same. Secondly, the operators of the enhancement projects, project a different total harvest for pink salmon than was finally generated by Jeremy Collie, so it is not correct to imply that these were the average cost projections of the operators. Finally, the 1991 harvest year is one event, and generally perceived to be an atypical event. \$0.12/lb is clearly a low price, but it is difficult to say that it represents the minimum price fishers are willing to accept at the quantity produced. I think the comparisons made here are instructive to the audience intended, but they could use some qualifiers.

15. Pg. 7 The footnote indicates that revenues for years 16 to 30 were determined by fixing revenues at the 10 to 15 year mean. For computing cost per pound, did the authors also compute pounds harvested in this manner for year 16 to year 30?

16. Pg. 16 The text says "To get a measure of the cost of a 15% decrease, we took 15% of the reported costs of a 100% decrease." This is different than the instructions given to the contractors by the project manager in the September meeting at UAF. The decrease was to be equivalent to the increment used for the 15% increase case.

17. I generally think there needs to be further clarification of what was included in the operators survey, at least by including a copy of the survey instruments in the appendix.

18. Pg 18. An econometric model that explained the substitution effects between salmon species at the landed level was one of the primary goals of the study. Why were the analysts unable to achieve this objective?

#### **Comments on demand models**

1. The simulations are made with numerous assumptions that are not fully explained in the text. This makes it very hard to determine what the simulations mean without inside knowledge of what the UAF team assumed.

Some examples of assumptions that should be documented in the study include:

**Assumption a.** Fish (both cost recovery and capture fishery) will be distributed into same product forms as they were traditionally.

**Assumption b.** Enhancement fish harvested in commercial fisheries are assumed to have the same mean weight as the mean weight from all fish harvested in a region.

**Assumption c.** The two low priced species are assumed to be substitutes as are high priced species, possibly leading to higher substitution effects than may be warranted.

2. Question pg 24 and 25. Elasticities for the block one equations appear to approach -2.0 or even exceed this value. Why are the change in total revenues reflecting elasticities approaching -1.0 or even less unitary elasticity in the simulations? The manuscript says that these elasticities should be referenced with caution, but does not explain why the simulation results are so different.

3. It is difficult to determine where the revenue loss is being distributed between each species in the

simulations. I tried to generate an own price elasticity from the revenue tables in the simulations and could not do it because there are no tables of annual exvessel prices generated for the cases. It would be helpful to see a table of the point prices estimated for each year of the simulations by species so that we can determine which species are bearing the revenue loss when another species is enhanced. John Boyce included such a table for the salmon demand studies for the state of Alaska in 1990 and it was very helpful.

4. Pg 148. There are certain conclusions drawn on the possible efficiency of a specific alternative investment of marketing and experimentation with different product forms. We don't know if the efforts to expand world demand would work from the UAF CBA studies conducted here. If they were cost efficient than they may be a good investment. Lots of alternative uses of the funds.

5. The documentation should have a clear discussion of how much of the explanatory power is lost between block 1 and block 2 estimates. At present is very difficult to determine how much precision is lost when dependent variable is the price of an individual species (block 2) instead of combined groups (block 1).

6. The prices used in the block 1 estimations are aggregated. They are really not individual price observations in block one, but the average revenue per pound. How do the aggregation of these prices affect the analysis?

7. Question: pg 3. It states that "Factors affecting wholesale level demand and supply will be included in the reduced form exvessel price equations." What does this statement mean?

#### **Comments on cost models**

I received a final manuscript for John Boyce's work on 11-19-92, so I have not had time to even provide any more than a cursory review of his results yet.

1. The manuscripts for the cost model and over all CBA describe the new and unique approach for estimation of fishing costs. The testing of this technique is called for in the RFP with the proviso that the contractors should use their best judgement in recommending an approach for estimation of fishing opportunity costs for the simulation model. It is not clear from the manuscript that the contractor believes that these functions to be the best ones for the task at hand, or that the costs are reasonable for applying to the enhancement program. I believe that this needs to be clarified further, since these catching costs have a significant effect on the NPV of sockeye, coho, king, and red salmon projects.

2. The fishing cost model is modified from techniques usually applied to non-market valuation (Cameron applied similar methods to estimation of the value of recreational fishing in Canada). The techniques indirectly rather than directly compute fishing costs, and there are pros and cons of each approach. It is customary, however, to verify highly novel non-market valuation techniques with information from fisher's themselves. For example, it would be nice to know if participants in the seine fleet in Lower Cook Inlet believe that the additional costs of catching enhanced sockeye salmon occur at the implied output prices estimated in the models? I contacted some Lower Cook Inlet Seine fishers and asked what percent of their total revenues would marginal fishing costs be if they were exposed to slightly larger or smaller catches 1990. I was told that the additional costs of catching an increase in abundance led to much lower costs than the 59% indicated in the study. Both fishers told me that the costs were much closer to 40% to 45% of gross earnings, and these consisted mostly of the crew share and enhancement taxes.

3. The enhancement tax is a transfer. Shouldn't change in this be subtracted out of the fisher's costs for each of the regions?
4. Did the PWS stat area include Copper River? This is a typical alternative for fishing in the pink fishery for gillnetters.
5. 1990, the year used to develop the cost models was the first of three years of low revenues for most of the state's enhanced fisheries. Could the use of a year with lower than typical revenues bias the computation of producer surplus in either direction?
6. The RFP specifically asks for a long run model for estimation of fishing costs. I do not see a discussion of whether the authors believe that they have achieved this in any documentation.

**Comments on biological population model**

I do not have a current manuscript for Jeremy Collies work, so I cannot comment on this one yet.

MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

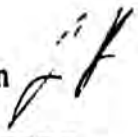
TO: Mark Herrmann  
Assistant Professor  
Department of Economics  
University of Alaska, Fairbanks  
Fairbanks, AK 99775

DATE: February 28, 1993

FILE NO:

TELEPHONE NO: 465-4160

SUBJECT: A Few Comments on  
the Salmon Demand Model

FROM: Jeff Hartman   
Economist  
Division of FRED  
Department of Fish and Game

**Comments on Draft Technical Report.**

Following our earlier discussions on the cost-benefit analysis you mentioned that you were interested in getting my review comments. I have not seen a final version of the International Marketing Model for Alaskan Salmon, so I hope my few comments will still be of some use to you. I believe that most of these comments have not been raised in any past reviews.

1. Pg 3 Quote from the text: "Factors affecting wholesale level demand and supply will be included in the reduced form equations."

Question: I thought that efforts to derive exvessel prices from wholesale prices were unsuccessful in this study, and that landed prices were derived from export quantities and prices?

2. Is "private expenditure" (pg 32) the same variable as "private consumption expenditure" for EEC (pg 112)? This is a statistic that I am not familiar with. Others reading the technical report, may be curious about what it is also. If there is more of an explanation in the text I on this I apologise for missing it.

3. Page 113. Quote from text: "The 10-year average harvest was agreed upon by Ginny Fay of Senator Cotten's office and Jeff Hartman of FRED Division and communicated to the principal

investigators in a September meeting at Fairbanks, Alaska." I agree that the October meeting produced clear direction from the project manager to contractors regarding which point estimate of production she wanted to use. However, as you will recall, I did voice strong objections to using 1 instead of three production points, and also stated my misgivings over which years should be used in the single point aggregation. It would be more accurate to say that: The project manager decided which point estimate to go with when it was revealed that there would not be sufficient time to run all 17 cases with the bracketed wild production for non-intensively modeled sites cited in the RSA. I realize, that the time constraint was not imposed by the researchers.

4. Page 113. Quote from text: "The future hatchery harvests for the other Alaska regions and species were estimated by the hatchery operators in a survey conducted by the FRED Division of ADF&G."

Comment: This is not quite correct. The survey was requested by the legislature. The state hatchery survey was carried out by ADF&G at the request and under the oversight of Ms. Ginny Fay. The PNP survey was administered by the Legislative Research Agency under direction of Ms. Ginny Fay, special assistant to Senator Richard Eliason.

5. A table of the mean weights used for computing production of enhanced fish from the non-intensively modeled sites would be helpful to the reader. Also, a table of the production numbers for enhanced non-intensive and intensive sites by year, that you used, would be useful for people trying to follow your discussion on the findings of each case studies.

6. Page 117. The text describes the interval testing that was applied to some of the exogenous variables. Graphs of the predicted output prices are provided, but there is not any discussion in this section of how these tests varied price response. It is the difference in own and cross price response between the current case (1) and the other 5 cases tested, that would tell us if the price response is large or small when the sensitivity testing was applied. I would like to hear in the author's words, whether these levels of variation in price are going to significantly change the outcome of the change in revenue from enhancement or not?

7. Page 148. Quote from the text: "Therefore, it may be advisable to increase efforts aimed at increasing demand for salmon, particularly pink salmon,..... This investment may provide greater returns to the salmon industry than investment in increasing salmon hatchery production."

Comment: The reader can see most of your econometric evidence, and quantitative analysis behind your conclusions about salmon enhancement in this manuscript. They cannot observe any equally rigorous study results presented about your advice to "increase marketing and promotion, product development, market expansion and development of new markets". I too, hope that these sorts of efforts would shift the demand curve outward into a more elastic region. Since of these types of marketing efforts have been underway for some time, some might question if there is much current evidence for certain types of marketing efforts to shift the demand curve where we would like it to be.

If you want this study to be remembered for its quantitative accomplishments, I think the framing of your advice statements above actually detracts from your main message. Perhaps if you were

to say that "If this investment were to succeed in shifting D1 outward sufficiently, than it may produce positive net benefits for Alaska." Or substitute "it may be worth further investigations of", instead of "It may be advisable".

8. Though not required in the RSA, some discussion of the next suggested steps in research on salmon demand would be helpful.

**Software and documentation:**

1. I am starting to review the CBA simulation model that John Boyce provided. After the CBA model is working we plan to start on the simulation software that you sent for the Demand model. A couple of our SAS experts are also interested in it. It sounds as though you plan to make changes in the simulation models and make it more user freindly in the next few months. After we review the current simulation software, we could provide some input on comment statements and documentation if it would aid in your subsequent software documentation.

2. Output files from simulation model.

I have attached a copy of one of the output files that you sent me. I have noted some variable names that may have typo's in them.

3. Some of the proc statements used in your simulation code are not covered in my Version of SAS/ETS User's Guide. Can you tell me which version of the SAS User's Guide these came from, and which PC version of SAS you are using?



UNIVERSITY OF ALASKA FAIRBANKS

**School of Management**

Fairbanks, Alaska 99775-1070

March 31, 1993

Molly McCammon  
Alaska State Legislature  
Capitol Building, Room 204  
Juneau, Alaska 99801-1182

Dear Molly

I apologize for the delay in answering your request to address the last requirement of the salmon demand portion of the state salmon study. I am happy that we have agreed that other areas of the demand portion have been fulfilled and that the final payment to UAF will not be held up. This news has certainly lessened the pressure on me.

I am going to suggest a couple of options to satisfy the programming part of the grant. I'll let you choose the most desirable then I will write it up more formally before I start to work on it. I was interested to read that Koenings was quoted in the paper as saying of our model that "We don't have any confidence at this particular time in what's coming out of that work model". I take it from this comment, and others, that the FRED division is no longer interested in using the model. This is probably good news since we are not speaking to each other and I now am free to document the use of the model so that the state can use it for verification. As I said before, this model was not intended to be used for any other project than this and was not designed to be effective for a period longer than the current time period, i.e., if the model were to be used in two years it would be much better to re-estimate the model with two additional years of data. If we had been asked to build a model that would have been more flexible to answer many different scenarios we could have done so. But this was not the purpose of the grant.

Therefore, I propose the following three options. Let me know if either one is acceptable or a third option would be preferable. Once you reveal your preference I will more formally write out a detailed plan.

### **Option 1 - Iterative option.**

We could do this as an iterative procedure. This would involve someone from the state taking bits of the tremendously large program, as I send it (with documentation), and verifying the results of our study. This process would be complete once the entire program was transferred. It would probably take 8 or 9 iterations. The advantage would be that we would be sure each part of the model was running before the next one arrived. The disadvantage would be, that under this scenario, I would not take the time to reprogram the mode to become more user friendly and there would be more steps taken to achieve the final objective. I would be ready to send the first installment sometime in June. I anticipate approximately three months to finish the transfer.

### **Option 2 - User Friendly Option**

I would make the program easier to use by spending more time on documentation and combining as many of the sub-programs as possible. It would still not be possible to combine all sub-programs. For this effort I would need Josh Greenberg's help since he is a much better SAS programmer than I am. We would be able to start this project after school is out, sometime in June. I anticipate about four months to rewrite the programs and to document it.

### **Option 3 - The Safer Option**

Since the model is extremely complicated and since I am the only one who I trust to run it without making runs which are inaccurate (or dangerous in their use) I could make a reasonable amount of runs that were specified by the state. In this case I would send all the programs to you without documentation. I would instruct Josh on how to run the programs (in case anything happened to me). Then we could agree on a reasonable number of runs that I would make that the state may desire. Again, I do not believe the model will be useful much past a year or so from now so I am not sure what different scenarios may be required. The advantage here is that I may be able to fix the model if (when!) it crashes and can stop any possible troubles in the intermediate steps. Since there does not seem to be any great need by anyone at the moment to continue using the model this might be the quickest and easiest solution for all involved.

In any case, does the state have the capacity to read 128 meg optical hard disks? This would be a much easier way to transfer the sizable programs than on floppies. If not, we can do it on floppies, probably enhanced by a common crunching program.

Thanks for your continued work on the project. Sorry that there have been so many miscommunications.

Cheers,



Mark Herrmann

*Molly*  
WALTER J. HICKEL, GOVERNOR

APR 13 1993

**DEPARTMENT OF FISH AND GAME**

**COMMERCIAL FISHERIES MANAGEMENT  
AND DEVELOPMENT DIVISION**

P.O. BOX 25526  
JUNEAU, ALASKA 99802-5526  
PHONE: (907) 465-4160  
FAX: (907) 465-4168  
*CJM*

April 8, 1993

Mr. Chris Mitchell  
Executive Director  
Alaska Fisheries Development Foundation  
508 West 2nd Avenue, Suite 212  
Anchorage, AK 99501

Dear Mr. Mitchell:

The Alaska State Legislature has encouraged the Department of Fish and Game select a contractor to carry out a technical review of a recently completed economic study of the statewide salmon enhancement program. The study and supporting technical documents for *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program* was produced for the Senate Special Committee on Domestic and International Fisheries in 1993 by the University of Alaska-Fairbanks, School of Management.

To carry out this technical review, the Commercial Fisheries Management and Development Division requests your assistance in finalizing contract language for the technical review and also participating in the contractor-selection process. We are interested in developing contract language that would result in a balanced, high-quality technical review of these studies. Your background in contracts related to Alaska's fisheries would provide helpful input for formulating the final documents.

I have enclosed a draft Authority to Seek Professional Services which details the questions that would be posed to the contractor as well as the scope of work to be covered in the technical review. It would be greatly appreciated if you could provide comments to me on the framing of the questions and scope of the work by April 15.

In addition, we are looking for economists to include on the list of potential technical reviewers. These economists must have strong skills in econometrics and fisheries economics. They should be familiar with the international markets and supply and price data for salmon. In particular, they need to have an understanding of the Bayesian bootstrapped-version of two-stage least squares used in these models. This is one of the major areas that the original technical review team had difficulty understanding.

Mr. Chris Mitchell

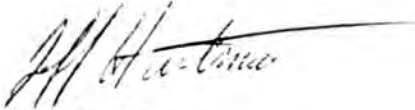
-2-

April 8, 1993

At this time, I am only aware of two economists that have these qualifications. They are James Wilen of the University of California-Davis and Ira Strand of the University of Maryland. If you are aware of additional economists with these qualifications, please contact me by April 12.

Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jeff Hartman", with a long horizontal flourish extending to the right.

Jeff Hartman  
Economist

Enclosure

cc: Johnny Holland  
Jeff Koenings  
✓ Molly McCammon

# MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

TO: Dave Massey, Loan Officer  
Division of Investments  
Department of Commerce and Economic  
Development

DATE: April 7, 1993

FILE NO:

TELEPHONE NO: 465-6155

SUBJECT: Request for Review  
of Professional Services  
Agreement

FROM: Jeff Hartman   
Economist  
Commercial Fisheries Management  
and Development Division

The Alaska State Legislature has encouraged the Department of Fish and Game select a contractor to carry out a technical review of a recently completed economic study of the statewide salmon enhancement program. The study and supporting technical documents for *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program* was produced for the Senate Special Committee on Domestic and International Fisheries in 1993 by the University of Alaska-Fairbanks, School of Management.

To carry out this technical review, the Commercial Fisheries Management and Development Division requests your assistance in finalizing contract language for the technical review and also participating in the contractor-selection process. We are interested in developing contract language that would result in a balanced, high-quality technical review of these studies. Your background in the private nonprofit enhancement program would provide helpful input for formulating the final documents.

I have attached a draft Authority to Seek Professional Services which details the questions that would be posed to the contractor as well as the scope of work to be covered in the technical review. It would be greatly appreciated if you could provide comments to me on the framing of the questions and scope of the work by April 15.

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At this time, I am only aware of two economists that have these qualifications. They are James Wilen of the University of California-Davis and Ira Strand of the University of Maryland. If you are aware of additional economists with these qualifications, please contact me by April 12.

Thank you for your assistance.

Attachment

cc: Johnny Holland

Jeff Koenings

Molly McCammon

# MEMORANDUM

STATE OF ALASKA  
Department of Fish and Game

TO: Kurt Schelle  
Research/Planning Project Leader  
Commercial Fisheries Entry Commission

DATE: April 7, 1993

FILE NO:

THRU:

TELEPHONE NO: 465-6155

SUBJECT: Request for Review  
of Professional Services  
Agreement

FROM: Jeff Hartman   
Economist  
Commercial Fisheries Management  
and Development Division

The Alaska State Legislature has encouraged the Department of Fish and Game select a contractor to carry out a technical review of a recently completed economic study of the statewide salmon enhancement program. The study and supporting technical documents for *A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program* was produced for the Senate Special Committee on Domestic and International Fisheries in 1993 by the University of Alaska-Fairbanks, School of Management.

To carry out this technical review, the Commercial Fisheries Management and Development Division requests your assistance in finalizing contract language for the technical review and also participating in the contractor-selection process. We are interested in developing contract language that would result in a balanced, high-quality technical review of these studies. Your background in fisheries and this economic study would provide helpful input for formulating the final documents.

I have attached a draft Authority to Seek Professional Services which details the questions that would be posed to the contractor as well as the scope of the work to be covered in the technical review. It would be greatly appreciated if you could provide comments to me on the framing of the questions and scope of the work by April 15.

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At this time, I am only aware of two economists that have these qualifications. They are James Wilen of the University of California-Davis and Ira Strand of the University of Maryland. If you are aware of additional economists with these qualifications, please contact me by April 12.

Thank you for your assistance.

Attachment

cc: Johnny Holland

Jeff Koenig

Molly McCammon

FDE 145-90: EXECUTE RSA

W 0694213 S 0012

RSA NUMBER 3127107 TRANS CODE MINOR 90  
DOCUMENT NUMBER A06942180012  
SOURCE RD CODE 11966 ADDITIONAL AUTH RD 31070  
EXECUTE AMOUNT 21737.91  
DESCRIPTION LONG 21737.91 2/93 BILL LEGISLATIVE ANALYSIS  
OF STATEWIDE SALMON ENHANCEMENT PROGRAM  
AR 42845

FISCAL PERIOD CODE C  
FEDERAL FISCAL YEAR -- DENOMINATOR ----

| FIN LINE | AMOUNT | NMR |
|----------|--------|-----|
| 1        | ---    | --- |
| 2        | ---    | --- |
| 3        | ---    | --- |
| 4        | ---    | --- |

PF1=QUIT 3=SUBMIT 4=BATCH ERRS 5=BASE 6=FIN

12=DELETE

|                                          |       |              |       |
|------------------------------------------|-------|--------------|-------|
| Post-It™ brand fax transmittal memo 7671 |       | # of pages > |       |
| To                                       | Molly | From         | Karla |
| Co.                                      |       | Co.          |       |
| Dept.                                    |       | Phone #      | 6626  |
| Fax #                                    | 3445  | Fax #        | X3234 |

Amendment

Scope of services?

\$ amount?

Completion date?

ASAB1000-01 RRN: 0033672  
RSN: 02669 CPD: 03/06/93

DISTRB RD: 11963 D03

STATE OF ALASKA  
STATEWIDE ACCOUNTING SYSTEM  
1993 RECENT ACTIVITY AUDIT TRAIL REPORT

PAGE:  
DATE: 03/07/93

MAR-24-93 MED 11:41

LAA EXEC DIRECTORS OFFIC

FAX NO. 4653232

P.02

| DOCUMENT                   | VND/EMP/DSTRB DESC     | TRANS  | WRNT     | NUM | SY       | CC | PGM | LC       | ACCT  | DATE  | ACTUALS  | ENCUMBRANCES | BUDGET    |   |
|----------------------------|------------------------|--------|----------|-----|----------|----|-----|----------|-------|-------|----------|--------------|-----------|---|
| A06858130018               | UAF91309 UNIVERSITY OF | 310-10 | 23412073 | 92  | 11001014 |    |     | 11001014 | 73270 | 02/13 | 21737.91 | 22350.00-    | 0         |   |
| XXXX TOTALS FOR AT EX      |                        |        |          |     |          |    |     |          |       |       |          | 21737.91     | 22350.00- | 0 |
| XXX TOTALS FOR CC 11001014 |                        |        |          |     |          |    |     |          |       |       |          | 21737.91     | 22350.00- | 0 |
| XX TOTALS FOR LC 11001014  |                        |        |          |     |          |    |     |          |       |       |          | 21737.91     | 22350.00- | 0 |
| * TOTALS FOR AR 42845-93   |                        |        |          |     |          |    |     |          |       |       |          | 21737.91     | 22350.00- | 0 |

University of Alaska Fairbanks  
Grant and Contract Services  
109 Administrative Services Center  
Fairbanks AK 99775-0840  
Telephone 474-6075, FAX 474-5508

February 5, 1993

Jenifer Childress  
Alaska Dept. of Fish and Game  
PO Box 25526  
Juneau AK 99801-5526

**Project Title** Legislative Analysis of Statewide Salmon Enhancement Program

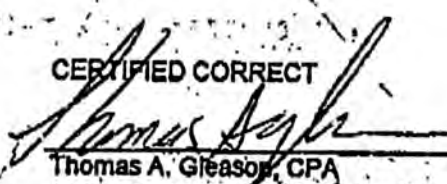
Request for second 50% payment per terms and mechanics of reimbursement for  
RS1121091/EN1123510. RSA amount: \$44,700.00.

**FINAL PAYMENT REQUEST**

|                                           | <u>Current Expenditures</u> | <u>Cumulative Expenditures</u> |
|-------------------------------------------|-----------------------------|--------------------------------|
| Per Schedule                              | <u>\$21,737.91</u>          | <u>\$44,087.91</u>             |
| Total Amount Billed                       | <u>21,737.91</u>            | <u>44,087.91</u>               |
| Total Charges Subject<br>To Reimbursement | <u>\$21,737.91</u>          | 44,087.91                      |
| Payment Received                          |                             | <u>22,350.00</u>               |
| Net Amount Due UAF                        |                             | <u>\$21,737.91</u>             |

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement.

CERTIFIED CORRECT

  
Thomas A. Gleason, CPA  
Accountant, Grant and Contract Services

Vgl

cc: 252942

School of Management, University of Alaska Fairbanks

to: Molly  
from: Jeff

Thanks for the new fan mail from Mark Herrmann. I have to admire Marks ingenuity in finding new and creative ways to blame FRED Division for everything that has gone wrong in his life.

Seriously, I am sorry that you have been exposed to this. After I sorted through Marks accusations, false information, and threats, it was apparent that I needed a copy of the documents that you sent to him to offer a response. After looking at the RSA and final UAF proposal and talking with our ADF&G RSA specialist, I would be in a better position to offer some suggestions.

Incidentally, Jenifer Childress, of ADF&G made the final payment for this RSA on February 13 and the check was cashed by UAF on March 3 (see attached). All of Marks puffing about not being paid, and having to bear costs out of his own pocket for the remaining expenses, appear to be a snow job. What is going on up there?

Also, I sent Jeff Koenings a response to Marks first emotional outburst letter to you of March 2. I have not sent it to you because I felt that it was beneath me to respond to Marks original commentary on FRED. Since I see more of the same misinformation in this memo, I will ask Jeff if he wants to send it to you.

final bill  
sent ÷

→ ~~AK~~ Günning \*

3/23/93

Draft RSA was never revised because  
superseded by contract.

It was clear we were asking for more  
than we could get

What Hartman proposed - was unreasonable.

have FRED Dir. for PC -

a letter can serve as a contract -

FRED D.  
not a contract between FRED & Univ. ÷

|                |
|----------------|
| - CPEC         |
| - Leg. Affairs |
| - Halford      |
| - OMIB         |

Letter to Koenigs. Hermann will provide the  
first simulations in SAS -

cc: to Hermann

huge model.

more iterations.

in AK - we have a model - ~~sub-model~~

too complex to be housed & run in ADF & G.  
contributed to university modelling.  
turf battle.

called  
Mark Hermon - on 3/23/93

Told him to write me w/  
what he thinks is reasonable to  
complete project.

~~draft~~

474-5219 - FAX #

John Boyce -

out of town for past 3-4 wks.

final copy -

mid April. still not finished re-write of fishing  
cost model. need it done by April 15 for  
presentation to Norway.

Nothing will change in tables & results -  
Ginny had given editorial comments -  
had spent 3/4 time of report on things that didn't  
work.

When - is more complete than what final will be.  
ask Ginny if she has a draft

Mark Herrmann  
School of Management  
University of Alaska Fairbanks  
Fairbanks, AK 99775-1070

Jeff Koenings, Director  
FRED Division  
AK Department of Fish and Game  
P.O. Box 25526  
Juneau, AK 99802-5526

John Lehman  
Dean, School of Management  
University of Alaska Fairbanks  
Fairbanks, AK 99775-1070

Carol Lewis  
Chair, Natural Resource Department  
University of Alaska Fairbanks  
Fairbanks, AK 99775-1070

Bob Logan  
Chair, Department of Economics  
University of Alaska Fairbanks  
Fairbanks, AK 99775-1070

Diane Bischak  
Department of Business Administration  
University of Alaska Fairbanks  
Fairbanks, AK 99775

Joshua Greenberg  
School of Agriculture and Land Resources Management  
University of Alaska Fairbanks  
Fairbanks, AK 99775

Keith Criddle  
Dept. of Economics  
UAF 99775

John Boyce  
Department of Economics  
University of Alaska Fairbanks  
Fairbanks, AK 99775

# MEMORANDUM

STATE OF ALASKA

TO: Jeff Hartman  
Economist  
Comm. Fish. Mgmt. and  
Development Division  
M/S: 1100

DATE: April 19, 1993

FILE NO:

TELEPHONE NO: 789-6160

FROM: Kurt Schelle <sup>MS</sup>  
Project Leader,  
Research & Planning  
C.F.E.C. M/S: 0302

FAX: 789-6170

SUBJECT: Review of Proposed  
Professional  
Services Agreement.

I did not receive your April 7th memorandum until last Friday afternoon (April 16th). Apparently there was some mix-up in the routing. I hope that this response is still useful to you.

I am not sure who has experience with both salmon market research and the use of large (48/36 equation) and complex econometric models for forecasting. I am also not sure who has extensive experience with the Bayesian Bootstrapped two-staged least-squares estimation methodology for multi-equation econometric models.

Perhaps Dan Huppert at the University of Washington or Richard Johnson at Oregon State University would have some suggestions. I believe Johnson has some experience with salmon demand modeling and was one of the founders of the "International Institute of Fisheries Economics and Trade".

I have attached a copy of a recent survey article published in Marine Resource Economics titled "Seafood Demand and Market Analysis". The article was co-authored by Cathy R. Wessells and James L. Anderson.<sup>1</sup> Their bibliography might provide you with some other potential candidates for the proposed technical review. From previous conversations, I understand that you may have "conflict-of-interest" reservations about contracting with some of the cited authors.

With respect to your project description, I have attached a few additional questions about the salmon market model and the "15/30-year" simulation forecasts. You may want to add some of these to your list if you feel that they are not already covered. Ben Muse will send you some additional questions on John Boyce's cost/net return models.

I would offer the following suggested change for the first three paragraphs of the section titled "Why the project is needed".

---

<sup>1</sup>Note that the article reviews Herrmann's 1990 dissertation on world salmon trade and contains some cautionary notes on applying the Bayesian bootstrapping technique.

The authors of the UAF CBA study raised significant policy issues based upon the forecasts in their report. The forecasts were made with a complex multi-equation econometric simulation model and required many assumptions about the values of exogenous variables thirty years out into the future.

Economists in the Department and in the Legislature who reviewed the study raised many questions about methodology, assumptions, and procedures. Nevertheless, given the great complexity of the models, the Department feels that it would be best to seek a thorough professional review by someone who is an expert in all the requisite areas. The reviewer should be knowledgeable on salmon markets, be familiar with the Bayesian bootstrapped two-stage least squares estimation technique, and be familiar with forecasting with a large and complex multi-equation simulation model.

The salmon market component of the UAF CBA study is large and technically complex. One bloc of the model contains 48 equations and the second bloc contains 20 equations. A single simulation takes several hours on a 486 33 MHZ computer. The researcher in charge of developing the salmon market model described the model as "one of the largest economic simulation model of its type in the world".

Other technical questions, . . .

Again, I hope that this memorandum and our attached questions are useful to you. Please let me know how we can be of further help.

Attachment.

cc:

Jeff Koenings  
Johnny Holland  
Molly McCammon  
Ben Muse

Guideline Questions  
For the Professional Review  
Of The Herrmann/Greenberg Salmon Market Model  
(K. Schelle's notes: 4/19/93)

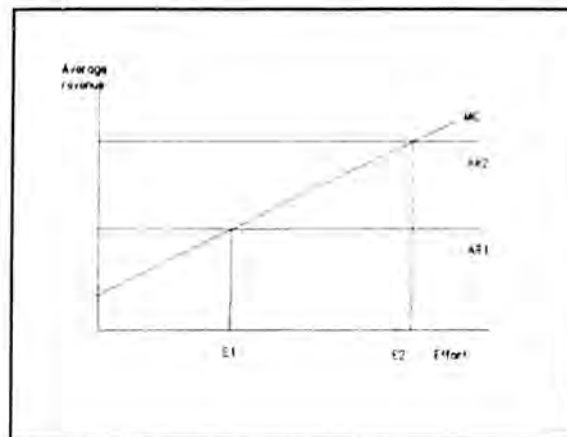
1. The model was "run" over the estimation time period so that simulation statistics could be calculated for the endogenous variables to see how the model performed. Do the simulation statistics indicate that the model "tracks" relatively well over the estimation time period?
  - a.) Do you feel that any variables track poorly over the estimation time period? What are these variables?
  - b.) Does the tracking of particular variables over the historical period raise any concerns about how the model might perform during the 15/30 year forecast period?
  - c.) Are the simulation statistics reported for endogenous variables over the estimation time period based on the same multi-equation model that was used to make the 15/30 year forecasts? If not, would it be prudent to redo the simulation statistics using exactly the same model that was used to make the simulations?
  - d.) Are there any portions or sections of the Bloc one model which raise concerns? Do you have any idea why the Atlantic salmon portion of the Bloc might perform poorly (and need to be dropped from the simulation model) during the simulations?
  - e.) Do you have any concerns about the model specifications, the estimation techniques, or the variable definitions used by the authors?
  - f.) Do you have any concerns about how certain variables were calculated?
  - g.) Would you have any suggestions for different model specifications?
  - h.) Do you have any reservations about the Bayesian bootstrapped two-staged least squares estimation technique which the authors utilized?
  - i.) Do you have any concerns about the procedures used to estimate species and area specific ex-vessel salmon prices in Bloc 2 of the model?

2. All forecasts require the use of "judgement" irrespective of how they are made. Forecasts of the future are not scientific exercises, even if they are made from complex empirically-derived econometric models. The following questions ask for your expert opinion on the assumptions and procedures used by the authors and the confidence which the State of Alaska should place in the results.
- a) The authors seem to imply that the model produces unrealistically high prices during the 15th year of the simulation. Does this raise concerns about the dynamic stability of the Bloc One model?
  - b) The Atlantic salmon portion of Bloc One apparently had to be eliminated to do the simulations. Key variables from this bloc were made exogenous and took on assumed values. Do you see any obvious specification problems with the original Atlantic salmon portion of Bloc One that would impact the dynamic stability of the overall model or otherwise bias the results?
  - c) In making 15/30 year forecasts into the future from a complex econometric simulation model, values for all of the exogenous variables need to be assumed.
    - i) In your judgement, are the values assumed for the exogenous variables in the mid-point simulations reasonable? Do any of the assumptions about particular variables seem unrealistic or give you cause for concern? If so, what assumptions or range of values would you recommend using for the variables in future simulations?
    - ii) Are the assumptions used by the authors for the high, low, and mid-point price predictions clear to you? Which exogenous variables have been increased and which have been decreased for the high and low scenarios?
    - iii) Which exogenous variables, if any, do you feel could substantially alter the results of the Bloc One model? Do you think that other plausible assumptions for these variables would ultimately alter the CBA results? If so, what are those assumptions?

- iv) What sensitivity analyses, if any, would you recommend?
- v) Does the use of 1991 dummy variables (the last year of the estimation period) in the specification of certain equations raise any concerns during the forecast period? Do the authors' arguments for setting D91 equal to zero during the forecast period in the low-valued salmon equation and equal to one during the forecast period in the high-valued salmon equation seem reasonable? How do these assumptions impact the results?
- d) Is there any way to estimate confidence intervals around the point estimate forecasts of the endogenous variables in the model? If so, how would the intervals be interpreted?
- e) Given the complexity of the CBA model (all components combined), is there any way to assign a confidence interval to the final "point estimate" of net economic benefits forecasted under particular scenarios?

Guideline Questions  
For the Professional Review  
of the Boyce fishing cost model  
(B. Muse's notes 4/20/93)

- 1 Does the model define the marginal costs of an effort increase to be the total variable costs of an additional operation entering the fishery? Does this underestimate the marginal costs associated with a change in average revenues by ignoring the possibilities (a) that existing operations may expand effort in response to higher average revenues, and (2) that the entry of new operations may impose technological externalities on existing operations? Does this bias estimates of cost changes associated with effort changes? Is any bias likely to be significant?



Effort is measured by the number of separate operations active within an area. At the effort level  $E1$ , above, a new operation is assumed to have entered the fishery when average revenues rose to  $AR1$ . Presumably at this point the average revenues have risen to (or just above) the minimum point on the new operation's average variable cost curve and the operation has found that it can minimize its losses by beginning to operate and covering at least part of its fixed costs for operating that day. The total variable costs of this operation's activity for the day appears to be the model's measure of the aggregate fishery marginal costs.

In order for the estimated marginal cost curve to be the actual aggregate industry marginal cost curve we have to assume that, as average revenues rise and new operations enter the fishery, the cost curves for operations already in the fishery remain the same. We also have to assume that these operations do not change their own effort levels and increase their average variable costs as new operations enter the fishery. If the cost curves rise because of external effects imposed by the new operations, or if operations already in the fishery expand their effort levels and increase their total variable costs, the actual marginal cost curve at  $E1$  might lie above the estimated marginal cost curve.

- 2 Does the short run nature of the analysis suggest that some costs, sunk from the point of view of a single day of fishing, may not be considered by the model? Does this bias estimates

of cost changes? Is any bias likely to be significant?

The model estimates marginal costs associated with a day's decision to fish. There are costs which are sunk from the point of view of a single day's fishing and which may not affect decision making in this short run.

As an example consider a fisherman who has come to Prince William Sound from out of state to seine for salmon. He has come to spend the season. On any given day he faces a choice of whether to stay at the dock or to go to one of several fishing grounds. He has, however, committed his time to this fishery in advance of the season. Does this mean that from the point of view of the one day decision, his opportunity cost of time is a "sunk cost" and not a choice variable, and may not be reflected in the aggregate marginal cost curve constructed for this model.

Is this opportunity cost, from the social cost-benefit point of view, a real cost which it is desirable to measure.

- 3 Can the model be used to evaluate a long term (15 or 30 years) change in harvest levels given the extremely short run (a day long opening) nature of the data used to estimate the cost model? Can the model successfully account for longer term effort and cost adjustments? If it can't, does this failure tend to bias the results in any direction? Is any bias likely to be significant?
- 4 To the extent that marginal costs include raw fish taxes and other transfer payments do these marginal costs overestimate marginal social costs? This question was suggested to me by Jeff Hartman.
- 5 Presumably crew shares are costs to decision makers and are reflected in the marginal cost curves. But can crew shares include an element of rent? If so, do marginal costs overestimate marginal social costs to the extent that they include crew share rental payments? Is there a way these crew share rental payments could be netted out of the analysis?
- 6 Does the failure of the model to differentiate between resident and nonresident fishermen tend to lead to over or underestimates of the benefits to the state of changes in hatchery production?

## House committee to review salmon enhancement program

By Eric Fry  
Alaska Journal of Commerce

The state House Special Committee on Fisheries will begin hearings in early April on the salmon hatchery

program, says Molly McCammon of the committee staff.

Twelve state and 25 private, non-profit hatcheries together produce about one-quarter of Alaska's commercial salmon harvest.

The legislative review is partly intended to give the Board of Fisheries clearer direction on managing mixed-stock fisheries, providing for broodstock, and providing for fisheries that help recover the hatcheries' costs.

costs.

The House hearings continue a process that began in the Senate in 1991.

Last summer the Legislature established a wild-stock priority and told the fish board to develop a mixed-stock policy.

But there is no clear policy for the hatcheries, now that the original goal has been met of rehabilitating the state's depressed stocks, the executive summary report said.

McCammon said that some scientists are concerned about the biological impact of producing more salmon, especially since the Russians and Japanese have increased their production. Scientists fear that the Pacific Ocean could be reaching its carrying capacity for salmon, she said.

The world supply of salmon from all sources doubled between 1980 and 1990—and prices have fallen.

Between 1988 and 1991, the average price Alaska fishers received for sockeyes fell from \$2.35 a pound to 77 cents a pound. The prices for pinks tumbled from 79 cents a pound to 13 cents, according to a 1992 report by Gunnar Knapp of the University of Alaska Anchorage.

The committee will review the regional planning teams that consider hatchery permit applications and develop comprehensive hatchery production plans.

The planning teams do not take into account the impact that production in one region has on other areas of the state, the report said.

A frequent complaint is that the planning teams are heavily weighted in favor of the commercial fishing industry and do not represent sport fishers, subsistence users and environmentalists, the report said.

"Another, more fundamental concern is that (Fish and Game Department) managers are usually outnumbered on the (planning teams)," the report said.

"As a result, the group can pressure department managers into approving projects that should probably be denied. ... There is also concern that the non-Fish and Game members of the (planning teams) may not be sufficiently capable of evaluating and making decisions on issues that are increasingly technical in nature," the report said.

And then there's money.

Since the salmon enhancement program began in 1972, Alaska has provided \$71 million in loans and \$12 million in grants to the private hatcheries.

And the state has spent about \$210 million in the past 20 years to run the Division of Fisheries Rehabilitation, Enhancement and Development.

Part of the legislative review is a controversial economic study that compared state funding of the salmon hatcheries with fishers' revenues.

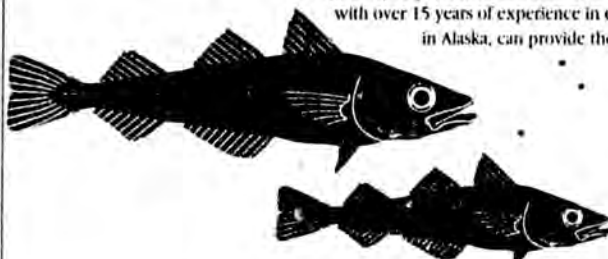
The study's conclusion: Eliminating the pink salmon hatcheries would reduce supply and might drive prices up.

The study also estimated that operating hatcheries at current production levels would cost the state \$420.2 million over the next 30 years but would produce only \$390 million in net revenues to fishers.

The report, by four University of Alaska Fairbanks professors, has not

Continued on Page 4C

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# Alaska Native a likely choice for next North Pacific council seat

By Eric Fry  
Alaska Journal of Commerce

Gov. Walter J. Hickel has nominated two Western Alaska Natives and a Gulf of Alaska fisherman as possible replacements for Henry Mitchell on the North Pacific Fishery Management Council.

Nominated were John Jemewouk, executive director of the Norton Sound Economic Development Corp.; Robin Samuelson, chairman of the Bristol Bay Economic Development Corp.; and Andrew Scalzi, a longtime fisherman and vessel owner, who is on the Kenai Peninsula Borough Assembly.

Hickel spokesman John Manly said Western Alaska Natives are a user-group that is heavily impacted by the council's decisions. Part of Hickel's intent is to see Natives represented on the council, Manly said.

The governor of Alaska nominates five of the 11 voting members of the North Pacific council, which manages commercial fisheries in U.S. waters off the Alaska coast. A sixth Alaskan, the fish and game commissioner, is automatically a council member.

The U.S. secretary of commerce makes the final three-year appointments, after review by the National Oceanic and Atmospheric Administration.

Jemewouk, who was reported by the Associated Press as Hickel's preferred candidate, said in an interview that he is excited by the prospect. "I look at it as a new perspective on the council."

He supports individual fishing quotas "to where it brings a better quality

product to market and helps support a wider range of people."

The community-development-quota program has benefits and shortcomings, Jemewouk said. "It helps get people off welfare and into jobs in the fishing industry."

As far as CDQs being extended to the Gulf of Alaska, Jemewouk said that many Southeast communities already are on the fishing grounds, but "there's some areas that could be developed."

In addition to heading the Norton Sound CDQ program, Jemewouk is a member of the National Indian Health Board and the Alaska Native Health Board, which he chairs.

Jemewouk was president of KEG Fish Co. from 1984 to 1989 and of the Elim Native Corp. from 1984 to 1987. He was born in the Eskimo village of Elim in 1951. His father is an Inupiat Eskimo from White Mountain, Alaska, and his mother is a Yupik Eskimo from Elim.

Henry Mitchell, who is executive director of the Bering Sea Fishermen's Association, has served on the council since 1984. His term will expire in August.

"Henry did an excellent job," said Clem Tillion, alternate council member, who cited Mitchell's work on the CDQ program.

**CDQs at the table**  
Both Jemewouk and Samuelson head community-development-quota programs that have benefited from recent council decisions.

The North Pacific council allotted 7.5 percent of the Bering Sea and

Aleutian Island regions' 1992-95 pollock quota to Western Alaska communities, which formed six development groups to harvest the fish with trawling company partners. The quota shares are worth collectively tens of millions of dollars over several years.

Community development quotas also are worked into the newly approved individual-fishing-quota plan for halibut and sablefish, which may go into effect in 1995 or later.

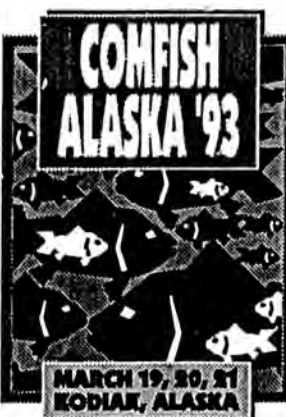
The IFQ plan gives transferable quota shares to vessel owners and leaseholders based on their recent catch history.

But some quota shares will be taken from each Bering Sea and Aleutian

Islands management area and given to nearby communities, which will distribute the shares among individual fishers. Non-CDQ fishers are expected to lose about 3.5 percent of their initial quota shares to CDQ fishers.

The pollock CDQ programs will not necessarily be the recipients of halibut and sablefish CDQ shares. In the IFQ plan, the CDQ shares come from particular management areas and must be fished from local communities only.

In the pollock CDQ plan, the recipients can fish anywhere in the Bering Sea and Aleutian Islands management areas.



In February, Gov. Walter J. Hickel received an \$18,000 voluntary payment from Mark Sngaroff, chairman of the board of the Aleutian Pribilof Island Community Development Association. The payment was in lieu of the state raw-fish tax that would have gone to the general fund had the CDQ group used an onshore processor for all of its harvest. APICDA formed a joint venture with Trident Seafoods Corp. and the Starbound Partnership to harvest its share of the CDQ pollock. Catcher vessels delivered about 70 percent of the fish to Trident's shoreside Akutan plant, but one factory trawler was used. In all, APICDA paid about \$80,000 in raw-fish tax in 1992.



PHOTO BY STEVE STICKLAND

Joe Blum, left, of the American Factory Trawler Association and John Roos of the Pacific Seafood Processors Association receive the first installment of a \$100,000 research grant to the Marine Mammal Research Consortium from Fred Richard, right, senior vice president of the National Bank of Alaska.

The consortium was formed by seafood companies to investigate the decline of marine mammals in the Bering Sea. Environmentalists have sought to link the decline to the commercial fishing of pollock, one of the mammals' food sources. Universities in Alaska, Washington state, Oregon and British Columbia will perform independent, peer-reviewed research, focusing on the Steller sea lion and harbor seals. The consortium hopes to raise \$900,000 over three years. Research is expected to begin in April. The federal Marine Mammal Protection Act is up for reauthorization this year. The National Marine Fisheries Service has recommended for discussion a regime that includes marine mammal quotas for certain species, and no legal takes for severely depleted species.



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## House committee to take hard look at salmon hatchery program

Continued from Page 2C

yet undergone peer review or public comment.

Representatives of private hatcheries said the report's methodology is flawed and the results may not be

statistically significant.

"The Department of Fish and Game is contracting for an independent technical review of the study," said a statement from Rep. Carl Moses-Al-Una-aska, who chairs the committee, "and I invite other interested groups

to do the same."

Not enough supporting documents have been released to make that possible, said Heather McCarty of the Prince William Sound Aquaculture Association, the state's largest producer of hatchery salmon.

The study, which used an innovative method of computer modeling, also had some limitations built into it, the authors said.

having no hatcheries—but all other regions would gain, the study said, particularly Prince William Sound.

Eliminating the pink salmon hatcheries would cause revenues to rise in Western Alaska, Kodiak and Southeast but drop in Cook Inlet and Prince William Sound, the study said.

Hatcheries accounted for 42 percent of the pink salmon harvest in Prince William Sound but only 3.8

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PHOTO BY STEVE MCCUTCHEON

By the terms of the contract, the professors measured only the direct economic benefits of hatcheries to commercial fishers and ignored indirect impacts such as fish processing jobs, as well as all social considerations.

And the report took no account of the hatcheries effects on sport or subsistence fishing.

The researchers were asked to look at 17 possible policies for managing the hatcheries over the years 1992-2021, including increasing, decreasing or eliminating the production of the various species (see the chart on page 5C).

One significant conclusion: The state's regions are affected differently by hatchery production because of varying amounts of wild salmon in the regions' stocks.

Those regions with an abundance of wild salmon would have higher revenues in a market that wasn't glutted, partly with hatchery fish.

At current hatchery production levels, Western Alaska would lose revenues over 30 years, compared with

percent in Southeast.

McCarty said one of the study's major flaws is that it took the highest production year since 1900 as the base, although salmon returns are cyclical.

Others will fill the gap if Alaska reduces production, she said. "Instead of attacking the problem from the marketing point-of-view, they assumed that you should just cut production."

In 1980, Alaska salmon harvests were 41 percent of the world salmon supply. By 1991, this had dropped to 31 percent, although Alaska produced 50 percent more salmon than in 1980.

Meanwhile, farmed salmon production nearly doubled between 1988 and 1990 to compose 30 percent of the world salmon supply.

In 1980, it was 1 percent.

Norway produces about half the world's farmed salmon, but production is expanding in Scotland, Japan, Canada and Chile, said Knapp's 1992 report.

McCammon said the House committee hopes to hold hearings on the economic report by mid-April.

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## Gulf groundfish allocations face further delay

By Eric Fry  
Alaska Journal of Commerce

The Alaska regional office of the National Marine Fisheries Service has resubmitted the recommended specifications for Gulf of Alaska groundfish to the U.S. secretary of commerce. A decision is expected by March 26, said Ron Berg of NMFS' Alaska office.

Approval of the specifications for total allowable catch, set by the North Pacific Fishery Management Council in December, have been delayed by a dispute over Pacific ocean perch.

The council recommended a catch limit of less than half of last year's, contrary to the council scientific committee's recommendation. This limit would render Pacific ocean perch bycatch-only and kill a Seattle-based trawler fishery worth about \$3.4 million a year.

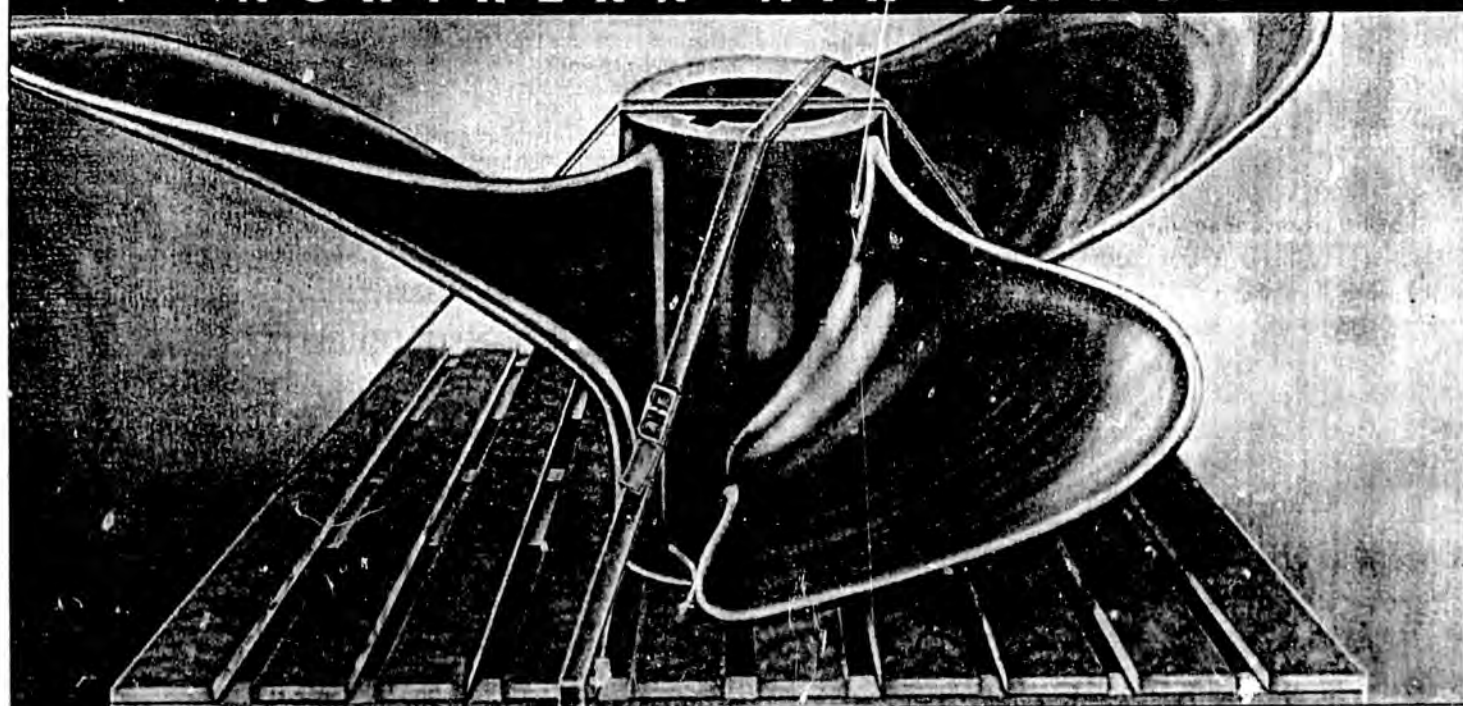


### Net benefits of the Alaska salmon fisheries with changes in hatchery production

| Possible policy choices                                                                        | Western AK                                                          | Cook Inlet       | Kodiak           | PW Sound         | Southeast        |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------|------------------|------------------|------------------|
| Current production<br><small>(All policy choices are figured over period of 1992-2021)</small> | \$993.40 million<br><small>(1992 dollars, discounted at 4%)</small> | \$276.55 million | \$288.69 million | \$126.63 million | \$737.78 million |
| Eliminate pink program                                                                         | 1,016.91                                                            | 271.01           | 312.64           | 95.02            | 874.81           |
| Eliminate sockeye program                                                                      | 1,036.43                                                            | 284.07           | 258.72           | 119.11           | 754.07           |
| Increase pink 15 percent                                                                       | 990.19                                                              | 277.31           | 281.15           | 116.59           | 712.88           |
| Decrease pink 15 percent                                                                       | 996.61                                                              | 276.73           | 293.54           | 131.11           | 758.86           |
| Increase sockeye 15 percent                                                                    | 987.77                                                              | 276.36           | 292.62           | 126.74           | 724.09           |
| Decrease sockeye 15 percent                                                                    | 999.17                                                              | 277.54           | 284.79           | 126.65           | 740.23           |
| Increase chum 15 percent                                                                       | 992.53                                                              | 276.15           | 286.22           | 123.13           | 736.14           |
| Decrease chum 15 percent                                                                       | 994.43                                                              | 276.92           | 289.33           | 126.07           | 726.29           |
| Increase coho 15 percent                                                                       | 991.88                                                              | 275.69           | 288.26           | 130.46           | 734.24           |
| Decrease coho 15 percent                                                                       | 994.02                                                              | 276.82           | 289.03           | 126.11           | 735.76           |
| Increase king 15 percent                                                                       | 992.97                                                              | 277.32           | 288.49           | 130.77           | 736.89           |
| Decrease king 15 percent                                                                       | 993.94                                                              | 276.81           | 288.90           | 126.69           | 732.94           |
| Planned production                                                                             | 955.09                                                              | 296.22           | 274.52           | 157.15           | 713.85           |
| Eliminate program                                                                              | 1,109.59                                                            | 288.91           | 309.48           | 144.29           | 863.69           |
| Increase all species 15 percent                                                                | 978.03                                                              | 274.76           | 277.56           | 114.16           | 674.43           |
| Decrease all species 15 percent                                                                | 1,005.97                                                            | 278.71           | 288.50           | 145.08           | 736.28           |

SOURCE: A Benefit-Cost Analysis of the Alaska Salmon Enhancement Program. Net benefit is the return to fishers minus fishing costs and the cost of hatcheries.

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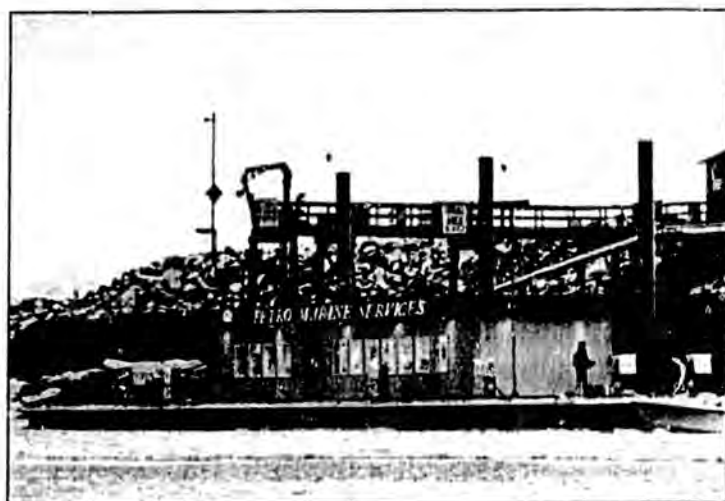


PHOTO COURTESY CeFer DESIGNS

## Petro Marine installs concrete floating gas barge at Homer

By the Alaska Journal of Commerce

A Canadian firm that specializes in custom designing and construction of concrete floating structures has completed a concrete floating gas barge at Homer for Petro Marine Services.

The 100 by 30 by seven-foot-deep Petro Marine concrete barge has many special features, said Jack Henwood, spokesman for CeFer Designs, in Richmond, B.C.

These include covered, recessed service trenches that house fuel lines and other services, and are designed to trap any spilled fuel and liquids. Trapped fuel and other contaminated liquids are then drained into a sump or catch basin.

The office and retail outlet superstructure is attached to a raised concrete pad not unlike the pad for a conventional slab home, Henwood said.

Explosion-proof electrical conduits run below deck through selected compartments of the barge to the fuel dispensing pumps and other electrically driven apparatus.

"We were looking to design and

construct a 'Cadillac' fuel/C-Store float for our Homer retail operation and from CeFer we received a quality product in all respects," said Don Ennis, vice president of Petro Marine's construction and special projects division.

Securing of the barge is accomplished by use of heavy-duty pile brackets around steel piles, Henwood said. The design of the barge also had to take into consideration the 1,400-mile tow from Vancouver to Homer. Several extra post tensioned cables were incorporated into the hull of the barge to ensure structural strength for the tow.

CeFer Designs' construction method also is used in construction of fish holding and fish processing barges, aquaculture barges, floating breakwaters, machinery platforms, floating camps, floating homes/offices/restaurants, heavy-duty vessel moorage, and marine floats.

Over the past 26 years, CeFer has built 50-60 concrete marine fuel dispensing floats and barges, Henwood said. Its customers have included major oil companies with marine outlets in British Columbia, he said.

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## ComFish boosts Kodiak economy

By the Alaska Journal of Commerce

ComFish Alaska '93, a three-day trade show for commercial fishers, is expected to bring a \$300,000-\$500,000 boost to the economy, says Wayne Stevens of the Kodiak Chamber of Commerce.

"It's the only time in the entire year I know I'm going to be full," said Ken Houston, manager of the 81-room Westmark Kodiak hotel.

The chamber expects about 5,000 ComFish attendees over the three-

day period, with up to 20 percent from outside the island.

Exhibitors will fill 130 booths (see list Page 8C), and salespersons should find plenty of customers in Kodiak, one of the nation's busiest fishing ports.

"It's a heck of a shot in the arm in a slow season," Stevens said. Hotels, bed-and-breakfasts, car rental agencies and restaurants should be busy, he said. The chamber begins preparations in August and relies on the help of 10-15 volunteers, Stevens said.

## NOAA sets nautical chart meeting

By the Alaska Journal of Commerce

Officials of the National Oceanic and Atmospheric Administration plan a nautical chart users meeting April 16 at the Anchorage Hilton.

A primary objective will be to provide chart users an opportunity to communicate their specific charting and survey requirements for Alaska waters, said NOAA Lt. Cmdr. John Wilder.

NOAA officials plan to make brief presentations on the condition of Alaska charts, plus current and future hydrographic survey projects.

Fisheries groups working in Alaska waters have been invited to attend, said Lt. Mark Larsen, NOAA liaison officer at Anchorage.

For further information, contact Wilder at 301-443-8752, or Larsen at 271-3153.



## Schedule of ComFish Alaska '93 workshops and events

### Friday, March 19

10 a.m. - "LifeRing On Call Physician Program for Fishermen," ComFish Hangar Seminar Room, presented by Kodiak Island Hospital, Dr. Mark Withrow.

11 a.m. - "Search & Rescue Procedures," ComFish Hangar Seminar Room, presented by U.S.C.G. Air Station Kodiak. Includes video and tour of new H-60 helicopter.

11:30 a.m.-1 p.m. - "The Future of the Alaskan Salmon Industry," featuring Paul Fuhs, commissioner of the state commerce department; and Chris Mitchell, executive director of the Alaska Fisheries Development Foundation, Westmark Harbor Room, luncheon buffet, sponsored by Kodiak Chamber of Commerce and Kodiak College.

1 p.m. - "RSW Systems," ComFish Seminar Room, presented by Thermal-Tec.

2 p.m. - "Business Cash Management," ComFish Seminar Room, presented

by Dean Witter/Reynolds.

2 p.m. - "Legal & Insurance Matters for Fishermen," Westmark, seminar and refreshments, sponsored by Sea-Pac.

3-4:50 p.m. - "Overview of C-Plans & OPA-90 Legislation," for fishing industry, ComFish Seminar Room, presented by North Coast Research Group, Tim Robertson.

5 p.m. - "Filtration/Oil & Fuel," ComFish Seminar Room, presented by DSR.

5 p.m. - Russian dinner at the Russian Orthodox Church.

6 p.m. - Reception at the Buskin River Inn, featuring Clarence Pautzke, executive director of the North Pacific Fishery Management Council, sponsored by Womens' Fisheries Network & World Express Travel, open to the public.

### Saturday, March 20

9 a.m.-noon - "You and the IRS," Westmark, featuring attorneys, tax accountants, lenders and consultants,

sponsored by CFAB, the Alaska Business Development Center and the state Division of Investments.

10 a.m. - "Retirement Planning," ComFish Seminar Room, presented by Dean Witter/Reynolds.

11 a.m. - "Alaska Weather," ComFish Seminar Room, National Weather Service.

Noon - "Onboard Freezing," ComFish Seminar Room, presented by Thermal-Tec.

1 p.m. - "Untangling Tax Snags," ComFish Seminar Room, presented by the Internal Revenue Service.

2-3:45 p.m. - "Cold Weather Survival/Hypothermia," ComFish Seminar Room, presented by the Kodiak Island Hospital, Dr. Marty Nemeroff.

4 p.m. - "Lube," ComFish Seminar Room, featuring a Mobil representative, sponsored by Petro Marine.

5 p.m. - "Search and Rescue Procedures," ComFish Seminar Room,

U.S.C.G. Air Station Kodiak, video and tour of new H-60 helicopter.

6:30 p.m. - Reception, Westmark Harbor Room, sponsored by L&S Travel, Kodiak Fishermen's Wives & Westmark, seafood, no-host cocktails, all are welcome.

7 p.m. - "Gold Rush Days," Golden Anchor, no-host bar, auction, poker, roulette, proceeds to charity, admission \$5, open to public, sponsored by Officer's Wives Club.

### Sunday, March 21

11 a.m. - "Alaska Weather," ComFish Seminar Room, National Weather Service.

1 p.m. - "Search & Rescue Procedures," ComFish Seminar Room, U.S.C.G. Air Station Kodiak, video and tour of new H-60 helicopter.

2:30 p.m. - "Tribal Proposed CCS Sale #149 in the Shelikof," ComFish Seminar Room, Minerals Management Service, discussion and questions.

## ALASKA'S LARGEST MARINE CARGO/TRANSPORT COMPANIES

(Ranked by Total Weight (in tons) Hauled in 1992)

| Rank | Company Name,<br>Address & Phone Number                                                           | Weight<br>in Tons<br>Hauled<br>in 1992 | 1992<br>Gross<br>Billings | No. of<br>Vessels<br>Company<br>Owns | No. of<br>Employ,<br>No. of<br>Locations | Year<br>Est. | President/<br>CEO                 | Types of Vessels<br>Owned by Company                                                                                                       | Areas & Frequency<br>Sailed by Co. Vessels                                                                                                    | Type of Cargo Company Hauls* |     |            |             |          |       |
|------|---------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------|--------------------------------------|------------------------------------------|--------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----|------------|-------------|----------|-------|
|      |                                                                                                   |                                        |                           |                                      |                                          |              |                                   |                                                                                                                                            |                                                                                                                                               | Refrig.                      | Dry | Brk<br>Bkt | Hvy<br>Lift | Ro<br>Ro | Other |
| 1.   | Foss Maritime Company<br>660 W. Ewing Street<br>Seattle, WA 98119<br>206-281-3855                 | 750,000                                | n/r                       | 160                                  | 36<br>2                                  | 1934         | W. Madigan<br>Oper. Mgr. Alaska   | Tugs/Supply<br>Boats/General Cargo<br>Barges/Regined Petroleum<br>Barges                                                                   | Haul by sailings as required<br>by cust.; move refined petro.<br>in bulk w/in AK full time;<br>moves entire annual output of<br>Red Dog Mine. | x                            | x   | x          |             |          |       |
| 2.   | Arctic Tug & Barge Co., Inc.<br>1200 Ocean Dock Road<br>Anchorage, AK 99501<br>278-5558           | 400,000                                | n/r                       | 2                                    | 9<br>1                                   | 1986         | David Pickworth<br>Oper. Manager  | Tugs & barge.                                                                                                                              | Cook Inlet, Beluga, Trading<br>Bay, Tyonek, all beach<br>landing areas in Cook Inlet,<br>Homer and Seldovia.                                  |                              |     |            |             | x        |       |
| 3.   | Alaska Marine Lines, Inc.<br>100 Mt. Roberts Road<br>Juneau, AK<br>907-950-4265                   | 252,000                                | n/r                       | 5                                    | 80<br>8                                  | 1967         | Alex McKellar<br>President        | Flatdeck barge, dry,<br>refrigerated, dry bulk,<br>liquid bulk in 20', 24', 40'<br>containers.                                             | Between Seattle & SE<br>Alaska twice a wk. Seattle &<br>Yukon Terr. & AK Interior<br>via Haines & Skagway once a<br>week.                     | x                            | x   | x          | x           | x        | x     |
| 4.   | Anderson Tug & Barge Co.<br>909 3rd Avenue<br>Seward, AK 99684<br>224-5508                        | 150,000                                | n/r                       | 4                                    | 15<br>1                                  | 1978         | John C. Anderson III<br>President | Ocean tugs and barges.                                                                                                                     | West Coast of United<br>States, Gulf of Alaska,<br>primarily between Pacific<br>NW and all Alaskan ports,<br>year-round service.              |                              | x   | x          | x           | x        | x     |
| 5.   | Yutana Barge Lines, Inc.<br>450 Front Street<br>Nenana, AK 99780<br>832-5503                      | 80,000                                 | \$8,000,000               | 20                                   | 103<br>103                               | 5            | Larry Shalver<br>Manager V.P.     | River & Coastal Tugs -<br>combination fuel and cargo<br>barges.                                                                            | From the Tanana & Kogukuk<br>Rivers, Norton Snd, Nome to<br>Hooper Bay & all pts.<br>between. Hqd. in Nenana &<br>St. Michaels.               | x                            | x   | x          | x           | x        | x     |
| 6.   | Maruk Freight & Salvage<br>Box 1485<br>Homer, AK 99603<br>235-7398                                | 799                                    | \$165,813                 | 1                                    | 2<br>1                                   | 1989         | Otto Kitcher<br>Owner             | LCM (landing craft).                                                                                                                       | Kachemak Bay, Cook Inlet,<br>Kodiak.                                                                                                          |                              | x   |            |             | x        |       |
| 7.   | Tutka Bay Barge Services<br>Red Mountain<br>Homer, AK 99603<br>235-8315                           | 320                                    | \$85,000                  | 1                                    | 2<br>1                                   | 1989         | Jack Estill<br>Owner              | LCM (landing craft).                                                                                                                       | Kachemak Bay, Cook Inlet,<br>Kodiak.                                                                                                          |                              | x   |            |             | x        |       |
| ★ ★  | Crowley Marine Services, Inc.<br>2401 Fourth Avenue<br>Seattle, WA 98121<br>206-443-8100          | n/r                                    | n/r                       | 450                                  | 200<br>12                                | 1953         | Brent Stenecker                   | Tugs, dry cargo deck, gen<br>cargo, wrecks, ice bkt., dry<br>dock petro., barges, rail car<br>-floats barges, crew supply<br>& water taxi. | W. Alaska thru-out season:<br>Naknek, Olingham,<br>Kuskokwim Rvr, Bethel<br>Coast, Nome, Kotzebue,<br>Lower Yukon, SSE Alaska.                | x                            | x   | x          | x           | x        |       |
| ★ ★  | Flynn's Barge Service, Inc.<br>345 W. Darling Hwy<br>Homer, AK 99603<br>235-8624                  | n/r                                    | n/r                       | 2                                    | 5<br>1                                   | 1961         | Wille Flynn<br>President          | Beach landing craft LCU -<br>Fox River 118' CG<br>certified, 85' tug                                                                       | Coastwide                                                                                                                                     |                              |     |            |             | x        | x     |
| ★ ★  | Samsen Tug & Barge Co., Inc.<br>Box 554<br>Sitka, AK 99835<br>747-4538                            | n/r                                    | n/r                       | 5                                    | 50<br>5                                  | 1935         | George Bigger<br>Owner            | Tugs, flat-deck barges,<br>ramp barges, bulk fuel<br>barges.                                                                               | Seattle to Sitka, Cordova,<br>Valdez, Kodiak, Dutch<br>Harbor, Adak. Service<br>several Alaskan ports in<br>spring and summer months.         | x                            | x   | x          | x           | x        | x     |
| ★ ★  | Tetlow Ocean Trailer Express, Inc.<br>1100 Olive Way, Suite 1100<br>Seattle, WA 98101<br>828-8218 | n/r                                    | n/r                       | 3                                    | 33<br>3                                  | 1975         | Jeff Kalk<br>Alaska Gen. Mgr      | RoRo - Roll-on/Roll-off                                                                                                                    | Port of Tacoma, WA to Port<br>of Anchorage, AK                                                                                                | x                            | x   |            | x           | x        | x     |

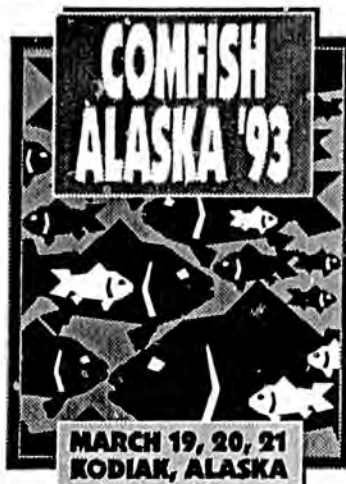
Please Note: A. ... marine Cargo/Transport Companies were contacted by fax 2 times over a 5 week day period for inclusion in this listing. Only companies who completed and returned a questionnaire by the deadline were included. Information was requested for Alaska operations only. \* Under type of cargo hauls - Refrig. = Refrigerated, Brk. Bkt. = Break Bulk, Hvy. Lift = Heavy Lift, Ro Ro = Roll-on/Roll-off, n/r = Not Ranked. \*\* Indicates ranking information was not provided; companies who did not provide ranking info. are listed in alpha order at the bottom of the listing. Sources: Representatives from each company. The companies provide the information for the list and the AJOC takes the provider of the information at their word.

It is not the intent of this list to endorse the participants or to imply that the size of a company necessarily indicates its quality of service. To the best of our knowledge this information is accurate as of press time. While every effort is made to ensure the accuracy and thoroughness of the list, omissions and typographical errors sometimes occur. Please send corrections or additions on company letterhead to Debi Becker, Research Editor, The Alaska Journal of Commerce, PO Box 81418, Anchorage, AK 99509-1418.

Compiled by Debi Becker on Mar. 15, 1993

## The ComFish Alaska '93 exhibitors, with booth numbers

300 - ACR Electronics Inc.  
 711 - Aksala Electronics Inc.  
 602 - Alaska Airlines  
 419 - Alaska Commercial Fisherman  
 705 - Alaska Commercial Fishing and Agriculture Bank  
 910 - Alaska Dept. of Fish & Game  
 215 - Alaska Detroit Diesel-Allison  
 221 - Alaska Diesel Electric  
 701 - Alaska Fisherman's Journal  
 807 - Alaska Journal of Commerce  
 721 - Alaska Regional Hospital  
 909A - Alaska Seafood Institute  
 907, 908 - Alaska Sea Grant College Program  
 318, 320 - Alaska/Seattle Ship Supply  
 502 - Alyeska Pipeline Services  
 810 - American Red Cross Kodiak Chapter  
 218 - Anchorage Cold Storage  
 416 - AT&T Maritime Services  
 719 - Authorized Marine & W.E. Stone  
 202 - Bayleysuit Inc.  
 322 - Boise Cascade Corp.  
 616 - Cascade Machinery & Electric Inc.  
 606 - City Market  
 412, 414 - City of Kodiak  
 619, 621 - Construction Machinery  
 610, 612 - Crewsaver Liferafts/SMR Technologies  
 518 - Cummins Northwest Inc.  
 200 - Danzas Corporation



609 - Dean Witter/Reynolds Inc.  
 407 - Division of Investments/CFEC  
 116 - DSR Companies  
 622 - Dunlop-Beaufort Canada Ltd.  
 700 - Era Aviation  
 110 - Food Service of America  
 208 - Fred Wall Marine Construction  
 216 - GR Battery Systems  
 821 - Grainger Inc.  
 105 - Grizzly Embroidery  
 718 - Guzi Electronic Marine  
 308 - Henry Vogt Machine Co. Refrigeration

405 - Independent Lift Truck of Alaska  
 310 - Innovac Technology (USA) Inc.  
 903 - Internal Revenue Service  
 219 - International Paint/Courtauld's Coatings  
 103 - J.C. Terpak Mechanical Maintenance  
 302 - Jensen Maritime Consultants Inc.  
 206, 305 - Joyncrafts, Marine Safety Services  
 904A - KANA  
 717 - Klein Electric & Thissen and Associates  
 911 - KMXT 100.1 FM Public Radio  
 520, 522 - Kodiak Auto Center Inc.  
 321 - Kodiak Diesel Service  
 716 - Kodiak Electric Association  
 816 - Kodiak Island Hospital and Care Center  
 814 - Kodiak Island Sportsman Assoc.  
 111, 113, 115 - Kodiak Marine Supply  
 516 - Kodiak Rental Center Inc.  
 421 - Koskovich  
 902 - KVOK/KJJZ  
 309 - Last Frontier Insurance Cache  
 523 - LeClercq Marine Construction Inc.  
 706, 708 - LFS Inc. & LFS Trawl  
 211 - Marco Seattle  
 117 - Marine Yellow Pages  
 201 - MarkAir  
 611 - Mid-Coast Marine Oregon  
 519, 521 - Mill-Log Marine

715 - Minerals Management Service  
 510, 512 - N C Machinery  
 107 - Napa Distribution Center  
 220, 222 - National Bank of Alaska  
 906 - National Marine Fisheries Service  
 901 - National Weather Service  
 618, 620 - Net's-Pacific  
 102 - New York Life Insurance Co  
 707 - Nichols Bros. Boat Builders Inc.  
 916 - NIOSH  
 912 - NOAA/NESDIS  
 905 - North Pacific Fishery Management Council  
 600 - Northern Air Cargo  
 401 - Northstar Sportswear Corp.  
 515 - O. Mustad & Son (USA) Inc.  
 210 - O'Kraft & Son-Kraft  
 406 - Pacific Telecom Cable Inc.  
 702 - Paine Webber  
 601 - Penair  
 415 - Permatex Industrial, Div. of Loctite  
 106, 108 - Petro Marine Services  
 720 - Port of Grays Harbor  
 409 - PTI Communications  
 418, 420 - Quality Marketing  
 505-511 - Radar Alaska  
 217 - Red & Don's Propeller & Welding  
 900 - Regional Citizens Advisory Council  
 301 - Rollins Hudig Hall-Marine Insurance  
 712 - Sabro Refrigeration Inc.  
 508 - Safeway Stores Inc.  
 513 - Salamander Pads Inc.  
 722 - Sally's Eyeland/Kodiak Vision Clinic  
 121 - Sealand Services  
 517 - Sea-Pac Insurance Managers  
 119 - Servis Red Ball Xtratuf  
 317 - Seward Ship's Dry Dock & Chandlery  
 123 - Small World  
 118-122 - Sulliff Hardware Inc.  
 205, 207 - Switlik Parachute Co.  
 311 - Teknotherm (US) Inc.  
 306 - The Fisherman's News  
 607 - Thermal-Tec Inc.  
 815 - Tippet Equipment Inc.  
 914, 915 - U.S. Coast Guard  
 914, 915 - U.S. Coast Guard Auxiliary  
 913 - U.S. Coast Guard Marine Safety Office  
 914, 915 - U.S. Coast Guard, 17th district  
 817 - US Travel  
 315 - Wesmar  
 109 - West Coast Propeller Service  
 819 - Wild Iris Enterprise/Island Foam  
 615, 617 - Yaquina Basin Marine Trades Assoc.  
 319 - ZF Industries

# COMFISH ALASKA '93

ALASKA'S LARGEST COMMERCIAL FISHERY TRADE SHOW  
 HELD IN ONE OF THE TOP COMMERCIAL FISHING PORTS IN THE COUNTRY

MARCH 19, 20, 21 KODIAK, ALASKA

PRESENTED BY:  
 THE KODIAK CHAMBER OF COMMERCE (907) 486-5557

### ComFish Alaska '93

Friday, March 19, 10 a.m.-6 p.m.

Saturday, March 20, 10 a.m.-6 p.m.

Sunday, March 21, 10 a.m.-4 p.m.

U.S.C.G. Hangar 3, Kodiak

Sponsored by the  
 Kodiak Chamber of Commerce  
 P.O. Box 1485, Kodiak, AK 99615  
 Phone (907) 486-5557  
 Fax (907) 486-7605



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Northwest Region  
Trade & Industry Services Division  
7600 Sand Point Way N.E.  
BIN C15700, Bldg. #1  
Seattle, WA 98115

March 31, 1993

F/NW01:LAB

Legislative Library of Juneau  
130 Seward Street, Suite 400  
Juneau, Ak 99801

To Whom It May Concern:

I would appreciate copies of the reports listed below that were mentioned in the Legislative Review of the Alaska Salmon Enhancement Program.

Draft Chapter 1X-Economics (January 1993) page 1.

- ✓ (Collie, 1992)
- ✓ (Herrman and Greenberg, 1992)
- (Boyce, 1992)
- (Enhancement Production Cost Analysis-FRED)
- ✓ (Herrman; Bischark, and Greenberg, 1992)

Attachment Chapter XI-Section E.

The Scope, Importance, of Economic Value of the Fishery Enhancement Program to the Recreational Fishery in Alaska-February 1992.

- ✓ P.1-(Jones and Stokes 1991)
- ✓ P.9-(Jones and Stokes 1987, 1989, and 1991)

For your use I have enclosed a copy of the recently published NMFS report: World Salmon Culture and a list of working papers by Oregon State University and the University of Rhode Island economists. Many of these papers address the international demand for salmon.

Sincerely,

Steve Freese, Ph.D  
International Trade Specialist

Enclosures

*sent  
7/26/93*



## URI/OSU RESEARCH PAPER SERIES

- Wessells, Cathy Roheim and James L. Anderson. 1992. *Innovations and Progress in Seafood Demand and Market Analysis*. URI/OSU Research Paper Series, Report #RI-92-101. Department of Resource Economics, Kingston, RI 02881.
- Anderson, Joan Gray and Cathy Roheim Wessells. 1992. *Consumer Ability to Discern Seafood Quality: Results of Experimental Studies*. URI/OSU Research Paper Series, Report #RI-92-102. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and Joan Gray Anderson. 1992. *Seafood Safety Assurances: Implications for Seafood Marketing and International Trade*. URI/OSU Research Paper Series, Report #RI-92-103. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1992. *State-Space Forecasting Approach to Optimal Intertemporal Hedging*. URI/OSU Research Paper Series, Report #RI-92-104. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1992. *Cross-Hedging Fishmeal with Soybean Meal Futures*. URI/OSU Research Paper Series, Report #RI-92-105. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and James E. Wilen. 1992. *Seasonal Patterns and Regional Preferences in Japanese Household Demand for Seafood*. URI/OSU Research Paper Series, Report #RI-92-106. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and James E. Wilen. 1992. *Economic Analysis of Japanese Household Demand for Salmon*. URI/OSU Research Paper Series, Report #RI-92-107. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and James E. Wilen. 1992. *Inventory Dissipation in the Japanese Wholesale Salmon Market*. URI/OSU Research Paper Series, Report #RI-92-108. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1992. *Price Forecasting with State-Space Model of Nonstationary Time Series: Case of the Japanese Salmon Market*. URI/OSU Research Paper Series, Report #RI-92-109. Department of Resource Economics, Kingston, RI 02881.
- James L. Anderson and Sofia U. Bettencourt. 1992. *A Conjoint Approach to Model Product Preferences: The New England Market for Fresh and Frozen Salmon*. URI/OSU Research Paper Series, Report #RI-92-110. Department of Resource Economics, Kingston, RI 02881.
- Vukina, Tomislav and James L. Anderson. 1993. *An Adaptive Model of Perishable Inventory Dissipation in a Nonstationary Price Environment*. URI/OSU Research Paper Series, Report #RI-93-101. Department of Resource Economics, Kingston, RI 02881.
- Wessells, Cathy Roheim and Joan Gray Anderson. 1993. *Consumer Willingness to Pay for Seafood Safety Assurances: Implications for Seafood Labeling and Public Policy*. URI/OSU Research Paper Series, Report #RI-93-102. Department of Resource Economics, Kingston, RI 02881.

#### Additional URI/OSU Research Papers

Emami, Ali, Lewis E. Queirolo, and Richard S. Johnston. 1993. Monopsony, Trade Restrictions, and Trade Reversal in International Markets for Intermediate Seafood Products: The United States-Canada Herring Dispute. URI/OSU Research Paper Series Report# OSU-93-102. Department of Resource Economics, Corvallis, OR. 97331-3601.

Johnston, Richard S., and Douglas M. Larson. 1993. Seafood Consumption and Giffen Behavior. URI/OSU Research Paper Series, Report #OSU-93-101. Department of Resource Economics, Corvallis, OR 97331-3601.

#### Other Papers

Bockstael, Nancy E., Ivan E. Strand, and Douglas Wilipon. 1992. Pulsed Generic Advertising: The Case of Common Property. Marine Resource Economics, Vol. 7, pp. 1889-208

Fleury, Eric. 1993. European Markets for Surimi Products. U.S. Mission to EC-Brussels, Mimeo.

Knapp, Gunnar, Paul Peyton, and Craig Wiese. 1993. The Japanese Salmon Market: An Introduction for Alaskans. Alaska Department of Commerce and Economic Development, Division of Economic Development.

Nerlove Marc. 1993(Feb). Procreation, Fishing and Hunting. American Journal of Agricultural Economics, Vol 75, No.1, p.58

DeVoretz, Don. J. and Kjell G. Salvanes. 1993(Feb) Market Structure for Farmed Salmon. American Journal of Agricultural Economics. Vol 75, No.1, p.227.

Edwards, Steven. 1992. Evidence of Structural Change in Preferences for Seafood. NOAA Technical Memorandum NMFS-F/NEC-87. NMFS Northeast Fisheries Science Center, Woods Hole, Mass. 02543



# *Fisheries Research & Consulting*

P.O. BOX 10727 BAINBRIDGE ISLAND, WA 98110 PH. (206) 842-6729 FAX (206) 780-5823

---

Ms. Molly McCammon  
P.O. Box V  
State Capitol  
Juneau, Alaska 99811

April 9, 1993

Dear Ms. McCammon,

Please send me a copy of the Stae Senate Special Committee's report,  
*Alaska Salmon Enhancement Program; Cost Benefit Study.*

Thank You,

Philip G. McCrudden

*sent 7/26/93*

*FISHERIES RESEARCH & CONSULTING*

**MEMORANDUM****DRAFT****STATE OF ALASKA**  
**Department of Fish and Game****TO:** Jeffrey P. Koenings  
Director**DATE:** May 23, 1991**FILE NO:****THRU:** J. S. Holland  
Assistant Director**TELEPHONE NO:** 465-4160**SUBJECT:** Request for Economic  
Information from the  
Board of Fisheries**FROM:** Jeff Hartman  
Economist  
Division of FRED

During a May 1991 meeting with Deborah Lyons of the Alaska Board of Fisheries, a specific request was made to supply the board with economic information on the findings of recent economic studies for salmon that would aid the board in their deliberations. In a subsequent meeting of the Alaska State Legislature, similar questions were raised; in particular, some of the economic questions raised at the meetings included:

- What effect have catches of salmon from the enhancement program had on market prices received by fishermen and processors?
- What effect would planned increases from this program have on future prices, particularly pink salmon prices?
- What effect would large harvests of pink salmon have on processing capacity? Could processing industry fail to supply sufficient processing capacity over the long run?
- What effects would this have on market prices?
- Since pink salmon fall in the category of lower-priced species, would increases in harvests of the lower-priced species effect the quality image of other Alaska salmon?
- Would consumers pay less for other Alaska salmon because more of the lower-priced species appeared on the market?

I have compiled a simple primer for Ms. Lyons that will be attached with other materials that are intended as background information for the board. With your approval, I would like to transmit this packet of information through Laird Jones, Executive Director of the Division of Boards.

Attachments

cc: Bob Burkett

**DRAFT**

**PRIMER ON SALMON PRICE-FORECASTING MODELS AND  
COST/BENEFIT ANALYSIS OF ENHANCEMENT  
FOR MANAGERS AND POLICYMAKERS**

by

Jeff Hartman  
Economist

Alaska Department of Fish and Game  
Fisheries Rehabilitation, Enhancement  
and Development Division

P.O. Box 3-2000  
Juneau, AK 99802-2000

May 1991

## INTRODUCTION

At the end of the 1991 legislative session, the Alaska State Legislature and the Alaska Board of Fisheries (BOF) initiated a review of the statewide salmon enhancement program. As part of the review, the policymakers developed a series of socioeconomic questions on the performance of the statewide fisheries enhancement program. The purpose of this primer is to outline the economic questions, explain which economic methods would be appropriate for addressing the questions, provide a history of relevant studies on the subject, provide a basic primer on the theory and methods that are used to estimate demand for Alaska salmon, and propose further work that would specifically address the questions of the BOF and Legislature.

The questions brought up by the BOF and Legislature include:

1. What effect have catches of salmon from the enhancement program had on market prices received by fishermen and processors?
2. What effect would planned increases from this program have on future prices, particularly on pink salmon prices?
3. What effect have large harvests of pink salmon had on processing capacity?
4. Could the processing industry fail to supply sufficient processing capacity over the long run? What effects would this have on market prices and revenue generated from Alaska's fisheries?
5. Since pink salmon fall in the category of a lower-priced salmon species, would increases in harvests of the lower-priced species effect the quality image of other Alaska salmon?
6. Would consumers pay less for other species of Alaska salmon because more of the lower-priced species appeared on the market?

Many of these questions can be addressed through the application of econometric models designed to explain how salmon markets work. The Alaska Department of Fish and Game (ADF&G), Fisheries Rehabilitation, Enhancement and Development (FRED) Division has been very interested in these questions over the last decade. Three separate salmon demand models (described in this text) and a cost/benefit analysis have been developed in the last 8 years to address these issues. Some conclusive results have been produced from these studies that are germane to the policymakers' questions.

## WHAT IS A PRICE-FORECASTING MODEL?

Market prices for many goods can be estimated by applying statistical procedures commonly used by economists. Applied to the appropriate data, these procedures can be used to create mathematical models called demand models, which may, among other purposes, be used to forecast prices and explain how markets work. In this paper, demand models are referred to as price-forecasting models. The application of these statistical procedures (a quantitative

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area of economics called econometrics) has been particularly successful in the field of agriculture for understanding how food-commodity markets work. These techniques have proven to be successful tools in agriculture because of the stable structure of many food-commodity markets. Some of these price-forecasting models for food commodities, such as grains and meat, have proven to be extremely precise. Typical variables that economists might test in food-commodity models include quantity of the good purchased over time, prices paid at one or more market levels, population growth in various market areas, consumer income, buying power of relevant currencies, and production costs in producing areas.

Forecasting the price of some goods can be extremely complex and not worth the effort. For example, forecasting the future prices for microcomputers might be a difficult task since technology is quickly changing the good itself and the expectations of consumers. Salmon markets may be undergoing some changes; however, evidence of major structural change was only found for chinook salmon in the most current round of demand-modeling studies (Boyce 1990).

#### **WHAT POLICY ANALYSIS CAN BE CONDUCTED WITH SALMON PRICE-FORECASTING STUDIES?**

Properly designed price-forecasting studies could provide a wealth of information to policymakers on how markets for Alaska salmon actually work. Some of the major policy analysis that could be addressed with these models include:

- Demand models for salmon can project the amount of change in prices paid to fishermen, processors, and exporters for proposed hatchery production levels.
- Price effects for each species of salmon can be estimated at the Alaska regional level. It is possible to determine how much of a price change would be experienced by fishermen in southeast Alaska by an increase (decrease) in enhanced production in Prince William Sound.
- The studies could predict the amount of price change to Alaska salmon that is caused by existing and planned production of farmed fish.
- Demand models can be combined with cost models for the commercial fisheries as well as with biological population models to determine the net benefits of enhancement investments, loans, or allocation decisions.

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## BACKGROUND ON COMPLETED SALMON PRICE-FORECASTING STUDIES FOR ALASKA

1. In 1983, at the request of the Governor's Mini-Cabinet on Fisheries, staff economists from the Commercial Fisheries Entry Commission and the FRED Division developed a formal cost/benefit analysis of the statewide enhancement program. This study included development of basic ex-vessel price models that described how prices for various salmon species would respond to planned production from the state and private nonprofit (PNP) enhancement programs. The study is entitled, "An Analysis of the Net Benefits of Existing and Proposed Enhancement Projects for the State of Alaska."

The final report, which computed the benefits to fishermen, harvesting costs to fishermen, and costs of producing the enhanced fish, was prepared for the Mini-Cabinet on Fisheries (Hartman 1986). An additional investigation and separate delphi study carried out by the Department of Commerce and Economic Development (DCED), Division of Economic Enterprise entitled, "The North Pacific Fisheries Delphi Project," was also undertaken to survey experts in salmon fisheries on the effects of the Alaska's major fisheries enhancement initiative on world markets. Following the completion of these studies, a moratorium on DCED loans resulted in restricted funding to producers of pink salmon. The circumstances in 1983 as well as questions asked were similar to the present, as this action followed a significant decrease in salmon prices. Prices promptly rebounded, despite the moratorium, as exchange rates and other economic trade conditions improved.

2. A second set of studies occurred in 1989 while the FRED Division was investigating the enhancement of sockeye salmon. A formal contract was developed for the Institute of Social and Economic Research to evaluate the price-responsiveness of sockeye salmon to increased Alaskan catches. The name of the study was, "Simple Demand Models for Alaska Sockeye Salmon Prices," by Nick Ronan (1989). The study indicated that catches for sockeye salmon could be increased well beyond the historic highest recorded yield before revenues would be dramatically reduced, and that Alaska was undersupplying sockeye salmon in the market from a revenue-generating perspective.
3. Finally, in 1990 a third and much more comprehensive contract developed ex-vessel level and wholesale-level price-forecasting models for salmon. The study is entitled, "A Comparison of Demand Models for Alaska Salmon" (Boyce 1990). There are conclusive results to this study that are germane to policy questions regarding industry-production levels, because the primary purpose of the study was to identify the variables that effect prices of Alaska salmon, and to determine the amount of influence that our state's output has on ex-vessel and wholesale prices.
4. Further work and revision of the Boyce study is underway in order to update the econometric models. A project proposal is being prepared by the FRED Division

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economist to outline specific economic studies to further improve our understanding of the economic effects of the statewide enhancement program. Some of the model improvements would allow policymakers to understand price impacts in various regions of the state's salmon fisheries, and to incorporate the effects of farmed salmon-production on prices.

### STUDY OBJECTIVES FOR THE CURRENT VERSION OF THE 1990 SALMON-DEMAND MODELS

Recently completed studies on salmon demand by the Dr. John Boyce of the University of Alaska-Fairbanks provide some building blocks for further work, but also produce some results that are relevant to current enhancement policy questions. The following points outline the major study objectives for the report, "A Comparison of Demand Models for Alaska Salmon." The goals of the study were intended to accomplish the following:

- Compare the predictive abilities of econometric-demand models for projecting market prices of five species of Pacific salmon against the use of average prices from the previous three years, and a price trend over the same period. Many regional aquaculture associations use average salmon prices to match other production data for estimating cost recovery and enhancement tax revenue for critical fiscal planning. This simple procedure could produce a price estimate that is as precise as any econometric model. This part of the analysis determines whether the econometric models are better or worse predictors.
- Compare the predictive abilities of simple ex-vessel price models with a more complex wholesale system of equation models. Previous salmon-demand research in Alaska has generated two different approaches for estimating salmon prices. The intent of this goal is to determine which of the two approaches produces the most precise price estimates.
- Determine if an increase in the average size of the Alaska salmon pack would increase or decrease total revenues to fishermen. Once the "best" model is determined, the amount of price change that is created by a 20% increase in the size of the catch would be determined.
- Where possible, provide price forecasts for five Pacific salmon species for long-term enhancement planning by projecting all exogenous variables for each of the models. To determine how much revenue would be created in the future by the enhancement program, certain economic variables must be projected, such as exchange rates, income in market areas, supply of salmon in the capture fisheries, and the price of substitutes.

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## VARIABLES USED IN THE 1990 SALMON-DEMAND MODELS

The variables tested in the econometric models include the following:

Fresh-Frozen Price  
Canned Price  
Ex-Vessel Price  
Fresh-Frozen Quantity  
Canned Quantity  
Ex-Vessel Landings  
Canned Inventory Holdings from Previous Year  
Fresh-Frozen Inventory Holdings from Previous Year  
Tuna Price  
Real Per Capita Income Average for U.S. and Japan  
Sum of U.S. and Japan Populations  
Exchange Rate in Yens/Dollar  
Real Japanese Short-Term Interest Rates  
Real Per Capita Income Averages of U.S. and United Kingdom  
Sum of U.S. and United Kingdom Populations  
Exchange Rate in Pounds/Dollar  
Short-Term Real Interest Rates

## MAJOR CONCLUSIONS OF THE SALMON DEMAND-MODELING STUDY

- The econometric models developed in this study predict prices more precisely than than averages of historical prices or price trends.
- The more complex wholesale system of equation models predict prices for chinook coho, and chum salmon more precisely than the ex-vessel models.
- The more complex wholesale system of equation models do not predict as well as the ex-vessel models for pink and sockeye salmon.
- In all models, revenues to Alaska fishermen would increase at higher than 1979 to 1989 mean catches.
- Pink salmon show a higher price response to changes in catch than other species in the ex-vessel models, but prices are unresponsive to changes in catch in more complex wholesale models.
- Amount of price-responsiveness from Alaska output is still difficult to determine for pink salmon; both the ex-vessel model and system-of-equations model have undesirable error statistics. Thus, it is difficult without additional work to draw

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conclusions of how price-responsive pink salmon are to changes in Alaskan harvests. Two of the ex-vessel models tested do show a high level of price-responsiveness, which can be interpreted as a suspicious sign of price-responsiveness.

- For sockeye salmon, price-responsiveness is small, suggesting that this species of salmon is undersupplied from a revenue perspective. The ex-vessel model for sockeye salmon clearly has more desirable error characteristics than the system-of-equations model. It is possible to draw some tentative conclusions about price-responsiveness with this model. The price-responsiveness (an elasticity for the average values of approximately 0.2) values for sockeye salmon are small and, as such, it appears that the supply of sockeye salmon could be increased well beyond the largest catch ever recorded without reducing total revenues to the fisheries.
- The major strength of this model is in determining the amount of price change from U.S. salmon production; the model is weak in "supply-side," which is important for determining the amount of price-responsiveness from production that occurs outside the U.S.

#### **WHAT ADDITIONAL ECONOMIC STUDIES COULD BE UNDERTAKEN TO GAIN A BETTER UNDERSTANDING OF THE STATEWIDE ENHANCEMENT PROGRAM?**

Many of the questions asked by legislators and BOF members could be addressed if price modeling were combined with cost models of the fisheries and hatchery programs to conduct a cost/benefit analysis of the statewide hatchery program. A cost/benefit analysis would consist of four components: (1) a hatchery-production model, (2) a population-growth model that reacted to fishing pressure, (3) a demand model, and (4) a fishing-cost model.

##### Hatchery Production Model for PNP and State Hatcheries

It is necessary to determine the costs of producing the increment in enhanced production. This could either be conducted by evaluating historical production costs and creating a model that would be used for estimating alternative production levels (called a production function), or by going to private producers with a survey and estimating production costs for several years into the future. In the Fisheries Mini-Cabinet study, a survey was used that asked producers to project future costs of production. A survey in this application would probably be the best mechanism for developing cost projections.

##### Biological-Population Model

Because salmon produced by hatcheries must compete for the same food, are exposed to the same predators, and are exploited in the same fisheries, hatchery populations cannot be considered independent of wild populations.

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A formal population model could be developed for that would describe interactions in fisheries of greatest interest. There are too many projects and stocks of salmon to formally consider interactions in the entire program and, as such, it makes sense to model these interactions in Prince William Sound only. A population model along the same lines as the Queen Charlotte Islands will be developed to estimate probable interactions.

## Salmon-Demand Model Improvements

Several potential improvements could be made in the demand models that are currently in place for the salmon enhancement program. One improvement is in the ability to estimate prices for salmon and price-responsiveness on a regional level. A second is the ability to estimate the amount of price change in Alaskan markets for a given increase (or decrease) in farmed salmon production. To accomplish these improvements, it would be necessary to (1) identify the linkages between Alaskan wholesale markets and export markets as the product leaves the U.S., and (2) develop new (CFEC) fish-ticket data reports that stratify price by region.

## Cost-Model Improvements

Fishermen use capital and labor in the process of catching fish. Accounting for these costs is an important step in a cost/benefit analysis of a fisheries enhancement project. The amount of additional costs required to harvest enhanced fish is difficult to compute because individual fishing businesses do not produce a formal record of their expenditures. There is a formal record of fishing behavior recorded in the State of Alaska fish-ticket file. This information could be used to develop a model of fishing costs.

## Simulation of Net Benefits for Policy Questions

Once the economic models are completed, they are combined so that the benefits and costs of the enhancement program can be estimated. The combined models may estimate prices, costs, and future harvest levels simultaneously in that variables in the demand model may depend on other variables in the cost-and-production models. Conversely some variables in the cost models may depend on variables in the price-and-production models.

Specific policy questions that would be estimated with the models include:

- What would the net benefits be for the current permitted capacity of all PNP hatcheries?
- What net benefits would accrue from a 10% increase in the permitted capacity?
- What net benefits would accrue from PNP operator projections of requested capacities five years from now (1996)?

**PARTIALLY ANNOTATED REFERENCE LIST  
OF MATERIALS RELEVANT TO THE LEGISLATURE  
AND BOF REVIEW OF THE FRED DIVISION  
AND STATEWIDE ENHANCEMENT PROGRAM**

by

Jeff Hartman  
Economist  
Alaska Department of Fish and Game  
Fisheries Rehabilitation, Enhancement  
and Development

Studies and Models on Salmon Demand and Enhancement Cost-Benefit Analysis

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UNIVERSITY OF ALASKA FAIRBANKS

**School of Management**

Fairbanks, Alaska 99775-1070

**DATE:** Nov 4, 1991

**TO:** Ginny Fay

**FROM:** Mark L. Herrmann *MLH*  
Department of Economics

**Re:** Salmon Demand Proposal

I am again happy to have the opportunity to respond to the RSA/RFP for the Salmon Demand Modelling that the Alaska State legislature desires to see performed. Because of my background and continuing interest in this area of study I believe that Josh Greenberg and I have a high probability of success in this endeavor. This proposal will attempt to meet as many of the demands laid forth in the October 3rd request as possible. I believe that this area is vital to the examination of salmon enhancement questions and I look forward to making a positive contribution.

This following proposal will liberally reference the work that I co-authored with Ron Mittelhammer and Bing-Hwan Lin entitled, "An Economic Analysis of the Pacific Salmon Industry: Effects of Salmon Farming -- Final Report". I would be grateful if you could supply interested parties with this work.

I am also pleased that the legislature will consider the extension of the original time deadline for the completed work. I believe that the additional time will be well rewarded. Although some useful information will be forthcoming in a relatively short period of time, the extension will allow for the type of quality work that is necessary to answer some of the complex issues that you have raised.

Thank you for considering us for this project. I hope we can embark on a mutually beneficial relationship in examining this important topic.

cc. John Boyce  
Keith Criddle  
Joshua Greenberg  
John Lehman

An International Supply and Demand Equilibrium  
Model for Alaskan Salmon

Mark Herrmann  
Assistant Professor  
Department of Economics  
University of Alaska Fairbanks  
Fairbanks, Alaska, 99775  
(907)474-7116

Joshua A. Greenberg  
Assistant Professor  
SALRM  
University of Alaska Fairbanks  
Fairbanks, Alaska, 99775  
(907)474-7189

This grant proposal is for the purposes of the Salmon Enhancement Project and may not be quoted elsewhere without the permission of the authors.

## INTRODUCTION

TITLE: An International Supply and Demand Equilibrium Model for Alaskan Salmon

Salmon is the highest valued commercially caught fish species in the United States (the largest salmon-producing nation) having an exvessel in value in 1990 of 612 million dollars which accounted for over 17 percent of the total U.S. seafood catch value. Alaska is the largest U.S. fishing region for salmon, accounting for approximately 90 percent of the U.S. catch during the last decade. Recent numbers of wild caught salmon in Alaska have been outstanding. The 1990 estimated harvest of 152.7 million salmon was the second highest harvest in Alaska history. However, salmon prices have recently been at low levels in real terms. This has caused friction in the Alaskan salmon industry as documented by the pink salmon dump and the early Bristol Bay sockeye strike. One hypothesized reason for the low prices is the influx of salmon from farming nations as well as the increased wild production.

Approximately 29 percent of the salmon produced in 1990 came from pen-reared salmon production, with an average of 80 percent of this being the highly-regarded Atlantic salmon species. The U.S. is concerned with its dwindling market shares of salmon consumed at home and abroad. For example, in 1980 virtually all of the salmon exported to the EEC originates in North America (Canada and the United States), but now the majority of salmon consumed in the EEC originated from salmon farms in Norway and the United Kingdom. In Japan, the largest salmon-consuming nation in the world, farmed salmon imports from the leading farming nation of Norway have increased 600 percent from 1986 to 1990. Even in the United States, increasing imports of Norwegian, Chilean, and British Columbian farmed salmon has meant that 50 percent of U.S. salmon consumption now comes from imported salmon.

With the pressures of increasing wild and farmed supplies, in combination with the sensitivity of salmon prices to fluctuating exchange rates and other exogenous factors, it is very timely to examine the factors that influence Alaskan salmon prices.

Although many factors that affect salmon prices are outside of Alaskan control, the issue of salmon enhancement is not. A cost/benefit analysis of the Alaskan salmon enhancement programs is needed to examine both the question of total output and the question of the mix of output by species.

This study is not only useful for the salmon enhancement program but is also useful for the U.S. salmon producers, processors, wholesalers, exporters, and government officials in order for them to make investment, production, marketing, and policy decisions.

## PROJECT OBJECTIVES

The specific objectives of this project are:

- 1) To update the existing international econometric salmon model as published in a work by Mittelhammer, Herrmann, and Lin for the National Marine Fisheries Service entitled *An Economic Analysis of World Salmon Markets: Effects of Salmon Farming*, with 1989 and 1990 data added (and possibly 1991). Quarterly variables would again be used (Also see Herrmann 1990).

2) To examine the possibilities of changing the functional form of the relevant equations in the above models to linear (or log-linear) instead of double-log to allow for changing elasticities along the demand curve.

3) To disaggregate the salmon species into chinook, sockeye, chum, pink, and farmed Atlantic salmon. An effort will also be made for coho salmon but coho salmon was not separated out in U.S. export statistics until 1986 and may not be possible to model successfully. If coho salmon cannot be modelled successfully as an internationally traded commodity, an approach similar to Boyce's, "A comparison of Demand Models for Alaska Salmon" will be undertaken for coho salmon alone.

4) To expand the model to include canned pink salmon and, if possible, canned chum and/or sockeye.

5) From the existing model to separate out Canada and the U.S. as separate salmon producing regions.

6) To report all relevant own-price cross-price and income elasticities. Cross-price elasticities will be between relevant Pacific and farmed salmon species.

7) To do this modelling at the exvessel and export levels. If the data looked reasonable, the wholesale level would also be modelled. At the very least the factors affecting the wholesale level would be included in the reduced form exvessel price equations.

8) To perform sensitivity analyses over the historical time period to validate the models and to answer questions as to the effects of Cases 1-9 and 11 over the historical time period. Case 10 would be examined if the coho salmon demand could be modelled successfully. Sensitivity analysis would also be done on various market factors such as changing exchange rates, tariff rates, income levels, etc. This sensitivity analysis may be performed independently of the entire demand, cost, and biological model, or may be done exclusively as a part of the final integrations of the three models.

9) To relate the aggregate North American price of salmon to the regional prices of salmon in Alaska through correlation analysis in an attempt to locate regional price changes.

10) To predict Alaskan salmon prices for as long as the model seems reliable. These predictions would be made on assumed levels of market variables and also would be presented with sensitivity analysis.

11) Cases 1-9 and 11 would then be examined in regard to the effect on future prices.

12) To program the past and future simulation programs into SAS and document it for easy use.

13) To write a final report as specified by the RSA/RFP.

I cannot promise the successful modelling of all the areas that the RSA/RSP asks for. However, I believe that Greenberg and I can make as good of an effort to meet as much of the specific objectives outlined in the RSP as any researchers can. We will start the

modelling effort by emphasizing sockeye and pink salmon and build it, step-by-step, from there.

#### PROJECT PLAN AND MILESTONE CHART

The model already constructed by Herrmann (1990) would be utilized. This model is summarized in Mittelhamer et. al. (1990) on pages 78 - 111. Price linkages here will include exvessel prices, import/export prices, and a proxy for wholesale prices. The equations from 1982 to 1988 will be expanded to further disintegration by species, countries, and by examining the functional form to allow variation in elasticities as supplies change. The expanded model will include data through 1991. This model is an international econometric supply and demand model that models the world shown in the figure below.

The Milestone chart is included at the end of this proposal.

We will model directly all of the variables that we can. Some variables, such as the supply of Chilean farmed salmon to Japan, may be modelled indirectly.

The following are *possible* equations that would be modelled (all salmon here is fresh/frozen unless otherwise mentioned).

1. Norwegian allocation of farm-raised Atlantic salmon

- Quantity allocated to the EEC
- Quantity allocated to the United States

2. EEC demand for salmon

- Quantity demanded of Scottish and Norwegian farmed Atlantic salmon
- Quantity demanded of North American chinook salmon
- Quantity demanded of North American sockeye salmon
- Quantity demanded of North American chum salmon
- Quantity demanded of North American pink salmon
- Quantity demanded of relevant North American canned salmon

3. Japanese demand for salmon

- Quantity demanded of North American chinook salmon
- Quantity demanded of North American sockeye salmon
- Quantity demanded of North American chum salmon
- Quantity demanded of North American pink salmon
- Quantity demanded of Norwegian farmed Atlantic salmon

4. North American allocation of chinook salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

5. North American allocation of sockeye salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

6. North American allocation of chum salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

7. North American allocation of pink salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

#### 8. North American allocation of chinook salmon

- Quantity allocated to Japan
- Quantity allocated to the EEC

#### 9. North American demand

- Quantity demanded of Norwegian farmed Atlantic salmon

#### 10. North American inventory holdings

- Quantity of chinook salmon inventory
- Quantity of sockeye salmon inventory
- Quantity of chum salmon inventory
- Quantity of pink salmon inventory
- Quantity of pink canned salmon inventory

#### 11. North American exvessel prices

- Price of chinook salmon
- Price of chum salmon
- Price of sockeye salmon
- Price of pink salmon

#### 12. Exvessel Regional Mappings

- The exvessel prices of species and regions in Alaska as the FRED division or other interested parties wish.

Bloc 1 above will model the allocation of a given supply of Norwegian salmon to the U.S., Japan, and the EEC. Because of the nature of the allocation set-up, only two of the equations are estimated and the third can be derived from these two. The Norwegian allocation equations will be modelled as if Norway exhibited market power and in regard to the newly placed U.S. tariffs on Norwegian Atlantic salmon imports which will enter through the U.S. demand equation as in Herrmann (1991a).

Blocs 2 and 3 will include equations for the demand in the EEC and Japan for as many of the species as can be estimated directly. Blocs 4-8 will be the allocation equations for wild Pacific and farmed Atlantic salmon into either the EEC or Japan. Once again the allocation of Pacific salmon into either the domestic market or the inventory holdings can be derived from here. Bloc 9 will be the U.S demand for farmed Norwegian Atlantic salmon. Missing is the U.S. demand for its own salmon. I have not been successful at getting these demand equations at the wholesale level when the data is used on a quarterly basis. Data must be used either on a quarterly or monthly basis to get enough observations since salmon export data is not disaggregated by species until 1981 and, in any case, farmed salmon is not important until this same period. Nevertheless, not much information for simulation or prediction purposes is lost as any factors affecting wholesale demand can be included in the exvessel equations (see Mittelhammer et. al. pages 108 to 112).

Bloc 10 includes the inventory equations. These equations are crucial to successfully model the world flows of salmon. Japanese inventories are also included although not modelled specifically. It may be possible to model the Japanese inventory equations directly, but we do not guarantee success. In the Japanese model, the recently completed research of Cathy Wessels of the University of Rhode Island and Jim Wilen of the University of California at Davis will be used to fine tune model specification.

Bloc 11 is the exvessel price equations. All international movement will link directly or indirectly back into these equations for sensitivity and prediction purposes (see Mittelhammer et. al. pages 108 to 112).

Bloc 12 will be the correlation of the U.S. exvessel prices with regional Alaskan exvessel prices. For example, we will take actual U.S. sockeye prices and correlate the movement of Bristol Bay reds to U.S. sockeye prices. We would expect this correlation to be high. Then we would use predicted U.S. sockeye prices to predict Bristol Bay sockeye prices.

Because of space considerations I cannot list all the variables that I will be using in each equation (please see Mittelhammer et. al. pages 64 to 72 to give you an indication of the types of variables that I work with).

I also cannot specifically tell you which functional forms that I will use. I will be looking at a combination of the double log, log-linear, exponential, Box-Cox, Logit, among other functional forms. I will choose the functional forms that fit best to theory, fit best to what we are trying to model, and fit best for each individual equation. These functional forms may likely include lagged endogenous variables in the equations to pick up habit formation.

Sensitivity analysis will be performed from the final model to estimate how well the model predicts past prices from the sample data. The usual econometric goodness of fit statistics will be used. Additionally the weighted goodness of fit statistics developed by Herrmann (see Mittelhammer et. al. pages 46 to 50) for the proofs of these methods. Sensitivity analysis, over the historical time periods, will be used to capture the movements of market factors on the quantity and prices of salmon (please see as an example of this Mittelhammer et. al., pages 118 to 192). These sensitivity analyses will include looking at the movement in North American exvessel prices and correlating them with regional exvessel prices such as the prices listed in the October 28, 1991 memo from Ginny Fay. Analysis over the historical time period can then be made as to what effects historical changes in hatchery management would have made on changes in fisheries revenues. Cases 1-9 and 11 will be examined if the modelling of the four Pacific salmon species were successful to this point.

Prices will then be predicted at the exvessel level. These predictions will be on a quarterly basis but will be reported as weighted average prices on an annual basis. The same sensitivity analysis that will be performed over the historical time period will also be performed on future prices, i.e. cases 1-9, and 11. (for an example of predictions and sensitivity analysis see Mittelhammer et. al. pages 196 - 213).

These predicted prices will then be mapped into regional Alaskan prices to get at regional differences. Marginal revenues can then be figured out per region and fishery by multiplying the predicted regional price by the catch.