

Project #: B73

Title:
Management Strategy Evaluation

Principal Investigator(s) and Recipient Organization(s):

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Contract Period and Amount of Funding:

1 February 2008 to 31 December 2012
\$ 409,126 (UW); 69,500 (AFSC)

Report Period:

1 April 2008 through 30 September 2008

Report Date:

30 September 2008

Lead Author of Report:

André Punt

Proposed timeline and milestones within report period:

- This project will only begin in earnest once the FEAST model is sufficiently well developed that it is feasible to begin to implement the assessment models and decision rules that will be tested. Therefore, the activities during the current reporting period are primarily related to planning.
- Attend relevant PI and EMC meetings.
- Advertise for the Postdoctoral Fellow.
- Prepare NPRB semi-annual report (Apr-Sep, due Oct 1)

Project Summary:

We will conduct a formal Management Strategy Evaluation (MSE) in which the FEAST model acts as an “operating model” and currently developed methods (stock assessments, MSM, and Ecosim) act as “assessment” models. Models from the range currently available for the Bering Sea, including: single species-assessments w/ correlative recruitment indices; multi-species models; and whole ecosystem models, will be tested. In addition, autocorrelative biomass dynamics/network models and nonlinear correlative models will be tested as “null” models for determining the added value of the more mechanistic approaches. We will attempt to implement the guidelines of Marasco et al. (2007) as regards evaluating management strategies in an ecosystem context. The metrics for evaluating the success of the “assessment” models will be the accuracy (lack of bias) and precision (lack of variance) of key model

outputs (such as recruitment and biomass, both in the past and as forecast under given management regimes) when they are fit to data generated (with observation error) from the operating (FEAST) model. The aim will be to provide information about the skill of each model in determining past and current states (hindcast/nowcast) as well as the success of each model when predicting future states from current states. When combined with management decision rules, success will be defined as the ability to keep fish populations and yields above a “best performance” reference point determined from the operating model and the ability to achieve high economic returns. An experiment will be also be performed to determine how often correlative models (including stock assessment models) need to be updated given a (simulated) “intensive field and retrospective sampling season” (in addition to standard monitoring data).

Progress Summary:

As noted above, the project has not started in earnest because the FEAST model is not yet sufficiently well developed. However, the lead PI (Dr Punt) has attended meetings of the Ecosystem Modelling Committee and well as meetings of the BSIERP PIs to ensure that planning for this project remains consistent with how the rest of the project (particularly the modeling component) is progressing. In particular, Dr Punt and Dr Ianelli have collaborated with Dr Aydin and Dr Oritiz to ensure that (to the extent practical) the FEAST model will be capable of representing the dynamics of modeled species at a resolution which will allow data to be generated using the FEAST model which can then be used by the “assessment models” that will be explored.

The advertisement for the Postdoctoral Fellow has been drafted and has been circulated. It is planned that the Postdoctoral Fellow will start working on the project on 1 January 2009.

Lessons learned and project adjustments:

No project adjustments have been needed. However, the importance of ensuring that the PIs on projects B73 and B70 collaborate closely to ensure that FEAST is designed with the capability of providing the data needed to apply the “assessment” methods to be evaluated is clear from the planning effort undertaken to date.

Integration activity:

The PIs of projects B73 and B70 have collaborated on the documentation for the FEAST model and to ensure that FEAST is able to provide the structure needed for the MSE analyses. Attendance at the PI meetings for other projects.

Education and Outreach:

N/A

Next year’s Workplan:

See attached

2009-2012 Tasks, Assignments, Timeline

<i>What</i>	<i>Who</i>	<i>Completion date</i>	<i>Task duration (Project Months)</i>	<i>Notes</i>
Appointment of Post Doc	André Punt	1 Jan 2009		
Project overview, how they may relate to NMFS and Council objectives	PI's, PostDoc	Feb 4 2009		Involve the NPFMC in project with an overview and feedback from SSC (Seattle meeting)
Selection of "assessment" models	PIs, PostDoc	31 March 2009	1-3	Involves collaboration with AFSC ecosystem modeling group, assessment authors, NPFMC SSC and Plan Teams
Mathematical specifications for all "assessment" models drafted and circulated	PostDoc	30 April 2009	2-4	Will be provided to original authors of the methods concerned for review / comment
Coding of assessment models completed	Post Doc	30 Sept 2009	4-9	
Testing of assessment models I completed (application to actual data)	Post Doc	30 Sept 2009	4-9	
Selection of operating model scenarios	PIs, PostDoc			Involves PIs for B70
Testing of assessment models II completed (application to deterministic FEAST data)	Post Doc	31 Dec 2009	5-12	
Council update on progress	PI, PostDoc	Feb 2010		Seattle Council meeting focus on objectives
Implementation of data generation using FEAST outcomes	Post Doc	31 March 2010	13-15	
Testing of assessment models III completed (application to stochastic FEAST data)	Post Doc	30 June 2010	13-18	
Publication 1 drafted	PIs, Post Doc	30 Sept 2010	19-21	
Selection of decision rules, assessment methods for further testing, and	PIs, PostDoc, Model Wshp I	July 2010		Model Workshop I

performance measures				
Implementation of decision rules	Post Doc	30 Sept 2010	19-21	May involve NPFMC, LTK component
Implementation of performance measures	Post Doc	31 Oct 2010	19-22	May require collaboration with project B71
Contribute to construction of ensemble runs based on tested assessment methods	Post Doc	30 June 2011	19-30	Depends on ensemble model component being funded.
Evaluation of management strategies based on outcomes from Wshp I	Post Doc	30 June 2011	19-30	
Review of MSE results, revision of decision rules, assessment methods	PIs, PostDoc, Model Wshp II	July 2011		Model Workshop II
Council update on progress	PI, PostDoc	Feb 2010		Seattle Council meeting focus on objectives
Evaluation of frequency of how often models need to be updated	PIs, PostDoc	31 March 2012	31-39	Involves PIs for B70
Revised MSE runs completed	PostDoc	31 March 2012	31-39	
Publication 2 drafted, final report		30 June 2012	39-42	

(Anticipated) key publications and outreach activities

1. Performance of multi-species and single-species assessment models for the Eastern Bering Sea ecosystem.
2. Can multi-species ecosystem-based management strategies achieve ecosystem objectives for the Eastern Bering Sea fisheries.
3. Results will be presented to relevant advisory bodies (e.g. Plans Teams, SSC, etc.) and the public starting in June 2010 if deemed appropriate by the NPFMC.