PMEL Science Review
Final Report

Pacific Marine Environmental Laboratory's Response to the Recommendations from the August, 2008 Science Review

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1. Rationale and outline of the Implementation Plan

The PMEL Review Team developed a list of 46 separate recommendations in their report. We are grateful for the Team s thoughtful consideration of PMEL s programs and needs, based on the material presented at the review. Rather than respond to all 46 recommendations sequentially as they were listed in the report, we categorized the recommendations and, in so doing, have adopted a strategy to utilize them to their fullest value.

We have identified issues that fall into the following five categories: 1) a summary recommendation, 2) recommendations that PMEL can use to move our research objectives forward within NOAA, 3) recommendations which PMEL has already put into motion and, in some cases, has already completed, 4) recommendations that are primarily outside of PMEL s control, but will be offered to the most appropriate NOAA offices, and 5) recommendations that were made concerning the conduct of the review, or for which we judged were made rhetorically. In this way, we account for all the recommendations, even those for which there is no action required on PMEL s part.

It should also be noted that the recommendations of the reviewers are numbered from 1 to 40, with two recommendations having more than one part. (There is a Recommendation 12, 12.2, and 12.5; there is also Recommendation 40, 40.1, 40.2, 40.3, and 40.4, for a total of 46 recommendations.) In this Implementation Plan, we retain the reviewers original numbering scheme for consistency with the reviewers report.

This final version of the Implementation Plan addresses updates since the previous version of the Plan was completed on November 25, 2009. For completeness, all recommendations are shown in this report. Those recommendations that have been modified from the earlier version will have the word UPDATE indicated before the response.

2.0 List of Reviewer Recommendations

Reviewer Recommendation	Addressed in Section…
1. PMEL d be e a e e - e b e a a f e cea a e c	3.2.1
2. NOAA d c de a e de be a e eff ea e c e a d f e e ec ed a ea .	3.2.1
3. PMEL c a e a d ca b c c e d a e e a c e e e a (de) a d e e a e de e e e ce.	3.2.2
4. NOAA/PMEL eed c e c ca NOAA ead a e e	3.2.4
5. PMEL d ea be ef f a f a eed-f d d e f ec de e e a d e - c ce .	3.2.4
6. PMEL d e da a a a e e ee e a d a c a ed de a d f c ea de a d f da a a d f a e de .	3.4.3
7. A , e c e a a d ba e f c d-ca ee eade eed be ace e ab a f a cce f a a (cce a) e e c e c f e e e e e.	3.3
8. W a e e d , d b ea !	3.1
9. I d be ef e e PMEL' e a d e b e NOAA/OAR f e f e a a e Lab' effec e e .	3.5.1
10. P de a c a d b d e b e ea c a ea a e a f e ab a a e.	3.5.1
11. PMEL a a e e d e f ce c e a d ec ca ed a a e d be b ed f PSU.	3.5.1
12. P de e f b e e e ea a d e ab a e ec a a d af c e be ded bef e e e e ea de a .	3.5.1
12.2 PMEL a a eed ded ca e eff b e ea c e c e f c e a e a e a de e e a a d c e e T a Wa P a NOAA.	3.2.3
12.5 PMEL a a eed ea e add a P D e e c e .	3.2.3
13. T a fe f c a e b e a ec e d be f ed b a c a a d c e f c ad e e ab e ec a e (e. ., de a).	3.4.2
14. PMEL d c de a e a e e e a ac c d a ea e f c e a e c , f a c a e Ocea C a e S a a .	3.2.1

15. T e L e Acce Se e d a e ea e b a d a e .	3.4.3
16. B d e ac PMEL e ea c b c ec e a e c e d e ec e ac a d e d c e -e a f CO2 e ea e b de a e ca c e .	3.3
17. T e PMEL e e ea d a e e M e J .	3.5.1
18. PMEL d a a ead e a OAR de e a f ca e eff e a a e NOAA C a e a ac e .	3.4.1
19. PMEL d be e de a e e a ce a d f e ca cea a c da a d c .	3.3
20. T e TAO a d a e ed PMEL de e a a e f a a c a e a da a.	3.4.2
21. PMEL eed a a a e e a NOAA C a e Se ce a a , c ea b da e be ee e ea c a d e a , a f f e d eff a d - a f a e c a e a a e f e d b e a dec .	3.4.1
22. T e PMEL CLIVAR a d ca b a d be e f NOAA e e R B f NOAA f d c a e a e a e C a I e ea c e e.	3.2.4
23. T e ece cea ca b e a e US We C a d be e a ed e NOAA b e a a e , b e a a a e a e ea c f d , a d be e ea ed a e a ba .	3.4.1
24. PMEL e a a ea e c e f e cea ca b a e e d be c a ed a de e f .	3.3
25. PMEL d a e a e f a ce e c ac b a a d d cea b e a da a e a e e e a c (add b ca).	3.2.5
26. PMEL e ee a a d e c e ce-e ee a e d c e be ed.	3.2.4
27. FOCI d c de a e ac e e f La a a ec e e e, c a a d de a d e e ca e d a c f e Be Sea/G f f A a a e .	3.3
28. FOCI d c de de a d/ AUV f e c e f e c c a , e edd f e d, ce e a d e e f a def e ad ec e a d d e e ce e , c a a a e f e a e e e.	3.3
29. NOAA d c e FOCI - e e e e f a e c a e cea c a a d f e e.	3.2.1
30. T e cce f FOCI a e be ee PMEL a d e Na a Ma e F e e Se ce d be c e ded a a e a e f - a e c c e a a d c d a add e c e a e e a a .	3.5.2

31. Re ea c eff , c a Ec FOCI, eed b d e a ac e de e ed b a a e ec e f c a b ade ec e - de e a .	3.3
32. FOCI d de e e f e c e e ade a e a e b e a a e de d .	3.2.2
33. Ec FOCI d be ef f ea e c ac e a c a e de , f ec f f e c a e c a e, c a e d ca d c a d b da c d (a e c a d a e a) f ca e ca de .	3.2.2
34. Ec FOCI d e e a d e ea c d ec ee e e e f c IEA f ec e a ac e a a e e .	3.3
35. Ba e f d d a e f ac f FOCI ac e . O e b e a e e e a ced ba e f d a c e a IEA e G f f A a a a d e Be Sea.	3.2.4
36. PMEL d a e f d f a e a ce f e f Be Sea .	3.2.1
37. FOCI dec de a a ed f a a d a be ed e e , ec f ca e a d e f Be Sea M , c bab d be a ed.	3.4.2
38. W e f a cea d e e e ?	3.3
39. C de a d e ff e f a a b .	3.3
40. I e ca e f a , a e f a ce ea e e a b ca d be ed ea e e cce f e a .	3.2.5
40.1 PMEL d c de e a d e e ca ab de acce a b da a a d f eca d a e ea a e e e .	3.2.3
40.2 PMEL a d b a a e e de a ab FACTS a d a a b FACTS a d C MIT e e .	3.2.3
40.3 PMEL'S a a a e 'b a d ' f MOST c de . e e ca ab e c de a e ed b e c e .	3.2.3
40.4 PMEL d be e a e e deb a d c a ade f e ca ab e a de .	3.2.3

3. Responses to the Recommendations

3.1 Summary Recommendation (to NOAA Leadership) (Recommendation 8)

- Rec e da 8 (W a e e d , d b ea !)

Response: T a ! We' a e a a a c e !

3.2 Recommendations Actionable by PMEL

3.2.1 Enhancements to observing/monitoring/research (Recommendations 1, 2, 14, 29, 36)

- Recommendation 1 (PMEL d be e a e e - e b e a a f e cea a e c .)
- Recommendation 2 (NOAA d c de a e de be a e eff ea e c e a d f e e ec ed a ea .)
- Recommendation 14 (PMEL d c de a e a e e e a ac c d a ea e f c e a e c , f a c a e Ocea C a e S a a .)
- Recommendation 29 (NOAA d c e FOCI - e e e e f a e c a e cea c a a d f e e .)
- Recommendation 36 (PMEL d a e f d f a e a ce f e f Be Sea .)

Response: (UPDATE) PMEL concurs with these recommendations and will continue to pursue funding support through NOAA and other funding agencies, as appropriate. Observation and monitoring of the ocean and atmosphere have been the mainstay of PMEL research since its inception. The oceans, especially, have been historically undersampled, and as the significance of the ocean s role in climate, and, more recently, climate change, is understood, there is an increasing interest in collecting high-quality scientific data over all ocean regions in support of numerous programs to accelerate our understanding of the oceans roles in sustaining the planet. As the Nation has expanded its thirst for knowledge, NOAA has tasked its ocean scientists to develop innovative methods in addition to conventional means to collect observations in support of research and PMEL has answered the challenge for many years.

PMEL has been successful in establishing support for three research themes since the 2008 Review: 1) Ocean Acidification, which was established and funded as a new NOAA research program in 2010 with PMEL providing a leadership role; 2) the PMEL Ocean Climate Stations program, which observes ocean-atmosphere flux

parameters, has secured NOAA funding for both the Ocean Station Papa mooring and for a new flux mooring to be established in the Aguhlas Current off the southeast coast of Africa in early 2011, and 3) baseline ecosystem observations in the Alaska Large Marine Ecosystems. PMEL s biophysical moorings in the Bering Sea, which are considered cornerstone observations for the eventual development of an integrated ecosystem assessment in that basin, are being supported at least through 2011 from a variety of NOAA and non-NOAA funding sources. PMEL continues to seek permanent support for these platforms from NOAA. Other long-term biophysical time series observations are being maintained with a mixture of PMEL ba e f d a d ec f d f e N Pac f c Re ea c B a d. T e e c de e - e e e e b e a L e 8 a d e La e La a S e S e f S a /G f f A a a a d a CTD/b e e e a e ab ed e d e Be Sea.

PMEL a a cce f ad ca ed f e e a f A f a ca ab e a e e e e e f e a e c a d c e a c a e e - e CLIVAR e ea d a a , ead NOAA- ed c e e e 1 2 ea . A cce f PMEL- ed c e a c e ed S , 2011 ab a d e NOAA S *Ronald H. Brown* a L e A13.5 e S ea A a c Ocea . F a , PMEL c e c ec a ab e b e a f e TAO-TRITON, PIRATA, a d RAMA ca ed a a . PMEL NWS/Na a Da a B Ce e b d e a d e ec c e a f e TAO A a NDBC f e d ef e ed e ace e e e a d e RAMA A a c e e a d, e ab ed a 26 e e I d a Ocea .

3.2.2 Modeling (Recommendations 3, 32, 33)

- Rec e da 3 (PMEL c a e a d ca b c c e d a e e a c e e e a (de) a d e e a e de e e e ce.)
- Rec e da 33 (Ec FOCI d be ef f ea e c ac e a c a e de f ec f f e c a e c a e, c a e d ca d c , a d b da c d (a e c a d a e a) f ca e ca de .)

Response: (UPDATE) PMEL will be bringing an NRC post-doctoral fellow on board in Fall, 2010 to develop a coastal ocean acidification model for the western North America continental shelf region. She will be utilizing the NCAR Community Climate System model v.3.1, in association with Dr. Scott Doney at Woods Hole.

Ec FOCI a bee a a ded f d FY13 e ESRL, GFDL, a d ROMS cea de de e e a cea de a d e ec e de a a ed b NMFS. D . Ja e O e a d a d M Wa a e c a e de a d D . A He a ead e Ec FOCI cea de eff .

- Rec e da 32 (FOCI d de e e f e c e e ade a e a e b e a a e de d .)

Re e: (UPDATE) T e e Be Sea a a de ; Ec FOCI a c d c a a a de d e ROMS de de f e e Be Sea a d G f f A a a e e b e a a e c ca de e f a ce.. PMEL e e c e f e B Reca P a e e f d f a de d f e Be Sea a a ; e a ed a $40K d be eeded f d d .

3.2.3 Tsunami Research (Recommendations 12.2, 12.5, 40.1, 40.2, 40.3, 40.4)

- Rec e da 12.2 (PMEL a a eed ded ca e eff b e ea c e c e f c e a e a e a de e e a a d c e e T a Wa P a NOAA.)

Response: (UPDATE) PMEL' a e e NOAA a d e a . Rece ad a ce ade b e PMEL a e ea c ea a e e ed ea e e ade NOAA a a ca ab e e e a f e b e. PMEL a e ded eed b f c a e ce de e e de a d de e e . W f d e NOAA T a P a ded e Wa e Ac f 2009 2012, PMEL e a ce e ea c ca ab , c ead a c ea e b ca . L be d 2012 a d e e a f f d ade a a ab e e Wa e Ac , PMEL b ed a a e a e e T a P a c e e e ea c a a ed 2009. T e FY12 P a Dec Me a d a e e T a Wa P a f a c ea e a a e e ded b e Wa e Ac FY 13. T c ea e d c de e f d f PMEL e ea c , ce e ea c e ed b NWS a c ca e e e be ade e a e .

- Rec e da 12.5 (PMEL a a eed a ea e add a P .D. e e c e .)

Response: T e PMEL T a P a c e a 12 P .D. c e b a d, a a e a f f e a a aff. T e f d f a T a Re ea c P a b NOAA a PMEL ea c e f c a e a NOAA' e a a eed a d e b ca f e ea c e be ef e b ade a c .

- Rec e da 40.1 (PMEL d c de e a d e e ca ab de acce a b da a a d f eca d a e ea a e e e .)

Response: (UPDATE) A a e f e Feb a , 2010 C ea a , e NOAA T a P a de a e e a c a e ce a e e a a ce f a e e a d f e ea c e . 2011 f d ded e ab e a a e e a a a d e ea c de e Na a Ce e f E e a P ed c (NCEP) c fac e a f eca a . T a da a a d de be ded e T a Wa Ce e e, a a e, e e ea c de ece e e a e da a f e b PMEL/Na a Ce e f T a Re ea c a d acade c, a e, a d e a a a a e . T e e ab e f e NCEP de e ec ed be c e ed b e e d f FY 11. T e e c a e a e f e ee a be ef b e e a a e e e a d e e ea c a ec f e a a .

- Rec e da 40.2 (PMEL a d b a a e e de a ab FACTS a d a a b FACTS a d C MIT e e .)

Response: (UPDATE) The functionality of FACTS, run under PMEL s Live Access Server, has been replaced by a new application called WebSIFT. WebSIFT is in development and will support the needs of the tsunami modeling research community. ComMIT will continue to be maintained as before to access the pre-computed propagation model database. Model output is also available directly through OpenDAP. User manuals are available for the MOST model and ComMIT software. FACTS has a user manual and a similar support documentation is envisioned for WebSIFT.

- Rec e da 40.3 (PMEL'S a a a e b a d f MOST c de . e e ca ab e c de a e ed b e c e .)
- Rec e da 40.4 (PMEL d be e a e e deb a d c a ade f e ca ab e a de .)

Response: P b ca e NOAA a f eca de c e e ab e acc ac a d e f a ce f e de . We ca c e b ca , b e e e ee e e ce f e f ded c a .

3.2.4 Resources (i.e., Laboratory funding, Shiptime funding) (Recommendations 4, 5, 22, 26, 35)

- Rec e da 4 (NOAA/PMEL eed c e c ca NOAA ead a e e.)

Response: T e NOAA f ee ' f cea a d c a e e ea c (c a OAR ac e) a dec ea ed d a a ca e a 15 ea . T ee C a I e e c e e ded ca ed OAR ac e e e e ed e 1990 a d e e e aced b e *Ronald H. Brown* a d e *Ka'imimoana*; e a e Na a Wea e Se ce (NWS) e e e . A c a e f d a e ded e ace e f C a I e UNOLS c a e ; e e , f d a bec e ade a e

a e e f e c a e f d ea d a a dec ea ed; a bee ade a a ab e add e b e- a e e ea c ca ed b Sea G a , NURP, a d GLERL; a d e c f e a e d a a ca . PMEL a a e e a d e ea c e c e NOAA ce c ce ab de e a ab c d c a ea e a a d, a e a e e, e a e ea e e a ed a c a f e a a d e a e a e f NOAA' ac f f e. A e c e e e e ad a NOAA e e ce , a d e e NOAA b d e a ce f add a f ee f d , e a de e ec ed ce PMEL' de e de c a e, e e e e. C e a d ec ed e ea c e e e f e, c d e f PMEL, be c de ed e e a e f e NOAA S Reca a a P a . PMEL ac e a c a e NOAA B Reca a a P a a d e e de e e f ad a ced ec e a d e f ed c e eed f e e f e.

- Rec e da 5 (PMEL d ea be ef f a f a eed f d d e f ec de e e a d e - c ce .)

Response: I e a , c eed f d a ded b a ce : PMEL e f, AA d c e a f d , NOAA Ec e G a Tea , a d Ocea E a , a e a fe . T e e c e e a NOAA f d ce a a ab e f c - , e a d ec , a c a f e a e- ea e , a e OAR AA a d DAA/LCI c de e a a ab f c f d a . PMEL c e e e a e f d c a e a .

- Rec e da 22 (T e PMEL CLIVAR a d ca b a d be e f NOAA e e *Ron Brown* f NOAA f d c a e a e a e C a I e ea c e e .)

Response: (UPDATE) T e ade ac f f d f e e e a (NOAA f ee c a e) a a e ac a NOAA a , b e a ac e ee e cea e ea c c . T e e c e e NOAA e e a a e a d e ea c de a d, a d a c a e f d f e ace e e e , e c c ea e d a a ca . PMEL a c a e NOAA F ee Reca a a S d , de a . Add a , PMEL a e eed a d ed e e e b e b e C a e P a Off ce f ee a d c a e f d a ca d c . PMEL a e e ed c a e f d FY2011 e We C a c a a Ocea Ac d f ca c e, c e a e c ed ed e UNOLS R/V *Wecoma*.

- Rec e da 26 (PMEL e ee a a d e c e ce- e ee a e d c e be ed.)

Response: PMEL c e c a e e e E ee De e e D de e e a d a e e d f ea cea a a e e . F e e, PMEL e e a e ec f d b e e f d ce , c a e add e ed Rec e da 5 ab e.

- Rec e da 35 (Ba e f d d a e f ac f FOCI ac e . O e b e a e e e a ced ba e f d a c e a IEA (I e a ed Ec e A e e) e G f f A a a a d e Be Sea.)

Response: (UPDATE) While not base funding, PMEL has been successful in securing multi-year research funds for both the Gulf of Alaska Integrated Ecosystem Research Program through the North Pacific Research Board and for the Chukchi Sea from the Department of Interior s Minerals Management Service. Both grants will support NOAA Ecosystem objectives in Alaska s Large Marine Ecosystems through 2012. NOAA ed f d f IEA ea a ed f e Ca f a C e IEA f e c ea . A f ca f d f a A a a IEA e a a ab e 2013-14 a e ea e .

3.2.5 Performance Management (Recommendations 25, 40)

- Rec e da 25: (PMEL d a e a e f a ce e c ac b a a d d cea b e a da a e a e e e a c (add b ca).)

Response: (UPDATE) PMEL does report to NOAA and the Department of Commerce on metrics related to the number of platforms deployed and/or maintained. NOAA and DoC have several corporate performance measures and Government Performance Management Act (GPRA) measures on which PMEL routinely reports its accomplishments. We have not, however, routinely reported on the quantity of data made available to others, as NOAA has not expressed an interest in metrics of this type. Within PMEL, the most significant and most often used performance metric for all scientists is their publication record. Publications have been a long-standing metric within OAR for many years and are directly applicable across observationalists and modelers in all disciplines.

- Rec e da 40: (I e ca e f a , a e f a ce ea e e a b ca d be ed ea e e cce f e a .)

Response: T ec e da c e e Rec e da 12.2 (ee ec 3.2.3, ab e). I e ca e f e T a P a , e f a ce ea e a e a e e f c e c e f f eca de a d e e e a f e e a e , c e de f eca . P b ca a a e a ea e f e ab a a e, b a a ce be ee a e ab affec b ca a . PMEL d e e b ca a e d e d d a a a e e f .

3.3 Recommendations Already Implemented (in various stages of completion) (Recommendations 7, 16, 19, 24, 27, 28, 31, 34, 38, 39)

- Rec e da 7 (A , e c e a a d ba e f c d-ca ee eade eed be ace e ab a f a cce f a a (cce a) e e c e c f e e e e e e e.)

Response: T e e a e a be f e e c e e ab a e be e ed b e aff. PMEL e e c e f c aff e a a d: a a be f e c e , a a e be f c e (e fede a , b e f e C e a e I e), a d a a e be f ec c a . PMEL a d ced PECASE (P e de a Ea Ca ee A a d f Sc e a d E ee) c e e a 10 ea , a d a ad e e a c e de a f e a e a d e e .

- Recommendation 16 (B d e ac PMEL e ea c b c ec e a e c e d e ec e ac a d e d c e -e a f CO_2 e ea e b de a e ca c e .)

Response: (UPDATE) PMEL CO_2 c e a e ac e e a ed b e PMEL Ve a a d e Ec FOCI a : a e ea c a a bee acce ed c d c CO_2 d e e Be Sea e e f 2011 a d f d f CO_2 e ea c e Ve Ma a a A c d e a bee ed e Off ce f Ocea E a a d Re ea c be 2011.

- Rec e da 19 (PMEL d be e de a e e a ce a d f e ca cea a c da a d c .)

Response: PMEL believes that the utility of the tropical oceanographic data products has been demonstrated adequately. As an illustration of this point, through 2008, 676 peer-reviewed publications have appeared in the scientific literature utilizing tropical oceanographic data from the TAO-TRITON, PIRATA, and RAMA Arrays. In 2008 alone, 28.8 million web hits were registered on PMEL s and NDBC s tropical moored buoys web sites, indicating that these datasets are being heavily used by the research and operational communities.

- Recommendation 24 (PMEL e a a ea e c e f e cea ca b a e e d be c a ed a de e f .)

Response: (UPDATE) T e PMEL Ocea C a e S a e ab ed a Ocea S a Pa a (50 N, 145 W), a ed b e Na a Sc e ce F da ,

e Ca ada De a e f F e e a d Ocea , a d NOAA, e f (a d) cea ac d f ca de ed e e c e f e cea ca b a e e a e be ea ed: CO_2 a d H. Be FY 2010, e ed f a c a b e C a e P a Off ce. FY10 Ocea Ac d f ca f d c de a c e a de f d f f f e e e e CO_2 b b CO_2 a d H e cea ac d f ca . F d FY11 a d be d e e de e f a be f cea ac d f ca e e .

- Recommendation 27 (FOCI d c de a e ac e e f La a a ec e e e, c a , a d de a d e e ca e d a c f e Be Sea/G f f A a a e .)

Response: Surface drifters and ARGO floats have been used in the Gulf of Alaska and Bering Sea regions in the past (focused studies were supported by NOS/GLOBEC, the Steller Sea Lion research effort, and other programs in the early 2000 s), and they have been very useful in describing transport, especially in the vicinity of the Aleutian passes. Lagrangian methods are a valuable tool in the EcoFOCI toolbox and will continue to be utilized as observing requirements demand.

- Recommendation 28 (FOCI d c de de a d/ AUV f e c e f e c c a , e edd f e d, ce e , a d e e f a def e ad ec e a d d e e ce e c a a a e f e a e e e .)

Response: (UPDATE) G de a e bee e ed cce f e G f f A a a ba , a e D . C a e E e f e U e f Wa . F d c e a a ab e c e eff . Ge a ca f c f Ec FOCI a f ed e Ea e Be Sea, e e e a de (a a e 70 e e) a d a e ac e f f ee f e ea e a e de e a b e a c. W Ec FOCI e e C c Sea e D I/M e a Ma a e e Se ce, Ec FOCI a a ed a c ab a e eff D . T We a e f e U e f A a a-Fa ba , e de e C c Sea.

- Recommendation 31 (Re ea c eff , c a Ec FOCI, eed b d e a ac e de e ed b e a a e ec e f c a b ade ec e - de e a .)

Response: Ec FOCI be a e f f a e- ec e e ea c eff ba ed P c a - ec e ec e f c 1999-2000, e NOAA a d ec ed add e e S e e Sea L a dec e e A e a I a d . S ce a e, PMEL a d e A a a F e e Sc e ce Ce e (AFSC) f NOAA Na a Ma e F e e Se ce a e bec e c ea f c ed ec e a ac e a a e e f e A a a f e e e .

- Recommendation 34 (Ec FOCI d e e a d e ea c d ec ee e e e f c IEA f ec e a ac e a a e e .)

Response: (UPDATE) A d ca ed ab e, Ec FOCI e ea c a ed a d a ec e -ba ed a ac bef e beca e a a c ce NOAA. Ec FOCI a bee a c a e NSF/N Pac f c Re ea c B a d BEST/BSIERP d ce 2008. BEST/BSIERP a e a ed ec e a ac a f e ba f a IEA e Be Sea. S a , Ec FOCI a bee f ded b e N Pac f c Re ea c B a d a c a e a G f f A a a I e a ed Ec e Re ea c P a , c be f e d d e 2011, IEA de e e a ba .

- Rec e da 38 (W e f a cea d e e e ?)
- Rec e da 39 (C de a d e ff e f a a b .)

Re e: Da a f a cab ed d e e ab ed e P ee Sea 2001 a ade a a ab e e eb ea e fa e Se e be , 2002. PMEL a e ab ed a d e Ya a Ba , O e (Ne) a a f a e b de a e d a e Ha f e d Ma e Sc e ce Ce e Ne 2008.

W e e e a e b eac a d ed ca be ef f a e e d a a ab e, PMEL d e a e a e e e de e e da a e ea e. Ra e , PMEL a ac c de a e f d e ea f e ca e e , a e a a , a d a b e cea e c a e bee e ac ed f ec e ed ed d e ac c eb e (:// . e . aa. / e /ac c .).

3.4 Recommendations Outside PMEL's Sphere of Influence

3.4.1 Climate Services (Recommendations 18, 21, 23)

- Rec e da 18 (PMEL d a a ead e a OAR de e a f ca e eff e a a e NOAA C a e a ac e .)

- Rec e da 21 (PMEL eed a a a e e a NOAA C a e Se ce a a , c ea b da e be ee e ea c a d e a , a f f e d eff , a d - a f a e c a e a a e f e d b e a dec .)

Response: T a a f e d c d e e f e e e da C a e P a NOAA a NOAA C a e Se ce a a . A ea

dea f d c a cc ed e e a ea a e e a e e de a d de f NOAA a a e C a e Se ce e e e a e A e ca e e. Se ec ed PMEL c e a d eade a e a d c e be ed d c .

- Rec e da 23 (T e ece cea ca b e a e U.S. We C a d be e a ed e NOAA b e a a e , b e a a a e a e ea c f d , a d be e ea ed a e a ba .)

Response: (UPDATE) PMEL relies on non-base funds from the Climate Program Office (CPO) (eventually, the NOAA Climate Service or, possibly, the Ocean Acidification Program Office) to fund the West Coast ocean carbon survey cruises. The planned 2011 West Coast cruise has been approved for funding by CPO. S e f d c e a e c e be e a ed e 2011 OAR c a e f d ce . A e de e e f a NOAA C a e Se ce ca ab e e , e d c be ee c a e e ea c a d c a e e a a bec e e d c a d e ca be e ed a a e. A e a e , e ec , c a de , a e be ab e a e a e e a ce e a e e ded c e e . PMEL a ece ac ed de f e a d e a a e e a ed a d e PMEL e ea c eff .

3.4.2 Transition from Research to Operations (Recommendations 13, 20, 37)

- Rec e da 13 (T a fe f c a e b e a ec e d be f ed b a , c a , a d c e f c ad e e ab e ec a e (e. ., de a).)

Response: PMEL a e f a ed ec a d f c ed e e ea c a . T e TAO A a , f a ce, a a fe ed e Na a Da a B Ce e (NDBC), e a ed b e NWS. PMEL c e de e e f e a a e NDBC c e a d e a e new sensors a e ace e b e . PMEL a ed f a d add e c e f c e e I d a Ocea . NOAA Ma a e e de e e e ce a d c ed e f a ac e .

- Rec e da 20 (T e TAO a d a e ed PMEL de e a a e f a a c a e a da a.)

Response: PMEL a ed e de e e a d e e a f e TAO T a P a f NOAA dec a fe e TAO A a f PMEL NDBC. A a f e a , PMEL a fe ed e e f a e e ed a c a d a a e e da a ea . PMEL e a c e ed TAO da , d a e e f e A a c e a NDBC

ab e de a ef e ed e e. A e f e da a, PMEL e a a e e da a a e a d a e a c ce NDBC e e .

- Rec e da 37 (FOCI dec de a a ed f a a d a be ed e e , ec f ca e a d e f Be Sea M , c bab d be a ed.)

Response: We agree. W NOAA, dec e e e a e ea c ec e a a a e ade b e e e a L e Off ce T a Ma a e . PMEL d be e f a e Be Sea e Ec FOCI a a e a a a e. We be e e a Ec FOCI a e ea c eff a d e Be Sea a e e ea c . T e a a e e ea ed c e e e a ed e a ed e d ca f ec e ea e e . If a d e NOAA c de a e e a e a a a , PMEL be ed e de e e f a a a e e a e a cce f .

3.4.3 Data Management (Recommendations 6 & 15)

- Rec e da 6 (PMEL d e da a a a e e ee e a d a c a ed c ea de a d f da a a d f a e de .)
- Rec e da 15 (T e L e Acce Se e d a e ea e b a d a e .)

Response: Da a a a e e ac e a e e f e e ea c e e f PMEL. Ac e c a LAS a a e bee de e ed e e a e e e f ec f c ec a a e e f e ea c ac e . Beca e f PMEL' b e e a a acce a cea a c da a e , PMEL c e de da a a a e e a d a a f NOAA' da a a a e .

3.5 Recommendations Not Part of the Scientific Program

3.5.1 Recommendations related to the Conduct of the Review (Recommendations 9, 10, 11, 12, and 17)

- Rec e da 9 (I d be ef e e PMEL' e a d e b e NOAA/OAR f e f e a a e Lab' effec e e .)

Response: A description of the OAR Laboratories planning and priority setting activities will be included in future lab reviews.

- Rec e da 10 (P de a c a d b d e b e ea c a ea a e a f e ab a a e.)

Response: T c d be a e ed f f e e e ; e e , a f ca f aff a d e ce a e Lab' a e e a a d a c , d be a b a def e e e e f a a c a e ea c a ea. T a c a e e ec e ab' ba e f d . A b f b ca b a a ea c e c ea -c a d c d be ea acc ed.

- Rec e da 11 (PMEL a a e e d e f ce c e a d ec ca ed a a e d be b ed f PSU.)

Response: A eed.

- Rec e da 12 (P de e f b e e e ea a d e ab a e ec a a d af c e be ded bef e e e e ea de a .)

Re e: We a ec e da OAR Head a e f f e e e .

- Rec e da 17 (T e PMEL e e ea d a e e M e J .)

Response: We a e OAR Head a e . O e ab a e be ef f a a a e e f c e e .

3.5.2 "Recommendations" that are not Recommendations (Recommendation 30)

- Rec e da 30 (T e cce f FOCI a e be ee PMEL a d e Na a Ma e F e e Se ce d be c e ded a a e a e f -a e c c e a a d c d a add e c e a - e e a a .)

Response: We a ee. T a .

Appendix C.
Acronyms Used in this Implementation Plan

AA	A a Ad a (f OAR)
AFSC	NMFS A a a F e e Sc e ce Ce e
AUV	A U de a e Ve c e
CLIVAR	C a e Va ab P a
C MIT	C M de I e face f T a
Ec FOCI	Ec e -F e e Ocea a C d a ed I e a
FACTS	Fac f e A a a d C a f T a S a
FOCI	F e e Ocea a C d a ed I e a
GLERL	OAR G ea La e E e a Re ea c Lab a
HYCOM	H b d C d a e Ocea M de
IEA	I e a ed Ec e A e e
LAS	L e Acce Se e
MOM	M d a Ocea M de
MOST	Me d f S T a
NDBC	Na a Da a B Ce e
NMFS	NOAA Na a Ma e F e e Se ce
NOAA	Na a Ocea c a d A e c Ad a
NOS	NOAA Na a Ocea Se ce
NURP	OAR Na a U de ea Re ea c P a
NWS	NOAA Na a Wea e Se ce
OAR	NOAA Off ce f Ocea c a d A e c Re ea c
OER	OAR Off ce f Ocea E a a d Re ea c
PECASE	P e de a Ea Ca ee A a d f Sc e a d E ee
PMEL	OAR Pac f c Ma e E e a Lab a
PPBES	NOAA P a , P a , B d e & E ec S e
PUMP	Pac f c U e a d M P c P a
TAO	T ca A e e Ocea A a
WebSIFT	Web-ba ed S - e I da F eca (S e) f T a