# PMEL Annual Operating Plan 2009 - 2013

This document summarizes the NOAA Performance Measures and Milestones that PMEL was responsible for during the last 5 year period. Performance Measures are in bold type and the milestones which relate to that measure are listed beneath it. The Target and Actual columns indicate which year(s) that each milestone was due: an "x" in the "Target" column indicates a milestone was called for; a corresponding "x" in the "Actual" column indicates the milestone was completed. Outyear performance measure targets through 2018 are also displayed.

| 5-Year Research Plan Goal: Objective - Target | NGSP Goal or Enterprise Evidence Of Progress | Performance Measure and related milestones | Measure or Milestone Targets | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Target | Actual | Target | Actual | Target | Actual | Target | Actual | Target | Actual | Target | | | | |
| | | | FY09 | | FY10 | | FY11 | | FY12 | | FY13 | | FY14 | FY15 | FY16 | FY17 | FY18 |
| | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | **Annual number of PMEL journal articles published in peer-reviewed literature** | | **104** | | **114** | | **141** | **60** | **122** | **75** | **120** | **75** | **75** | **75** | **75** | **75** |
| | | Publish a paper assessing satellite-based flux products using OCS reference time series. | | | x | x | | | | | | | | | | | |
| Climate: ID trends - Assess the connections of high latitude climate varability | Climate: Improve understanding - Arctic sea ice | Publish the Annual Arctic Report Card | | | | | | | x | x | x | x | x | | | | |
| | Climate: Assessments - Impacts and key vulnerabilities | Contribute one or more sections to the Oceans chapter of the annual State of the Climate report. | | | | | | | | | x | x | | | | | |
| | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | Submit a paper on using acoustic records to estimate the year-long CO2 gas flux from an erupting submarine volcano. | | | | | | | | | x | x | | | | | |
| | | Submit an invited paper on "Hydrothermal Plumes" for the "Encyclopedia in Marine Geosciences," a contribution to the ongoing Springer publication "Encyclopedia in Earth Sciences." | | | | | | | | | x | x | | | | | |
| | | Submit a first-author paper to a peer-reviewed journal showing how the hydrothermal system on Axial Seamount changes over a full eruptive cycle. | | | | | | | | | x | x | | | | | |
| Climate: Improved assessments - Sustain assessments of the impacts and risks of climate | Climate: Assessments - National and regional assessments | Submit one section for the NODC Annual State of the Climate Report 2014 | | | | | | | | | | | x | | | | |
| Climate: Improve understanding - Assess features of tropical oceans | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | Submit for publication in a special issue of JGR an overview of the Western Tropical Pacific Ocean. | | | | | | | | | | | x | | | | |

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| Oceans: Increase knowledge of physical and chemical changes - Dominant forcings | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | Submit a manuscript for publication entitled: " Helium Isotope and C/3He Signatures in the Northern Lau Basin: Distinguishing Arc, Backarc, and Hotspot Affinities" | | | | | | | | | | | x | | | | |
| Oceans: Understand ocean acidification - Provide scientific stewardship | S&T: Holistic understanding - Improved understanding of ocean acidification | Submit the following paper for publication in JGR-Oceans: "The Physical and Biogeochemical Controllers of Ocean Acidification in the Northern Gulf of Alaska" | | | | | | | | | | | x | | | | |
| | | Submit the following manuscript for publication in Global Biogeochemical Cycles: "Natural variability and anthropogenic change in equatorial Pacific surface ocean pCO2 and pH." | | | | | | | | | | | x | | | | |
| Oceans: Map and characterize basin boundaries - Develop and apply technologies | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | Submit a manuscript summarizing baseline obsesrvations from a 5-year record of natural sources of ambient sound near the Antarctic Peninsula in the Scotia Sea. | | | | | | | | | | | x | | | | |
| | | Submit for publication a manuscript on CO2 bubble plumesas observed at the NW Rota submarine volcano, Mariana Arc. | | | | | | | | | | | x | | | | |
| Climate: Improve understanding - Assess features of tropical oceans | | Submit a paper on the mechanism of initiation of La Nina events due to Easterly Wind Surges | | | | | | | | | | | x | | | | |
| Oceans: Increase knowledge of physical and chemical changes - Dominant forcings | | Submit a paper for publicatiom entitled "Eruption Modes and Cessation of Volcanism at West Mata Volcano," documenting the eruptive history of this active site from 1996 through 2012. | | | | | | | | | | | x | | | | |
| Climate: Improve understanding - Assess climate influences of ocean basin properties | Climate: Improved understanding - Climate observing systems | **Cumulative number of data collection platforms deployed by PMEL in support of the Global Ocean Observing System (GOOS)** | | | | **525** | | **571** | **622** | **666** | **676** | **735** | **788** | **837** | **882** | **923** | **960** |
| | | Deploy additional RAMA observing sites | | | 3 | 3 | 2 | 2 | | | 2 | 2 | | | | | |
| | | Increase TAO data research archive with 180,000 daily average data values | | | | | x | x | | | | | | | | | |
| | | Deploy 40 Argo floats | | | | | | | 60 | 60 | 40 | 60 | 40 | | | | |

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| | | | FY09 | | FY10 | | FY11 | | FY12 | | FY13 | | FY14 | FY15 | FY16 | FY17 | FY18 |
| Climate: Improve understanding - Assess climate influences of ocean basin properties | Climate: Improved understanding - Climate observing systems | PIRATA array maintained in the tropical Atlantic. RAMA array in the tropical Indian Ocean is planned for completion in 2015, provided adequate funding, foreign partner ship support, and security arrangements. | | | | | | | x | x | | | | | | | |
| | | Maintain OceanSITES mooring in the Kuroshio Extension region and at station PAPA. Moorings are visited and refreshed at least once each year. | | | | | | | x | x | | | | | | | |
| | | Conduct a major survey cruise to monitor marine aerosols and air quality approximately every other year. | | | | | | | x | x | | | | | | | |
| | | Complete two sections per year across the Solomon Sea, and conduct numerical modeling studies to help interpret the observations. | | | | | | | x | x | | | | | | | |
| | | Maintain underway $CO_2$ instruments on ships (1 in equatorial Pacific, 2 off the Pacific coast), add 1 additional system in FY2013 provided adequate funding support from the Climate and Ocean Acidification program offices. | | | | | | | x | x | | | | | | | |
| | | Maintain 15 moorings each year (FY 2013 – FY 2017), provided adequate funding support from the Climate and Ocean Acidification program offices. | | | | | | | x | x | | | | | | | |
| | | Conduct CLIVAR cruise in N. Atlantic to reoccupy Line A16(N). | | | | | | | | | x | x | | | | | |
| | | Recover and redeploy ocean climate station moorings at stations Papa and KEO. | | | | | | | | | x | x | | | | | |
| | | Analyze realtime profiles from 2 Prawler moorings deployed in the subtropical Atlantic SPURS experiment | | | | | | | | | x | x | | | | | |
| | | Complete reoccupation of WOCE Section A16S | | | | | | | | | | | x | | | | |
| | | Conduct two research cruises to maintain climate reference stations KEO and Papa in the North Pacific in support of national and international partnerships. | | | | | | | | | | | x | | | | |

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| Climate: Improve understanding - Assess climate influences of ocean basin properties | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | Lead a Western Atlantic Climate Study 2 cruise in the North Atlantic onboard the the R/V Knorr to study sea spray aerosol. | | | | | | | | | | | x | | | | |
| Oceans: Map and characterize basin boundaries - Explore poorly-known regions | S&T: Holistic understanding - Improved understanding of ecosystems | **Annual number of coastal and marine ecosystem sites adequately characterized for management or research purposes** | | | **3** | **3** | **3** | **3** | **3** | **3** | **2** | **2** | **2** | **3** | **3** | **3** | **3** |
| | | Conduct an acoustic characterization of seafloor volcanoes in the northern and eastern Lau basin. | | | x | x | | | | | | | | | | | |
| | | Complete a research cruise in the Gulf of Alaska to characterize and understand the physical, chemical and biological aspects of the Gulf of Alaska marine ecosystem. | | | | | | | | | x | x | | | | | |
| | | Deploy an array of moored hydrophones along the equatorial mid-Atlantic ridge to be used for studies of natural and anthropogenic sources of ambient noise, presence and distribution of cetaceans, and seafloor earthquake prediction | | | | | | | | | x | x | | | | | |
| | Oceans: Improved understanding - Increased use of ecosystem information | Conduct multi-year distributed biological observatory (DBO) research cruises with Federal, State, and international partners, maintaining moorings and observing annual hydrographic surveys of water column properties in all 5 DBO regions, expanding our baseline understanding of the Chukchi Sea. | | | | | | | | | | | x | | | | |
| Oceans: Increase knowledge of physical and chemical changes - Dominant forcings | S&T: Holistic understanding - Development and transition of technologies to operations | **Number of tools, technologies, and information systems developed to enhance NOAA's observing, forecasting or management responsibilities.** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **1** | **1** | **0** | **3** | **2** | **2** | **2** | **2** |

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| Oceans: Increase knowledge of physical and chemical changes - Dominant forcings | S&T: Holistic understanding - Development and transition of technologies to operations | Continuation of the unique 14-year characterization of ecosystems and physical , chemical, and biological ocean environment processes that impact them within the NOAA NeMO Seafloor Observatory at Axial Volcano. | | | | | | | x | x | | | | | | | |
| | | Analysis and interpretation of Galapagos Rift hydrothermal ecosystems environment through utilization of data from the NOAA Ship Okeanos Explorer (Joint with OER) | | | | | | | x | x | | | | | | | |
| | | Seafloor and water column characterizatuion of hydrothermal vent fields in the Southern Kermadec Arc | | | | | | | x | x | | | | | | | |
| | | Completion of analysis and publication of results of the first use of glider technology for ocean acoustic detection. | | | | | | | x | x | | | | | | | |
| | | Build and deploy the first ever device for collecting the gas discharge from an actively erupting submarine volcano (West Mata). | | | | | | | | | x | x | | | | | |
| | | Release the Surface Ocean Carbon Atlas (SOCAT) version 2.0 Global Underway pCO2 data set. | | | | | | | | | x | x | | | | | |
| | | Conduct a research cruise to investigate the physics, chemistry, and lower tropic levels of the Southeast Alaskan shelf, a subarctic ecosystem. | | | | | | | | | x | x | | | | | |
| | | Manitain the NPCREP Climate and Ecosystem obserbing network and distribute data to stakeholders. | | | | | | | | | x | x | | | | | |
| | | Conduct acoustic gliders surveys in US waters including Mariana Arc | | | | | | | | | x | 0 | | | | | |
| | Oceans: Improved understanding - Increased use of ecosystem information | Maintain the North Pacific Climate Regimes and Ecosystem Produvctivity (NPCREP) Climate and Ecosystem Observing network and distribute data to stakeholders. | | | | | | | | | | | x | | | | |

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| Oceans: Increase knowledge of physical and chemical changes - Dominant forcings | Oceans: Improved understanding - Increased developmetn and use of climate | Increase our understanding of the effects of climate variability on Alaska's Arctic Large Marine Ecosystem | | | | | | | | | | | x | | | | |
| Climate: Record - Technical Solutions | S&T: Observing Systems - Reduced life cycle costs of observations | Test the NOAA/ESRL/CSD optical particle counter in the NOAA/PMEL Manta UAS. | | | | | | | | | | | x | | | | |
| Integrated Observing Systems: Leverage advanced technologies to improve data access - Demonstrate tools to help optimize use | S&T: Observing Systems - Enhanced access and use of environmental data | Complete development of the The Surface Ocean Carbon Atlas (SOCAT v.3) PI-directed data entry and quality control system | | | | | | | | | | | x | | | | |
| | | Make Real time oceanographic observations available as an operational Web service from the NOAA Observing System Monitoring Center (OSMC). | | | | | | | | | | | x | | | | |
| Climate: ID trends - Assess the connections of high latitude climate varability | S&T: Holistic understanding - Increased understanding of climate, weather, oceans, ecosystems | Organize/lead an international workshop to assess the state of knowledge related to Arctic/midlatitude weather linkages. | | | | | | | | | | | x | | | | |
| | | Conduct an experiment on the NOAA P-3 aircraft to document and understand the implications of Arctic heat flux to the atmosphere resulting from newly ice-free regions. | | | | | | | | | | | x | | | | |
| Oceans: Increase knowledge of physical and chemical changes - Dominant forcings | | Participate in the Geotraces Pacific cruise, examining the impact of hydrothermal and coastal processes on the chemistry of the Pacific Ocean. | | | | | | | | | | | x | | | | |
| Oceans: Increase knowledge of physical and chemical changes - Regional forecasts | Weather: Reduced loss - Fewer fatalities | **Number of tools and technologies developed and transitioned to increase tsunami forecast accuracy and timeliness. (Cumulative)** | | | | **54** | **65** | **65** | **75** | **75** | **76** | **83** | **77** | **78** | **79** | **80** | **81** |
| | | Complete & Integrate Tsunami Forecast Models into the Tsunami Forecast System developed for NOAA/NWS Tsunami Warning Centers. | 6 | 6 | 11 | 11 | 11 | 11 | 75 | 75 | | | | | | | |
| | | Install new version of the Short-term Inundation Forecasting of Tsunamis | | | | | x | x | | | | | | | | | |
| | | Implement next version of tsunami forecast software at NOAA Tsunami Warning Centers | | | | | | | x | x | | | | | | | |

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| | | | FY09 | | FY10 | | FY11 | | FY12 | | FY13 | | FY14 | FY15 | FY16 | FY17 | FY18 | |
| Oceans: Increase knowledge of physical and chemical changes - Regional forecasts | Weather: Reduced loss - Fewer fatalities | Develop one new forecast tool in support of operational tsunami forecasts, as determined by NWS requirements. | | | | | | | | | x | x | | | | | | |
| | | Continue implementation of the tsunami forecast modeling tools at NCEP supercomputer faciliities. | | | | | | | | | x | x | | | | | | |
| | | Advance version 8 of the Live Access Server to official release status and install it for operational usage at GFDL, for the SOCAT carbon community, for the Unified Access Framework, and for the Earth Systems Grid Federation (ESGF) climate model distribution system | | | | | | | | | x | x | | | | | | |
| | | Conduct a data workshop for participants of the WACS (Western Atlantic Climate Study) to share data and outline publications from the cruise. | | | | | | | | | x | x | | | | | | |
| | | Develop the next version of the NOAA SIFT tsunami forecast application in collaboration with the Tsunami Warning Centers. | | | | | | | | | | | x | | | | | |
| | | Baseline testing of a new model for Tsunami Warning Center's forecast operations. | | | | | | | | | | | x | | | | | |
| | | Develop an Implementation Plan, with NWS, to transition the tsunami forecast model to NCEP. | | | | | | | | | | | x | | | | | |