

Notes & Comments on Draft ‘Charting Course for Ocean Science in US: Research Priorities for the Next Decade. NSTC Joint subcommittee on Ocean Science & Technology

General

Could be reduced – much repetition. A few examples (page, sentence number(s)):

p. 8.11-30: last 2 paragraphs seem repetition of previous 2 pages.

p. 14.7-8., p. 37.22-23 – repeats from first paragraph of section (p.36.4-5).

Many statements so general as to be meaningless (a bit like mom & apple pie). Parts of introduction read more like conclusions, thus are repeated later in document
Overriding emphasis on human use or impacts on humans due to ocean changes. Need more focus on understanding/maintaining health of ocean’s ecosystems.

Throughout, document makes a giant leap from physical oceanography to humans, with minimal mention in a few places of ‘productivity, coral reef systems, pathogens, invasives, etc. Intermediate/upper connections are skipped over (fishes, birds, mammals). Ignores the potential, for ‘top-down’ impacts on ecosystems and regimes; its not always ‘bottom-up’ control.

p.7 – notes 21 research priorities identified. Later in document, not clear which these are (due to subsections and repetitions). Number sections and priorities for easier reference.

Agree with need for sharing of research platforms, and information management/distribution.
Agree with emphasis on long-term observing systems. (but incorporate all trophic levels).

Much talk of ‘multidisciplinary research’, but document primarily focuses on physical oceanography or humans (or impact of physical/climate changes on humans). ‘Higher trophic levels’ are mentioned on p23.14 (‘incorporate feedback mechanisms among higher trophic levels’ within large-scale ecosystem models.

Among six themes that ‘represent key areas of human interaction with ocean’: most have common issues – requiring up-to-date data, database management & communication/availability, GIS applications, and modeling (whole approach is very heavy on modeling component).

Specific comments:

p.21.28: notes they want to provide ‘foundation for huge coastal tourism and recreation industry that is the fastest growing area of the ocean economy’. This could impact seabirds in particular.

P.25.4-10: emphasizes need to enhance information technology and data support infrastructure. Agree, but need to recognize many valuable data that are not integrated into useable databases.

p.25.14-17 – also notes emphasis on GIS, modeling, databases. And, esp, investment in training and maintaining this workforce. Agree this is important to long-term maintenance, success.

p. 26-30: increasing resilience to natural hazards: might address impact of human re-locations or locations on other wildlife. Emphasis here, again, is on reducing impacts to humans. Should also more completely address changes from human activities that increase damage vulnerability.

p. 31-35 'Enabling Marine Operations' -Does not seem to address unsafe operations and the impacts from foreign registered vessels. (No mention of "great circle" routes through Alaska's waters). Mentions need for 'balancing sustainable use and protection of the environment'.

p. 32.20: agree that need to "increase understanding of environmental impacts and conditions affecting marine transportation" is necessary. But also, need to understand and protect environment from the anticipated increase in marine transportation.

p.32.27-28: notes need to improve communication & collaboration among stakeholders; foreign business/shipping interests not included in the list (of industry, local, state, federal government, and researchers). If 'industry' includes foreign-based ships, state this clearly.

p.37.7-9: ocean regime shifts also affect seabirds and non-commercial fishes.

p.39.18-28. Agree that we need continuous, sustained monitoring, database maintenance, integration among systems/databases, and modeling.

p.43.5-7. an example of where discussion of 'ecosystem-based management' shifts more towards human benefits?

p.44.13: would include that we also need people knowledgeable in ecology/ecological relationships. This whole page is fairly general and states obvious.

Areas where 'seabirds as indicators' applies:

p. 22.10-12: to assess condition of resources & determine impacts of management alternatives.

p. 40.9-10: need for 'biological sensors that collect a variety of information, including data on sentinel organisms and habitats'. This paragraph could include upper trophic levels.

p.42.3-4: invest in 'novel methods of investigating ecosystem mechanisms'.

p. 42.22-23: 'development of next-generation trophic dynamics models'.

p. 43.9-18: 'Apply understanding of marine ecosystems to develop appropriate indicators...for sustainable and effective management.' No mention of upper trophic levels other than humans.

p.43.30-31. Agree with need for infrastructure and research vessels – don't forget upper trophic levels in these plans.

p.44.4: 'shore-based facilities for sampling and observing system' can include colony-based seabird work – past, present, and planned into future.

p.45.27-29: seabirds as indicators would be part of assessment of risks from contaminants (section is on 'enhancing human health').

p. 46.16-17: would add wildlife health and contaminant load as indicators of ecosystem.

p. 48.6-8: notes 'use of marine species as models for study of diseases, toxicology, biochemical processes' and use of 'sentinel species' to serve as early warning systems. *Seabirds as indicators here could include occurrence of seabird dieoffs, chick deformities, loss of productivity, etc.*

p.57/25: note that seabirds were among first indicators of El Nino/LaNina impacts.

p.61.4-5: to compare systems where ecosystems management strategies have been enacted.

Under 'Opportunities for Progress':

p.50.17-19: Need to stress international aspect necessary for a global observing system. No mention is made of integrating other nations into research etc.

p.50.24-26. Don't forget ecological issues. Land-based and at-sea monitoring of marine birds can also be platforms to add to physical & biological data. These activities already take valuable data, but need better database management, maintenance, distribution, access. Put resources into using what's already available, especially for looking back, or to validate models.

p.54.18: Find it narrow to only consider 'realizing the goal of sustainable use of ocean and its resources'. Is that really our goal? How about minimizing human impact on ecosystem health? A well-functioning ecosystem is necessary for humans, and we don't yet understand it.

p.55.26-28. Real goal appears to be to shift focus to a study of humans – their benefits, resource uses, recreation. This sets up every management action (or level of support for research) with respect to how humans can benefit; not necessarily a way to understand the ecosystems.

p.58.1-2. another example of omitting everything inbetween oceans and human health (though do mention fish stocks (presumably as human food).

p.58.28. What are the 21 research priorities? Provide a table and reference numbers.

p.61.12-20: This is only place where integration of higher trophic levels (other than humans) is really addressed, though still no mention of specific groups.

p.62.4-24: this paragraph is a 'wish list' of future advances, and suddenly rather specific regarding genetics, physical sensors, etc; is it really relevant for this document?