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## Letter to the Editor

**Scientific relevance cuts both ways: Informing current and future decision-making**

As many places around the world move forward with more comprehensive, ecosystem-based management (EBM), decision-makers frequently question whether there is sufficient science to take on such an approach. In collaboration with a number of colleagues, we published a recent review to assess the state of the science relevant to EBM along the US west coast (Lester et al., 2010). As decision-makers wrestle with the spectrum of possible changes to policy and practice necessary to implement EBM, it is not surprising that they would seek a scientific assessment of available information and tools (and in this case, the assessment was in fact a response to requests from decision-makers). Gregr and Chan (this issue) contend that by addressing this question, we give the (unintended) impression that some threshold of science is a necessary precursor to effective EBM. We could not disagree more. In fact, the intent of our review and others like it is not to determine the *feasibility* of moving forward with EBM, but rather to assess what science exists to inform a change from business as usual. The main point of this review, and another publication by many of the same authors (Tallis et al., 2010), is that we *already have enough* information to start implementing EBM today anywhere around the globe. We strongly agree with Gregr and Chan that EBM must be iterative and adaptive to deal with new information and unexpected changes. However, whether the intent is to implement more iterative change or a revolutionary, wholesale shift away from sector-by-sector management, it is constructive to assess the state of existing knowledge.

Gregr and Chan suggest that a focus on science for specific decision-contexts would be more useful and effective than the broader assessment of available information conducted by Lester et al. While we agree that science should not be de-coupled from decision-making, we strongly disagree that scientific synthesis outside of specific decision-contexts is in some way less useful to EBM. Science-policy discourse is a two-way street. Current management questions can and do inform scientific research. However, scientific understanding can also inform *new* policy directions (ocean acidification being a recent case in point), provide new avenues for cross-agency dialogue and collaboration, and thus contribute to future decision-making contexts. While science neither drives nor dictates policy, it has a crucial role in informing policy. Thus, scientists must tackle both research questions that directly address current management decisions and questions that will inform future management strategies. We would argue that the former is no more relevant than the latter – it is simply a matter of perspective, need, or opportunity.

None of us believes that we will ever have perfect information or that we can measure or model our way through the complexities of real-world dynamics. Gregr and Chan seem to conflate our exploration of *what do we know* with the question of *do we know enough*. In many, if not most, cases around the world, there is a mismatch between what we know scientifically and current management, typically manifest as a lag between available science and that actually used in making deci-

sions. We do know enough to move forward with various aspects of EBM and more comprehensively consider the range of ways humans interact with coasts and oceans. The more that our growing understanding of these interactions can inform management, the better.

Any scientist engaged at the nexus of science and policy is painfully aware that a lack of information is often an excuse for inaction. Given the pressing need for science to inform policy in a time of dramatic and possibly irreversible global change, losing ourselves in academic debates about how science can inform EBM is counter-productive. Management will benefit from focusing effort on connecting new scientific knowledge and tools to decision-makers and creating progressive change through innovative ideas. Such ideas have a key role in informing what decisions could be on the table in years to come.

**References**

- Lester, S.E., McLeod, K.L., Tallis, H., Ruckelshaus, M., Halpern, B.S., Levin, P.S., Chavez, F.P., Pomeroy, C., McCay, B.J., Costello, C., Gaines, S.D., Mace, A.J., Barth, J.A., Fluharty, D.L., Parrish, J.K., 2010. Science in support of ecosystem-based management for the US West Coast and beyond. *Biological Conservation* 143, 576–587.
- Tallis, H., Levin, P.S., Ruckelshaus, M., Lester, S.E., McLeod, K.L., Fluharty, D.L., Halpern, B.S., 2010. The many faces of ecosystem-based management: making the process work today in real places. *Marine Policy* 34, 340–348.

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