

# Challenges Great & Small

Kenneth Brink


**P**racticing scientists daily face a range of challenges. How can I get this computer code running? What step do I tackle next in this research project? What do I want to be working on two years from now? What are the important problems in my field that I can tell my mother-in-law about next time she starts asking why she should care about ocean research?

We probably all have answers to each of these questions somewhere in our memory banks. Of course, we are normally concerned about those immediate issues that are keeping us from getting that report finished or such. Most of us, however, would also have some thoughts about the bigger issues that face the science, even if we could not frame the words as clearly and compellingly as we might like. Further, for most of us, there is little motivation to back off and take a science-wide perspective on the grand challenges we face. Rather, the motivations we experience usually push us to a more personal scale of concerns. This is all very natural.

For all that, there is a clear need for stating compelling grand challenges. These ideas have considerable value to each of us in terms of adding a sense of how our own work fits into a much broader picture. They also add value to the individual scientist through

the direction given by knowing, say, that the ocean carbon dioxide sink needs to be understood. Finally, and not unimportantly, a well-stated grand challenge has tremendous value for attracting public interest and consequently funding.

What, then, makes a challenge grand? First, and most important, it has to express an important, exciting scientific conception. If it is not good science, it will likely prove to be a house of cards. Second, it is almost a tautology to say that the challenge will likely involve some very large task that will not be completed in a short time or with a small-scale effort. Finally, the challenge should either capture the public's imagination from the beauty of the problem, or reflect a real societal need for the results.

At this time, one could state a range of grand challenge ocean problems. Issues such as sustained fisheries, abrupt climate change and harmful algal blooms are all of enormous importance and represent exciting scientific issues. The present issue of this magazine frames another grand vision—a Census of Marine Life—and it will be a challenge to the reader to place the exciting ideas presented here into perspective. 

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