

Defining Ecosystems

What is an ecosystem? Natural variability: (cloud underwater analogy) -
IMAGINE-

Better and more operational understanding is critically needed! Both the Pew and National Commission on the Ocean clearly articulated the need to adjust management programs to an “ecosystem” approach.

Perhaps most importantly is to make clear that ecosystems exist in a hierarchy of geography and process. This means that we can add up building blocks of ecosystems to larger levels of ecosystems. This is critical from a management perspective in terms of how programs are structured, implemented, and the expectations that are generated.

Although ecosystems by definition are comprehensive not all of the elements within them obey the same spatial or temporal boundaries. The point needs to be recognized, however, that at any point in time there is cohesion of these elements that are working synergistically in a definable geography.

This is critical to define because for operational purposes boundaries must be determined if we are to practically address ecosystems. This must be done with the knowledge that these boundaries are “soft, and dynamic”. In other words, ecosystems and their properties must be recognized to exist in what is called dynamic equilibrium. This means that their boundaries are shifting in time and space over time.—But do have a “general” geography that must be the management focus.

It is also critical that we understand the dynamic nature of these systems over time because many of the programs we construct and the expectations we create, are based upon the idea that ecosystems are relatively static.

Consequently, we are always shocked when the system performs differently than our expectation. A good example of this dynamic equilibrium is the effect of the El Nino phenomena on west coast ecosystems.

But perhaps the paramount point to recognize from a management perspective is that we do not manage ecosystems nor do we manage the behavior of animals within the system. In fact, we only manage the human activities and the extent to which they affect elements of an ecosystem.

So what does ecosystem management really mean? It means that the science and the management activities undertaken are determined specifically based on how the elements on the system will be affected, through their linkages and trophic levels within the ecosystem. If these systematic relationships are not considered explicitly – then you are not taking actions that are ecosystem based. The expectation is always to maintain or achieve an equilibrium in the system that produces the desired characteristics or products and services (uses) of the system.

Unless a practical framework is in place that has the geospatial properties of the system defined including a characterization of the primary drivers and interactions within the system, and a definition of the current or some state of equilibrium to guide the activities to be undertaken (e.g., the suite of management, science, and research), it is hard to say that anything is being done in an ecosystem management framework.

If we are really going to try and describe or explain the concept of ecosystem and ecosystem management, we have to recognize that we have a lot of work to do to define an ecosystem framework within which government programs can be evaluated, organized, or developed.