distributes in vertical zones although it was intervened. There were tropic rain forest, monsoon rain forest, upland rain forest, subtropical evergreen broad-leaf forest, mountainous mossy forest, temperate broad-leaf forest, coniferous and broad-leaf forest, mountainous shrubbery and grassland from the bottom to the top of mountains. Pollen assemblages are well corresponding to the main components of forest in vertical zones. Both of total organic content and magnetic susceptibility in the surface sediments are highest in this subsystem. In the subsystem of channel-floodplain-bank of river, vegetation is characterized by hydrophytes and swamp plantgrass and shrub with scatters of tropical forest. The pollen assemblages in the different reaches reflected that river plays a more important role than wind in pollen dispersal from the upper reaches to the estuarine. In the subsystem of delta plainflats, vegetation includes the swamp forest and mangrove. Pollen assemblages of the surface sediments from this subsystem and the submarine delta can indicate that the hydrodynamic conditions highly co-effects on the pollen distribution with both local and regional vegetations.

In addition, great mounts of bamboo, pine forest and grassland contribute to the major secondary vegetations of those burned forests under which the soil shows the highest magnetic susceptibility. That means the large difference of magnetic susceptibility in the mountainous areas is not only related the vegetation effects but also the human activities with fires. Coherent to the more terrestrial sources, magnetic susceptibility in the channel-floodplain subsystem is also obviousluy higher than that in the flats and the predelta-shelf subsystem.

New foundations for restoration and adaptive management in the Chesapeake Bay watershed

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The thirty-year effort to restore Chesapeake Bay has generated numerous scientific advances and new models for regional management of coastal resources. However, increased pressure on the watershed from a population that now exceeds 16 million residents continues to impair ecosystem health and slow the progress of restoration efforts. Growing frustration on the part of the general public and policymakers has sparked calls for a greater focus on accountability and performance-based adaptive management to justify the large public investment. The scientific and management communities recognize the need for new approaches to address these challenges. Experience suggests that efforts must be better targeted, supported with an appropriate level of funding and administrative infrastructure and linked in an interdisciplinary manner. Among several examples of integrated approaches to management in the Chesapeake watershed, we focus on three specific efforts each is an attempt to build a new foundation for adaptive problem solving in an ecosystem context.

Understanding thresholds. Most scientists acknowledge that the Bay is unlikely to respond to restoration efforts in a simple, predictable manner. Instead, the Bay will cross certain ecological thresholds that may cause quick changes, either for worse or for better. One example of a threshold response is the catalytic growth of underwater grasses in response to improved water clarity. A new initiative has started to bring scientists and managers together to examine such nonlinear or threshold events and to help develop new predictive tools to monitor recovery, manage public expectations, and maintain a clear and confident approach to restoration.

Managing fisheries. Management of economically and ecologically important Bay fisheries has become increasingly more complex. The completion of a fisheries ecosystem plan for Chesapeake Bay has catalyzed an effort to implement regional ecosystem-based fisheries management. Success will depend on strong scientific analyses from a diverse array of participants and stakeholders to provide decision support tools for fisheries managers, tools that integrate factors extending across biological, geographic and socioeconomic boundaries. Success will depend on an inclusive structure that yields credible policy recommendations that managers can translate into tangible actions.

Building local capacity. The success of watershed restoration depends on decision making at the local level. On-the-ground solutions that result in measurable improvements in water quality and wildlife habitat on a small watershed scale will ultimately build the foundation of Baywide restoration. A new initiative is underway to develop a sustained interface between communities and relevant knowledge and technical service providers in the public, non-

profit and academic sectors. The goal of this undertaking is to build needed capacity for land use planning, implementation of best management practices and watershed restoration where it can be most effective.
From the pursuit of a new scientific understanding related to ecological thresholds to a new structure to facilitate ecosystem-based scientific input to fisheries management to capacity building for watershed restoration at the community level, these three efforts are collectively building a new generation of interdisciplinary, adaptive management approaches for the Chesapeake watershed.

Phytoplankton species succession in Tokyo Inner Bay under global warming using experimental microcosm system

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Global Warming is one of the most important environmental problems because of its serious effect on the ecosystem structure including the energy flow, the material circulation and the biological interaction. IPCC reported in 2007 that 40% of all wildlife species on the earth will exterminate with 4℃ increasing in atmospheric temperature. However, the basic information for the relationship between Global Warming and biological species succession in aquifer has not been enough to establish the countermeasure in both academic and administrative. For this reason, the experimental data is much important to be obtained sooner and numerously.
This study was conducted to investigate the effect of temperature on microbial community structure, especially phytoplankton flora which plays important roles on aquatic ecosystem as primary producer, using the experimental flask-size microcosm system. The experimental microcosm system is filled with sea water and sediment that sampled in spring season from Funabashi port in Tokyo Inner Bay, Japan. The glass culture vessel is 480 ml volume, and was pored 100 g(w/w) of sediment and 380 ml of sea water. that contains nutrient salts and zoo and phytoplankton. The microcosm culturing was conducted under 20,000 lux(L/D=12/12 hr.), without stirring, and the incubate temperature was set up to 10℃ (lower), 20℃ (usual) and 30℃ (higher). Quantity and quality analysis of phytoplankton was conducted with microscopic observation for 60days culturing period.
The results obtained can be concluded as follows;
1) The dominant species was different in each temperature condition within the same sea water, and water bloom (red tide) was observed under high temperature conditions.
2) Heterocapsa rotundata, Thalassiosira spp.and Skeletonema costatum, some of which produce toxic matter, were dominant under high temperature conditions, and the possibility of occurrences of some trouble was suggested in water use for human society.
3) The common species of phytoplankton such as Skeletonema costatum in each microcosm indicated high specific growth rate in high temperature conditions.
4) Bio-diversity was lower in both high and low temperature conditions from the viewpoint of the Shannon Index (H’) analysis.
5) Temperature increasing influences to ecosystem structure as same as temperature decreasing from the viewpoint of the Nomura-Simpson’s coefficient (NSC) analysis.

Effects of climate change on long-term and seasonal variations of the water temperature in Seto Inland Sea

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The Seto Inland Sea (SIS) located in the western part of Japan is connected to the western Pacific Ocean through two channels: Bungo Channel in the west and Kii Channel in the east. The meteorological and oceanographic data with high temporal (~monthly) and spatial (~km) resolutions have been collected over the past few decades around the SIS. To assess the impacts of climate change on the coastal sea, the spatial and temporal variations of air and water temperatures around SIS were examined by historical data and numerical model. The air temperature has increased about 1-2° C due to the global warming and progress of urbanization irrespective of the season. On the other hand, the long-term variation of water temperature in SIS has the seasonal dependence over the past 29 years (1972-2000). The water temperature has positive trends (1~3° C) during autumn-winter and negative trends (-1~-3° C) in spring-summer at the surface and the