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Review: Payments for watershed services in coastal regions: not *whether* but *when* - and the cost of delay

When Katrina struck the Gulf coast of Louisiana and Mississippi, there was no lack of scientific information, timely warnings, public awareness, or even response plans. These included not only immediate plans for disaster relief from the long anticipated consequences of the loss of coastal wetlands and barrier islands, but also a long-term plan for restoration (see Coast 2050 1998 and LCA 2004). Lacking, however, were the financial resources, institutional capacity and political will necessary to implement the response plans. Consequently, the disastrous response to Katrina has exposed links between these coastal wetlands and the economic well being of the entire US, along with other vulnerabilities and social dysfunctions, of which it is only a symptom.

As land loss has accelerated along the region's coastal areas, storm surges and flooding have become almost routine – even in the absence of hurricanes. In the past, these wetlands acted as a buffer against flooding, protecting not only the city of New Orleans from flooding, but also the extensive infrastructure that supports offshore oil and gas operations in the Gulf of Mexico, as well as key ports. Even in their depleted condition these wetlands support 20% of US commercial fishery production and during hard times in particular, make a significant contribution to the livelihoods of the diverse cultures that inhabit this region and who, themselves, have made significant contributions to national and global cultural heritage (Gramling, 2005).

The loss of 1,900 square miles (4,900 square km) of these wetlands since the 1930s is not so much a result of the actions of individual landowners, but of the extensive flood protection structures (or 'levees'), over 8,000 miles of canals - built to support offshore oil and gas operations and shipping, as well as subsidence. The levees increase vulnerability to flooding by preventing the deposit of sediment in coastal floodplain areas that would otherwise form coastal land. Other sources of vulnerability are changes in climate that have led to a rising sea level and, most likely, to an increase in the intensity of hurricanes (Kerr 2005). Poverty is a further source of vulnerability which has limited response options.

The people of Southern Louisiana – approximately 540,000 or 15% of whom have a fishing license, are keenly aware of the services provided by coastal wetlands. Over the past decade, there has been a concerted effort by scientists, environmental groups, business leaders, local and national government agencies and citizens of the region, to develop a comprehensive and scientifically sound plan for coastal restoration. Long before the hurricane, local public officials and newspaper headlines warned that it would be necessary to “pay now or later” and to either “repair the marshland or rebuild New Orleans” based on this \$14 billion plan for which funds were urgently requested over a 10 year period. These funds would probably not have entirely eliminated the damages caused by Katrina, but together with additional funds that were requested for levee improvements and other structural measures, they may have proven a bargain in light of the consequences. Recognizing the inadequacy of piecemeal approaches to the restoration of these wetlands, there have also been calls for Louisiana and other coastal states to receive a 50% share of the revenue from offshore oil and gas operations adjacent to their coast. By a constitutional amendment passed last June, the Louisiana legislature now requires all new revenues that might be obtained from offshore oil and gas extraction to be placed into a trust fund for this purpose (PACE 2005).

Such a policy would also go a long way towards addressing a root cause of the disastrous response to Katrina – a policy that placed the burden of response on individuals and local governments, without giving them also a constitutional right to the benefits of natural resource extraction. As an independent stream of revenue, these funds could also be used to reduce vulnerability by building local capacity to respond to extreme and hazardous events. However, achieving this will require more than innovative payment arrangements. The sale of leases for offshore oil and gas exploration and development is the second most significant source of US government revenue after the federal income tax, and provides a basis for government revenue projections and policy decisions before they are even sold.

Events such as Katrina – and also the South Asian Tsunami – may lead to greater value being placed on the supporting services of watersheds that maintain coastal areas, or *indirect values*, rather than only on the more direct and tangible values such as freshwater and recreation. However, overcoming value conflicts over inevitable trade-offs will require a comprehensive strategy addressing both the political and technical challenges of maintaining and restoring ecosystem services.

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Books:

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Tidwell, Mike (2004) *Bayou Farewell : The Rich Life and Tragic Death of Louisiana's Cajun Coast*. Vintage Press

Other links:

[America's Wetland](#) – provides an up to date collection of news articles.

[Hurricanes, Climate, and Katrina](#): A selection of past *Science* articles related to hurricanes, coastal disasters, and disaster policy are being made available free of charge by Science and its publisher, the AAAS.

For a history of coastal restoration efforts in Louisiana by the Federal government, see the presentation of US Senator Mary Landrieu, [Louisiana's Coastline: Federal Initiatives to Save Our Coast](#). Friday June 2, 2005.

New Orleans and Hurricanes was also the subject of an Environmental Science Seminar Series hosted by the American Meteorological Society, held 6-19-05 in Washington DC. Presenters included Mary Landrieu, US Senator from Louisiana, Thomas Knutson, a Research Scientist at the NOAA Geophysical Fluid Dynamics Laboratory, and Shirley Laska, Director of the Center for Hazards Assessment, Response and Technology and Professor of Sociology at the University of New Orleans. Highlights of the presentations can be found [here](#)

For further discussion of whether there are links between [hurricanes and global warming](#), see www.realclimate.org

For a sampling of the musical heritage of Southern Louisiana - much of which is related to the 1927 flood – and its contribution to American music, there is a series of audio programs, *Down in the Flood*, that can be downloaded from www.highwatereverywhere.com

Announcements:

PDFs from the previously mentioned Special Issue of *Agriculture Ecosystems and Environment: Environmental Services and Land Use Change: Bridging the Gap between Policy and Research in Southeast Asia*. Tomich, TP, van Noordwijk, M, and Thomas, DE eds., Vol. 104/1 (2004), can now be downloaded from: <http://www.asb.cgiar.org/AgEE.htm>

UNECE Seminar on Environmental Services and Financing for the Protection and Sustainable Use of Ecosystems. (Geneva, 10-11 October 2005) UN Economic and Social Council, Economic Commission for Europe, Meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. The seminar is a follow-up to the Seminar on the Role of Ecosystems as Water Suppliers (December 2004), in which governmental officials, experts from international organizations, non-governmental organizations and the private sector highlighted the role of water-related ecosystems (wetlands and forests) in water management and made recommendations for an effective implementation of the ecosystem approach. This

Seminar will be organized around three major themes: valuing ecosystem services, legal and contractual aspects, and challenges for implementation. The Seminar is organized by the UNECE secretariat of the Water Convention and the Swiss Agency for the Environment, Forests and Landscape, in close cooperation with the World Conservation Union (IUCN) and the secretariat of the 1971 Ramsar Convention on Wetlands. Cooperation has also been sought with the UNECE Timber Committee, the Food and Agriculture Organization of the United Nations (FAO) and the Ministerial Conference on the Protection of Forests in Europe (MCPFE).

Further information on the seminar is available at http://www.unece.org/env/water/meetings/payment_ecosystems/seminar.htm.

About the Flows Bulletin

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