Report of Breakout Groups
CREST Symposium April 2005

The CREST Symposium "Progress in Understanding Coastal Land Loss and Restoration in
Louisiana: The W. Alton Jones Foundation Report Revisited," was held in Lafayette, LA in
April 2005. Included in the symposium was a session entitled "Setting the Science Agenda." The
aim
of the session was to set an agenda for science as applied to coastal restoration along the northern
Gulf coast, which can be used to frame a strategic plan for CREST and other similar programs.

The session began with introductory remarks by John Day (LSU; in his role of Chair of the
National Technical Review Committee panel reporting on the Louisiana Coastal Area (LCA)
proposal), and Jean Cowan (Louisiana Dept. of Natural Resources) on the need for more science
within the LCA. These introductory remarks were followed by a series of breakout sessions, led
by Virginia Burkett, Doug Meffert and Bill Nuttle. The breakout groups brainstormed
outstanding scientific questions relating to coastal restoration science, and each group finished
by identifying the three most important research topics. They then reported back to a plenary
session, after which a panel of agency representatives, made up of Jean Cowan (LA DNR), Mike
Liffmann (LA Sea Grant), Tim Axtman (USACE) and Leah Bray (MS Dept. Marine Resources)
responded.

The consolidated report from the meeting is presented below. There was considerable overlap
between the three groups, although sometimes with different emphasis. The top-ranked
suggestions of the three groups are combined under the "First priority" heading; additional topics
suggested by the groups are grouped according to topic under "Other topics suggested."
Although the three groups put their priority suggestions in order of perceived importance, the list
below does not rank the topics.

First priority:
1. Prediction of elevation change before and after restoration
    We still know little about subsidence rates – what controls them (spatially and emporally)
    and how do we monitor them with a suite of consistent measurements? How do these
    rates depend on/interact with sea level rise? Can we determine the relative importance of
    subsidence and faulting and use the information to predict future changes? Is erosion or
    subsidence a bigger problem? After restoration, we need to be able to predict likely
    changes from both the method used to restore the area (e.g., slurry pumping, diversions)
    and by site characteristics (e.g., terracing, barrier island nourishment).

2. Support for topical workshops that will examine critically assumptions and conceptual
    models in project design
    The CWPPRA and other restoration programs in Louisiana and Mississippi have resulted
    in a large number of completed projects. Workshops should consider questions such as:
    What have we learned from these projects that could influence the design of future
    projects in the region? How can we ensure feedback from monitoring into adaptive
    management? Did the design and application of conceptual models facilitate project
    assessment? Did the operational predictions agree with the observations, and did any
    physical structures operate as planned? Was the predicted land gain observed? How can
    we include biological performance indicators?

3. Metrics for assessing restoration project performance (i.e., criteria for evaluating project
    success and sustainability)
    At present, there is a lack of both quantitative and qualitative methods that allow us to
    determine whether restoration activities have been a success. This lack applies to many of

the more commonly used techniques, including the effectiveness of barrier island restoration as applied especially to land building, hydrologic restoration, shoreline stabilization, terracing and other techniques for reducing coastal land loss. Although monitoring is a requirement of all restoration projects, are we actually continuing the monitoring for long enough and examining the correct parameters? On the biological side, can we, for example, forecast successfully the effects of diversions on fishery production, and if not, can we make use of adaptive management to operate diversion structures successfully to both restore estuarine areas and benefit coastal fisheries?

4. Social aspects of coastal restoration
There is a need to improve the public's acceptance and trust of restoration plans. This mistrust to a large extent stems from a lack of available information, particularly during the early planning phases of projects, and could be improved by making more use of local extension services, for example. There is also a need to develop tools and approaches for assessing public understanding (examples include polling, the use of cultural brokers and librarians, and the identification of other agents of change). Similarly, can we identify and compare the risk factors and economic factors associated with different infrastructural components (e.g., roads, levees) on local communities? How do these affect ongoing economic activity, such as fishing, or longer-term strategies such as retreat from the land?

5. Implications of broad regional and global trends on coastal restoration
We tend to consider coastal land loss and restoration as local effects. However, changes at the local level depend, in many cases, on much larger shifts that encompass regional and even national trends. How do global change, demographic trends, energy development, and other processes external to the coast affect restoration and protection? What are the likely future demands on our coasts in terms of land use and development, and are they sustainable?

Other topics suggested:
Monitoring
- There is a need for annual surveys of the coastal area for aerial photography; the data should be archived and made available for public access even if these images are not examined by federal or state agencies. (This could be a pilot project for the LCA.)
- It should be mandated that CRMS monitoring sites are included in any restoration projects (where applicable).

Economics
- A comparison should be undertaken of the economics of completing one large project as opposed to several smaller projects (which is more efficient both economically and from an engineering viewpoint?).

Wetlands
- Studies are needed on the effects of varying hydroperiod and nutrient loading on productivity and community composition as a function of marsh type.
- There is a need to establish design and construction/operational criteria for marsh creation - are marshes best sustained by active or passive activities?
- Given that resources such as sediment are limited, what is the initial priority to ensure the long-term function of restored areas? Is it determined by e.g., increasing available land area or by concentrating on downstream components such as increased fish production? Or can we consider both?
- Do we understand the demand for e.g., sediment well enough to be able to make sensible use of the available supply?

<u>Restoration methods</u>
- Rather than the piecemeal projects funded at present, there should be comprehensive, interdisciplinary studies of freshwater diversions – from physics to socioeconomics, including communication, collaboration and outreach.
- What are the most effective approaches for protecting and restoring the Chenier Plain?
- There is a need for an in-depth look at barrier island restoration research (design-specific guidance and analysis of the relative contribution of barrier island stabilization to inland flooding and coastal wetland loss)

<u>Coastal forests</u>
- What is the fate of coastal forests? Is regeneration adequate for sustainability? Are there differences in futures of managed versus natural stands? Are there incentives that might be implemented to encourage land owners to conserve coastal forest resources?

Discussion

M. Liffmann (Louisiana Sea Grant)
Liffmann pointed out that many of the items listed by the brainstorm groups fit into the Sea Grant plan; this includes such topics as fisheries, wetlands, water quality/resources, and public policy). He stated also that Sea Grant has an extensive network of extension agents, who could be used to help spread information on the results of restoration projects. There remains a need for Sea Grant, CREST, the Governor's Office, and other groups funding coastal restoration research to continue to interact to ensure "the biggest bang for the buck."

T. Axtman (USACE)
Axtman is the liaison between the New Orleans District and the LCA planners. He pointed out that we must ensure that the LCA S&T Office is used to get major restoration projects funded, and was a little perturbed that the list of suggestions seemed to concentrate on outstanding information requirements. He stated that he sees a need for getting more involved with the social side of restoration, especially if we are looking at a 20-30 year timeline. This requires outreach to the public and will need to focus on land use issues. This then brings in the whole question of how sea level rise in the longer term will affect dredging and other aspects of local infrastructure.

L. Bray (MS DMR)
Bray is the coastal zone manager for the Mississippi Department of Marine Resources. Much of their work is concerned with beach replenishment and aspects of how the ecosystem responds to outside forcing. She put the question as to how Mississippi and Louisiana can act together so that both can benefit, and so that we can facilitate getting needed projects done. While habitat destruction along river, estuarine and marine boundaries has been a problem, Mississippi is now working towards using "soft" rather than "hard" (e.g., rocks, pilings) boundaries for restoration projects.

J. Cowan (LA DNR)
Cowan, as a coastal zone manager in Louisiana, questioned how we should decide when enough is enough, i.e., how much research is really necessary to allow us to make sensible decisions on restoration projects. Is that last 5% of information (which will likely cost 50% of any given project) really that important? She felt that one of the fundamental gaps is looking at the impact of not doing any restoration, and asked what other techniques are out there that we should be looking at.

M. Liffmann
Liffmann pointed out that there are a lot of social issues that we need to confront now, and that these cannot wait for another 10 years. In particular, this included such aspects as population

changes and their associated infrastructure demands. Additionally, here are legal implications to not doing anything; what, for example, is the legal liability if e.g., roads are abandoned?

M. Davis (Coalition for the Restoration of Coastal Louisiana)
Davis suggested that the necessary sense of urgency has not yet sunk in as far as many government agencies and NGOs are concerned. He asked if CREST and other similar groups could be used to increase the rate of restoration activity.

E. Turner (LSU)
Turner suggested that he believes the sense of urgency is there within the organizations considered by Davis, but that because so much is riding on a few large projects, these carry both an increased risk of failure and an increased time to come to fruition. He asked whether it might be better to put together a list of smaller projects that can be carried out faster and cheaper, with less risk to the system if one fails.

J. Nyman (LSU Ag. Center)
Nyman agreed with Turner on the subject of large projects, and pointed out that this was particularly the case when one compares projects in the delta with projects elsewhere, However, the initial list of projects for the LCA does not include any work outside the delta region.

B. Good (LA Geological Survey)
Good suggested that coastal issues stemming from regulatory concerns could provide a more valuable source of subject matter for coastal research efforts than is evidenced at present. For example, in many respects, issues such as those associated with proposed enlargements of navigation channels, increased freshwater withdrawals from the coastal areas for municipal and agricultural uses, and the fate of logged swamps are similar to and could be synergistic with research done to support restoration efforts.

V. Burkett (USGS, Lafayette)
Burkett stated that she had recently attended a meeting of an IPCC group, where attendees were shown a new tool for simulating the effects of sea level rise (SIMCLIM; available free from www.simclim.com). This tool consists of a model that incorporates the latest sea level rise estimates, and can be used to simulate likely sea level changes to be expected over the next 50 years under varying climatic forcing conditions.