

MINUTES
CHIEF OF ENGINEERS ENVIRONMENTAL ADVISORY BOARD
October 29, 2010
Coral Gables, Florida

1. CALL TORDER

The Chief of Engineers, **LTG Robert L. Van Antwerp**, called the Environmental Advisory Board (EAB) to order at 0900, hours, 29 October 2010 at Westin Colonnade, Coral Gables, Florida 33134. The following EAB members were present:

- Dr. Richard F. Ambrose**, Director of the Environmental Science and Engineering Program and Professor, Department of Environmental Health Sciences, University of California at Los Angeles;
- Mr. Terry Cook**, EAB Vice-Chair, State Director, Kentucky Chapter of the Nature Conservancy;
- Dr. Christopher I. Goddard**, Executive Director of the Great Lakes Fisheries Commission;
- Dr. William L. Graf**, Foundation University Professor and Chair, Department of Geography; Interim Associate Dean for Research, College of Arts and Science, University of South Carolina;
- Mr. Robert S. Joe**, Special Projects Manager (Retired), Metropolitan Water District of Southern California;
- Dr. James E. Kundell**, EAB Chair, Professor Emeritus and Director of the Environmental Policy Program (Retired), Vinson Institute of Government, Professor Emeritus, Odum School of Ecology, University of Georgia;
- Dr. Denise J. Reed**, Professor, Department of Earth and Environmental Sciences, University of New Orleans; and,
- Dr. William W. Walker**, Executive Director, Mississippi Department of Marine Resources

Also present were **MG William Grisoli**, Deputy Commanding General for Civil and Emergency Operations; **Mr. Theodore (Tab) Brown**, Chief of Planning and Policy; and **Ms. Rennie Sherman**, Executive Secretary for the EAB.

2. WELCOMING REMARKS AND OPENING DISCUSSION

The Chief of Engineers, **LTG Robert L. Van Antwerp** opened the meeting with welcoming remarks; discussing the importance of the EAB and having leaders in the environmental arena participate. He then introduced the EAB. After his opening remarks, LTG Van Antwerp performed the oath of office for Dr. Ambrose, Mr. Cook, Dr. Goddard and Mr. Joe for their second terms on the Board. LTG Van Antwerp then turned the meeting over to Dr. James E. Kundell, EAB Chair.

Dr. Kundell thanked the Jacksonville District for hosting the EAB meeting and those attending. He then updated the Chief on the actions of the EAB since the last meeting on January 22, 2010, including the previous two days of working sessions. He was very impressed by the immensity of the Everglades during the earlier helicopter tour and the new insights given during the related briefings. Dr. Kundell briefly discussed the key issues considered or reviewed by the EAB including:

- The Chief's response to the Chairman's Letter on the Sustainable Rivers Program, May 19, 2010
- The Chief's response to the Chairman's Letter on Gulf of Mexico Recovery, September 2, 2010
- Climate and Sea Level Change
- Principles and Standards review
- Cumulative Effects
- Invasive Species – including Asian carp
- Sharing knowledge gained

Dr. Kundell then invited the EAB members to make comments.

Mr. Joe commented that there seems to be progress on the Vegetation and Levees issue with a pending guidance letter allowing variance and that some trees can be allowed. Mitigation is still a concern; the guidance letter should include mitigation guidance.

He also pointed out that the Sustainable River Program (SRP) on Green River was a success because of relationships of Louisville District Engineer and the Nature Conservancy. They found authority to make operational changes to move the project forward. The other eight proposed projects will need Corps Headquarters emphasis to work it out without much money or added authority. Mr. Joe suggested that Dr. Graf get the EAB involved with the SRP project on the Bill Williams River.

LTG Van Antwerp responded acknowledging the need to address mitigation guidance in the levee vegetation letter. He expressed surprise that little new authority is needed for Sustainable River Program.

Dr. Graf discussed climate change, saying that the Jacksonville District, working with local partners, is trying to accommodate sea level change with structures at near-coast locations, which is relatively easy to detect and predict; but similar changes are also occurring at interior locations where water is controlled by structures. There is more limited understanding of effects of sea level change related to these structures. He stated that managers must think about and prepare for both immediate and long term effects. Sea level change must not be considered only from the political aspect; science and engineering should not shy away from considering sea level change. He added that climate change is especially important to consider for interior basins, such as the Missouri River, where the reservoirs control sediments.

Regarding the Sustainable Rivers Initiative, it seems we can make great progress with minor tweaks within existing authority. Cooperative effort is the basis for moving forward.

Mr. Cook discussed the Sustainable Rivers Initiative. He met with new Corps commanders during their pre-command training as The Nature Conservancy (TNC) representative during their ½-day session, where he briefly discussed the EAB and the Environmental Operating Principles in addition to NGO cooperation. In September, TNC and Corps Louisville District staff coordinated a joint technical meeting in Louisville, Kentucky and field trip to the Green River to discuss the Sustainable Rivers Initiative. This involved discussion on technical aspects of proposed program measures with academics, river experts from several districts, and Corps Headquarters staff.

Mr. Cook reemphasized the challenge for SRP presented at Louisville meeting. In the first 10 years only 10 SRP projects were initiated; the goal is to have 100 projects in the next 10 years. As a result of the Louisville meeting, the SRP focus will expand to include both water quantity factors and water quality parameters.

Mr. Cook also touched on Mountain-Top Removal Mining, where discussions make obvious the need to consider ways to meet national energy demands without impacting natural resources. There is a consistent need for better science to assess and mitigate cumulative effects of Mountain-Top Removal and other large scale projects.

LTG Van Antwerp acknowledged there are a lot of concerns. The agencies have gone back to individual permits for Mountain-Top Removal Mining and want better mitigation.

Dr. Ambrose said that The birds-eye view of the Everglades during the earlier helicopter tour was great and provided an improved perspective of the immensity and complexity of the system. He discussed Mountain Top Mining and offered it as another type of large complex system. The issue of Cumulative Effects is not only associated with Mountain Top Mining, but many types of bigger projects. He said that how to improve mitigation of stream impacts will be important.

Regarding Climate Change, the Board has had many briefings. Climate change is very complex; aspects include changes in precipitation patterns and resultant flow pattern changes. The Corps needs to incorporate climate change in the Regulatory Program. At the very least climate change should be considered for future projects that have adaptive management plans. Permit applicants want fast closure but climate change considerations need to be included in permit evaluations.

LTG Van Antwerp responded that permits are currently based on short point-in-time considerations rather than extended periods. The Corps need to consider this recommendation and how to include climate change in the regulatory process.

Dr. Goddard discussed the Great Lakes, where the Administration has committed to the rehabilitation of Great Lakes ecosystem. The Great Lakes Fisheries Ecosystem Restoration (GLFRS) program is authorized for \$100 million, but the program required a 35% match by stakeholders, which has slowed progress. Now the stakeholders have their 35%, but the Corps has only been appropriated \$12-17 million for Great Lakes Initiative. It is a very protracted process to move projects forward.

Regarding the Asian Carp, 15 years ago the concern was invasive species moving from the Great Lakes into the inland rivers. The Corps built barriers to contain the invasive species. Now the invasion is from the rivers into Great Lakes and problem is even more complex. The complexity of the problem is documented in interbasin studies, studies of the Chicago Waterway and several other studies. Concern for the carp invasion of the Great Lakes is so grave that the White House Council on Environmental Quality has appointed a "Carp Czar". The GLFR Study is enormous and Corps has a key role; the Corps needs to look for ways to expedite the studies, improve the flow of funds, and to implement projects.

Dr. Reed returned to the Mountaintop Mining issue. She stated that the nation has been working under the National Environmental Policy Act and the Clean Water Act for decades but we still struggle with the same key issues: How effective is mitigation? Is mitigation really adequate? How should we address cumulative effects?

Attention is focused on individual projects but issues for many projects in many interrelated areas are not considered. She pointed out that the Regulatory Program has a key role as steward. It is a systemic issue that includes the Gulf Coast and other ecosystems. We do not fully consider the unintended consequences of well as intended actions. We have learned of well intended Everglades actions to move and spread water that have facilitated movement of invasive fish into the Everglades. We are not sure if this risk was considered during project planning; whether a deliberate decision was made that this was an acceptable risk, or whether it was even considered. We (the EAB) are not sure this impact was ever actually considered. The Corps is urged to assure that necessary guidance and adequate support from Corps Headquarters are in place.

Dr. Kundell focused on the rewrite of Principles & Guidelines (P&G)/Standards, stating that the EAB has submitted comments. Comments from the National Academy of Sciences are expected in December, and the EAB is willing to review the draft again after NAS comments are incorporated.

3. SEA LEVEL RISE, SHORE PROTECTION, AND SOUTH FLORIDA

Mr. Glenn Landers, Jacksonville District, presented a Jacksonville District Case Study, giving an overview of forecast climate change concerns related to Everglades Restoration Planning, discussing Corps sea level rise projections for Florida, identifying potential sea level rise impacts on natural and developed areas of South Florida, and outlining interagency efforts to develop enhanced models and other information required for future detailed evaluation of alternative adaptation strategies.

He stated that sea level rise has been variable over geologic time, and it is not just a recent man-induced phenomenon. However, the rate of change is of concern; it has been rising by about 2mm per year for last 5000 years. The change in sea level rise can be more rapid at times, and this relates to changes in glacier melt rates.

The Corps implemented a new Engineer Circular (EC) on considerations of sea-level change (EC 1165-2-211) that applies to *all* phases of Civil Works projects. It does not include regulatory actions. Supporting guidance is also being prepared.

LTG Van Antwerp asked the presenter's opinion of the excluding regulatory functions from the sea level change regulation. Mr. Landers responded that he did not consider this as a good approach. The EC does not have specific time frame or increments to consider but the rollout recommended 20, 50, and 100 year increments. The time frame or increments to consider need to be firmer in the Engineering Regulation. Further, risks and uncertainty analyses need to be incorporated in guidance.. There is a recent trend for sea level rise becoming more apparent, and the trend is for acceleration. The Corps needs to consider changes in a human time frame and build adaptability into projects being designed today. We need to rethink and modify existing projects. Adjusting structures requires lead time and early planning to incorporate future allowance for change is important. Selecting the sites of long term projects in critical areas requires rational consideration.

In Florida, water salt water intrusion is a concern as is the increase in head from landward sources; these changes increase flood risk. Even saltwater washing briefly over surface kills vegetation altering the environs that are now fresh-water based. We need models for rising tail water that can handle both surface and ground water. We need to shift thinking to consider "Mean High High Tide", not just "Mean High Tide". Past interruption of distribution of fresh water into Biscayne Bay by canals is now changing back to sheet flows.

The Comprehensive Everglades Restoration Plan (CERP) is reevaluating projects with consideration of sea level rise. The Corps needs to be sure new P & G includes consideration of sea level rise. Climate change impacts all Corps Mission areas.

QUESTIONS AND DISCUSSION

Dr. Reed indicated that the earlier EC says "consider" sea level change in design of projects then the later version shifts to "may". How much difference is this change of emphasis making?
Lander's response: The National Park Service allows for natural shoreline retreat.

Dr. Reed, in response, said one can absorb shift within the project foot print? Considering sea level change takes more than looking at the In Progress Report and "justifying" the design. We have discussed spreader canals that show the consequences of this approach. Will we do anything different based on what we should have learned? We see one in construction without much, if any, consideration of sea level change in the design and another example where structures allow for a two-foot rise.

Dr. Graf indicted that there are interesting implications for CERP, that of rising base level for interior that will result from sea level rise. What are upstream consequences, and how are these changes to be addressed? Dr. Graf asked if precipitation shifts are a concern.

Dr. Kundell said that sea level change is happening. We need to get this across to the public. We need to show that we are seeing shifts in our lifetime. Dr. Obeysekera's presentation (which the Board had a briefing on earlier) can show these changes. There will be effects of storms on top of tropical surges on top of sea level rise. These changes will especially effect flooding and flood insurance. Will FEMA allow rebuilding in damaged areas?

Dr. Graf said that those in engineering and science need to outline that climate change and sea level change really are happening and display the consequences of implementing one alternative based on the assumption there will be no climate change or sea level change versus another alternative that assumes climate change or sea level change. The trends show climate change and sea level change is happening, it's the rate at which they are happening that is arguable. Whatever the rate we use it will require new planning approaches for the long term conditions.

Dr. Reed offered that we need non-academics to make the point that climate change and sea level changes are really happening. The current Sea Level Change EC will expire and a revision [the ER] will then be coming out. There is an ongoing West Coast Study that is due out late next year [2011] that will include new National Research Council sea level change curves for the west coast. Issuance of the new guidance [ER] should be coordinated with the release of the new study so the new ER will have the latest National Research Council information. She added that cold current changes will mean that our knowledge will be continuously evolving.

Mr. Brown responded that we can make adjustments to extend the current EC and allow the new ER to include current science.

4. CLIMATE CHANGE, VARIABILITY, AND WATER RESOURCES MANAGEMENT IN SOUTH FLORIDA

Dr. Jayantha Obeysekera, Department Director, Hydrologic & Environmental Systems Modeling, South Florida Water Management District said that a large number of models are available, and that many of these models are based stationarity. However, stationarity is no longer an acceptable assumption. There are two distinct questions to address; short-term effects of climate change and the long-term effects. Climate change drivers include natural cycles and man-induced factors, interactions of the natural and man-induced factors, and the landscape. One must consider predictable extremes such as impacts of unusually heavy precipitation at the high high tide, rather than the same precipitation at mean high tide. He said that whether man or nature has the greater impact varies with location and "variability will be the pattern" and decadal shifts will likely repeat in the future. Sea level rise is not constant. The South Florida Water Management District and many other agencies are focusing on the +50-years level in their planning. He also said that downscaling is "not there yet"; this is where adaptive management can be used to address changes. He also said that hurricanes have a natural variability that is more of a factor than global warming. He basically suggests a "no regret strategy."

QUESTIONS AND DISCUSSION

Dr. Reed commented that this brings home that for different projects it may be more complex than just sea level rise. Is there any effort to evaluate altered runoff capacity, etc?

Mr. Brown responded that there are Research and Development efforts but there is nothing in the current plan for evaluation processes. **Ms Sherman** responded that the Corps is looking at pilot studies.

Dr. Reed suggested that Mississippi droughts, interior floods, and sea level change may all be interrelated.

LTG Van Antwerp said that historically, the Corps' efforts are to get and keep water in the channel. We need to look at the effects of extreme events such as the increased sediment distribution in rivers and salt water intrusion into fresh water systems.

Dr. Reed, in turn, offered that low water periods may also result in major changes. Study considerations must bracket the extreme situations. We need to look at raising awareness related to all extremes.

Dr. Obeysekera identified low land levees near sea levels having the greatest increased risk from sea level change. He indicated that the Sacramento River levees are such an example.

Mr. Brown said the Corps does consider it but struggles with how to deal with the various projected rates of change as they relate to alternative designs and evaluations.

Dr. Graf added that we also need to consider that rivers carry sediments and nutrients into reservoirs. Bigger swings in flow will impact reservoir capacity along with sediment chemistry. Thus, we need to look and think more expansively.

Mr. Cook suggested that adaptability flows is important. Sustainability flow operations may allow improve stream capacity by natural processes. In all models there is some uncertainty in predictability. Are we looking at seasonality of precipitation, that is, when it is delivered, such as snow or rain?

Dr. Obeysekera responded that long trends are a bit better, but we are not ready to look at seasonality for planning. We are not seeing the patterns needed for trend predictions. We have some regional NOAA models to use in terms of extremes.

LTG Van Antwerp pointed out that South Florida Water Management District is now looking out at 2060. Then he asked if they are looking out beyond 2060 and at increments between now and 2060.

Dr. Obeysekera replied that most projects the District do look at 50 year as a primary point of reference, but the District is also looking at smaller and larger increments. This is an ongoing discussion.

Dr. Kundell said that the horizon is a curve. If there is an error we should want it towards the high end rather than be too low.

Dr. Obeysekera replied that counties do not want to look too far into the future or at too high predictions. They want to consider far more certain/likely plans since more robust designs cost more and money is very tight now.

5. PUBLIC COMMENTS

There were no public comments.

6. CLOSING REMARKS AND ADJOURNMENT

Dr. Kundell thanked the Jacksonville District and other Corps staff for helping put together the EAB meeting. He then turned the floor back to **LTG Van Antwerp**.

LTG Van Antwerp concluded that among the many take away points it is clear we need to look more at cumulative effects of all projects and not just the mountain top mining projects. He further concluded that climate change and the resultant changes to the environment need to be considered at the more extreme ends and not just the median ranges.

LTG Van Antwerp called for comments from around the table.

MG Grisoli said that he enjoyed the session and the opportunity to learn and he looks forward to future discussions. He said it would be a big challenge to incorporate all this information into the plan formulation process and get the changes institutionalized. It is pretty clear the issues are more than just Sea Level Change. He said that he looked forward to potential interaction with the Corps Coastal Engineering Research Board.

LTG Van Antwerp thanked the Board members, the presenters, and the audience for attending and participating. He then adjourned the meeting.