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Lessons learned: An assessment of the effectiveness of a National Technical Review Committee for oversight of the plan for the restoration of the Mississippi Delta

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Abstract

This paper presents lessons learned about the function of a national review Committee (National Technical Review Committee—NTRC) for a major U.S. Corps of Engineers water resources study, the Louisiana Coastal Area Study (the restoration of the Mississippi Delta). Lessons learned are based on responses to five questions to the NTRC. What was the best thing about the experience? What was the worst thing about the experience? What one thing was not done that should have been done? What is the most important lesson for similar future committees? Are there any other lessons? Several important cross-cutting themes were recommended for future national review groups: (1) a national review group adds value and (2) the Corps must early on think through the structure, process and use of the review group, including: the group's purpose, the degree of independence or interaction, treatment of Committee members, the use of the group's comments, scheduling of group activities, and needs to support the group. While the NTRC found much that should lead to improvements for future groups, it strongly recommends

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that seeking top professional advice during the course of study is appropriate for the Corps. Committee members found their experiences to be professionally and personally rewarding.

Keywords: Mississippi Delta; Coastal restoration; Technical oversight review; U.S. Army Corps of Engineers

1. Introduction

This paper presents the lessons that 10 scientists and engineers learned about the function of a national review Committee for a major U.S. Army Corps of Engineers water resources study. The study was the Louisiana Coastal Area Study (the restoration of the Mississippi Delta) and the Committee was the National Technical Review Committee. The Committee members hope that these lessons will enlighten and provide advice to future members of similar committees, team members and others who participate in Corps' studies, as well as people interested in review of comprehensive, complex, controversial studies of our nation's natural resources and infrastructure.

This paper is organized in three sections. This introductory section describes the paper's purpose, and provides a brief overview of the Coastal Louisiana Area study, the National Technical Review Committee and the methodology and organization for this paper. The next section presents the lessons learned in response to each of the five survey questions. The final section summarizes the key lesson themes that emerged across all the survey questions.

1.1. Background

Through its Civil Works program, the U.S. Army Corps of Engineers plans, designs and constructs projects to reduce flood damages, improve commercial navigation, restore degraded ecosystems and manage the nation's water and related land resources. If, during the initial planning phase, a feasible and justified project to solve a water problem is identified, the Corps prepares a report that will eventually be sent to the United States Congress requesting approval to implement the project.

Corps' reports have a long history of undergoing various reviews as they are prepared and work their way to the Congress. In recent years, various interests have advocated independent peer reviews of Corps' reports by unbiased external experts, and this view has been included in proposed legislation affecting the Corps. Congress included a requirement in the Water Resources Development Act of 2000 for the National Academy of Sciences to provide recommendations on the use of peer review in major project assessments. The resulting report on *Review Procedures for Water Resources Project Planning* (NRC, 2002) presents an excellent overview of the history and procedures related to the review of Corps' planning reports. The Council's report also commented on the role of review in the Corps' process:

"Whatever type of review process is implemented within the Corps, the role of review panels should be to identify, evaluate, explain, and comment on key assumptions that underlie technical, economic, and environmental analysis. Review panels should highlight areas of disagreement and controversies to be resolved by the Administration and Congress. A review panel should be given the freedom to comment on those topics it deems relevant to decision makers, leaving it to the recipient of the review to decide whether those issues constitute 'technical' issues or "policy" issues. Review panels should also be able to evaluate whether interpretations of analysis and conclusions based on analysis are reasonable. But review panels should not be tasked to provide a final "thumbs up/thumbs down" judgment on whether a particular alternative from a planning study should be implemented, as the Corps of Engineers is ultimately responsible for this final decision."

In recent years, various interests have advocated independent peer reviews of Corps' reports by unbiased external experts, and this view has been included in proposed legislation affecting the Corps. In September 2003, the United States House of Representatives

approved the Water Resources Development Act of 2003. Among its provisions, the Act establishes a peer review process for Corps' projects. "It sets a US$ 50 million cost threshold for mandatory peer reviews of project studies, with certain discretionary exemption authorities for the Chief of Engineers appealable by a governor or federal or state agency head". Such reviews are to be conducted by a peer review panel and are limited to "scientific and technical matters, not policy or compliance with law. The Chief of Engineers must respond in writing to peer review, but review recommendations are only advisory" (U.S. House of Representatives, 2003).

More recently, in June 2004, the United States Senate introduced its Water Resources Development Act of 2004, which also includes provisions for independent reviews of Corps' studies or reports. The Senate language requires the Inspector General of the Army to convene independent peer review panels to report on "the economic, engineering, and environmental analyses of the project". The Chief of Engineers would be required to prepare a written response to peer review reports (U.S. Senate, 2004). At the time of this writing the Congress has not acted on either the House or Senate bills.

1.2. Louisiana Coastal Area Study

The Louisiana Coastal Area Ecosystem Restoration Study (popularly called the LCA Study) is a major feasibility planning study of coastal Louisiana. The study is being conducted by the U.S. Army Corps of Engineers, New Orleans District and the State of Louisiana, Department of Natural Resources, in partnership with other public agencies and public interests. The study's purpose is to investigate ways to sustain a coastal ecosystem that supports and protects the environment, economy and culture of southern Louisiana and that contributes greatly to the economy and well-being of the nation. More specifically, the LCA seeks to develop a comprehensive management plan to address the extremely high rate of wetland loss that has taken place over the past century (Boesch et al., 1994; Day et al., 2000; Fig. 1). The current feasibility phase of planning was initiated in 1999, and a report was sent to the Congress in late 2004 (Fig. 2). Additional information about the study is available from the study website at www.lca.gov.

1.3. The National Technical Review Committee

The National Technical Review Committee was established in early 2002 by the Corps of Engineers office to "provide an external, independent technical review of the Louisiana Coastal Area Study through a close coordination with the study team. The Committee was composed of nationally recognized scientists and engineers whose areas of expertise covered the range of issues addressed in the LCA study (Table 1). The purpose was to ensure quality and credibility" (U.S. Army Corps of Engineers, 2003). While this initial charge to the Committee clearly focused on a review role, problems arose because the Committee was also asked to provide ongoing comments as the LCA study progressed. This led to questions regarding whether or not the Committee fell under the requirements of the Federal Advisory Committee Act (the Corps eventually determined that it did not). In the end, the NTRC balanced the roles of providing both technical advice and technical review. The tension between advisory and review roles surfaces in the Section 2 of this paper, particularly in discussions about the committee's purpose, lack of responses to Committee comments, and whether the group was independent or interactive.

Table 1
Members, affiliations, and expertise of the National Technical Review Committee

John Day (Chair), Louisiana State University, Coastal Ecology and Management
Donald Bosch, University of Maryland, Estuarine Ecology and Management
Ellis Clairain[a], U.S. Army Corps of Engineers, Wetlands Ecology and Management
William Mitsch, The Ohio State University, Wetlands Ecology and Water Quality
Kenneth Orth[a], U.S. Army Corps of Engineers, Water Resources Planning
Leonard Shabman, Resources for the Future, Resource Economics
Charles Simenstad, University of Washington, Estuarine Fisheries
Bill Streever, BP Exploration, Inc., Anchorage, Alaska, Wetland Ecology and Restoration
Chester Watson, Colorado State University. River Engineering
John Wells, The Virginia Institute of Marine Sciences, Coastal Engineering and Geomorphology
Dennis Whigham, The Smithsonian Institution, Wetlands Ecology and Management

[a] Clairain and Orth are employees of the Corps of Engineers and not technically members of the Committee. However, they participated in all meetings and activity of the Committee.

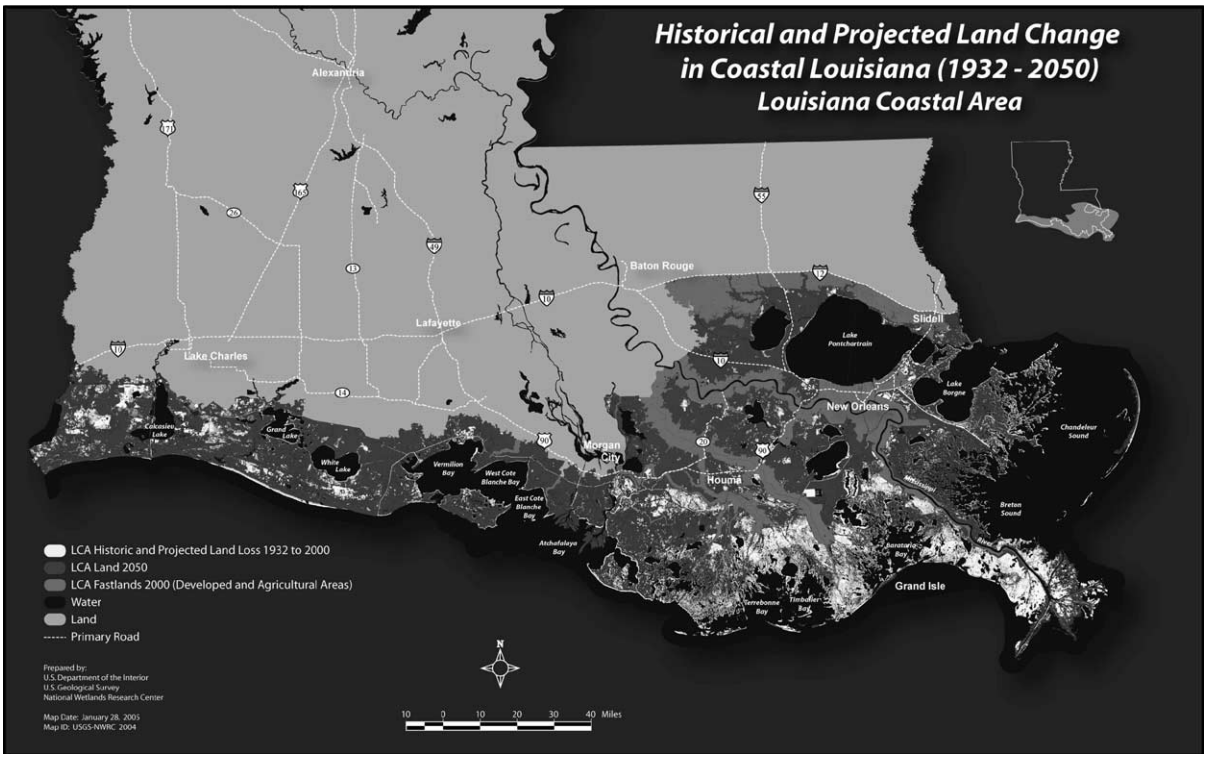

Fig. 1. Historical and projected land change in coastal Louisiana. (*Source:* U.S. Geological Survey, National Wetlands Research Center).

The Committee met nine times at the New Orleans District office (June 10–13, 2002; August 25–28, 2002; January 6–9, 2003; March 10–13, 2003; April 21–24, 2003; July 22–24, 2003; November 4–6, 2003; April 27–29, 2004 and August 16–17, 2004). Each meeting usually consisted of an initial day of briefings to the Committee by Louisiana Coastal Area Study team members and other experts, a day and a half of closed-door sessions for writing and discussion among Committee members, and an out-briefing of the Committee's comments to a study team representative.

During and immediately after each meeting, NTRC members prepared their individual comments that covered a wide range of scientific and engineering issues, including:

- general planning and socioeconomic elements;
- scientific and conceptual bases for restoration and management;
- specific plan elements;
- future trends issues.

The Committee's comments were not intended to represent a consensus of opinion among the different scientists but rather to maintain an open and objective discussion of ideas and suggested courses of action.

Committee members' individual comments were discussed with representatives of the LCA study team at each meeting's out-briefing for immediate consideration in incorporation into the planning process. And, after each meeting, the Committee report was updated to reflect recent discussions. Thus, the report represented a living document through August 2004 when the final NTRC report was presented to the study team (NTRC, 2004a).

1.4. Methodology and organization of the paper

By the time the NTRC had its third meeting the members recognized that the process they were experiencing was resulting in some early successes and opportunities as well as problems and failures. The

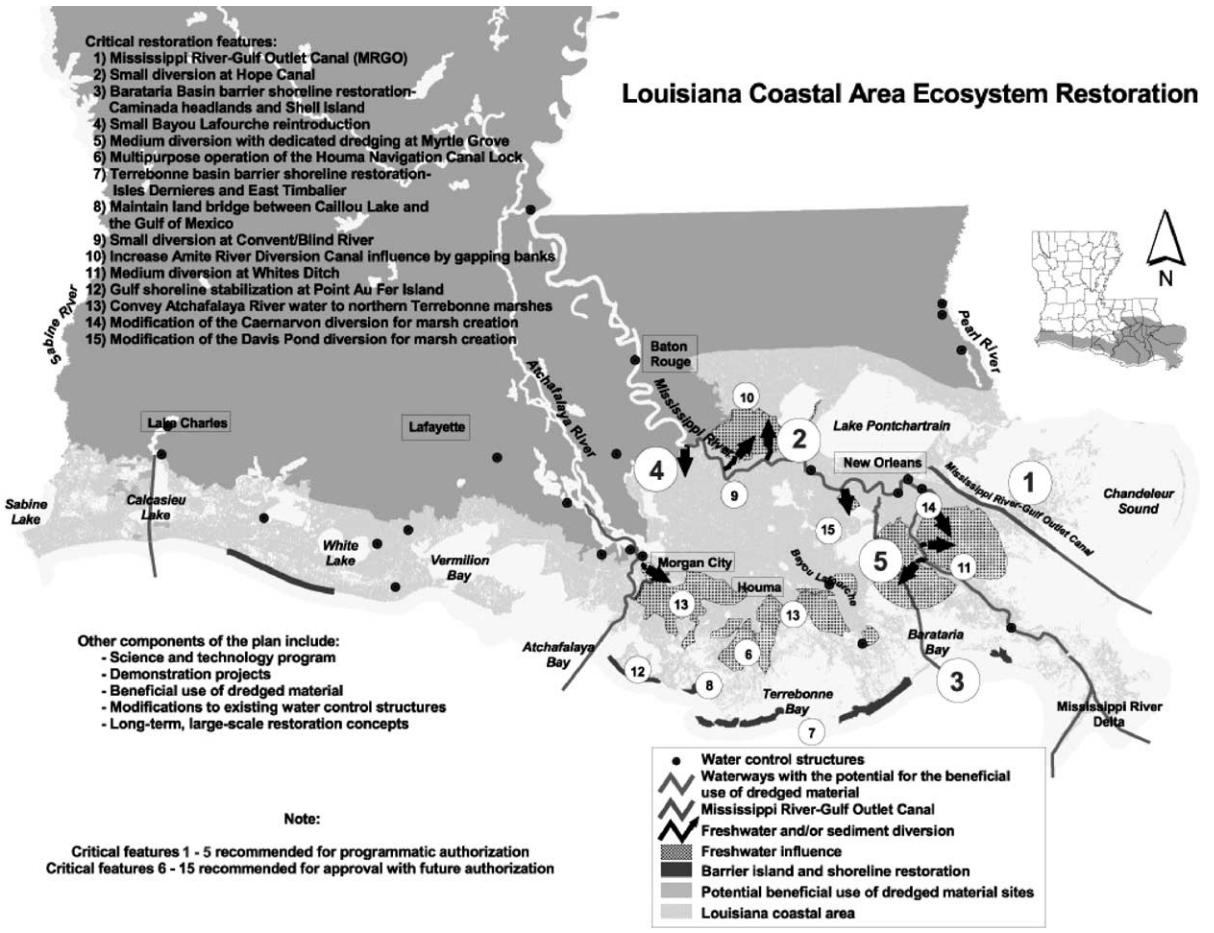

Fig. 2. A map showing the current Louisiana Coastal Area plan for the restoration of the Mississippi Delta. Critical restoration features are specific features including activities such as diversions of river water, beneficial use of dredged material, barrier island restoration, and hydrological restoration. (*Source:* U.S. Army Corps of Engineers, New Orleans District).

Committee agreed that it would be valuable to begin to capture these lessons and document them in a paper that could be useful to future similar committees. In January 2003, Committee members were asked to begin individually documenting the lessons they were learning by responding to a survey of five questions (Table 2).

Committee members submitted their responses between February and July 2003. The responses were analyzed by question and in total to identify recurring themes. An initial draft paper presenting the results was prepared in October 2003 and critiqued during the November 2003 meeting. The draft was

Table 2
Survey questions addressed by the National Technical Review Committee

What has been the best thing about the NTRC experience?
What has been the worst thing about the NTRC experience?
What one thing did the NTRC not do that it should have done?
What is the NTRC's most important lesson learned that it should pass along to future committees that may be similarly involved with a large, complex comprehensive Corps' study?
Please list any other lessons learned from the NTRC experience that you would like to pass along to the Corps and future committees

updated during the summer of 2004 and completed following the August 2004 meeting. This final paper presents a collection of the key lessons learned by the NTRC during its association with the Louisiana Coastal Area Study. The lessons are presented in the member's own words to preserve their original incisive intent.

2. Lessons learned

This section presents the NTRC members' lessons learned in response to each of the five survey questions (Table 2). Not all comments by NTRC members are included below but the comments cited reflect the substance of all comments received. A full listing of Committee comments is presented in the technical report submitted to the Corps (NTRC, 2004b).

2.1. Question #1—What has been the best thing about the NTRC experience?

Committee members' responses sounded two main themes in response to this question: that the NTRC made a difference with the Corps, and that the NTRC was a worthwhile professional and personal experience.

- The Committee made a difference with the Corps.

  "Being in a position to make a potentially material difference *within* the process: It is relatively rare to serve in an independent consultative capacity and find that your collective advice is being seriously considered and even incorporated into the emerging products."

  "I have felt that the overall study has been modified to accommodate at least some of the NTRC comments. In other words, the participation in the NTRC appears to have influenced the scope and quality of the study (although we have yet to see written products so this remains more an assumption than a matter of evidence.)"

  ". . . it seems clear that the NTRC will have some influence on the plan put forward to Congress . . . The very fact that the Corps is attempting to convene something like an NTRC seems promising."
- The Committee was a worthwhile professional and personal experience.

  "I have enjoyed and professionally benefited from the direct access to the technical leadership of this study, as they have led a planning effort for a complex and important topic of national interest. This participation has enhanced my understanding of the difficulty of planning at this scale, while accommodating multiple stakeholders."

  "The most positive aspect of the NTRC experience has been the interaction among such a knowledgeable group of scientists working towards a problem of national significance. NTRC members had their "hearts in it" and were a well-versed and well-prepared group of individuals. I personally learned new information outside my general field of expertise each day of each meeting."

2.2. Question #2—What has been the worst thing about the NTRC experience?

The Committee's responses raised particular concerns about the lack of responses to its comments, and general and specific concerns about the process of conducting the Committee's business. Some Committee members also observed that the Committee's purpose was not clearly defined and that it was engaged too late in the LCA study process.

- Lack of responses to the Committee's comments.

  "The Committee and the Corps should have agreed early in the process on how Committee comments—advice and questions—would be exchanged. When the Committee provided comments, it anticipated Corps reactions and responses, but it was not clear what the Corps did with the Committee's input. There should have been a better understanding and process for writing Committee comments, receiving written Corps' responses, and documenting the Committee's satisfaction with Corps' responses."

  "Lack of explicit feedback on NTRC comments and recommendations: Feedback from the Corps and partners has been exceedingly inconsistent and unspecific."
- The Committee's business process was generally disorganized.

  "In a word, 'disorganization.' While I believe that future efforts such as this one should be more orga-

nized, I recognize that this was one of the first times the Corps has adopted this approach, and with that in mind the apparent lack of organization is not surprising."

"The lack of effective planning for the work that the NTRC would be asked to accomplish. The first two meetings were, in particular, not focused and a lot of time was spent in determining what the tasks of the NTRC would be relative to the LCA planning process."

- The Committee's business process had specific flaws.

  "Committee meetings seemed to be randomly scheduled without any relation to key study events and products. Future meetings should be timed such that the Committee can provide meaningful input to, for example, the study objectives and constraints, the future without-project condition, and the management measures to be considered; and review of key documents such as the draft 905(b) analysis, documents developed for the feasibility scoping meeting and the alternative formulation briefing, and the draft feasibility report."

  "Not a lot of bad experiences but it has been frustrating trying to allocate time to studying the material supplied to us and giving intelligent feedback, given the short time we are paid to be part of this project. The entire committee is a very busy bunch and we have to devote our time to things that may be less interesting but more necessary."

- The Committee's purpose was not clearly defined.

  "In the future, NTRC's should start with clear goals and clear deliverables. If these need to be adjusted along the way, that can occur, but it should only occur for a good reason. Without clear targets, the NTRC was not able to develop a strategy that would best enable them to accomplish specific tasks or objectives, and often the NTRC proceedings appeared to ramble with little purpose."

- The Committee was engaged too late in the study process.

  "Entering the process at an intermediate stage? In such a complex program, that has had much iteration before the Corps' process, it is unclear whether the NTRC could have been involved before some critical steps in the Corps' process had passed."

2.3. Question #3—What one thing did the NTRC not do that it should have done?

Many Committee members responded that more time very early in the process should have been devoted to clearly defining the purpose, business process and other rules about how the Committee would operate. Several members expressed concerns that the Committee should have worked harder at insisting that the Corps pay attention to its advice. Finally, some members commented on other things that the Committee should have done, including: improve the quality of written materials, work in specialty sub-teams of the full Committee and stay engaged between meetings.

- Early and clearly defined the purpose, business process and other rules of the Committee.

  "Clearly define process and sequence of products and timeline: Entry into the NTRC process was aimless. It would have been so much easier if the goals, processes and schedule would have been laid out from the very beginning, instead of the NTRC members having to persistently inquire about 'where we are heading?"

  "The Committee and the Corps should have invested more time during the first meeting discussing the rules of the game, what the Corps and the Committee members expected, how the Committee would conduct business, and other understandings. These and other similar issues surfaced over the course of the Committee's meetings and led to some degree of frustration and missed opportunities as a result of having to fix things as we went along. Early planning will not resolve every conceivable question but it will certainly smooth the process. The Corps and the Committee should have jointly prepared a charter documenting these early understandings."

- Worked harder at insisting that the Corps pay attention to the Committee's comments.

  "Perhaps be more forceful in getting the Corps to respond in a more genuine manner. Insist more on changes we thought necessary."

  "However, at this point I suspect that the NTRC will not succeed in convincing the Corps to bring some of the most pressing planning issues to resolution. As we move along towards the 4th meeting, questions about rationale, feasibility, modeling and decision-

making continue to loom large. If the NTRC is to play an interactive role with the Corps in formulating the LCA Plan, as opposed to simply reviewing and providing recommendations, then the NTRC will probably come up short on where some of those interactions end up leading."

- Other things the Committee should have done.

  "The Corps should have insisted that all written materials should clear an editorial review before circulation. Although the NTRC members and presumably Corps employees assigned to this project were pressed for time, there is no excuse for some of the cryptic writing that was presented to (and presented by) the NTRC. I believe that cryptic reports are worse than no reports, and that if there is not time to write with reasonable clarity then a project such as this should not go forward."

  "Written documents, once released in any form, will be quoted and held as the work of the NTRC. I was unaware that these drafts were being circulated. The unfinished drafts can cause many unforeseen problems, and only finished reports should be circulated."

  "We should have broken into sub-teams to focus on topics where we had the greatest expertise. This would have allowed time to provide comments and us to work on topics between meetings and our input would have been timelier. This would have made sense because we are not an advisory committee, but are rather individuals with particular expertise. There would have been meetings of the whole, but fewer of them."

  "We should have found a way to commit more time (appropriately compensated, as needed) to stay engaged between meetings with each other and with the study leadership.

  "We should have spent at least 20% of our time in the field. How can NTRC members pretend to understand issues when they have not seen sites on the ground?"

2.4. Question #4—What is the NTRC's most important lesson to pass along to any future committee that may be similarly involved with a large, complex, comprehensive Corps' study?

Committee member responses to this question centered on three themes. First, a review group similar to the NTRC is a valuable addition to comprehensive, complex and controversial study such as the LCA Study. Second, both the study team and the review group should think through the groups' business process and issues related to both the group and its process. Third, a review group should be involved and clearly organized very early in the course of a study. Some Committee members also recognized the need to resolve Federal Advisory Committee Act (FACA) questions.

- A review group is a valuable addition to a Corps' study.

  "Value of scientific scrutiny, even if 'internally advisory', in formulating responses to complex problems, such as ecosystem-scale restoration: The NTRC has learned that, if incorporated into the ongoing Corps' General Investigation (GI) process, its most valuable service is identifying and transmitting 'red flags' in underlying hypotheses, assumptions, and strategies."

  "Large, complex, controversial Corps studies should include a committee, based on the NTRC experience, as an integral part of the way in which such studies are conducted. Although such a committee would not be a substitute for independent technical review it is a good vehicle to ensure independent seamless review when, from a practitioner's perspective, it is most helpful—during the course of study rather than after the fact."

- Think through the review group's business process and related issues.

  "I think this kind of effort could be fruitfully organized around the steps in the traditional planning process, recognizing that we need to iterate though that process several times."

  "For those of us who may be asked to be in similar groups in the future, we should, as a group, closely examine the purpose of the Committee and the expectations of the agency calling for Committee formation. The resources available to the Committee and the time required to complete the project must also be closely examined."

  "I remain concerned that our credentials will be used (misused?) to add credibility to the report that is produced. While we may feel that our criticism will be there for all to see, the fact is that the focus will not

be on our comments, and if they are, the study team can plead agency discretion and say we were heard and our views were carefully considered. I have seen this done (without intentional malice) many times. I think that this is inevitable, but the risk that our credibility will be misused is less if we are just listed by name as individual experts offering advice under a loose NTRC umbrella and there is not an NTRC appendix in the larger report."

- A review group should be involved and clearly organized early.

  "Activities such as this should happen much earlier in the planning process. Too many things appeared to be cast in stone by the time this committee was established."

  "The study was not well organized when we were first engaged, and the role we could play had not been well thought out. Initially they assumed we would rank projects they had selected for possible implementation. This was cast out as a role immediately because the NTRC saw that the request to Congress was not going to be an exact replication of the Everglades. In short the frustration was that the district was not sure what it was trying to accomplish and so it was not clear to them how we could best help the effort. That being said, I suspect that our digging in our heels has been in part responsible for helping to clarify the purpose of this phase of the study effort."

- Resolve Federal Advisory Committee Act (FACA) questions.

  "We are not a committee, but a collection of individuals. (as an aside, ambiguity in this regard must be addressed so that FACA issues do not continue to haunt this kind of process)."

2.5. Question #5—Please list any other lessons learned from the NTRC experience that you would like to pass along to the Corps and future committees

A final survey question asked Committee members to identify any other lessons learned that they would like to pass along. Members' responses generally fall into two major categories: lessons concerning the NTRC's business process and lessons concerning the NTRC's membership.

Business process lessons repeated many of the points raised in previous responses, including: to clearly define the Committee's purpose, think through documentation, respond to comments and think through schedule and time. Other lessons are to develop good meeting agenda, provide read-ahead material, agree on whether agreement is needed, and vary the meeting locations. Members also identified many needs for supporting staff, meeting infrastructure and supplies, and break time.

Lessons learned about the NTRC membership generally surfaced here for the first time, and included: who should be on the Committee, appoint a strong chairperson, compensate members fairly, respect members' names, should the Committee be interactive or independent, and educate participants. Many of these points were not mentioned until this final survey question. While members usually agreed on these lessons there were differing opinions about the questions of who should be on the Committee and the degree to which the Committee should interact with the Corps and others, or be independent.

- Process—Clearly define the Committee's purpose

  "The question must be asked (and honestly answered) by the Corps 'for what reason are we establishing this review committee?"'

  "The Corps should have engaged the Committee in a partnership to write a brief, clearly-written charter (mission/purpose/vision statement) that spells out what the Corps expected. This should have been done during the first day of the first meeting."

- Process—Develop good meeting agenda

  "The first order of business for each meeting should be a discussion of the agenda for that meeting, including an explanation of the reasons and purpose for each speaker and topic to be covered."

- Process—Provide read-ahead material

  "Provide sufficient background information *electronically*: Although some of the fundamental technical and informational reports were initially provided to the NTRC, we continually had to encourage the Corps, state and other staff to provide fundamental information for NTRC deliberations. These included background scientific literature that had synopsized the state of the knowledge about (wetland) land loss in the Delta, LCA manage-

ment and planning documents and some preliminary NTRC guidance information. However, information describing the Corps' and local sponsor's plans for developing a comprehensive restoration approach and process was not provided. As a result, the NTRC spent more of the early Committee meetings on understanding the intended process than on content. The NTRC could have focused its attentions much earlier if the Corps would have distributed a CD (or more, as required) to all the Committee members with sufficient time prior to the first meeting for them to become completely up to date."

"Determine what background reading material must be available to committee members and deliver prior to the first meeting."

- Process—Agree on reaching agreement

  "The Committee struggled with whether it should attempt to reach consensus in its findings and comments, or if comments should be presented as the views of individual members. This should be clarified during the first meeting."

  "There is a certain degree of discord in every organization (e.g. clearly the case with the Corps of Engineers at our meetings)."

- Process—Think through documentation and recommendations

  "The Committee struggled with the nature of its report—whether it should be a cumulative, rolling report revised after each meeting, or a diary in which the results of each meeting are separately documented."

  "The Committee should have come to an early agreement on how it intended to document its activities and advice. One option is to document each meeting in a stand-alone set of minutes. Another option—followed by the NTRC—is to have a rolling set of minutes or living report that evolve from one meeting to the next. The Committee should also have reached an early agreement on whether members' names would be associated with individual and specific comments and recommendations."

- Process—Respond to comments

  "Such committees should be independent and responses to committee requests should be required."

- Process—Think through schedule and time

  "From the beginning, the NTRC and the Corps need to cooperatively arrange a full schedule for all meetings, information exchange, and deadlines for input, and a *full* commitment for attendance by each Committee member."

  "When such a Committee is composed largely of academic experts, the Corps should, to the extent practicable, schedule Committee meetings during common academic break and vacation periods to minimize lost class time on the part of those who teach university classes."

- Process—Vary the meeting location

  "The field trip during the first meeting was an essential element in quickly building the Committee's understanding of the problems and potential solutions under consideration by the Corps. There is no substitute for exposure to field conditions, and an early field trip should be required in any future Committee established by the Corps."

  "Meetings should have been held at multiple locations around Louisiana. While it is convenient to work from the Corps District offices, at least some of the NTRC members had limited experience in Louisiana and they would have benefited from site visits and discussions with stakeholders throughout the state."

- Process—How to measure success

  During preparation of the final report NTRC members were asked to suggest metrics that could be used to measure the success of the NTRC. Responses to this question included:

  "The goal is to have a sense that we were listened to and our suggestions thoughtfully considered (even if not adopted). The success metrics I would suggest are about the process and not outcomes: (1) has there been a set of written responses to our written materials within two weeks after the NTRC report is filed?; (2) has there been open discussion in the outbrief with high level senior study leadership?; (3) has there been full participation from the HQ-level members of the vertical team and the state in NTRC deliberations?"

  "If the Corps documented ways in which NTRC comments were used (and not used), each comment could be ranked from 1 (very low influence) to 5 (fundamentally changed the direction of the plan).

These rankings could be compiled as a metric."

- Process—Other comments

  "It is always difficult to coordinate (herd?) an imposing collection of scientists that are, in addition to the NTRC, juggling a plethora of other commitments. But, whether due to the lack of control by the NTRC Chair or just pure lack of interest, the level of attention and participation of NTRC members to the issues at hand has been extremely inconsistent. In the middle of deliberations or even presentations by non-NTRC participants or invitees, it was not uncommon to see NTRC members in the middle of separate, and often loud, conversations or replying to their e-mail. This is more likely the result of taking the advantage of an inattentive operation of the NTRC program and schedule, rather than intent to be disengaged per se. Nonetheless, the *impression* is of being discourteous and uninterested, especially when the NTRC is supposed to be obtaining important information or feedback."

2.6. What one thing that the NTRC did that it should not have done?

- "Value Engineering (VE): It is not evident whether this wasn't a particularly useful application for Value Engineering, was premature, or the person conducting it wasn't effective, is not apparent. But, considerable, critical time was consumed during the first meeting in the VE exercise. As it turns out, the time required establishing the NTRC goals and process wasn't sufficient until subsequent meetings."
- Membership—Who should be on the Committee?

  "The NGO [non-governmental organization] community should be represented on the NTRC."

  "Avoid 'balancing' the NTRC: I do disagree with one recommendation in the existing (3/4/03) draft: "The NGO [non-governmental organizations] community should be represented on the NTRC." The NTRC should be assembled on the basis of technical expertise, *not* representative stakeholders or affiliations. If there is a specialty that is best represented by someone who happens to be in a NGO that is entirely appropriate. But, the composition of the NTRC should not be designed for political balance: there is too much at stake in terms of the scientific and technical expertise required to assess these complex issues."

  "The Corps' included a senior Corps' employee as a member of the Committee. This could have jeopardized the Committee's ability to be independent in the eyes of some outside observers. Corps employees should not be included on such Committees in the future."

  "The NTRC should be more diverse in terms of (a) cultural backgrounds, (b) sex, (c) sector (academic, private, foundation, NGO, government). While I recognize that there is a limited pool of relevant expertise available, even this limited pool was not reflected in the make up of the NTRC; for example, there are many female wetland experts that could have been selected as NTRC members, there are many private sector consultants with very strong practical backgrounds in all aspects of wetland restoration, economics, and engineering, and there are many NGOs that could have provided expertise."
- Membership—Appoint a strong chairperson

  "It is important to appoint (select) a strong committee chair, and to do it early on. It must be clear that the chair is willing and able to devote the time and energy to the task."
- Membership—Compensate members fairly

  "Committee members should be paid commensurate with their level of work. The Corps took great care to select nationally-recognized experts, yet paid only a token honorarium ... While there is a certainly an element of important public service in being a Committee member, there is a need to be fair and to balance that service with reasonable compensation for the quality and extent of work expected of Committee members by the Corps."

  "Also, the lack of sufficient funding resulted in committee members often only putting time into the effort while they were on site."
- Membership—Respect members' names

  "Don't put NTRC in promotional situation: Avoid putting Committee members in position of being advocates/endorsers of political expressions of the aligned restoration initiatives, such as "Restore America's Wetlands!" Keep the NTRC purely technical, and don't ask or assume that the Commit-

tee members can provide such endorsements, even though they may support the concepts."

- Membership—Interactive or independent?

  "There were frequent periods when there was no study team member present during Committee meetings, and valuable discussions and debates among Committee members were not captured and therefore lost from the team. The Corps did not get the full benefit of the Committee's work."

  "Committee members often had the opportunity to speak with study team members outside the formal Committee meetings (in the hallway, over coffee, etc.). These exchanges were often as important as the Committee's formal comments."

  "The Committee should have more opportunities to interact with senior Corps leaders and interests outside the Corps, such as the Framework Development Team."

  "The Committee out briefs at the end of each meeting were strategic events, but they were not attended by senior officials who could have benefited from Committee insights and comments. As a minimum, the District Commander and the senior study and district leadership should have participated in the out briefs."

  "If the NTRC review is to be considered independent, working behind closed doors and in confidence should be encouraged. If it is not an independent review, it should not be presented as an independent review."

- Membership—Educate participants

  "Communication between our committee and the Corps on ecological restoration/engineering was hampered by the fact that, despite its immense talent in conventional engineering, the Corps and its principle engineering consulting firms are quite low on understanding the principles of successful restoration–self-design, adaptive management, etc. Educational institutes are there to help solve on the learning curve but there has been very little opportunity to carry this out. Given that there are now 2 very big restoration projects under the Corps and hundreds of smaller ones, the retraining of the Corps in fundamental techniques is much needed."

  "During the first meeting the Committee should have been given a "Corps 101" presentation to set the context for the study, what the study team was trying to accomplish, and the various internal Corps stakeholders to be involved. Most Committee members were at best only generally familiar with Corps planning procedures, requirements, terminology, etc."

3. Lesson themes across questions

The National Technical Review Committee responses suggest several important themes that cut across the five survey questions, specifically:

- a national review group adds value to a Corps' study;
- the host Corps' office must think through the structure, process and use of a national review group;
- reach an early agreement on the structure, process and use of a national review group.

3.1. A national review group adds value to a Corps' study

Members generally agreed that they believed that the NTRC had made a positive difference in the Louisiana Coastal Area Study. While it may not be practical to establish such a group for all Corps' studies, it is surely a good investment for comprehensive, complex, controversial and highly uncertain studies such as the LCA Study.

"Providing input to the Corps, well ahead of project implementation, of suggested strategies in ecological approaches that will enhance their probabilities of success of the restoration project."

"Value of scientific scrutiny, even if 'internally advisory', in formulating responses to complex problems, such as ecosystem-scale restoration: The NTRC has learned that, if incorporated into the on-going Corps' General Investigation (GI) process, its most valuable service is identifying and transmitting 'red flags' in underlying hypotheses, assumptions, and strategies."

"On-going external, independent scientific review can be an important part of the design and decision making in complex environmental restoration and management. There is a 'middle ground' of intimate involvement in the process and completely detached and dis-

passionate technical review that can be very constructive as well as evaluative."

3.2. The host Corps office must think through the structure, process and use of a National Technical Review Group

While the intent of having a national review group is commendable, the host office must follow it with a substantial amount of the basic work necessary to make the group functional and useful to the Corps. Some of the most important questions that were repeatedly suggested in the NTRC members' responses were: What is the review group's purpose? The Corps' purpose for the NTRC was not at all clear to its members, especially in the early meetings:

"The worst aspect of the NTRC experience has been the decided lack of clarity, especially early on, in the NTRC mission and how it should be accomplished in the time frame that was available. The pathway has not been clear and NTRC members felt that the goals/mission/final products were a moving target . . . At the end of the first meeting, many of us could not answer the simple question 'why are we here?"'

Will the review group be independent or interactive? Although the NTRC members were not unanimous in their comments on this question, most would have preferred a more interactive relationship with the study team and others:

"The Committee faced the fundamental issue of whether it should be independent of the Corps study team, or work closely with the study team . . . The nature of the relationship and expected interactions between the Committee and the Corps should have been clearly and jointly discussed and documented in the Committee's charter."

"Unless there is a reason for confidentiality, arrange for key agency personnel to listen to committee deliberations. Some important elements of the discussions may never make their way into a list of recommendations."

How will review group members be treated? The NTRC was a group of 10 scientific and engineering experts recognized in their respective fields. Most Committee members were from academic institutions. In assembling such groups in the future, the Corps must recognize that members have concerns about things such as their time, their names, and compensation:

"Not a lot of bad experiences but it has been frustrating trying to allocate time to studying the material supplied to us and giving intelligent feedback, given the short time we are paid to be part of this project. The entire committee is a very busy bunch and we have to devote our time to things that may be less interesting but more necessary."

"It was not clear how the Corps intended to use the Committee's work, and, by extension, the good names of the Committee members."

"NTRC members should be paid for their participation. While a generous stipend was offered by the Corps, for those members who did not draw salaries while working on the NTRC the hourly value of the stipend was very low."

What will be done with the review group's comments? Although the NTRC members felt that they were making a positive difference, one of their major frustrations was that they did not understand what became of specific Committee comments that were provided to the study team:

"Lack of explicit feedback on NTRC comments and recommendations: Feedback from the Corps and partners has been exceedingly inconsistent and unspecific."

"When the Committee provided comments it anticipated Corps reactions and responses, but it was not clear what the Corps did with the Committee's input. There should have been a better understanding and process for writing Committee comments, receiving written Corps' responses, and documenting the Committee's satisfaction with Corps' responses."

What is the schedule and timing of review group activities? The NTRC found it difficult to understand the flow of the study's work and decisions, and how its comments played into that flow. Many Committee

members, especially those affiliated with the universities, often had conflicts between the timing of NTRC activities and the demands of their "regular job":

"Committee meetings seemed to be randomly scheduled without any relation to key study events and products."

"From the beginning, the NTRC and the Corps need to cooperatively arrange a full schedule for all meetings, information exchange, and deadlines for input, and a *full* commitment for attendance by each Committee member."

What's needed to support the review group? The NTRC spent too much of its scarce meeting time attending to the details of its own administrative support: exchanging electronic files, learning how to operate audio–visual equipment, returning emails and telephone calls, and so forth. To ensure that it makes the most of valuable meeting time, the host office must fully support a group's needs for support staff, meeting infrastructure, supplies, and agenda breaks:

"The Corps should have provided administrative assistance during the meetings so that Committee members could focus on their assignment."

"I would strongly reinforce the observation that the lack of a dedicated staff person, facilities and services inhibited the NTRC's efficiency. It is difficult to remember just how many times we had to go seek a computer equipment technician just to get the video projection system running for a visiting presentation or NTRC deliberations."

3.3. Reach an early agreement on the structure, process and use of a national review group

This lesson reinforces the previous points about thinking through the structure, process and use of a national review group, and adds "and do it early!" Committee members found numerous examples where earlier actions and decisions may have improved its value to the study. The importance of addressing and resolving questions during, or even before, the first meeting cannot be over-emphasized:

"The Committee and the Corps should have agreed early in the process on how Committee comments—advice and questions—would be exchanged."

"The Committee and the Corps should have invested more time during the first meeting discussing the rules of the game, what the Corps and the Committee members expected, how the Committee would conduct business, and other understandings."

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