Science Evaluation

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Enhancing Opportunities for Beneficial Use of Dredge Sediments

LOCATION

Gulf Coast region - MS, AL, TX

SPONSOR(S)

Mississippi

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

Planning

REVIEWED BY:

DATE:

8 Jan 2015

Best Available Science:

These 6 factors/elements help frame the reviewers answers to A, B and C found in next section:

1. Have the proposal objectives, including methods used, been justified using peer reviewed and/or publicly available information?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Comments

The objective is to determine how to use dredged material for beneficial use in filling in low lying marsh areas. This is what they referred to as best use - BU of material. They have preselected low lying target areas in the three states for using dredged material and described issues to restore in these areas.
There are citations that dredged material can be used for Beneficial use .

The Scientific details of how they would determine the BU are not included in the proposal. Will they use circulation models? which models and why ? Would they examine the composition of the material to determine if it is applicable for land fill and how would this criteria be determined? What locations would the dredged material come from and would this increased dredging impact coastal circulation and erosion and water quality ?

2. If information supporting the proposal does not directly pertain to the Gulf Coast region, are applicant's methods reasonably supported and adaptable to that geographic area?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Comments

The details of how they plan to make a decision for Beneficial Use of dredged material in the targeted location , were not described adequately. They did not describe other geographic areas in which use of dredged material was used.
The data that would be used to make the decision for the BU was not described. The proposal was vague of details of the data required for the decision. Perhaps they are still determining what data is required to meet the objectives.

3. Are the literature sources used to support the proposal accurately and completely cited?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Comments

The sources cited were listed but are limited and the details explaining how they would be applied in the project were vague. Citations simply referenced that "dredged material can be used for land fill." There is little scientific citations on the procedures and methods that would will used to determine if dredged materials can be used for beneficial use. Examples of scientific citations suggested are those that address:
1) Missing citations on how specific circulation models are used in the decisions for dredging

4. Are the literature sources represented in a fair and unbiased manner?

- ◉ YES
- ○ NO
- ○ NEED MORE INFORMATION

Comments

Ok, but didn't have sufficient citations to address possible science issues. The citations addressed the political, needs for restoring land loss and not the science issues required for environmental impacts for beneficial use. The need for restoration is there but the science to address the positive and negative issues is lacking and is required.

5. Does the proposal evaluate uncertainties and risks in the scientific basis for the proposal, including any identified by the public and Council members?

- ○ YES
- ◉ NO
- ○ NEED MORE INFORMATION

Comments

The proposal did is not mention of the risks and uncertainty of using the dredged material at these selected targeted sites. This is a major limitation of the proposal.
The project did not address what are specific research issues that were required to address the uncertainty in achieving their objective. For example, the project's objective could have a "negative" impact on the environment and cause more harm than good. These potential risk areas need to be identified through the science goals to assess the beneficial use BU of

6. Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk that in 5-10 years the project/program will be obsolete or not function as planned given projections of sea level rise?)

- ○ YES
- ◉ NO
- ○ NEED MORE INFORMATION

Comments

A concern is that the risks associated with this project must be identified and a mitigation strategy be defined in the project to monitor and assess risks. This was not addressed adequately in the proposal. A method to monitor the project achievement was not discussed. They mention that previous landfill studies have shown that they have subsided in the last 5 years. There was nothing presented to determine that this process will continue to occur and that land fill using dredged material will subside again. A more positive evaluation of the risk is suggested to determine the uncertainty.

Based on the answers to the previous 6 questions, and giving deference to the sponsor to provide within reason the use of best available science the following three questions can be answered:

A. Has the applicant made a reasonable determination that the proposal is based on science that uses peer-reviewed and publicly available data?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Information Needed:

The proposal uses references that Dredged material can and has been used beneficially, but stops with the details. . However , the basic science questions to answer the beneficial use of dredged material was not stated or addressed. The proposal addressed the need to restore low lying areas with dredged material. The scientific methods to be used to address this goal were not clearly stated and appear to be missing. The proposal suggests that it would determine these issues in the

B. Has the applicant made a reasonable determination that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?

- ○ YES
- ◉ NO
- ○ NEED MORE INFORMATION

Information Needed:

The project is based on need for restoring low lying areas and not as much the science issues. The proposal did not address specifics on how science can maximize the beneficial use of dredge material. It references say it has been done , but the procedures they will used to extend or maximize new science was not addressed .What would they do to apply and extend the

C. Has the applicant made a reasonable determination that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects?

- ○ YES
- ○ NO
- ◉ NEED MORE INFORMATION

Information Needed:

The proposal indicates the use of dredged material has been used before and has been successful. From this standpoint if was reasonable and there are scientific references. However the details and limitations of these citations are not addresses of these procedures. The scientific uncertainties of the project was not discussed in detail and include all aspects of the project uncertainty.
Suggest including, composition of the dredged material to be used is required. What is the subsidence rate of these areas being targeted? How will the areas be topographically surveyed and monitored? How do and will major floods or storms

Science Context Evaluation

A. Have other methods been discussed and reasons provided to why the method is being selected (e.g., scientifically sound; cost-effectiveness)?

The proposal did not suggest alternatives. The idea appears cost effective if it works. A sound scientific criteria needs to be established to determine the beneficial use of dredged materials. The risks to the a well defined approach are required inorder to make it scientifically sound and cost effective. A list of scientific questions is required to outline the project focus and methods that will be used to address the objective. There have been studies on dredging guidlines that are used for disposal

B. Has your agency/vendor/project manager conducted a project/program like the one proposed?

Yes to a certain extent. Although not specially addressing dredged material directly, we have experience in addressing the measurements and methods required to determine a monitoring program that can be used to determine the environmental impact on the beneficial use of dredged materials. Our capability include models, remote sensing, bathymetry charting , and insitu assessments. Additionally, we have the ability to assemble and bring together multiple data sets to demonstrate

C. Is there a risk mitigation plan in place for project objectives? (captures risk measures as defined under best available science by the Comprehensive Plan and Act)

None that I know. I expect a strong relationship with the AMCE is required to assess and extend their capability for assessing dredging in these targeted areas .

D. Does the project/program consider consequences with implementation? (captures risk measures as defined under best available science by the Comprehensive Plan and Act)

The consequences of the project were not identified as stated before. There can be both positive and negative impacts of using dredged materials. Examples were indicated previously including :
1) What are possible changes in coast circulation from dredging and land filling 2) will the composition of the dredged material change the water quality for public and ecological health 3) will the composition of dredged material in a low lying area support vegetation, submerged seagrasses, oyster growth, marsh grasses etc. 4) will these targeted areas being filled

E. Does the project/program have clearly defined goals?

The programs goals were not specifically scientific but were more generic and scientifically vague. As stated previously, how will the project goals of establishing beneficial use of dredged materials be determined? what are the metrics that will be used to determine success or failure of the project. Without some clear guidelines outlining the goals, and how they will reached, the success of the project is in jeopardy.

F. Does the project/program have clearly defined objectives?

The program outlined objectives were general and scientifically vague. Details of the metric and procedures on how they would determine the beneficial use of dredge materials for restoring low lying areas was missing. The proposal appears to be asking what needs to be scientifically investigated to determine the use if dredged material. The proposal should have a clear set of goals and objectives and approach on how they will achieve the science goals. This was not clear. The proposal should have a scientifically sound background with an hypotheses to be test and evaluated. The basic scientific questions to

G. Does the project/program have measures of success? (captures statistical information requirement as defined by the Comprehensive Plan and Act)

This is a concern that was described previously, as a limitation of the project. Yes, previous citations have shown dredged material can be used in certain instances. The provided the bases for the project, but what science is required to carry this out . When can dredged material work and when can it not be used? What environmental conditions impact success? Metrics are required on the beneficial use of dredged material for land fill. This includes 1) identifying the methods used 2) identifying the specific data required to be monitored and reported. 3) identifying the positive and negative impacts 4)

H. Is a monitoring program in place to determine project goals, success and help adaptive management (if applicable)? (captures statistical information requirement as defined by the Comprehensive Plan and Act)

There is not any specific monitoring program that was identified in the project to achieve the project goals. As described before, the details of the data to be collected was not identified to meet the goals. The changes in the coastal environment from circulation, to river floods and fluxes, to tides and major storms etc, all will impact the success of the program. A real time adaptive monitoring system to optimize data collection and demonstrate beneficial use of sediments for restoring the coastal is required to enable a statical evaluation of the projects success. This can be accomplished but was not part of the

I. Does the project/program consider recent and/or relevant information? (captures statistical information requirement as defined by the Comprehensive Plan and Act)

The project addresses a need for restoring the low lying coastal areas by using a effective material from dredged material. This is potential source of material for areas along the coast requiring some increased support. Are there data available in recent program that can be used to meet the objective. The targeted areas in the states have been identified as important and can provide a good regions for public accessible. The statistical environmental requirements for these areas is based on several documents which appear to define relevant concerns for restoration. These were good supporting documentation and the details of how they were applies to this project were not reported. These documents and references do not cover a wide

J. Has the project/program evaluated past successes and failures of similar efforts? (captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the Comprehensive Plan and Act)

The project identified many past success studies that have used dredged material for filling low lying areas. It did not get into the details of what was scientifically monitored to determine how the success of this project was determined. Also the project did not address where dredged material and a land fill could fail or identify conditions where it could fail. The uncertainty associated with the limitations of the beneficial use of dredged material and how these conditions would be evaluated was not clearly defined and thereby posses a project risk.

Please summarize any additional information needed below:

The basic ideas of using dredge material for restoring low lying areas may be a positive direction. However the scientific goals and objectives to ensure the project success is required and missing in the current proposal.

The scientific details of what will be accomplished and how it will be addressed are required in the proposal. The proposal needs to clearly state what are the major science questions that will be answered and how are they related to the science plan of restore?

The details of what are the data are required to be collected, monitored and analyzed to meet the science objectives were not