

This webinar provided an overview of the Multi Criteria Decision Analysis (MCDA) module within the Institute for Water Resources (IWR) Planning Suite II.

The IWR Planning Suite II is a Corps-certified model that was originally built for the formulation and evaluation of ecosystem restoration projects. However, the model is now more widely used in other business lines to evaluate actions involving monetary and non-monetary costs and benefits.



The MCDA module provides users with the ability to consider the influence of multiple criteria on project alternatives. This module helps planners and economists clarify and convey tradeoffs across multiple criteria (such as acres of wetland restored, habitat units created, or number of jobs created), and can assist study teams in evaluating multiple types of benefits across the four accounts (National Economic Development, Environmental Quality, Regional Economic Development, and Other Social Effects). MCDA is a decision-aiding tool that helps study teams present decisions involving more than one criterion or planning objective.

The webinar was presented by Eric Johnson, an economist with IWR. Additional questions regarding IWR Planning Suite can be directed by email to: DLL-CEIWR_IWR-PLAN@usace.army.mil.

Additional resources on IWR Planning Suite and MCDA are available online:

- *IWR Planning Suite Website: <https://www.iwr.usace.army.mil/Missions/Economics/IWR-Planning-Suite/https://www.iwr.usace.army.mil/missions/economics/iwr-planning-suite/>.*
- *Trade-off Analysis Guide: <https://www.iwrlibrary.us/document/fbee8a0d-16e1-4dcc-a6f1-8c69c8859b2f>*
- *Expert Elicitation (with Risk): https://www.iwr.usace.army.mil/Portals/70/docs/risk/Expert_Elicitation_dft.pdf*

This summary of the Question / Answer session of the webinar is not a transcription; questions and responses have been edited and reordered for clarity. Note: Most questions received were outside the scope of this presentation, but the speakers attempted to answer to the best of their ability. This webinar was focused on the basic mechanics of using MCDA within IWR Planning Suite, not in setting up good plan formulation, analysis, and collaboration.

Tips and Training on Using IWR Planning Suite's MCDA Module

Is there training available for project delivery team (PDT) members with no MCDA experience? How can the Ecosystem Restoration Planning Center of Expertise (ECO-PCX) or Flood Risk Management Planning Center of Expertise (FRM-PCX) help PDTs apply the tool in a study?

IWR can assist with mentorship, training, and application of the MCDA module, and some other training presentations are available on IWR's online library: <https://www.iwrlibrary.us/>. The library houses an expert elicitation guide among other resources. But when it comes to establishing the criteria and

Multi-Criteria Decision Analysis (MCDA) and IWR Planning Suite Q&A Session

weights, engaging the PCXs and the vertical team is critical. They have experience working with teams and vertical communication, and the PCXs will strive towards using consistent practices.

IWR's Collaboration and Public Participation Center of Expertise (CPCX) is another resource for help and training: <https://www.iwr.usace.army.mil/Missions/Collaboration-and-Conflict-Resolution/>. Hunter Merritt is the point of contact for learning more and joining the CPCX email distribution list.

The U.S. Fish and Wildlife Service also offers some training related to MCDA:

- Decision Analysis and Expert Elicitation Training: <https://nctc.fws.gov/feature/story-alc3190.html>
- Collaboration and Conflict Transformation in Multiparty Processes Micro-Learning Videos: <https://nctc.fws.gov/courses/microlearning.html>

The MCDA approach is challenging to use in part due to the subjectivity in evaluating qualitative data. How should PDTs avoid this pitfall during policy and technical review?

The methodology for assigning weights should be coordinated with the PCX and through the MSC and vertical team depending on its application and intent. Engaging the PCXs early in the study on the study-specific application of the tool will aid vertical team collaboration and ensure PCX buy-in to the approach and formulation with the MCDA tool. A team would also benefit from reviewing the various available training resources.

If the MCDA module is being used for establishing relative “weights” of ecological outputs for the Environmental Quality (EQ) account, involving the ECO-PCX would be helpful in this application. This may require a lower level of coordination. Similarly, a simple screening early on may not require such coordination and involvement. The level of coordination needed depends on the context and problem that teams are informing by using MCDA techniques.

Use of the MCDA Module and Approach

How often is the IWR Planning Suite MCDA module being used in current studies?

The MCDA module is newer and so it hasn't been used extensively. However, IWR believes that at least each MSC has used it at some point. There are no statistics on this because IWR is not informed on which teams are using the module, unless IWR receives an email about the module from the team.

Has IWR provided examples of MCDA being used to compare criteria from different accounts (e.g., Regional Economic Development (RED), Other Social Effects (OSE), or EQ), different mission areas, or in different types of studies such as Watershed Assessments?

There are some current and more recent studies that have used MCDA and IWR may be able to share those. Past examples are limited in their usefulness and faced challenges for many of the reasons mentioned. Some examples simply don't have good materials and documentation to share with a team to help them understand what was done, because the model was used in PDT “churning” activities and MCDA may not have been ultimately used.

The CPCX can also assist study teams in designing a process to establish agreed-upon criteria and weights for MCDA, through a consensus-based process or expert elicitation.

Does the IWR Planning Suite have an option to identify correlated criteria to help recognize and manage relationships without eliminating potentially meaningful criteria or requirements?

A correlation matrix is available within the tool.

Can distributions be applied to the weights?

The MCDA module has an outranking method that has a distribution around preferences. There also may be some options within the Uncertainty Module to explore this further.

How are weights assigned? Is it done in a workshop or does the PDT determine the weights?

The assignment is dependent on the situation. It is possible to hire experts in elicitation to help assign the weights depending on the problem. This webinar focused on the mechanics of using MCDA, not in setting up good plan formulation and analysis.

Who is the decision maker when referencing "decision maker's preferences"? Is the decision maker a PDT member or another individual? Should the PDTs channel the preferences of USACE or Administration decision makers when working with MCDA?

The "decision maker" must be determined within the context of the problem. It is suggested that PDTs channel the preferences of USACE or Administration decision makers for decisions regarding developing a recommendation of a water resources project for Congressional authorization. PDTs can also use MCDA as a quick screening tool to narrow down options and then use other techniques to "optimize" or evaluate and compare plans. In addition, teams can use IWR Planning Suite's MCDA tool for other non-feasibility study planning activities like Planning Assistance to States or International and Interagency Services.

Can PDTs use MCDA to identify the recommended plan? What should the PDT do if the recommended plan based on MCDA is not the National Economic Development (NED) Plan?

MCDA is meant to inform the process, not the decision maker per se. If the study team is using MCDA to compare and select a plan based on criteria beyond NED, the analysis can be used to support the policy exemption package to recommend something other than the NED plan. This could be done by demonstrating the MCDA (and vertical team agreement on the weights assigned) supports the recommendation of a plan that meets criteria important to the decision-maker, including the non-federal sponsor in the case of a locally preferred plan. The PDT may also use the outcomes of the MCDA to present an alternative (e.g., "max benefits across four categories"), even if that alternative is not selected or recommended. It could also help identify the robustness of options.