Multi-criteria Integrated Resource Assessment (MIRA): When Clumsy Solutions are Superior (updated 8/12/14)

Through an inclusive, explicit, transparent, iterative learning-based decision process, MIRA facilitates stakeholder engagement for collaborative multi-objective decision making.

MIRA is designed on these decision analytic principles:

1) Consideration of Stakeholders
2) Context
3) Criteria and their metrics
4) Significance of the data metrics
5) Value judgments

What kinds of analytical problems can MIRA handle?

1. Policy/decision problems with many and diverse stakeholder interests
2. Mix of quantitative and qualitative data/information, including chemical and non-chemical stressors and human health and ecosystem/ecosystem services
3. Data/model uncertainties as well as decision uncertainty
4. Policy/decision problems that utilize highly technical, expert information as well as stakeholder values
5. Rank ordering and comparing things

Tame vs. Wicked Problems

Tame problems:

- Have a right answer,
- Have objective measures of success,
- Are fact-driven,
- Have a knowable truth (even if we don't know it now or if there is uncertainty about it).

Wicked problems are:

- Multi-dimensional, i.e., Hard to define because of diverse stakeholder perspectives,
- Have no single right answer; only better or worse conditions,
- Have no objective measures of success,
- Have solutions often have to be discovered through learning,
- Values-driven.

Wicked problems (PDF) (15pp., 1.3MB) - Rittel and Webber (1973)

Simple way to think about tame vs. wicked:

Resolving tame problems helps us understand what is happening in the environmental system.

Resolving wicked problems means we are deciding what we want to do within the environmental system.

Why MIRA?

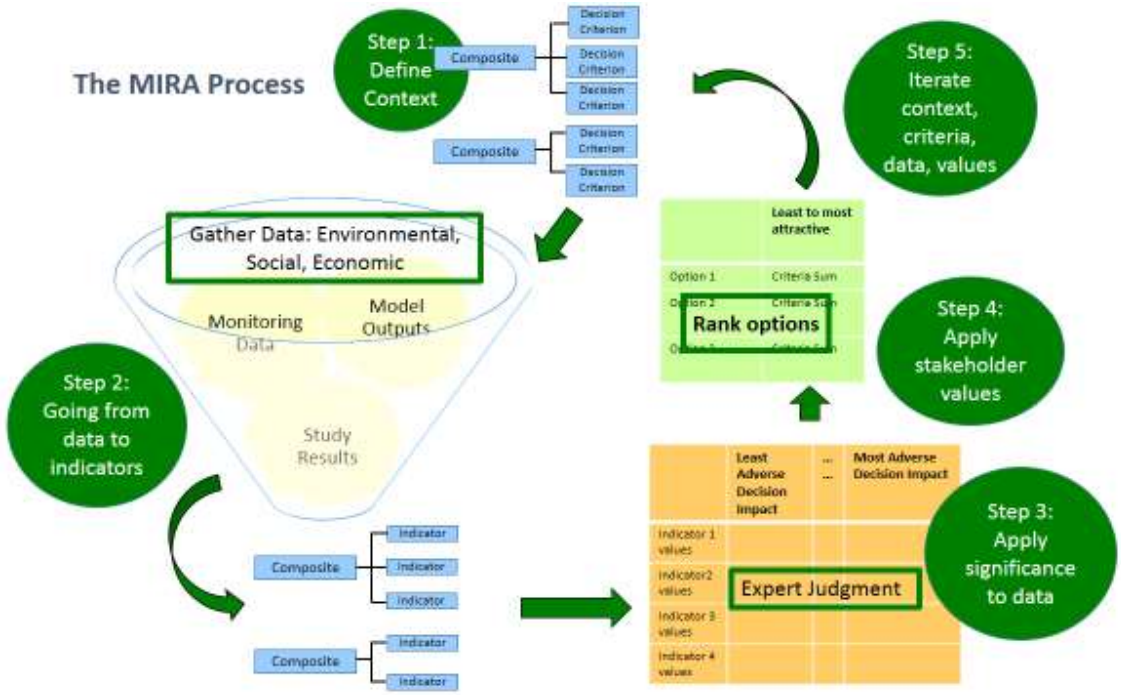
Environmental problems are complex and deciding what to do about them is complicated by diverse stakeholder perspectives, a combination of science, economic and socially relevant data/information, and sometimes, regulatory constraints. Defining the problem and finding the necessary common ground in which to make policy decisions are difficult but necessary if we want to live healthfully and harmoniously within our social, economic and ecological landscape. These are wicked problems.

What's wicked got to do with it?

All decision making problems are wicked problems. Environmental decision making problems typically also contain tame problem components (i.e., we want to use scientific data in decision making). Knowing which components are tame vs. wicked in the environmental decision making problem flags those components that are best resolved with mathematical and scientific data and models (**elegant solutions**) vs. those components that are best resolved with facilitated stakeholder discussion and the application of values (**clumsy solutions**).

6 Steps in the MIRA Process:

1. Initialize/Define the Context
2. Initialize/Define the Criteria/Narratives/Data and Organization of Indicators applicable to the Context
3. Initialize/Apply significance to the data
4. Initialize/Apply values
5. Learning via iteration



Questions? We'd love to talk with you. Contact us:

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For applications and references, see: http://www.epa.gov/reg3esd1/data/mira.htm