

# Development of a Stakeholder Engaged Structured Decision Making Framework

**Paul Black**

Neptune and Company, Inc.  
[www.neptuneinc.org](http://www.neptuneinc.org)

WM2017 Session No. 120  
Phoenix, AZ



# Outline

- What's risk?
- What is Stakeholder Engaged Structured Decision Making (SE-SDM)?
- Benefits of this paradigm?
- Where is there interest now?
- How can the P&RA COP help?



# What is “Risk”?

**Wikipedia** (clearly an authoritative source!)

- **Risk** is the potential (probability) of gaining or losing something of value.
- **Values** (such as physical health, social status, emotional well-being or financial wealth) can be gained or lost when taking risk resulting from a given **action** or inaction, foreseen or unforeseen.
- **Uncertainty** is a potential, unpredictable, and uncontrollable outcome.



# Value/Probability Conundrum

“Unless we make a conscious choice to separate utility and probability, the two inevitably become intertwined in a hopeless melange in which we lose site of, and confuse, the underlying assumptions that drive our perceptions of what we want (utility) and what we’ll get (probability).”

Morgan D. Jones – The Thinker’s Toolkit



# Example

- Betting on favorite team!

“If you’re honestly going to try and make money, you have to remain unbiased in every way. When you bet on your team, a large percentage of the time your judgment is clouded.”

- Mixing utility (desire) and probability (chance)



# Example

- In Waste Management we do not remain unbiased in our science modeling
  - We insert desire to be protective
- Consequence is that we are “losing our bets” (increased cost, not optimizing use of disposal system, etc.)
- And we are not using the right value judgments (arbitrary and ours instead of representing all stakeholders values)

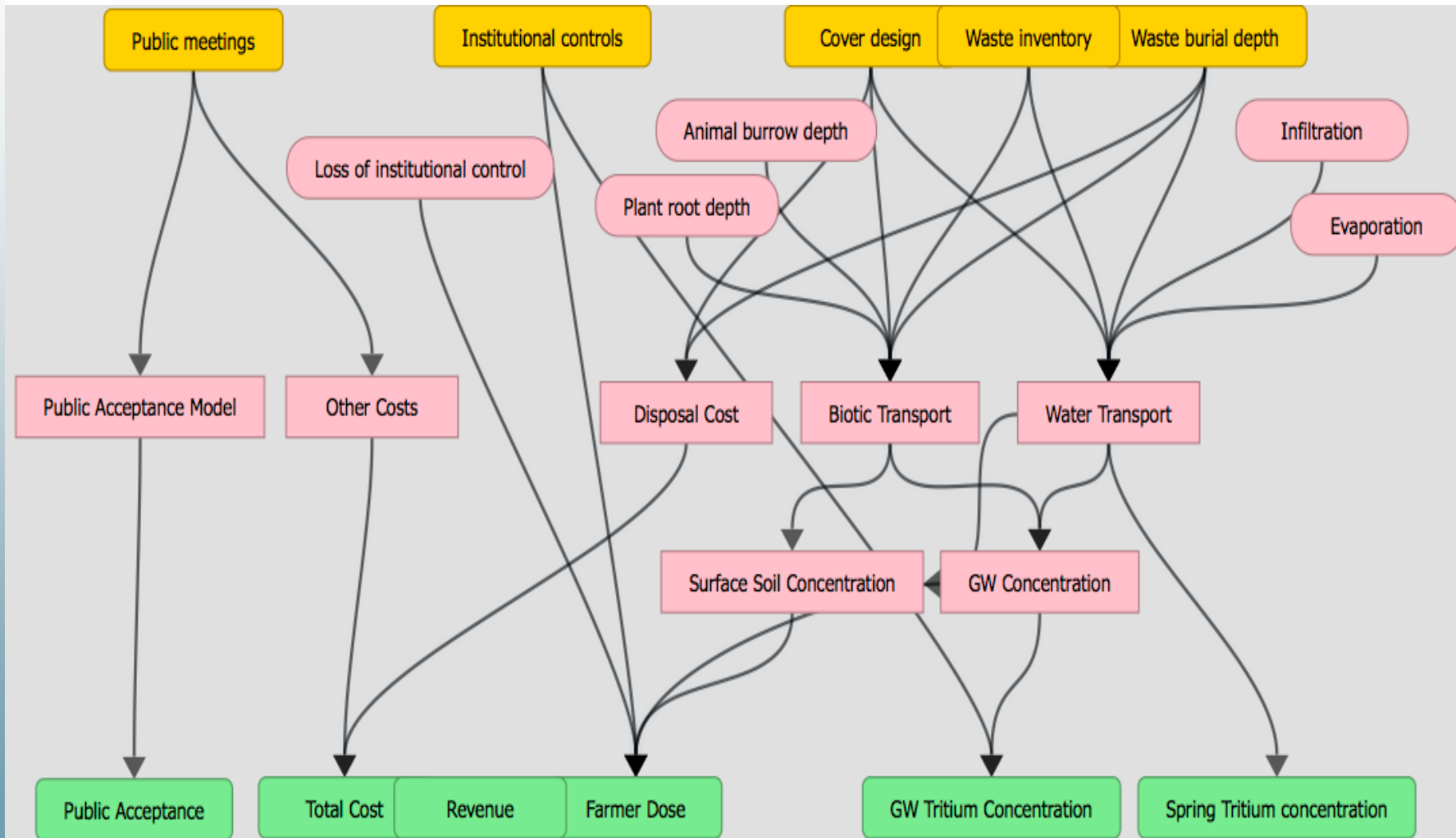


# SE-SDM

- Values-focused thinking (Ralph Keeney, 1990s)
  - What matters to the stakeholders (why)
  - Concerns lead to identification of objectives (reduce risk, minimize costs, improve local economy, sustain economy, protect environment, etc. – can/should get very specific)
  - Objectives (what) lead to initial options (how)
  - Options augmented by subject matter experts
  - Consequence analysis performed by SMEs (evaluate options by connecting to and estimating effect on objectives – address uncertainties throughout)
- Dialogue/iterate
- Adaptive management



# Options → Models → Objectives





# Benefits of SE-SDM

Defensibility, traceability, transparency, reproducibility, openness, vetting, agreement, etc.

- Mitigates against decision making bias (improves decision making and reduces costs)
- Provides clarity on wider question of value (rather than just costs)
- Transparency improves societal support and benefits local socio-economic planning
- Provides greater certainty and confidence (more reliable lifetime planning and cost estimation)
- Provides reassurance that investments are both responsible and accountable to wider society
- Supports more effective regulatory decision making



# Benefits of SE-SDM

- This means we can better support our nuclear industry (level the playing field?)
- Bring down costs while still being protective
  - Address some of GAO's concerns?
  - And some Congressional concerns?
- Optimize:
  - disposal (so we don't run out of space sooner than necessary)
  - remediation
  - decommissioning



# Current Interest?

- Home:
  - EPA
  - FDA
  - UAF
  - DOE (perhaps)
- Abroad:
  - IAEA initiative – CIDER
  - OECD-NEA
    - <http://www.oecd-nea.org/news/2017/2017-01.html>



# Current DOE Projects

- West Valley
  - Options analysis for long term disposition of various types/sources of radioactive material/contamination
  - Exhumation vs Engineering
- Los Alamos
  - Options analysis for the long term disposition of RH TRU in 33 shafts
  - Exhumation vs Engineering



# Current DOE Projects

- Exhumation
  - Partial or full?
  - Reprocessing, packaging, shipping (where?)
- Engineering
  - Covers, walls
  - Time frames
- Both systems will fail without engineering, so this is a race against time itself
- Regulatory paradigm includes DOE Orders, NRC (WV), EPA, States, and NEPA



# Status of P&RA COP?

- Goal of “supporting risk-informed decision making”
- Supporting a technical march forwards
- Facilitating information sharing
  - Webinars, meetings, web-sharing of information, steering committee
- Can we do more? Can we share more?  
If so, how?



# Options for More?

- Support efforts to move technical challenges forwards
  - Not just SDM – there are other challenges
- Perhaps help get out of the regulatory morass we are in?
  - By developing a consistent approach to risk-informed decision making
- Affect 435.1 revision

But, none of this is possible without **funding** of some kind!

P&RA COP could make a large difference!



# P&RA COP could be....

*An agent of technological change and effective communication for “risk-informed decision making”*

