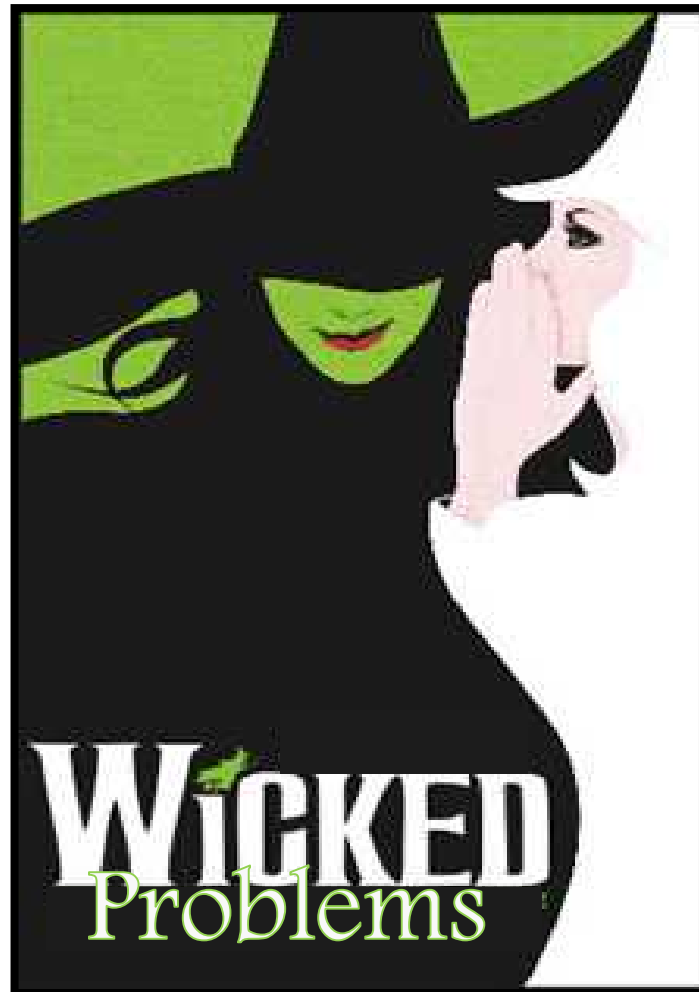


**Institutional barriers and opportunities
for improving policy approaches
to reducing excess reactive nitrogen
from U.S. Agriculture**

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Reactive Nitrogen is a Wicked Problem



The Problem

Tame Problem

- The clear definition of the problem also unveils the solution.
- The outcome is true or false. Successful or unsuccessful.
- The problem does not change over time.

Wicked Problem

- No agreement about what the problem is. Each attempt to create a solution changes the problem.
- The solution is not true or false – the end is assessed as “better” or “worse” or “good enough.”
- Problem changes over time.

The Role of Stakeholders

Tame Problem

- The causes of a problem are determined primarily by experts using scientific data.

Wicked Problem

- Many stakeholders are likely to have differing ideas about what the “real” problem is and what are its causes.

Nature of the Problem

Tame Problem

- Scientifically based protocols guide the choice of solution(s).
- The problem is associated with low uncertainty as to system components and outcomes.
- There are shared values as to the desirability of the outcomes.

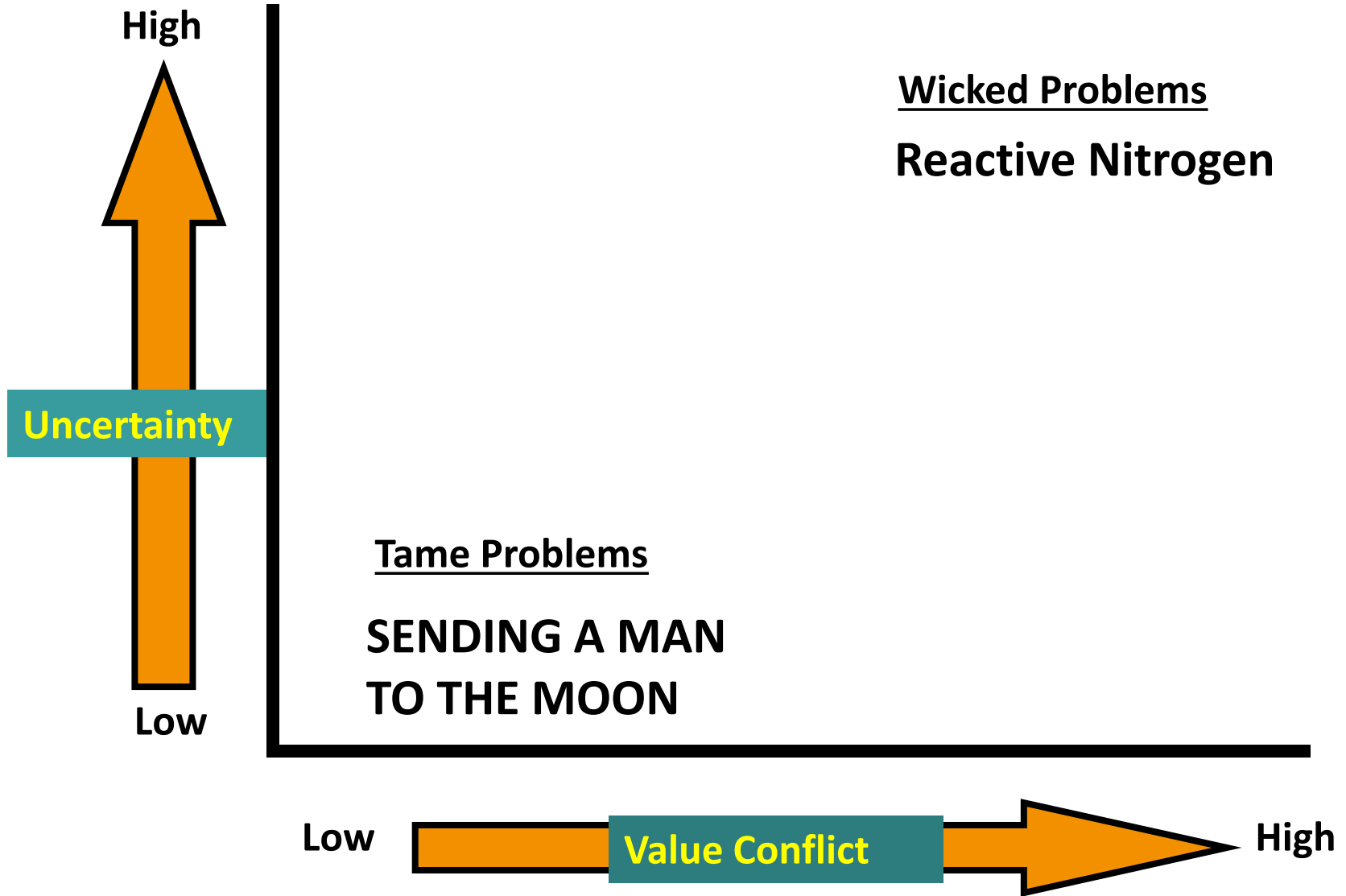
Wicked Problem

- Solution(s) to problem is (are) based on “judgments” of multiple stakeholders.
- The problem is associated with high uncertainty as to system components and outcomes.
- There are not shared values with respect to societal goals.

Wicked Problems: Value Conflicts

- Experts are not allowed by stakeholders to dictate desired outcomes.
- Goals are negotiated, not determined analytically.





Primary Institutions involved in the Nr Problem

- **USDA** since 1936
- **EPA** since 1970

Different missions

Different stakeholders

Different Authorities and Intents

USDA – Conservation Title – Voluntary & incentives

EPA – Clean Water Act – Regulations & enforcement

EPA – Clean Air Act – Regulations & enforcement

USDA and EPA

A history of stakeholder:

Love vs dislike

Trust vs suspicion

Wickedness Intensifies Conflict

Case of EPA and Florida nutrient standards:

- State and Federal involvement
- Multiple interveners and stakeholders
- Conflicts between institutions and practices
- No best scientific answer for nutrient standards

What Opportunities?

Could we work towards:

- Increasing alignment of stakeholder perceptions?
- Utilizing both carrots and sticks?
- Increasing local actions if federal abandonment?



Our Earth