Learning to be sustainable (?)

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Last time around...

1. Data in search of question

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1. Data in search of question
2. Why learning?

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1. Data in search of question
2. Why learning?
3. Sustainability & Learning

Last time around...

1. Data in search of question
2. Why learning?
3. Sustainability & Learning
4. What data do I need?

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Why learning?

Sustainability & Learning

Data

Objective

What I **am** doing

- Expand on last presentation
- Show my thinking
- Test out the argumentation of my thesis

What I am **not** doing

- Traditional paper presentation

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Invitation to conversation!

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Why learning?

Sustainability & Learning

Data

Definitions[1]

1. Reliability: is the learning outcome public, stable, and shared

[1] March et al. (1991)

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1. Reliability: is the learning outcome public, stable, and shared
2. Validity: does learning aid in understanding, prediction, and control

[1] March et al. (1991)

Learning & Sustainability I

Valid learning

Creation of quantitative/mental models that inform in advance or lead to desirable states.

- Robust climate models (Manabe & Wetherald, 1967; Forster, 2017)

vs. invalid learning

- Surprising, unpredicted arctic ice loss (Guarino et al., 2020)

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Learning & Sustainability II

Reliable learning

Developing a mental or formal model that is widely accepted.

- Collective learning process (Wright & Nyberg, 2017)
- Bridging epistemic communities (Aronczyk & Espinoza, 2019)

vs. unreliable learning

- Unintentional or deliberate rejection of learning (Hermwille & Sanderink, 2019; Koontz & Thomas, 2018)
- Persistent resistance or ignorance (Boudet et al., 2020)

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What keeps valid knowledge from being reliable?

Learning & Sustainability III

Example of conflicts

- Biases (e.g., Makov & Newman, 2016)
- After building coalition, validity of knowledge in doubt (e.g., Aronczyk & Espinoza, 2019; Wright & Nyberg, 2017)
- Entrenched invalid learning (e.g., Boudet et al., 2020)
- Knowledge gap between layman and (relative) experts (e.g., Camilleri et al., 2019)
- Self-interest (Rerup & Zbaracki, 2021)

Example 1

Maguire and Hardy (2009)

1. 1950s: DDT is most used pesticide

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   - Human health
   - Environmental impact

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Maguire and Hardy (2009)

1. 1950s: DDT is most used pesticide
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3. 1960s: Cost-benefit discussions in *Science*, *Ecology* etc.

Example 1

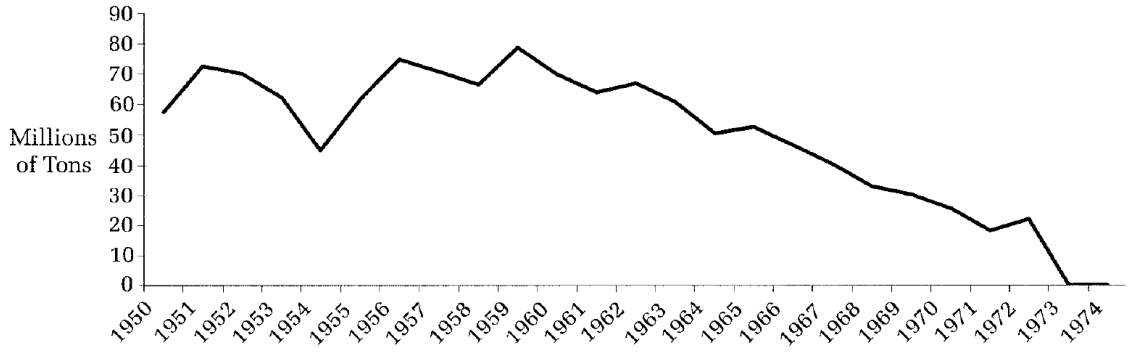
Maguire and Hardy (2009)

1. 1950s: DDT is most used pesticide
2. 1963: Rachel Carlson problematizes DDT adverse impacts in *Silent Spring*
   - Human health
   - Environmental impact
3. 1960s: Cost-benefit discussions in *Science*, *Ecology* etc.
4. 1972: EPA investigates, bans DDT nationwide
   - DDT use already down 67%

Examples

DDT

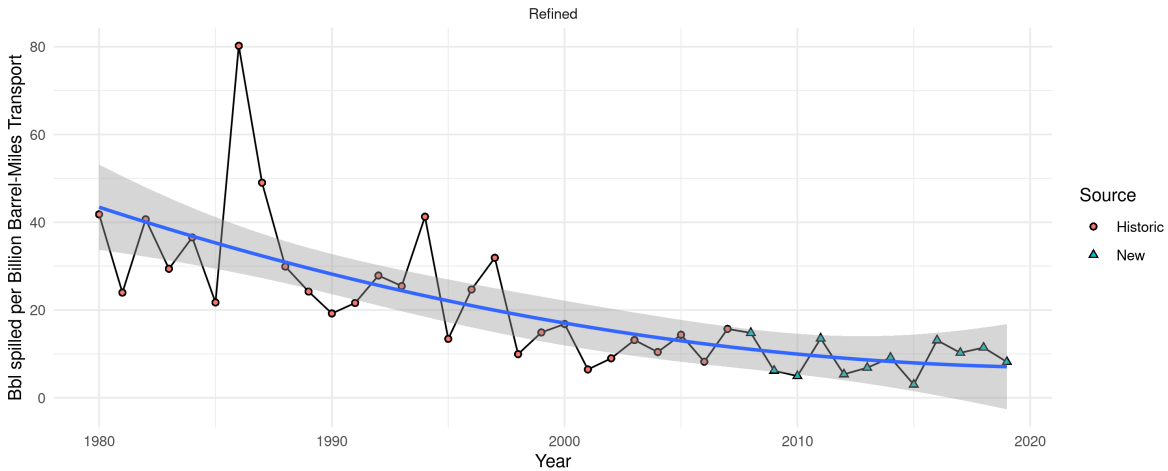
FIGURE 1
Volume of DDT Usage, by Year[a]



[a] Source: EPA (1975), page 149.

vs.

Pipeline spills



Blue line: Quadratic curve of best fit, with confidence interval.

Source (new): https://github.com/julianbarg/oildata

Source (historic): http://www.api.org/environment-health-and-safety/clean-water/oil-spill-prevention-and-response/~/media/93371EDFB94C4B4D9C6BBC766F0C4A40.ashx, p. 38

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Example 2

Pipeline industry[2]

1. Mid-century enthusiasm for oil & pipelines
   Consensus–engineering epistemology reliable & valid

[2] Estes (2019)

Example 2

Pipeline industry[2]

1. Mid-century enthusiasm for oil & pipelines
   Consensus–engineering epistemology reliable & valid
2. Problematization
   Prominent spills (e.g., Exxon Valdez)
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Example 2

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1. Mid-century enthusiasm for oil & pipelines
   - Consensus–engineering epistemology reliable & valid
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   - Pipeline safety technology
   - Advertisement & lobbying

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Example 2

Pipeline industry[2]

1. Mid-century enthusiasm for oil & pipelines
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2. Problematization
   - Prominent spills (e.g., Exxon Valdez)
   - Environmental movement
3. Industry offers partial response
   - Pipeline safety technology
   - Advertisement & lobbying
4. Tension persists
   - Coexistence of two epistemic communities
   - Limited communication

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[2] Estes (2019)

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Why learning?

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Why should we (sustainability researchers) care about reliability & validity?

Sustainability theory I

Validity–
Environmental management

1. Organizational level narratives

Reliability–
Ecocentrism

1. Organizational level and above

3

[3] For now borrowing terminology from Purser et al. (1995)

Sustainability theory I

Validity–
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1. Organizational level narratives
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1. Organizational level and above
2. Greenwashing & pollution

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4. Learning meets counterforce

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$\Rightarrow$ Underlying models of change & collective learning

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Why learning?

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Exemplary phenomena

1. Industry-driven deregulation in Texas/Louisiana

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2. Pipeline spill into Houston River 94'

Exemplary phenomena

1. Industry-driven deregulation in Texas/Louisiana
2. Pipeline spill into Houston River 94'
3. Public/private differences

Thanks!

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