

Sustainable Pedagogy

HON 250 and HON 350

Jeff Brown and Taylor Mitchell

Why Teach Engineers about Sustainability?

- ▶ Students will gain “an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.” --ABET
- ▶ “dedicated to ensuring a sustainable future in which human society has the capacity and opportunity to maintain and improve its quality of life indefinitely, without degrading the quantity, quality or the availability of natural, economic and social resources”--ASCE
- ▶ *Engineers must take leadership roles not only on technical projects but in society more generally. Engineers must lead in their communities, in local, state and federal governments, and help lead society to a sustainable world. There are probably no second chances, now is the time for action, and we have to get it right. Now is the time for engineering leadership, our country needs it and our planet needs it.*--ASME’s Vision 2030

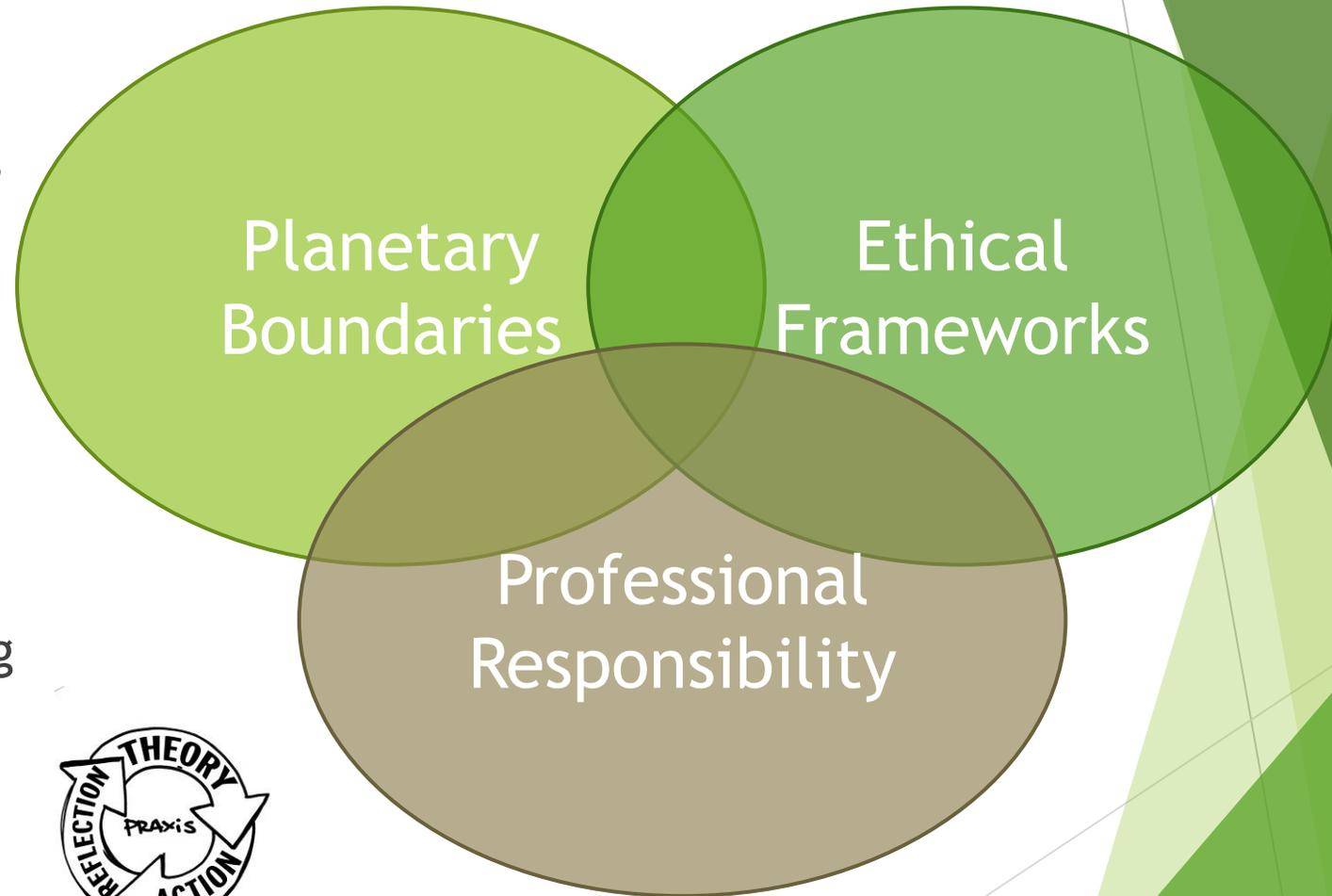


Engineering
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How to Teach Sustainability?

- ▶ Provide interdisciplinary framework and professors
- ▶ Incorporate science, ethics, and rhetoric
- ▶ Move beyond solving equations provided by professors
- ▶ Focus on Honors program (HON 250-350 sequence)
- ▶ Use transformative teaching techniques
- ▶ Apply Praxis Model (Theory, Action, Reflection)
- ▶ Increase empathy via analysis of critical narratives



Defining Critical Narratives

- ▶ Critical narratives are structured, placed-based stories, intended to *foster connections* between the audience and specific cultures and communities.



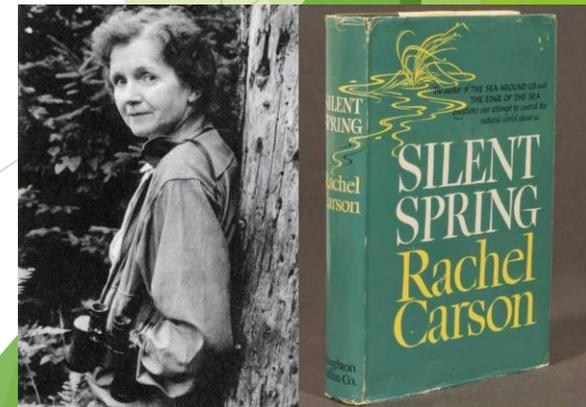
By Alex Blumberg, Jon Mooallem

Producer Alex Blumberg interviews the writer Jon Mooallem, who just wrote a story for the *Atlantic* about a period in the early 1900's when meat was scarce in the United States. A group of forward-thinking men had a plan to fix that problem. It was ingenious in every way except for one. Jon's story is also an [Amazon Kindle single](#). (12 minutes)

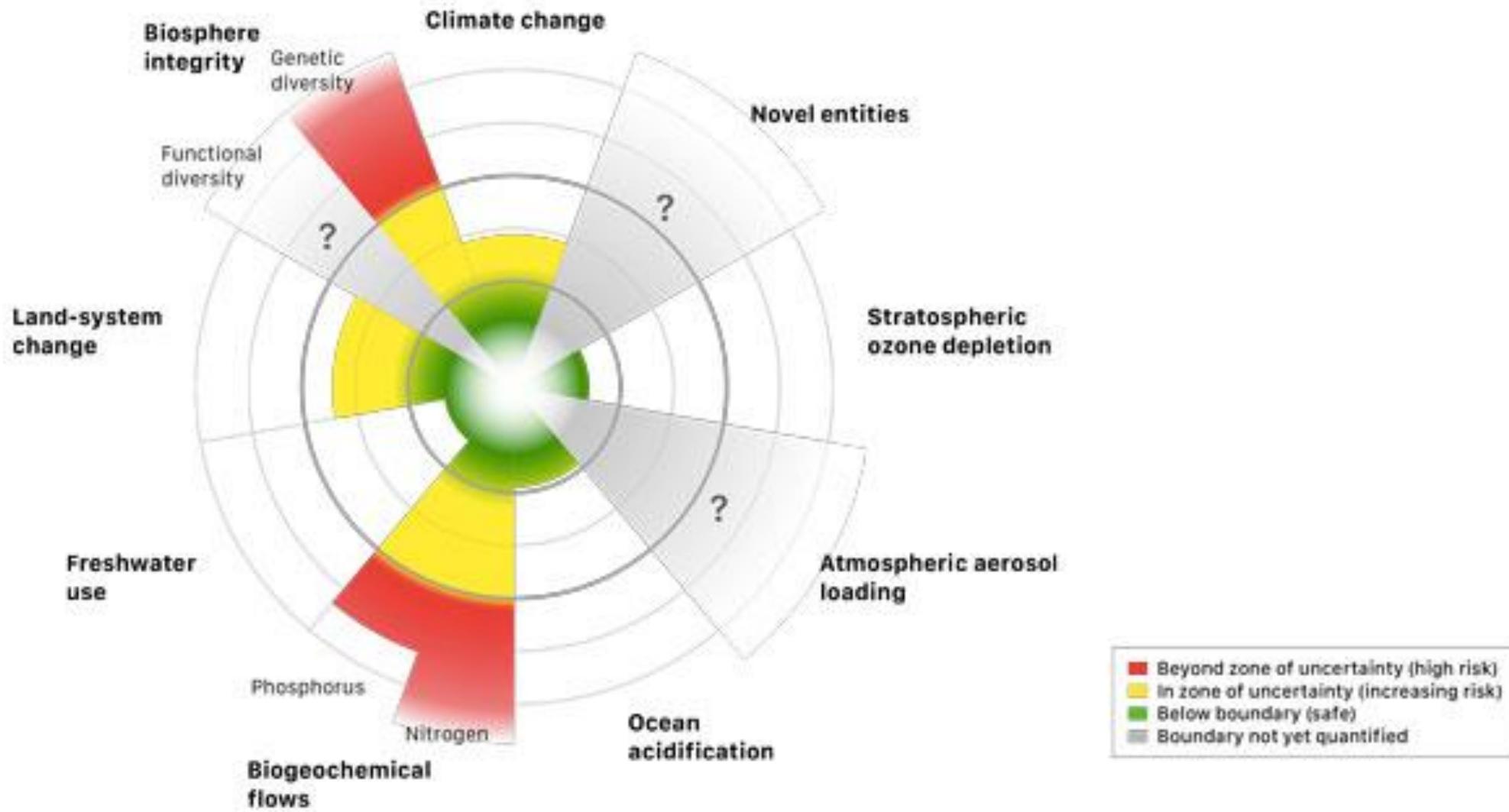
Thinking Like a Mountain

A deep chesty bawl echoes from rimrock to rimrock, rolls down the mountain, and fades into the far blackness of the night. It is an outburst of wild defiant sorrow, and of contempt for all the adversities of the world.

Leopold's *A Sand County Almanac*



Setting Foundation: Planetary Boundaries



Transitioning from Science to Ethics

The Rhino Hunter

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September 7, 2015

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(Image Credit: Andrea Mongia)

Back in 2014, Corey Knowlton paid \$350,000 for a hunting trip to Namibia to shoot and kill an endangered species. He's a professional hunter, who guides hunts all around the world, so going to Africa would be nothing new. The target on the other hand would be. And so too, he quickly found, would be the attention.



RADIOLAB

Discussing Ethics

- ▶ Provide theories and principles
- ▶ Debate situational cases
- ▶ Apply framework/theories to actions



Transitioning from Ethics to Rhetoric

How do you solve a problem like Fritz Haber?

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January 9, 2012

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- What is one instance of Haber as a relatable **character**? One trait that might make him a “good” or heroic character?
- What is the **setting** of the story? What context/history/cultural event might have shaped this character?
- Consider the structure of the **plot** (beginning, middle, or end). Is this story told in a linear way? Was this helpful to the story? Why?
- Consider the **narrator/PoV** from which the story was told. Is this story told in the 1st (“I”) or the 3rd (he) PoV? Do you trust this narrator?
- How do you feel about Haber at the end of the story? Why? Be sure to list one example from the story to support your feelings.
- ***Should scientists carry doubt with them? Why?***
- What ethics (consequentialism; deontologist; egoism; etc.)/ principles can be applied?