Sustainability

From Awareness to Application

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ENGINEERING & GEOLOGICAL
SERVICES

Sustainability

Awareness

Sustainability

Awareness

Sustainability

Perceptions

Sustainability

Six Degrees of Recognition

No Limits: Natural resources and ecological systems are essentially limitless.

Limits: Natural resources and ecological systems are finite.

Stewardship: Finite natural resources and ecological systems must be effectively managed, maintained and enhanced.

Predicament: Society is using up resources and ecological carrying capacity faster than they can be replaced, replenished or restored.

Consequences: Reaching or exceeding resource or carrying capacity limits has serious consequences.

Urgency: Society must act soon before the consequences become inevitable, devastating and irreversible.

Source: ASCE Fundamentals of Sustainable Engineering Course

Sustainability

Six Degrees of Recognition

	Attitude
No Limits	I can use whatever I need.
Limits	I know there are limits but there are plenty of resources left.
Stewardship	I have a moral, economic and often a regulatory obligation to manage well.
Predicament	I need to understand these limitations and their possible consequences.
Consequences	I understand the consequences and they could be severe.
Urgency	I need to take action now to deal with urgent and serious problems.

Source: ASCE Fundamentals of Sustainable Engineering Course

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Awareness

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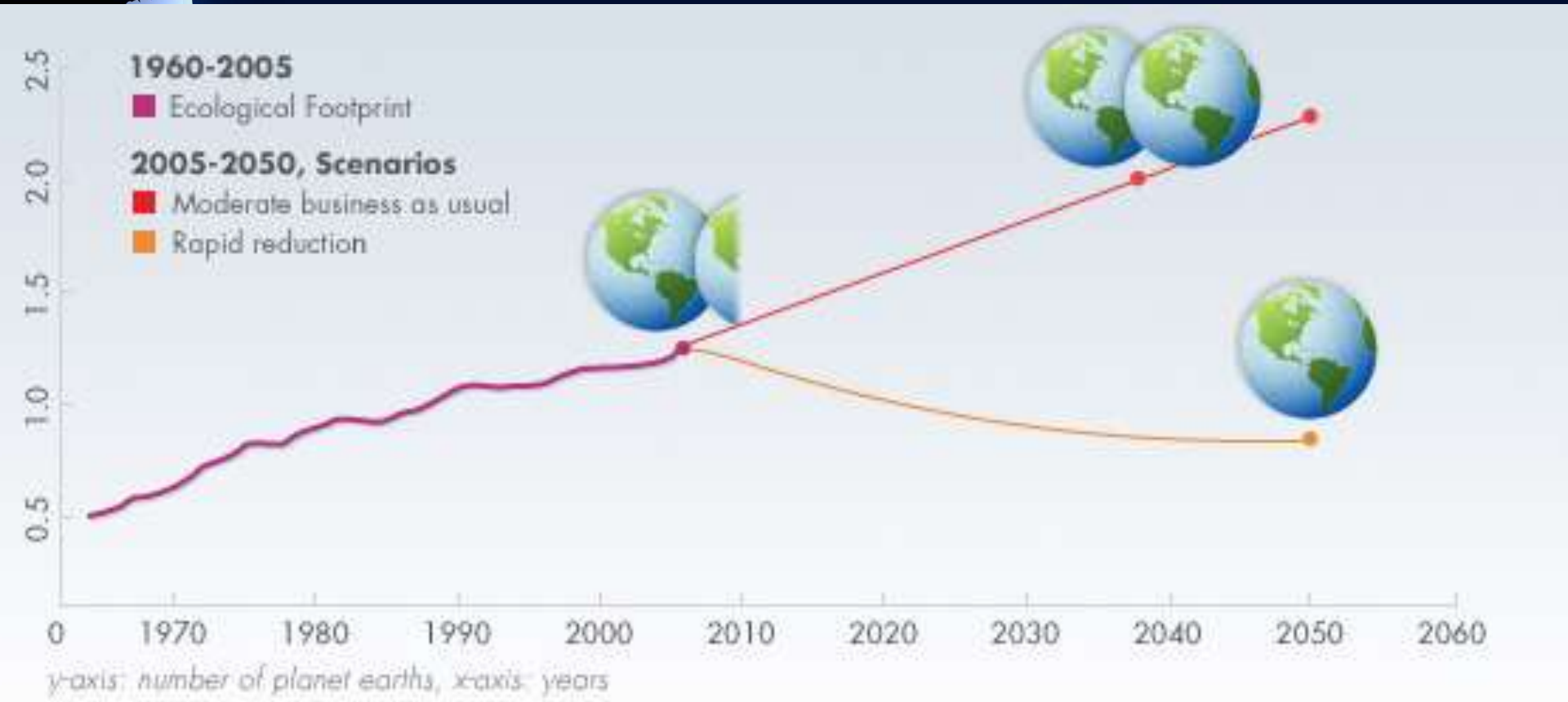
Awareness



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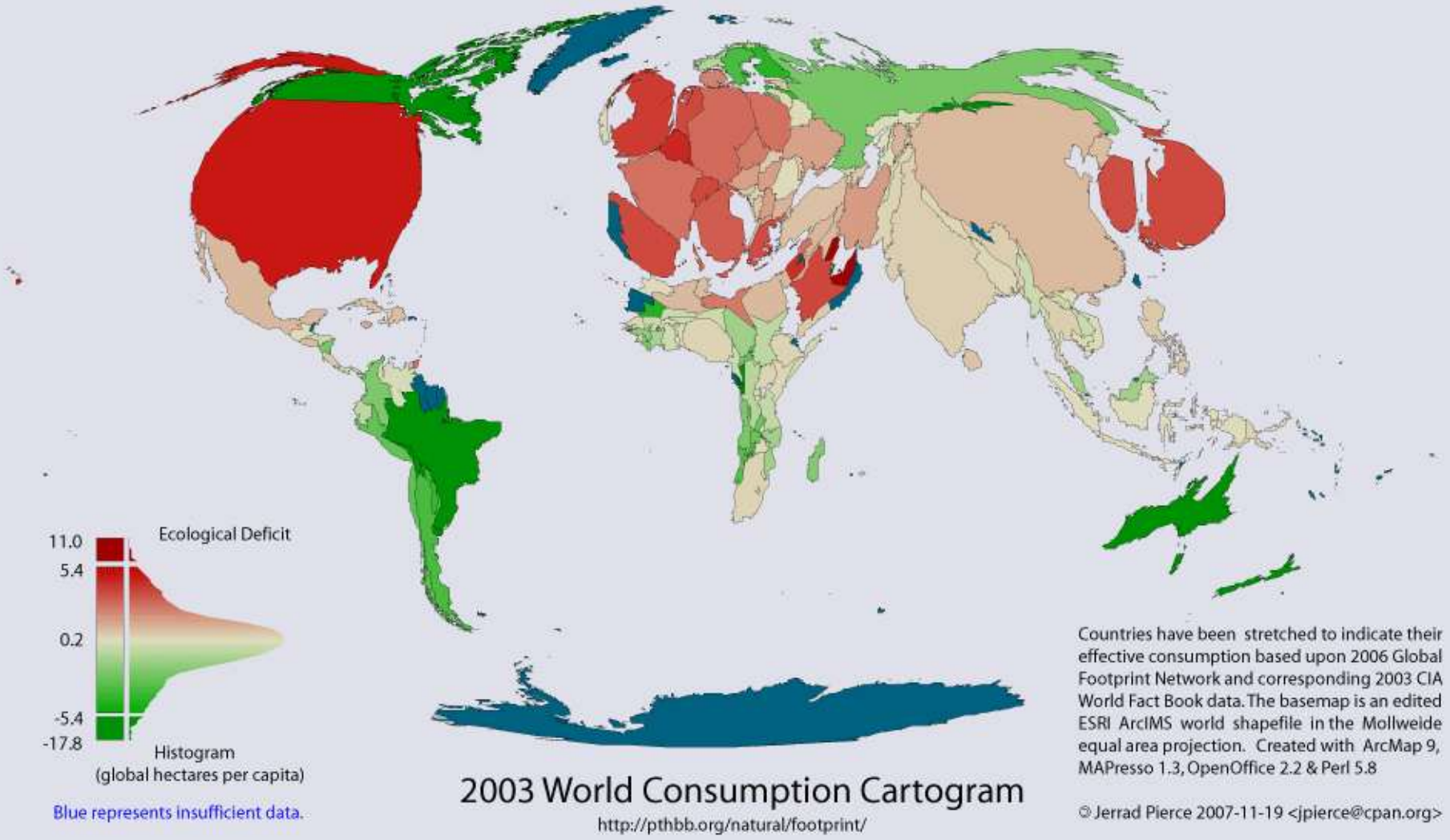

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Awareness

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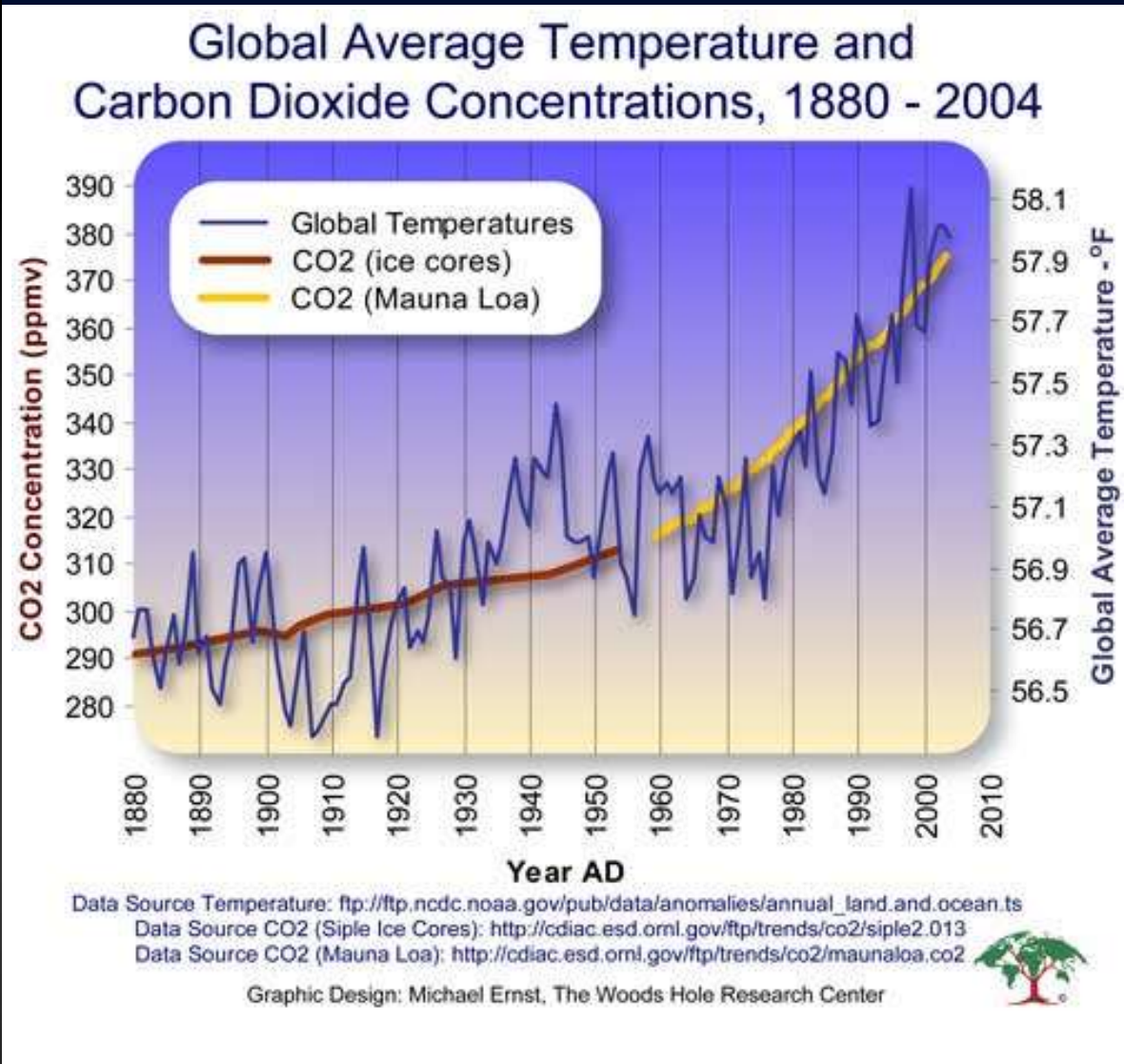

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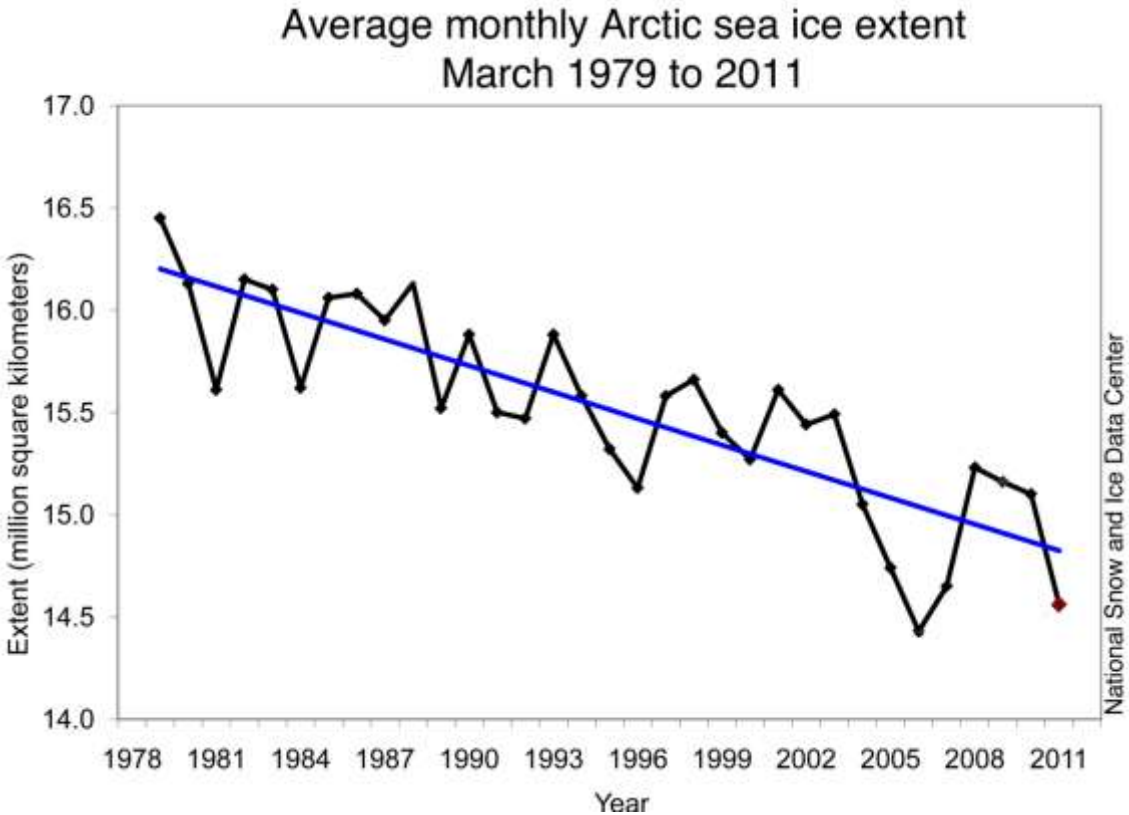

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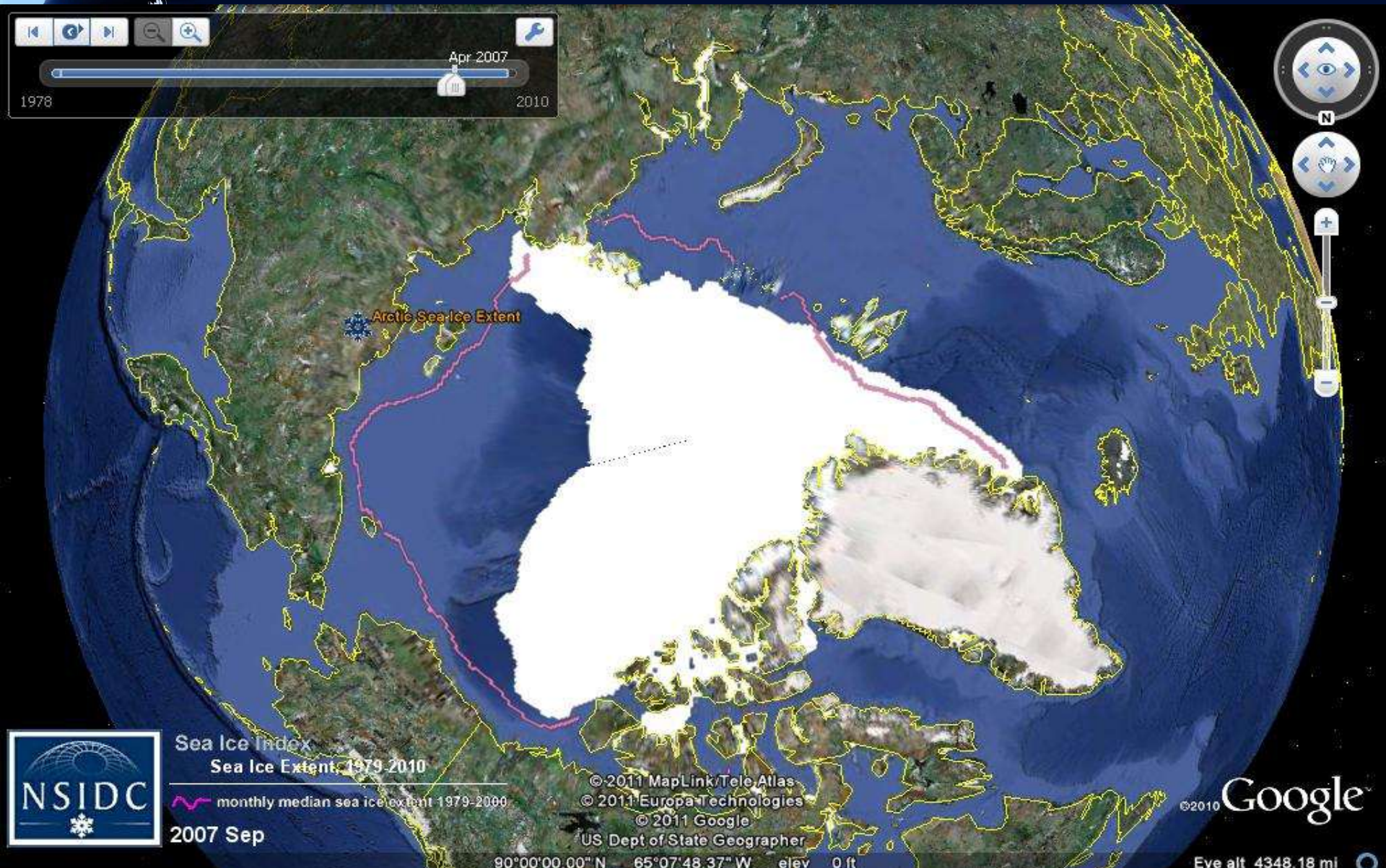

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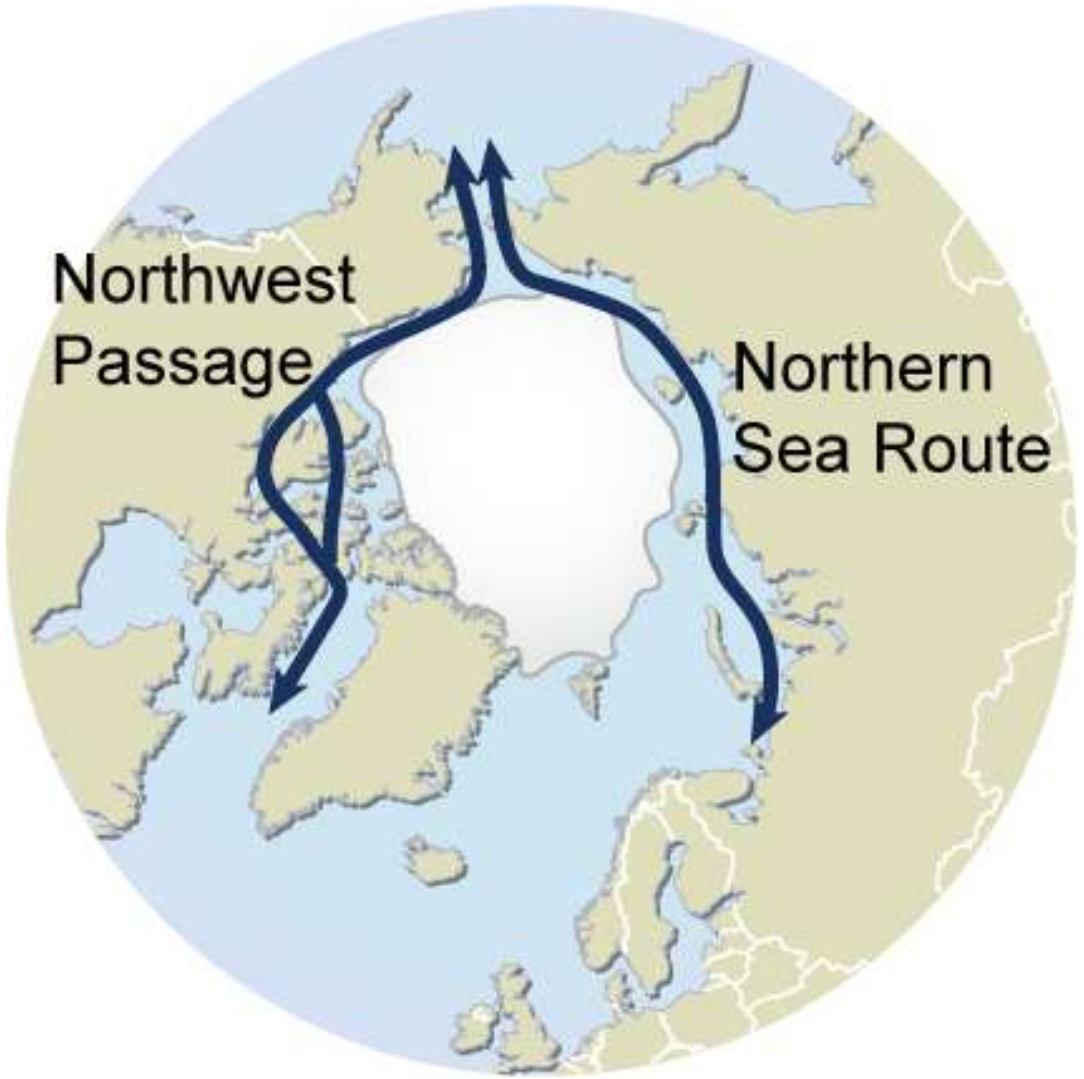

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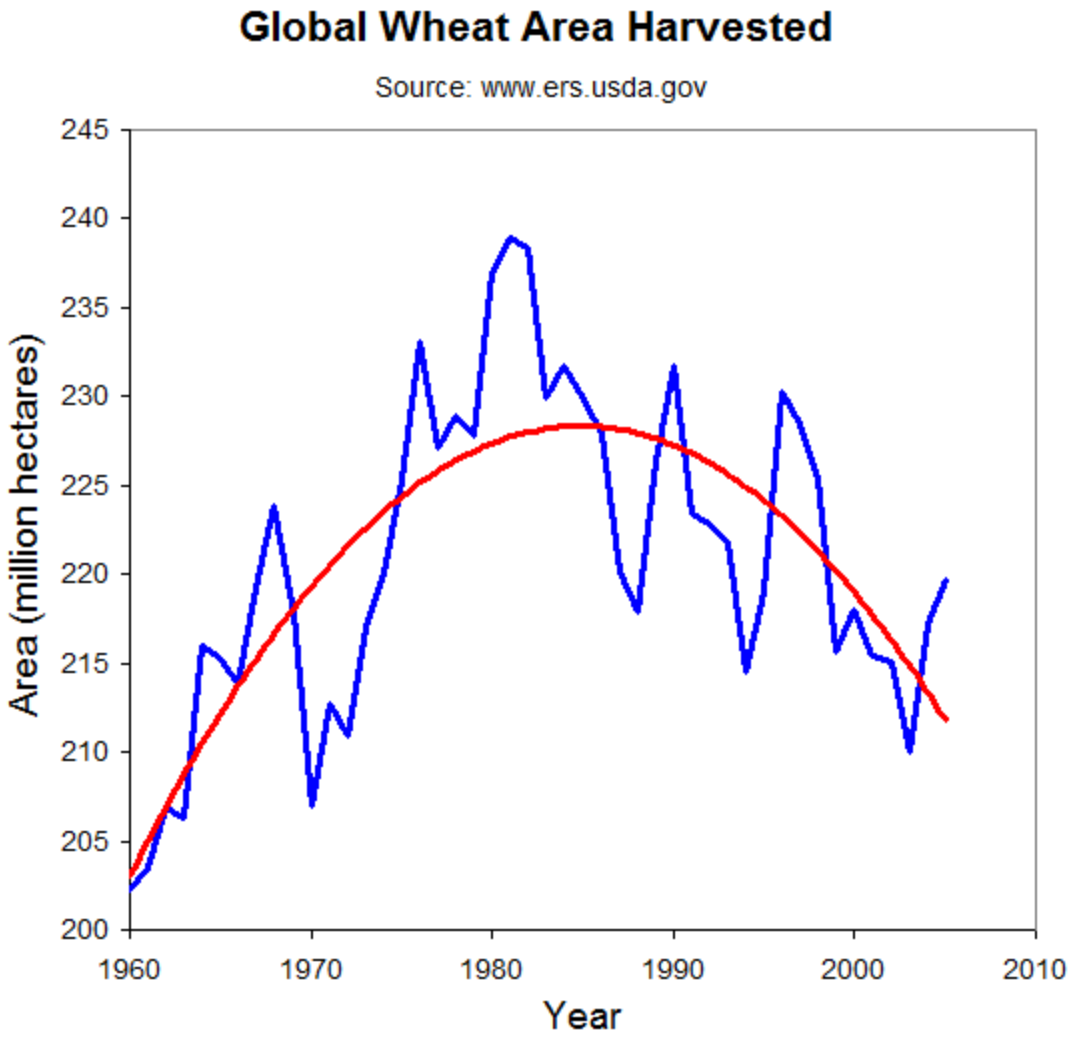

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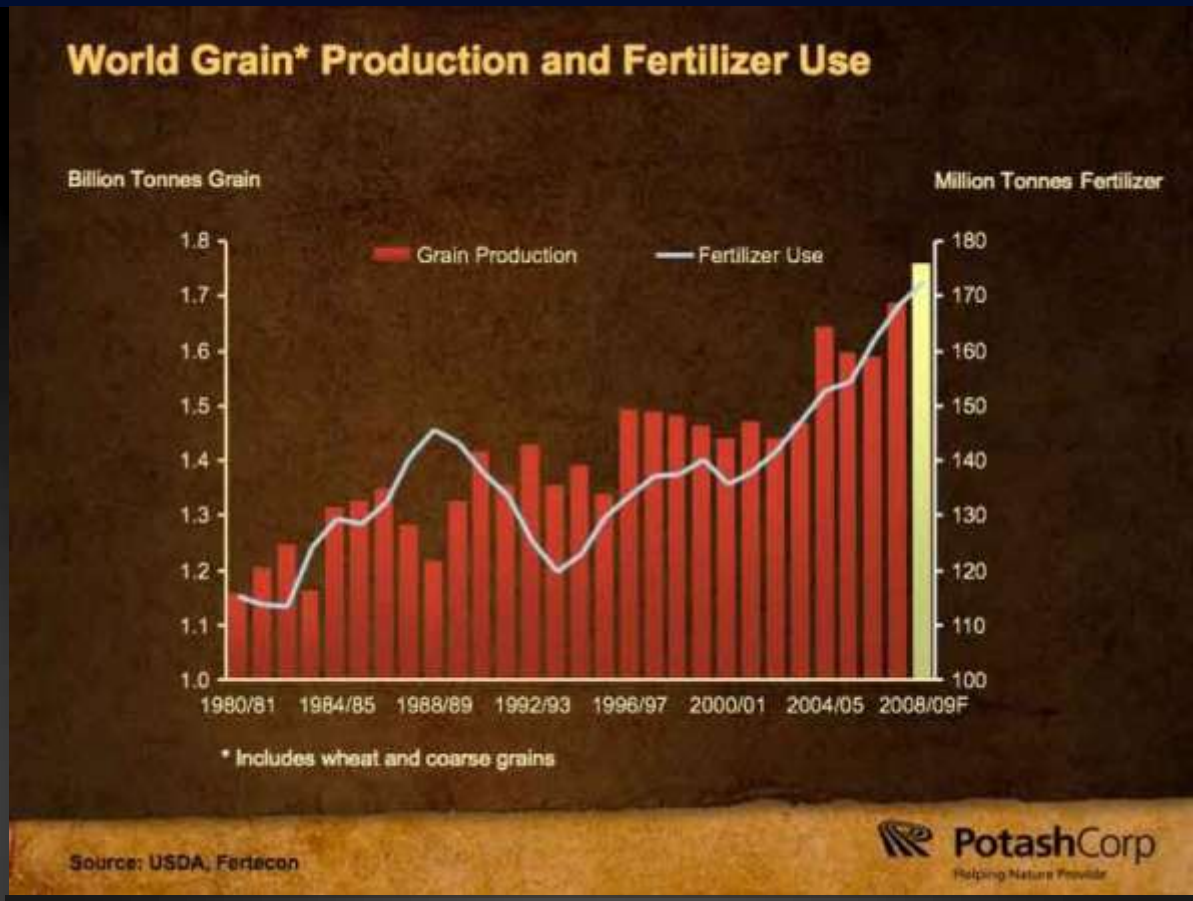

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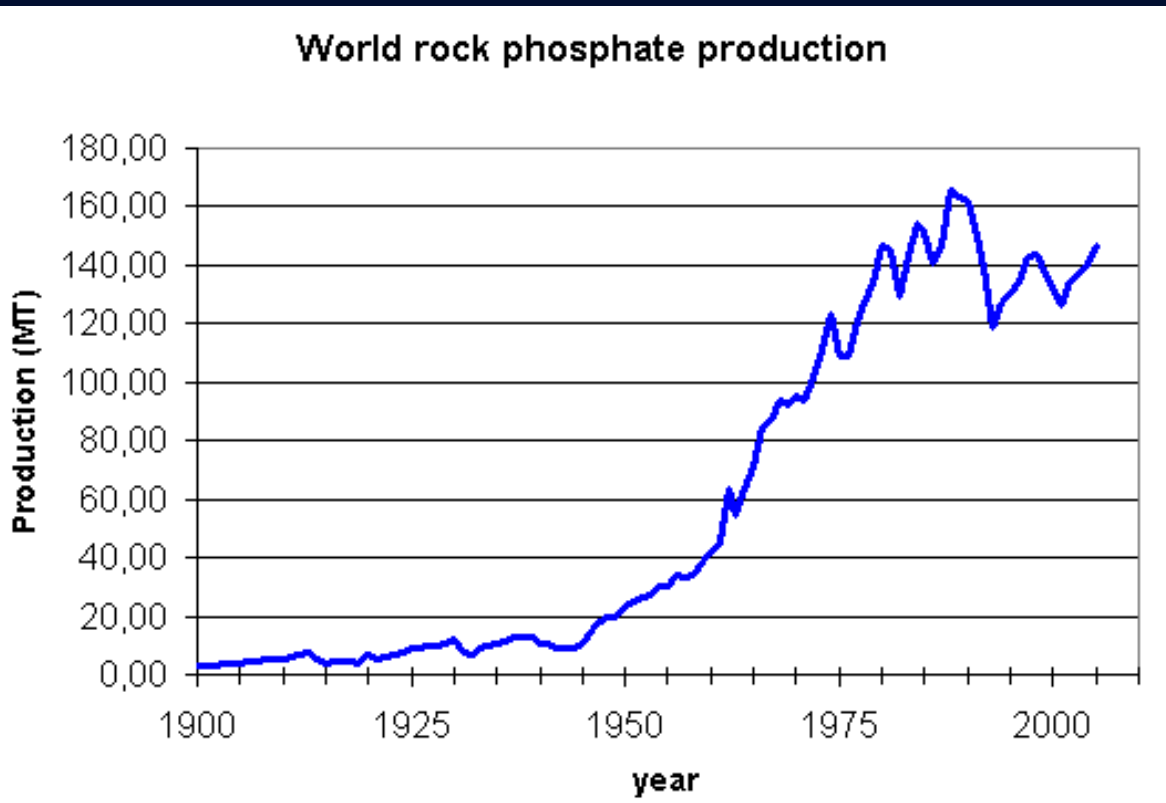

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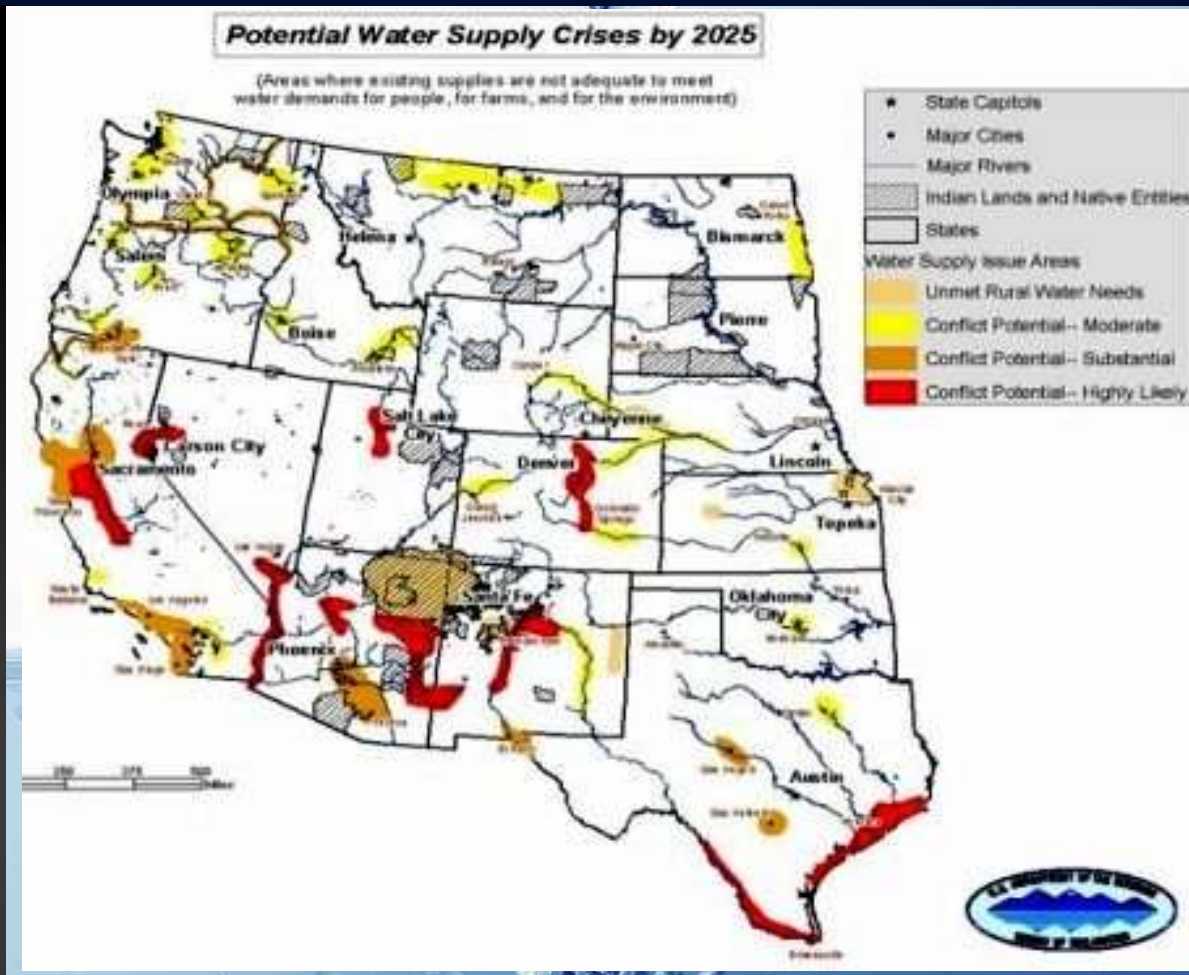

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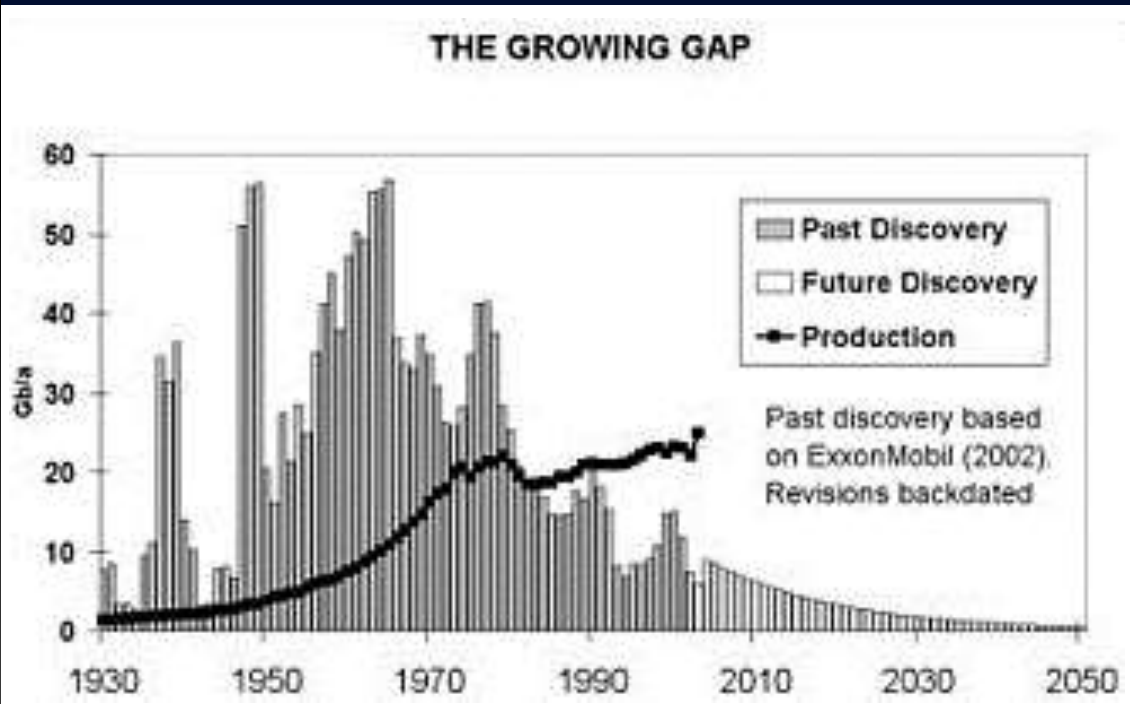

Oil exploration and investment:

$350B needed annually through 2030

$390B actual world expenditure 2000-2007 combined

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From Awareness to Application

Reducing carbon emissions isn't just for environmentalists anymore.

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From Awareness to Application

Sustainability Rating Systems

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Infrastructure Sustainability Rating Systems

- CEEQUAL (UK, 2004)
- Envision (USA, under development)
  - Institute for Sustainable Infrastructure

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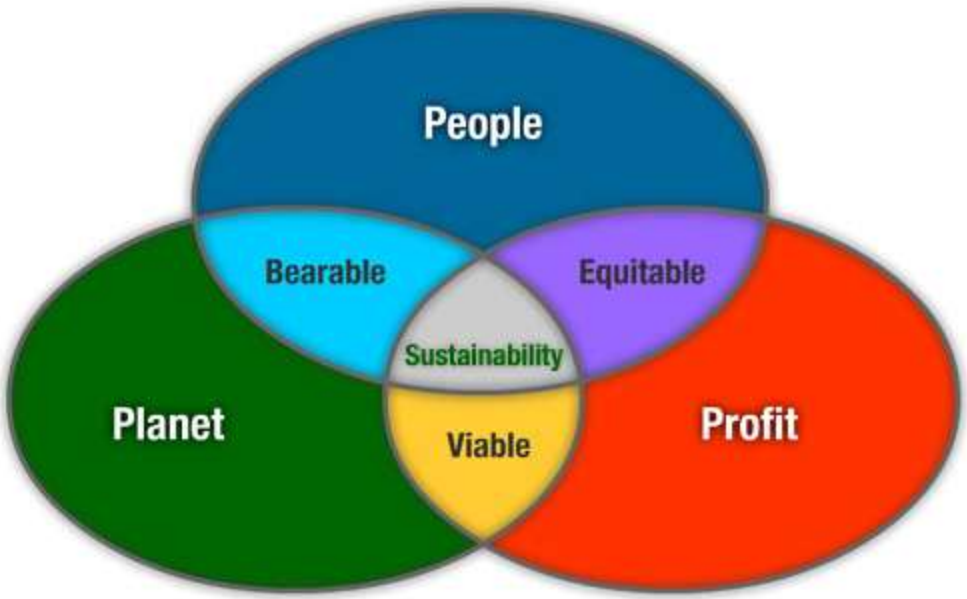
Principles Incorporated into Envision

- Triple Bottom Line (Economic, Environmental, Social)
- Pathway
- Systems
- Enlarging



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Enlarging Opportunities:

Sustainability at All Project Phases

- Planning
- Design
- Construction
- Operations & Maintenance
- Decommissioning

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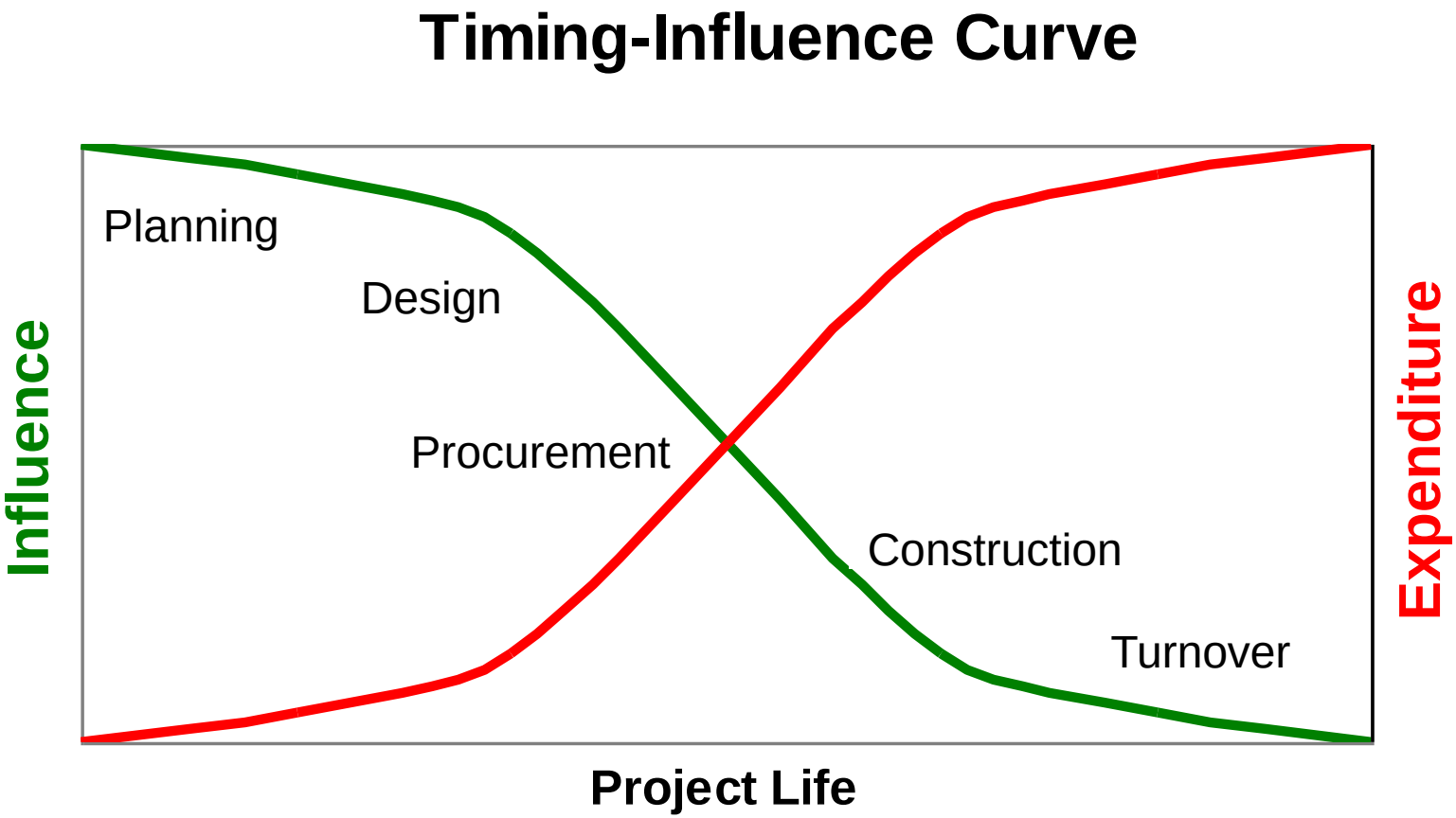

Adapted from CII Constructability Primer.

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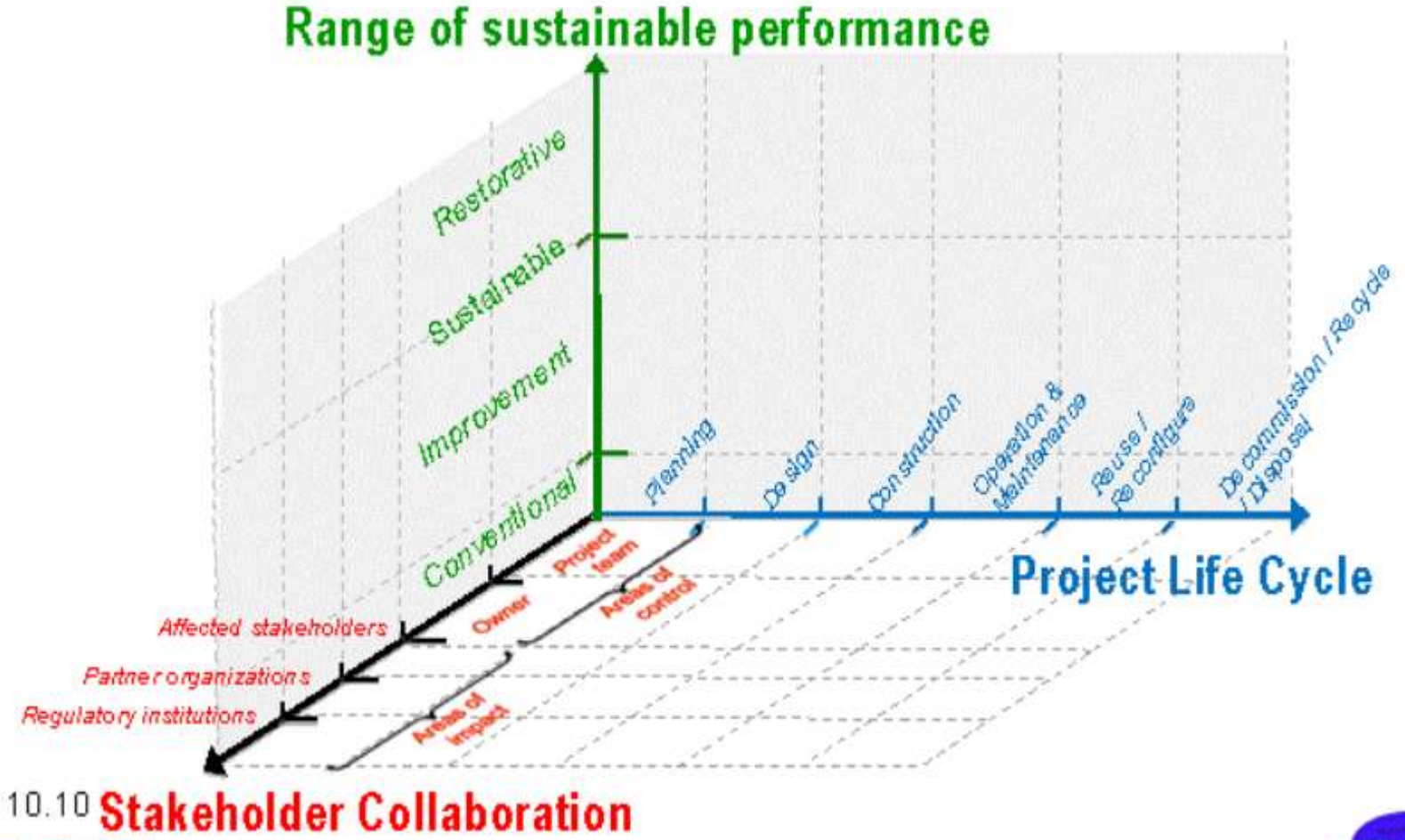

Source: ASCE Fundamentals of Sustainable Engineering Course

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Application

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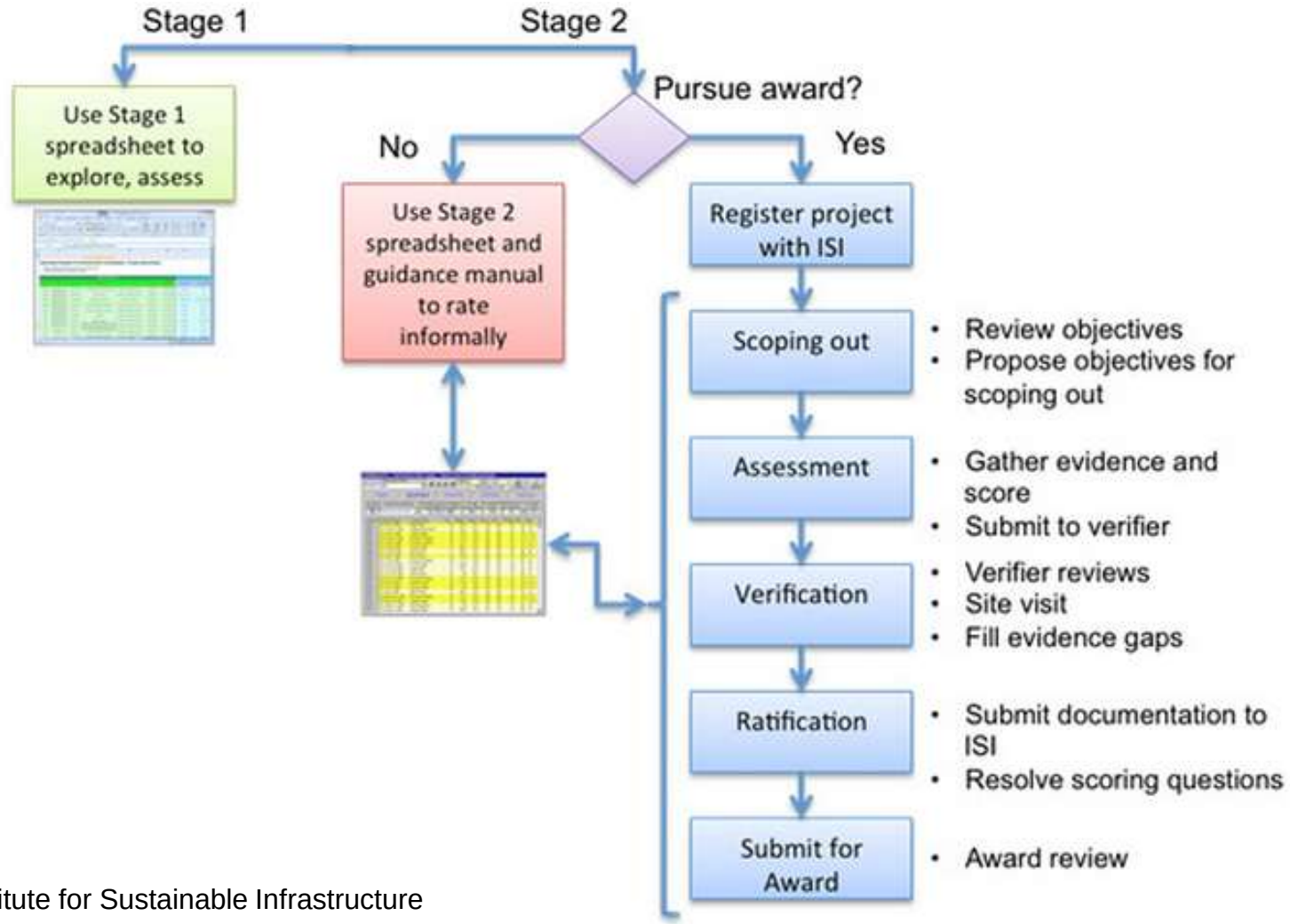
The Envision Rating System



Source: Institute for Sustainable Infrastructure

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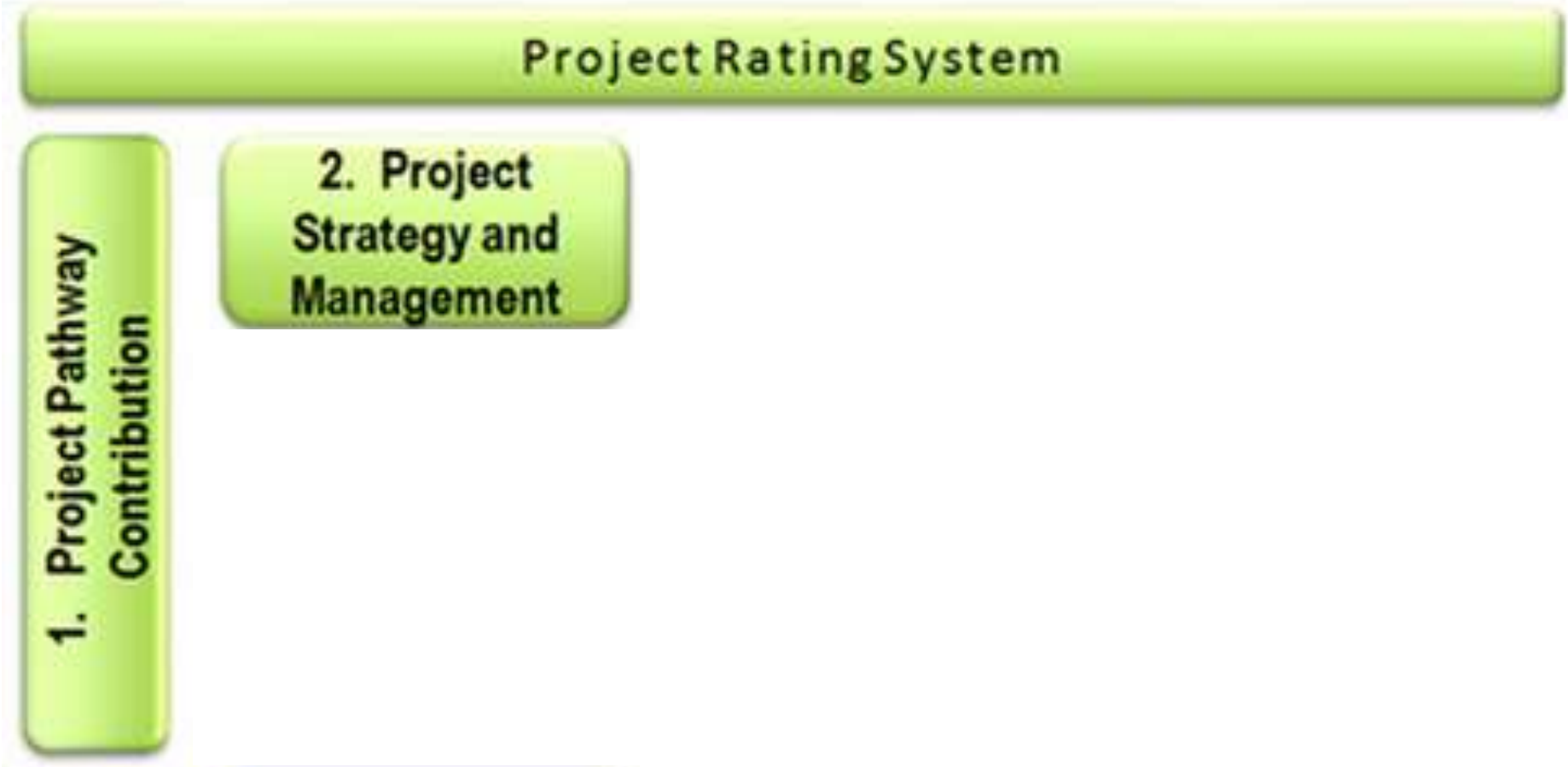

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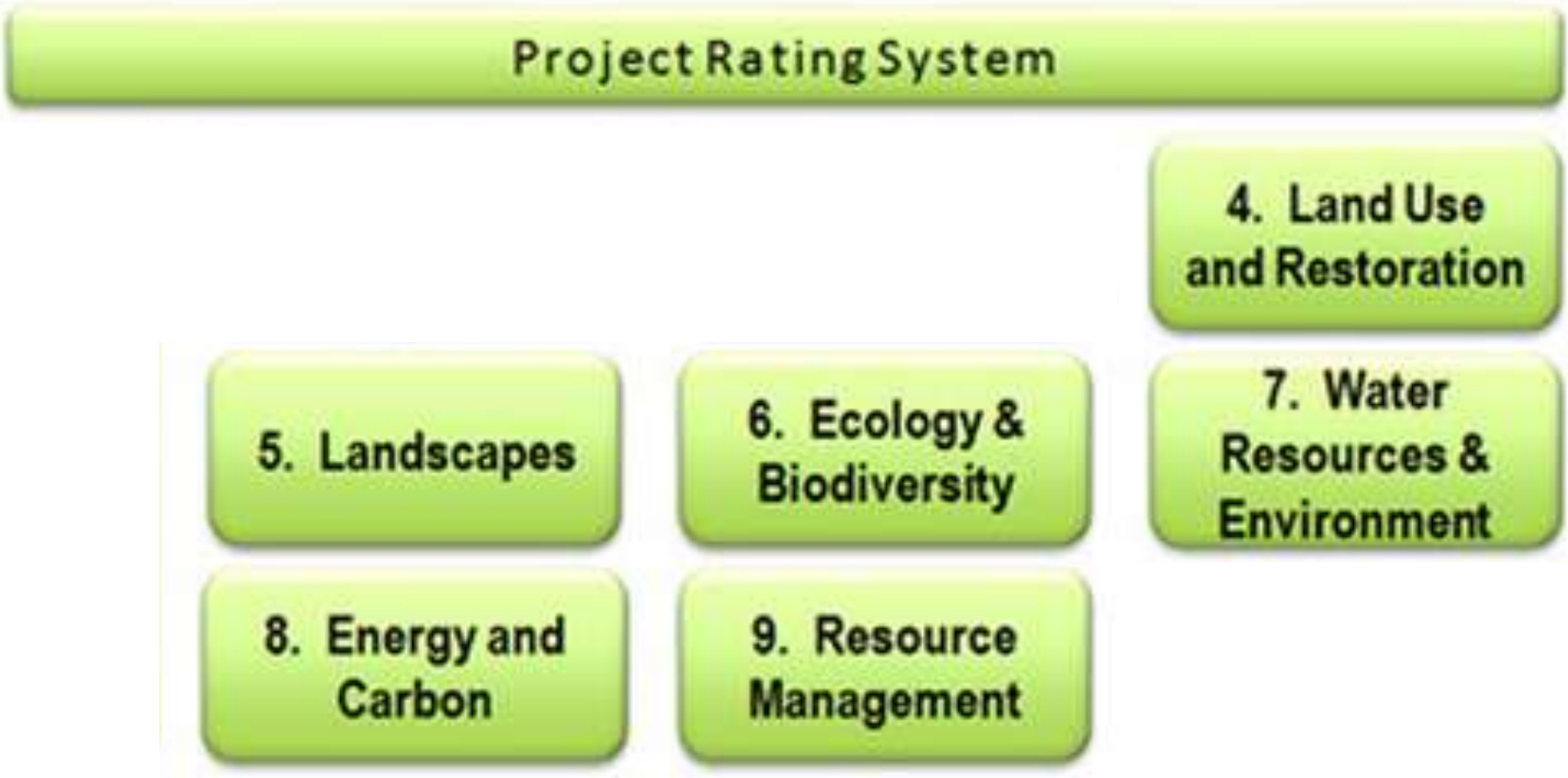

Source: Institute for Sustainable Infrastructure

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Example Objectives

- Project Pathway Contribution: Avoid traps and vulnerabilities that create unacceptably high, long-term costs or risks.

- Land Use and Restoration: Prevent soil loss and pollution infiltration from stormwater runoff during construction.

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Example Objectives under Project Strategy and Management

- Pursue by-product synergy applications.
- Pursue opportunities for sustainability improvement throughout the useful life of the project.
- Work with public agencies to identify and resolve conflicting regulations, standards and policies.

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The Envision Rating System

Source: Institute for Sustainable Infrastructure

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Stage 4 Tools: Life Cycle Assessment

Potential Influence of the Envision System

- A measure of good government
- A factor in loan rates and bond ratings
- A factor in “Infrastructure Bank” financing decisions

Evaluation of the Envision System

- Weighting scheme difficulties
- Greenwashing vs.

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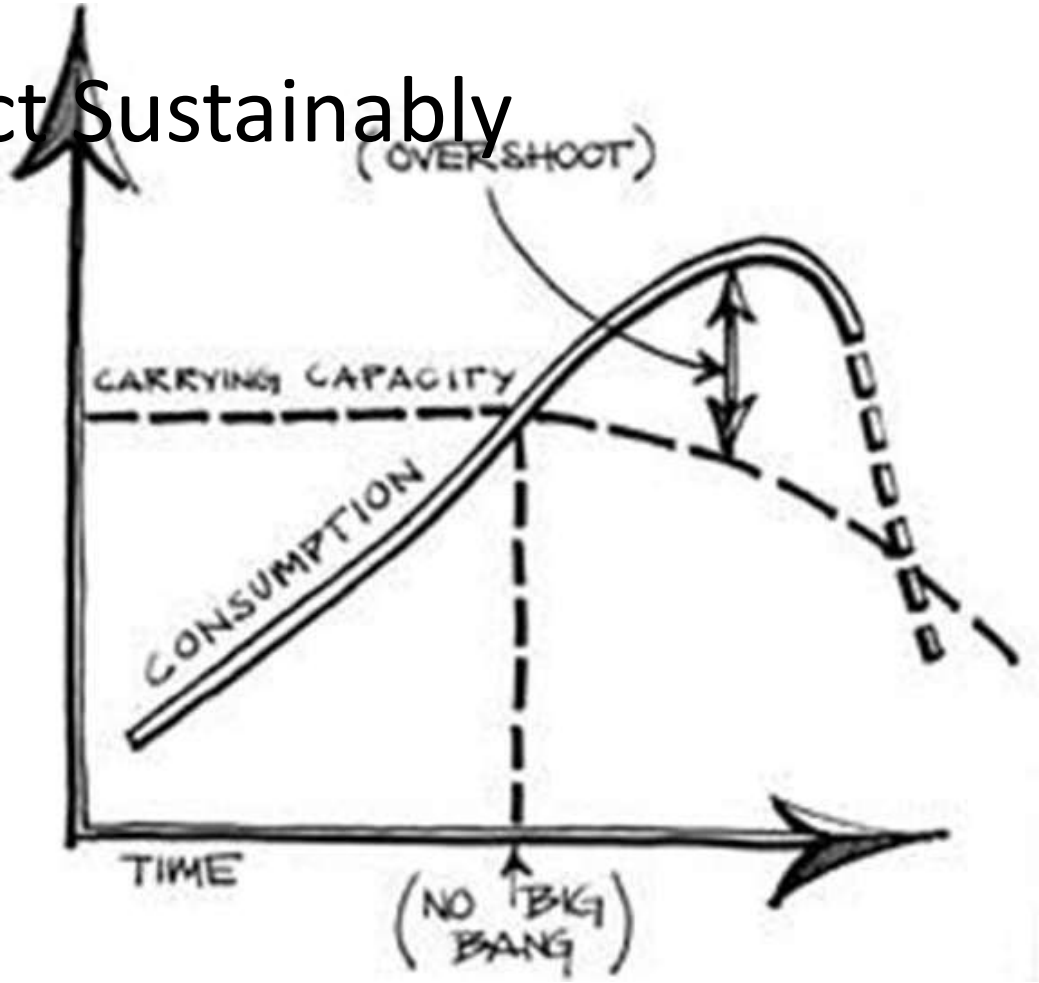
Think and Act Sustainably

Overshoot



Source: *Our Ecological Footprint*, Wackernagel and Rees

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Limits to Growth

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