Monday, December 8, 2014
ACES Conference

Comparing Arctic Resource Valuation for Policy Making

Ecosystem Services, Climate Change, and the Arctic Environment

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Introduction

- Working Backwards: Which Policies?
- Which Ecosystem Services?
- Valuation Fundamentals
- Summary

Working Backwards: Which Policies?

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Working Backwards: Which Policies?

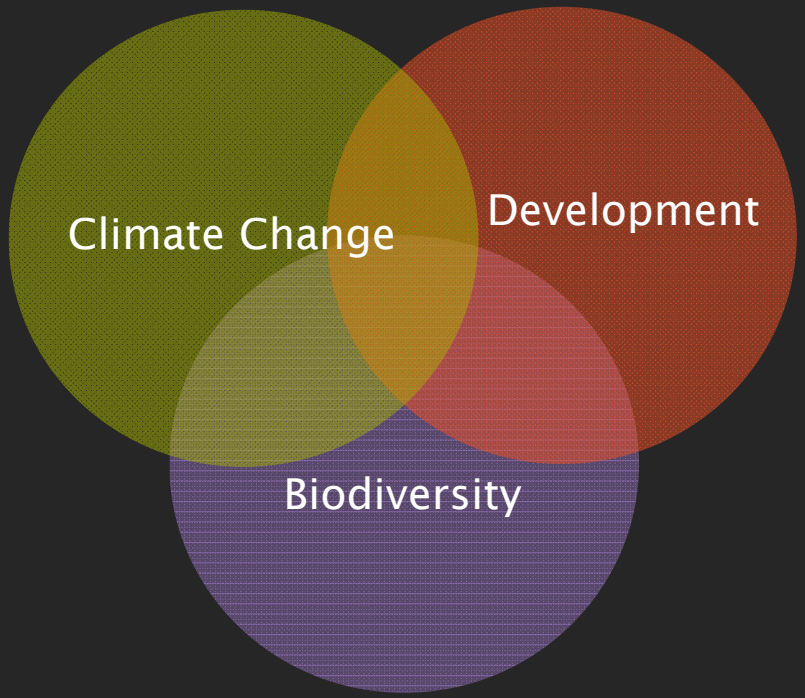
- Policies Related to Climate Change
  - Mitigating Impacts
  - Adaptation
  - Monitoring
- Policies Related to Biodiversity
  - Overexploitation
  - Invasive Species
  - Preservation of Habitat
  - Resiliency

Working Backwards: Which Policies?

- Policies Related to Development
  - Oil and Gas Development
  - Other Mineral Development
  - Increased Shipping Lanes
  - Indigenous and Coastal Populations

Working Backwards: Which Policies?

Mitigation; Adaptation; Monitoring



Oil and gas; transportation; indigenous and coastal populations

Preservation of Habitat; Invasive Species; Exploitation

All of the Above

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Which Ecosystem Services?

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Which Ecosystem Services?

- Provisioning
  - Reindeer
  - Commercial Fisheries (10% of Global; 5.3% of Global Crustaceans by weight)
  - Commercial and Subsistence Hunting, gathering, and small -scale fishing
  - Recreational and Sport Hunting

From Arctic Biodiversity Assessment, Conservation of Arctic Flora and Fauna (CAFF)

Which Ecosystem Services?

- Cultural
  - Tourism
  - Non-Market Values

From Arctic Biodiversity Assessment, Conservation of Arctic Flora and Fauna (CAFF)

Which Ecosystem Services?

- Supporting and Regulating
  - "Other services, including supporting services that make possible other ecosystem functions, and regulating services, that keep ecosystems in balance, are not considered here. They are important, but relatively little information is available for the Arctic on these topics"

From Arctic Biodiversity Assessment, Conservation of Arctic Flora and Fauna (CAFF), a working group of the Arctic Council

*2013 , **678 pages**!*

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Which Ecosystem Services?

- Supporting
  - More than 50 percent of the world's wetlands
  - Arctic and Antarctic together account for more than 10 percent of global freshwater reserves

Which Ecosystem Services?

- Regulating
  - Temperatures
  - Sea level
  - Jet Stream

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Valuation Fundamentals

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Valuation Fundamentals

- What is the policy question?
- Which ecosystem service(s) are needed?
- Do you need monetary units or are ecological units sufficient?

- Select boundaries of analysis:
  - Geographic
  - Demographic
  - Temporal

Valuation Fundamentals

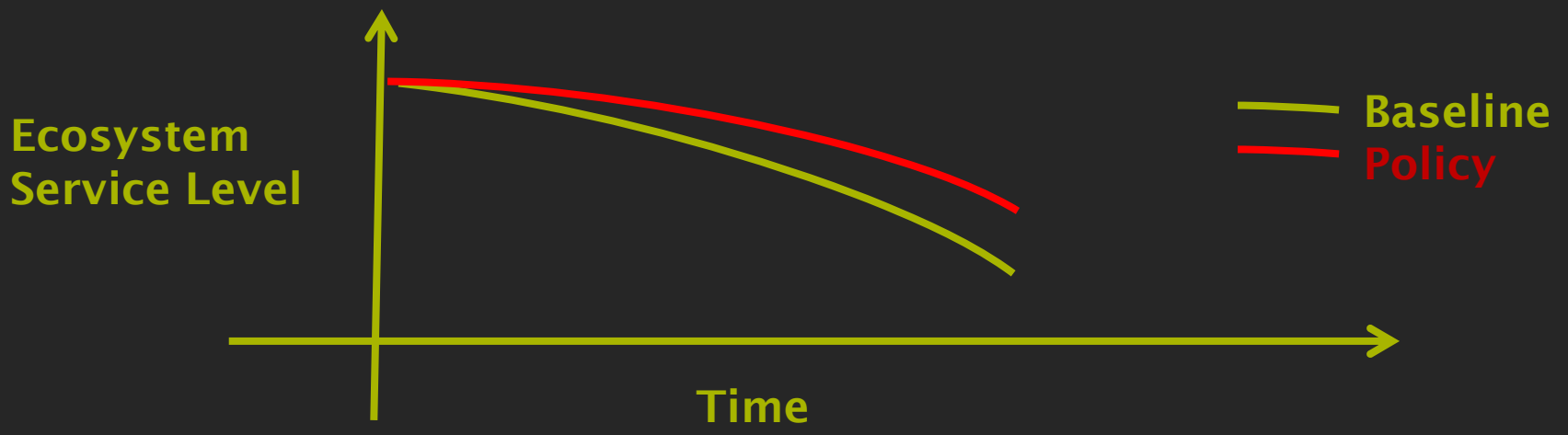
- Estimate the Baseline, not the Stock
  - Measure an indicator
  - Something quantifiable
  - Through time
  - Much Climate Change Work Focuses on the Difference between Current Conditions and the Future under Climate Change

    Baseline = Current Conditions
  - Policy Choices often need a Baseline that Includes Climate Change

    Baseline = Future under Climate Change

Valuation Fundamentals

- More on Baseline
  - Baseline should capture climate change impacts
  - IPCC
  - Other Sources



Valuation Fundamentals

- More on Baseline
  - Example:

    "LONDON, July 24, 2013 (Reuters) - A release of methane in the Arctic could speed the melting of sea ice and climate change with a cost to the global economy of up to $60 trillion over coming decades, according to a paper published in the journal ***Nature****"*

  - (Global GDP approximately $70 trillion in 2012)

Valuation Fundamentals

- More on Baseline
  - But:

Press Release

future ocean
KIEL MARINE SCIENCES

67/2012

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Helmholtz Centre for Ocean Research Kiel

Gas Outlets off Spitsbergen Are No New Phenomenon
Expedition to the Greenland Sea with Surprising Results

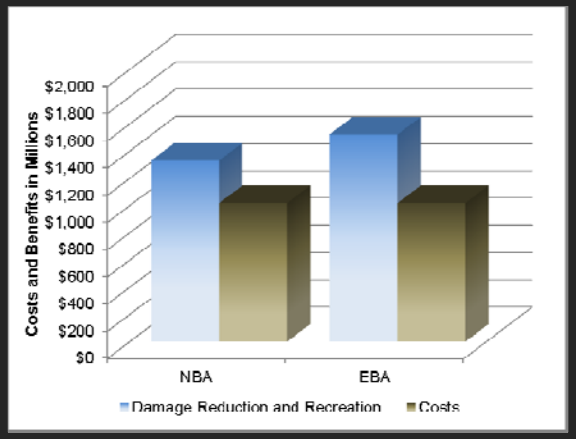
September 19, 2012/Kiel. Marine scientists from Kiel, together with colleagues from Bremen, Great Britain, Switzerland and Norway, spent four and a half weeks examining methane emanation from the sea bed off the coast of Spitsbergen with the German research vessel MARIA S. MERIAN. There they gained a very differentiated picture: Several of the gas outlets have been active for hundreds of years.

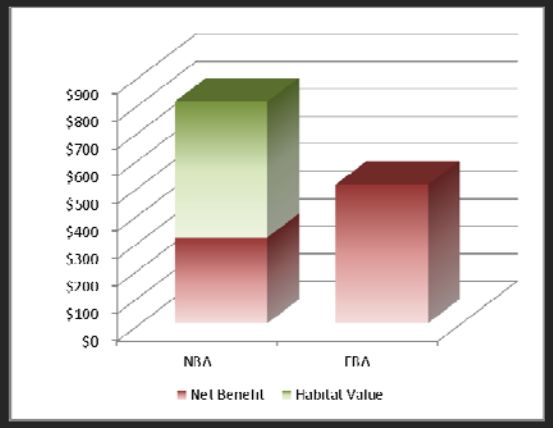
Valuation Fundamentals

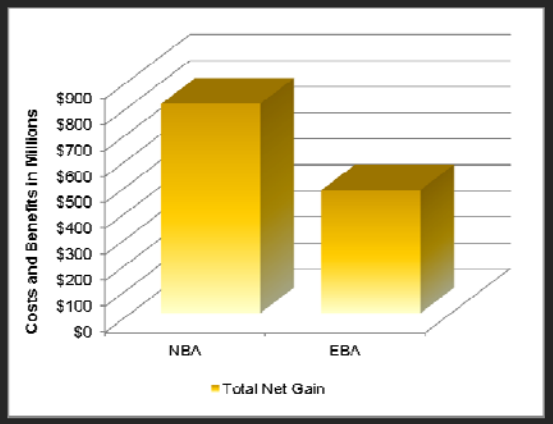
- Method follow the policy question
  - Overexploitation
  - Invasive Species
  - Preservation of Habitat
  - Resiliency
  - Adaptation
- Key is Decision Making

Valuation Fundamentals

- Example
  - Adaptation Question – Measure Benefits and Costs: financial and ecosystem services







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Summary

Summary

- Many ecosystem services in the Arctic – unfortunately not as much data
- All policies will need good ecological units to monitor progress
- Are ecological units sufficient?
- Many policy decisions will require climate change as baseline
- Valuation strongest for marginal decisions

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