

IUCN Environmental Law Centre, IUCN Academy of Environmental Law
Research Committee, and IUCN Commission on Environmental Law

Workshop:

*Ecosystem Services, Economic Valuation, and Environmental Equity:
Complementary or Contradictory?*

University of Maryland Francis King Carey School of Law
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Law, Ecosystem Valuation and Risk Allocation

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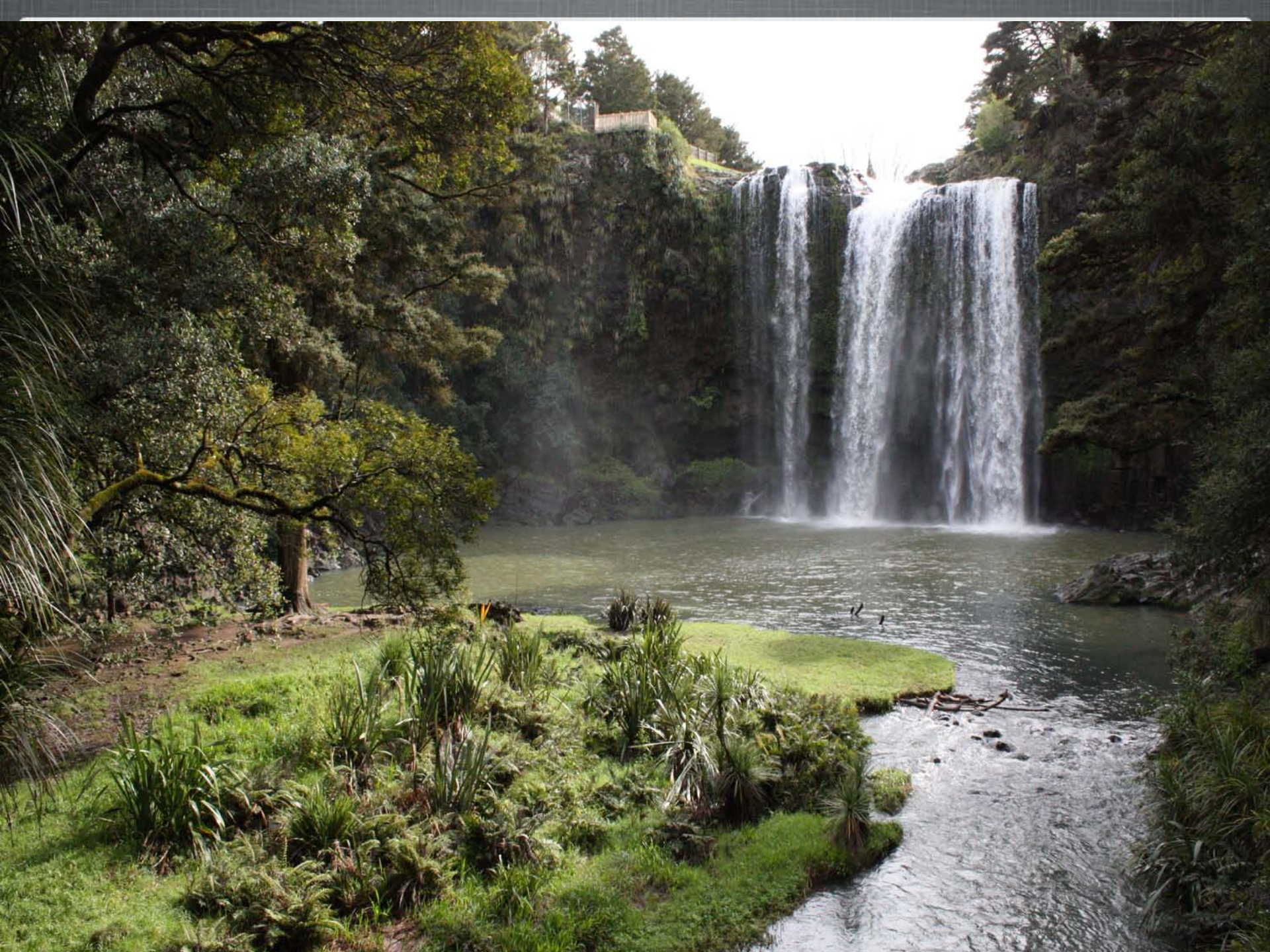
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General Statement of the Sustainability Problem

- Because “the world is more messy, more crowded, more interconnected, more interdependent, and more rapidly changing than ever before, the more ways of seeing the better. The systems thinking lens allows us to reclaim our intuition about whole systems...”

Meadows DH *Thinking in Systems: A Primer* 6 (2008)

- Ecosystems lack market value
- Destruction or impairment of ecosystem functions reduces the services ecosystem supply and thereby reduces the overall wealth and well-being of human society
- Paradigmatic outcome of the prisoners’ dilemma: ecosystem impairment is individually rational and collectively deficient
- The Externality Problem



Law's Response to Ecosystem Value

- **The Common Law's Paradigm: Value of Property (Locke)**
- **Tort Law**
 - **Private Nuisance and Public Nuisance**
- **Evolution of Environmental Laws**
 - **Late 19th century conservation laws and national parks**
 - **Modern Media-based Environmental Laws**
 - **Clean Air Act, Clean Water Act, Hazardous waste laws, Endangered Species Act**
 - **Silos, fragmented, uncoordinated, inconsistent**
- **Law for Complex Systems**



Ecosystems and the National Environmental Quality Act

- **NEPA: A Sustainable Development Statute?**
 - “create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations.”
 - Congress recognized “the profound impact of man’s activity on the interrelations of all components on the natural environment, ... and the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man....” 42 USC § 4331(a)

NEPA's Limitations

- Procedural Only:
 - EA or EIS prepared prior to government's decision
- No Normative Requirement
 - Project-based analysis only
 - Narrow definition of Alternatives
 - Mitigation of Environmental Harm must be considered, but need not be required
 - No enforcement of mitigation
 - No learning: no post-project monitoring, data collection or analysis of lessons learned

NEPA, Complex system Feedback and Responsibility for Risk

- Absent fraud, so long as the process is followed and decision is not arbitrary or capricious
 - No consequences for substantive errors in EIS evaluations or data
 - No obligation to measure or evaluate actual environmental impacts
 - No agency mandate to enforce promised mitigation
- Teton Dam collapse example

Risk of Ecosystem Harm



Gulf of Mexico Ecosystem

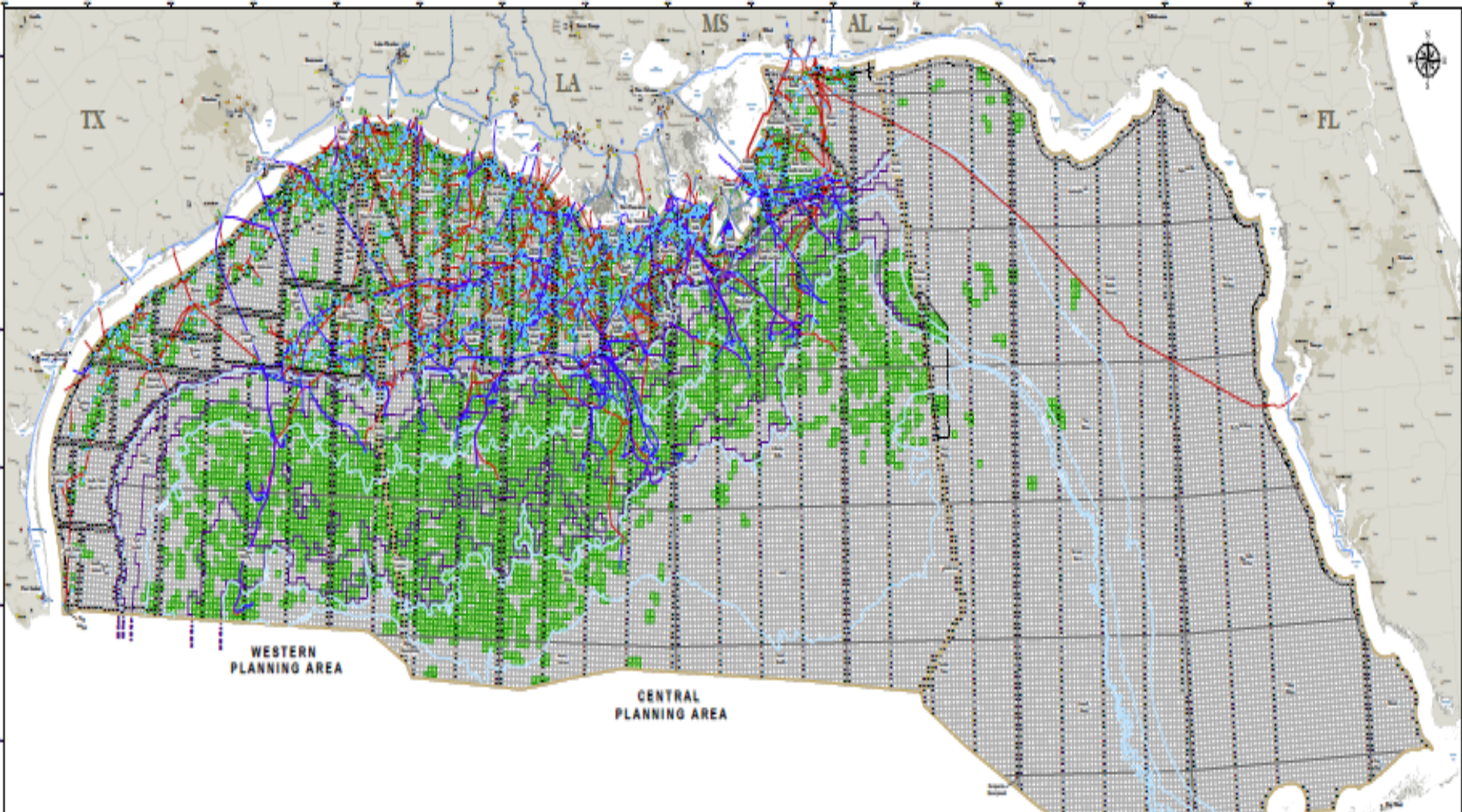
50686+ Bore Holes in Gulf of Mexico

<http://robslink.com/SAS/democd33/borehole.htm>

Extensive Underwater Pipeline Network (see next slide)

Macondo Well | National Commission on the BP Deepwater
Horizon Oil Spill and Offshore Drilling

http://www.oilspillcommission.gov/chief-counsel/video/C21462-330_CCR_Macondo_Well



VISUAL 1
Active Leases and Infrastructure
 September 29, 2010
 Gulf of Mexico
 Outer Continental Shelf

Active Lease	Active Oil Pipeline 20" and Greater	Selected Town or City
Flower Garden Bank Block Withdrawn from Leasing	Active Oil Pipeline Less Than 20"	OCS Oil and Gas Structure
Eastern Planning Area Sub 231 Boundary	Active Gas Pipeline 20" and Greater	Pipe Casing/Pipeline Facility
OCS-Related Coastal Navigation Channels	Active Gas Pipeline Less Than 20"	Supply Base
Gulf Access Route	Royalty Relief Line	Platform Fabrication Yard
Gulf Intracoastal Waterway (GIWW)	R/G Line	Crude Oil Terminal
	Planning Area Boundary (see Dashboard)	Helicopter Hub
	Protection Boundary	Oil Refinery
	Water Depth (meters)	Shipbuilding and Repair Yard

DO NOT SCALE THIS MAP TO DETERMINE EXACT DISTANCES OR LOCATIONS. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. FOR MORE INFORMATION, VISIT www.boenre.gov.

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 Revised 9/29/10
 Scale: 1:500,000
 North Arrow: True North
 Date: 9/29/10
 Contact: BOENRE
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**EASTERN
 PLANNING AREA**

Oil Supply Increase vs Demand Reduction

600 to 900 million barrels yield from oil field over 50 year lifetime (3-5 billion barrels at 20 to 30 percent recovery rate)

Over 50 years 2012-2017 cars and light trucks will save 18.5 billion barrels of oil

20 to 38 times more oil saved by fuel efficiency than the field would produce

about \$1.89 trillion savings (plus the money saved by not drilling, by avoiding oil spills, preserved ecosystem services)

9.6 billion tons of CO₂ emissions would be avoided.

Oil will still be underground, available for use by future generations

Ecosystems and Least Cost Energy Choices

- Only about **20 giant oil fields** in the world
- Can put **more efficient vehicles on the road faster than finding and drilling new oil fields**
- **So why drill?**
 - **At \$100 per barrel oil in field worth \$60-90 billion**
 - **so field would be profitable even after BP pays for clean up**
- **Ecosystem services restoration inherently incomplete, some harm is irreversible and lost ecosystem services are irreplaceable**

Are the value of Gulf of Mexico Ecosystem Services included in permit decision?

The NEPA alternatives problem: Solutions with least ecosystem service loss never considered

Shifting the Risk of Ecosystem Services Harm

- Need for objective, measureable criteria to evaluate predicted and actual ecosystem services impairment
 - Quality and quantity of adverse impacts
 - Translatable into specific money-based valuations
 - Used in proposal evaluation and approval
 - Harm secured against, as with any financial risk
- Macro and project-based evaluation needed
 - National wealth accounting
 - Valuation of policy choice (e.g., oil drilling vs vehicle efficiency)

Legal Tools and Ecosystem Services Science to Secure Against Ecosystem Risk

- Use improved science and understanding of complex systems for assessing and valuing
 - ecosystem services risks and financial risks to current proposal from future regulation and protection of ecosystems
 - Externality insurance, Environmental bonds, Collateralization, Liquidated damages;
 - “NEPA as Contract”
 - Mitigated Environmental Assessments Problem (see CEQ memo)
 - Citizen enforcement of mitigation failures
 - Responsibility for unanticipated ecosystem harms and incentives for enhanced ecosystem restoration and environmentally beneficial projects
 - Offset credits, cap and trade, additionality

