Adapting to an Environmental Management Paradigm Based on Protecting the Service of Nature

Private Sector Challenges

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Corporate Environmental Consideration

- Governance
- Business Analysis / Strategic planning
- Research and Development
- Project Planning – Gated systems

Internal Processes

- External Communication
- Facility Operations/Decommissioning
- Project Development / Financing
- Market Place Performance
Corporate Management Systems - Not Monolithic

- Highly organic and integrated with the business
- Reflect operational purpose, & historic development of a corporation – “the culture”
- Respond to external regulatory / market processes
  - 40+ year evolution with current regulatory systems
- Specific to industrial categories – self regulation
- Type and flow of information useful for business decisions is defined by existing systems and processes
- Ecosystem Service (ES) information must have utility in these systems to influence business performance
Is Change Inevitable?

“The question is no longer if ecosystem Services will be a key framing of environmental issues among multilateral institutions in coming years, but rather exactly when, where and how it will occur.”

Global Public Sector Trends in Ecosystem Services, 2009—2011 Summary
BSR March 212
Business Actively Engaged with ES
Voluntary Corporate ES Applications

- **Governance**
- **Business Analysis / Strategic planning**
- **Research and Development**
- **Project Planning – Gated systems**

**Internal Process**

- **External Communication**
- **Facility Operations/Decommissioning**
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- **Market Place Performance**
Corporate Policy Commitment to ES Growing

- Growing numbers of corporations are making to commitment to consider both Biodiversity & ES as part of their Governance processes.

- AkzoNobel
- Barrick Gold
- BC Hydro
- BHP Billiton
- British American Tobacco
- BP
- Coca-cola
- Dow
- Eni
- ExxonMobil
- Nestle
- Puma
- Rabobank
- Rio Tinto
- Shell
- The Walt Disney Company
- Weyerhaeuser
Biodiversity and Ecosystem Services

- We identify biodiversity protection objectives and consider ecosystem services and exploration activity through our ESHIA process, the preparation of Environmental Management Plans, and our Environmental Business Planning efforts.

[Website Link]

www.exxonmobil.com/Corporate/safety_env_biodiversity.aspx
Environmental Business Planning

- Environmental Business planning a part of annual planning process for all Business units and facilities
  - ISO 14000 linkage

- Traditional focus
  - Compliance
  - Environmental injury

- Difficult to justify going beyond compliance

Diagram:

- Environmental Aspects Analysis
- Environmental Impacts
- Performance improvement Projects
- Compliance Assessment
- Investment Analysis

ACES December 12, 2012
Environmental Business Planning

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- Ecosystem services values help understand benefits beyond compliance
R&D – Ecosystem Service Tools

- Exploring tools to assess the value of ecosystem services through stakeholder engagement in Arctic

- Using expert solicitation to develop planning matrix for deep water Gulf of Mexico Ecosystem Services
Integration of ES into Property Design and Management

- Sustainable Design
- Low Impact Design / Green infrastructure
- Natural Landscaping
- Wildlife Property Tax
- Institutional Controls on Future uses
- Marketable Conservation Credits

Activities:
- Acquire
- Operate
- Redevlop
- Divest
- Retire
Integrating New Design with Existing ES

- Low Impact Design (LID) / Sustainable Sites Initiative

- Manage storm runoff with natural infrastructure that will enhance water quality and increase diversity of habitats
  - Rain gardens
  - Bio-swales vs. piping
  - Meadows vs. lawns

- Lakes are operational components of site non-potable water supply

- Forest modulates microclimate

- Natural floodplain buffers retained

- Extensive trail system provides access to nature
ES in Corporate Investment Decisions

- Value based analysis (e.g. NPV) of management options and trade-offs generally require value inputs as monetary estimates

- Many ES have biophysical values but can’t be monetized in absolute terms - Exceptions
  - Provisioning ES which trade in commodity markets (e.g. lumber)
  - Ecosystem structure (i.e. green infrastructure) that can be normalized to engineered structure for function can be valued as a replacement cost

- ES information often relegated to economic or community sensitivities
# New ES Tools Rapidly Developing

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Tool:</th>
<th>Tool:</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify ecosystems and ecosystem services of concern (Primarily a qualitative assessment)</td>
<td>SCREEN</td>
<td>Corporate Ecosystem Services Review (ESR)</td>
</tr>
<tr>
<td>2</td>
<td>Prioritize and rank ecosystem services of most concern, including eliciting preferences from stakeholders</td>
<td>SCOPE</td>
<td>EcoAIM ESValue</td>
</tr>
<tr>
<td>3</td>
<td>Given a specific geographic area (or set of scenarios), what will be the change in ecosystem services? Who will be affected? How will they be affected?</td>
<td>ASSESS</td>
<td>ARIES, InVEST, EcoAIM, EcoMetrix</td>
</tr>
<tr>
<td>4</td>
<td>What is the value of changes in ecosystem services? Value to whom? Quantified how?</td>
<td></td>
<td>Tool: EcoAIM, ESValue, NAIS</td>
</tr>
<tr>
<td>5</td>
<td>Implement &amp; Monitor</td>
<td>DEVELOP MANAGEMENT PLAN</td>
<td>Tool: EcoMetrix</td>
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</table>

*Input data at right landscape scale lagging!*
Some Corporate ES Applications Uncertain

Internal Processes
- Governance – ES as EPIs?
- Business Analysis / Strategic planning – Delivered value?
- Research and Development
- Project Planning – Economic?

External Processes
- External Communication – EPIs?
- Facility
- Operations/decommissioning
- Project financing
- Market place performance – P&L?
Regulated Corporate ES Applications

**Internal Process**
- Governance
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**External Processes**
- External Communication
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Regulatory and Policy Uncertainty High

- Ecosystem Service concept useful to understand value of environmental protection.

- Significant international effort to explore ES approaches for regulatory purposes (e.g. USEPA ORD, EU/EA, UNEP-IPBES)

- Utility of ES metrics as compliance endpoint needs further development and demonstration

- Many scientific challenges
  - ESV measure consumer preference not ecological integrity
  - ESV changes across a landscape as community changes
  - Lack of service and value data at scale of compliance
Barriers - Challenges

Current Regulatory Approaches

- ES information aligns well with Land Use decision; but land use mostly regulated locally.

- Major federal and state regulations driven by risk mitigation or Injury avoidance not ES production.

- Regulations require biophysical or engineering data or targets; ES data not included.

- Linkage between stressor exposure, impact to structure or function and ES is intellectually apparent but not often scientifically demonstrated.
## U.S. Clean Water Act

### Today
- Protection goals linked to services (fishable, swimmable and drinkable)
- Regulatory controls linked to engineering and toxicity based standards
- Delegated to states – Basin plans
- Site specific criteria allowed
- Administrator flexibility

### Tomorrow
- Could set performance based on ES tied to WQS
- Requires significant research
- State or regional basin plans objectives tied to ES beneficiaries
- Requires regional data
- Routine use of Administrator flexibility
- Rely on NEBA (net Environmental Benefits Analysis)
Houston - Galveston Region – Natural Value

- SE Texas ecological diversity = economic impact
- Recreational use / Commercial fisheries
  - $3.2 B / year from Recreational fishing and boating
- Significant conservation Initiatives in play
Water is Dominant Landscape Feature

- Freshwater for drinking water
- Stormwater management / Flood control
- Industrial Use / Commercial Transportation
- Freshwater inflow – Streams, wetlands, estuaries

Context and recipient can vary across a region. So the service of water changes as you move from North to South.

What is the value of 1 acre ft. of water or an acre of freshwater wetlands?
Management of Change Process Required

- Change to Ecosystem Services as basis of performance requires *change management process*
- Current environmental management systems evolved with regulations founded on bio-physical science and engineering principles.
- Current compliance focuses on risk mitigation or injury avoidance not on ecological systems production.
- Current regulations have ES as aspirational goals but not as compliance goals or targets
- Any change to ES based regulatory performance will require new infrastructure
  - New management frameworks
  - New forms of data
  - New skill sets for Regulators and users
Change Demands a Robust Dialogue

- Are we replacing or updating regulatory systems?
- Is an ES assessment an ecological or a socio-economic analysis?
- *Fit for Purpose?* - What type and scale of data are we collecting and how will it be used.
- ES type and intensity are influenced by context and audiences; can regulations be adaptable and flexible for spatial and cultural differences?
- What scientific information and methods are needed prior to installation of regulations?
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