Climate Change and the National System of Marine Protected Areas

Jennie Hoffman
EcoAdapt
1. Put MPAs into broader context
Broader Management Context
Broader Spatial Context

Land-sea connections
* Release of toxic material due to sea level rise
* Changes in terrestrial input (e.g. sediment, freshwater)
* Landward shift of marine ecosystems

Great Barrier Reef:
Water quality influences bleaching risk → working with national, regional, local governments as well as watershed landowners/land users to improve water quality
2. Manage for Uncertainty

Adapted from Peterson et al 2003
Scenario Planning: what information would actually make a difference to what we do?
Experimental Adaptive Management

- Try different management approaches in different places;
- Best available science says: uncertainty is high
- MUST have monitoring
3. Find/Create Refugia

- Include refugia explicitly as element of MPA coverage
- Limit local/regional change, e.g.
  - NOx and SOx contributions to acidification
  - Protect/restore processes supporting shoreline accretion (biological and physical)
4. Build Climate Change into Existing Frameworks, Plans, Regulations, etc.

• Designing and managing MPAs and designing and managing MPAs for climate change should be the same thing in today’s world
  – Climate change + MSYs
  – Climate change and acceptable pollutant levels
  – Climate change and critical habitat designations
Human systems are as complex and varied as ecological systems.

<table>
<thead>
<tr>
<th>Ecological Concept</th>
<th>Human analog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range shifts</td>
<td>Migration/resource use shifts</td>
</tr>
<tr>
<td>Shifting Community Assemblages</td>
<td>Ditto (new resource conflict, e.g.)</td>
</tr>
<tr>
<td>Pristineness</td>
<td>Pristineness (community “intactness”)</td>
</tr>
</tbody>
</table>