



Examples of Rapid Ecological Assessments

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Empowered lives.
Resilient nations.

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Selection of REA Examples...



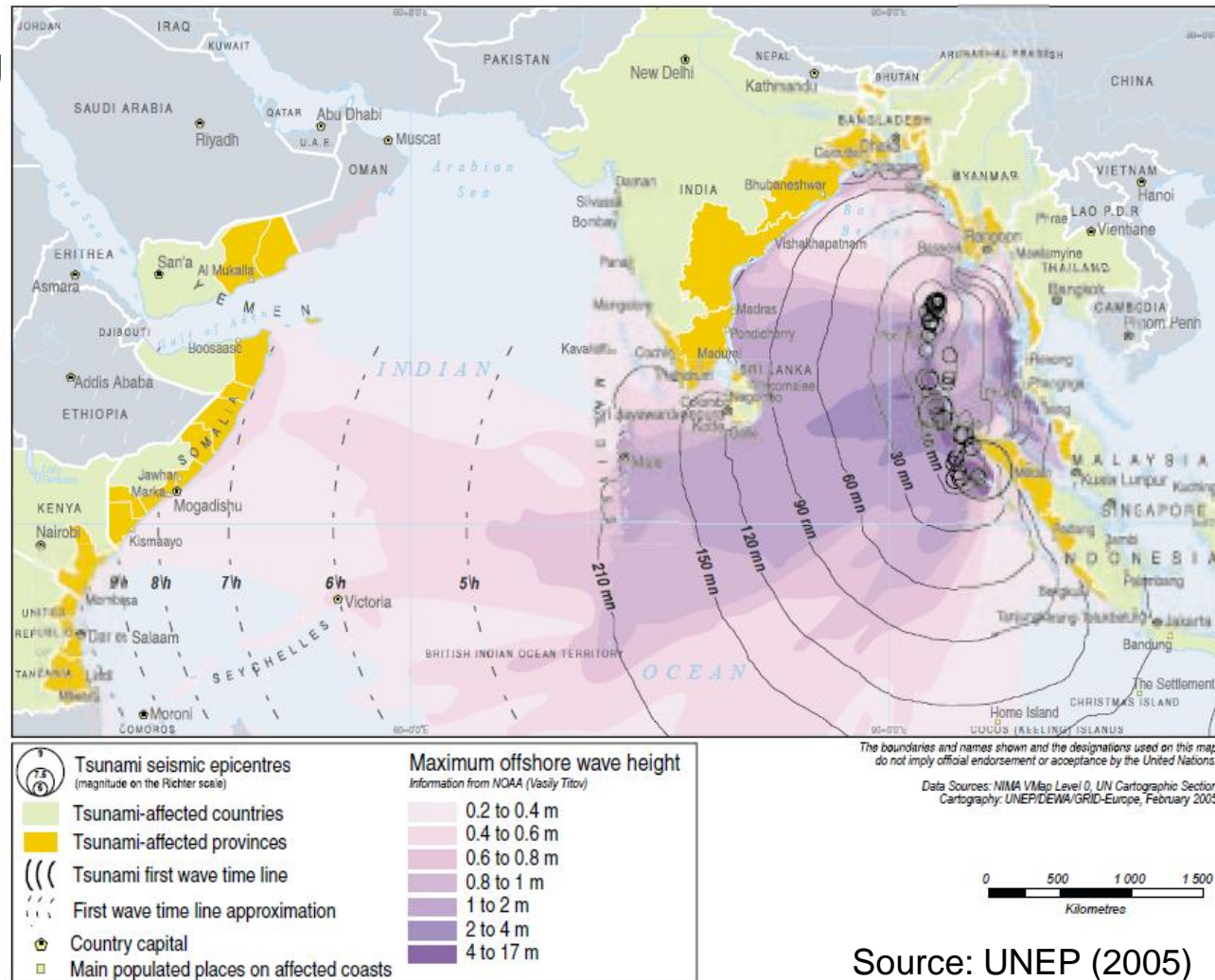
- REAs examples were chosen
 - To reflect a range of methods and purposes
 - To reflect a range of geographic scales
 - For their focus on aquatic/wetland systems

UNEP REA: 2004 Indian Ocean Tsunami

(source: www.unep.org)



- Enormous scale, affecting many nations and killing >200,000 people.
- UNEP conducted REA immediately after the tsunami. Provides a good example of:
 - Speed
 - Damage Assessment
 - Risk Assessment
 - Use of GIS, RS
 - Use of Local Expertise
 - Effective Coordination
 - Focusing International Attention



Source: UNEP (2005)



10 Jan 2003



29 Dec 2004

Sources: Images acquired and processed by CRISP National University of Singapore image © CRISP2004, <http://www.crisp.nus.edu.sg/tsunami/tsunami.htm>
 Irfan Fauzan, 2005, Preliminary Assessment of Tsunami Impact on Ecosystems in Aceh, Ministry of Environment and Global Environment Cent.
 Created by DWA/GRID-Europe February 2005

0 1 2 3 4
 Kilometre



Sources: Images acquired and processed by CRISP National University of Singapore. CRISP2004, <http://www.crisp.nus.edu.sg/tsunami/tsunami.html>
 Ibuliana, Pital, 2005, Preliminary Assessment of Tsunami Impact on Ecosystems, Arch. Min. o' Environment & Global Environment Cent.
 Created by UN/DEWA/GRD-Europe February 2005

0 0.25 0.5 0.75 1
 Kilometre



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UNEP REA:

2004 Indian Ocean Tsunami

(source: www.unep.org)



- Some of the UNEP REA findings:
 - Healthy ecosystems protected people/property
 - Massive salination of inland water, wetlands, agricultural lands, drinking wells
 - Environmental infrastructure was damaged (e.g., sanitation and solid waste disposal sites)
 - Massive amounts of natural and man-made materials dragged into the ocean by receding waters
 - Majority of wildlife avoided harm; damage to endangered nesting turtles was notable exception



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UNEP REA:

2004 Indian Ocean Tsunami

(source: www.unep.org)



- The UNEP REA
 - Generated recommendations
 - Identified urgent measures
 - Identified information gaps
 - Identified evolving secondary threats (e.g., risk of disease outbreaks, increased timber demand)



Source: UNEP (2005)

REA: Lagoons & Estuary in Sekondi-Takoradi, Ghana

(source: Coastal Resource Center-Ghana/Friends of the Nation 2010)



- Objective: Provide basic scientific data for biodiversity assessment to determine ecological health.



- Scale: 2 lagoons (Essei and Butuah), 1 Estuary (Whin R.)



- Approach: REA consistent with Ramsar Framework for Wetland Inventory

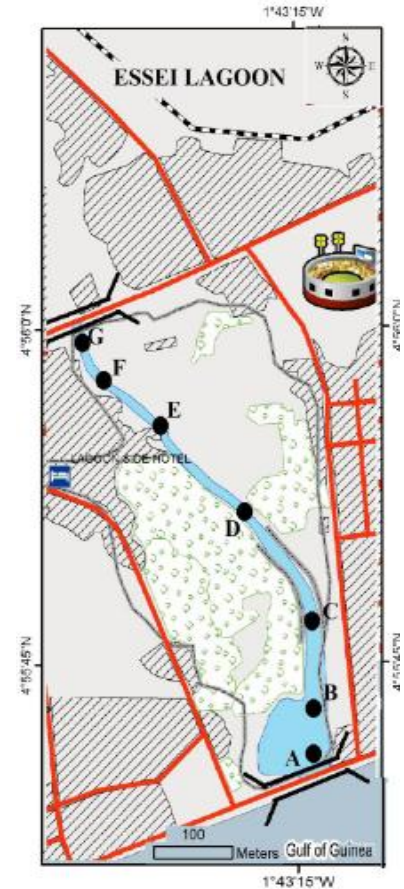


REA: Lagoons & Estuary in Sekondi-Takoradi, Ghana

(source: Coastal Resource Center-Ghana/Friends of the Nation 2010)



- Mapping
 - Satellite imagery: water extent and land use
 - Historical (1973) map for comparison
- Data Collected in Field
 - GPS mapping validation
 - Hydrographic factors
 - Plankton samples
 - Macroinvertebrate samples
 - Fish sampling and measurements
 - Habitat condition and threats
 - Social surveys
- Supplementary Information from outside research: mammals, amphibians, reptiles, birds



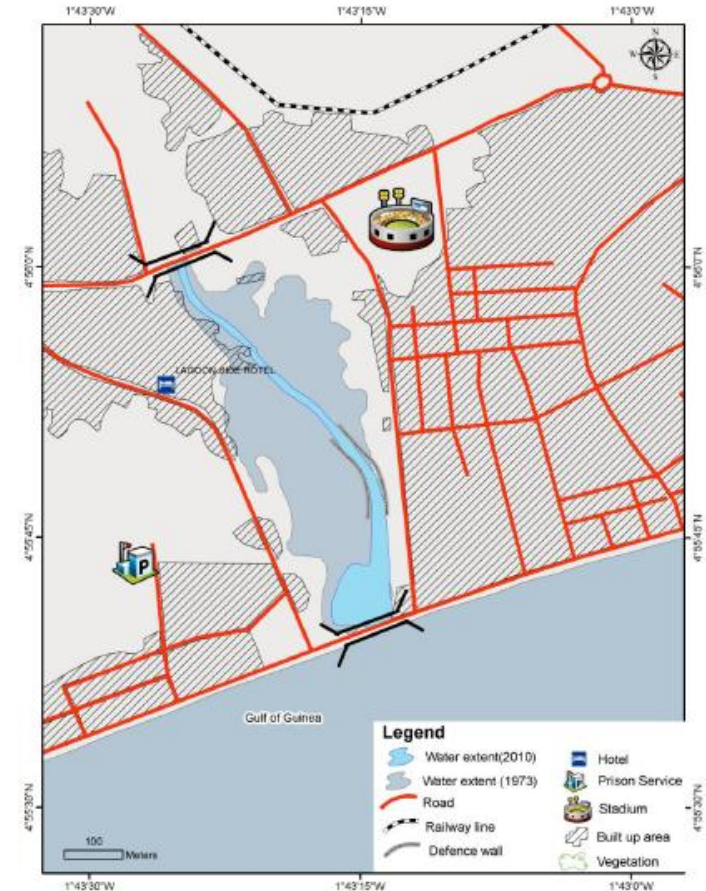
**Sampling Locations
(Essei Lagoon)**

REA: Lagoons & Estuary in Sekondi-Takoradi, Ghana

(source: Coastal Resource Center-Ghana/Friends of the Nation 2010)



- Select Findings
 - Essei Lagoon decreased in water surface area by 82% bet. 1973 - 2010.
 - Butuah lagoon & Whin estuary appear to have increased in water surface
 - Generally lower biodiversity (plankton, macroinvertebrates, fish) for lagoons
 - Dominance of certain invertebrates probably reflects high levels of organic matter
 - Fish sizes in estuary were smaller than normal, implying importance of habitat for juveniles and/or overfishing



**Water Surface, from 1973 to 2010
(Essei Lagoon)**

REA: Aguacaliente Wildlife Sanctuary, Belize

(source: Meerman et al. 2006)



Figure 1. Location within Belize

- Objective(s): (unstated) In support of management planning and zoning:
 - Develop a more detailed ecosystem map with species lists
 - Assess context for stressors (natural and socio-economic)
 - Species specific assessments
 - Effects of Hurricane Iris (2001)
- Scale: Wildlife Sanctuary (~ 2,000 ha)

REA: Aguacaliente Wildlife Sanctuary, Belize

(source: Meerman et al. 2006)



Field work was preceded by collection and analysis of existing information.

Data is often at different scales, different levels of accuracy.

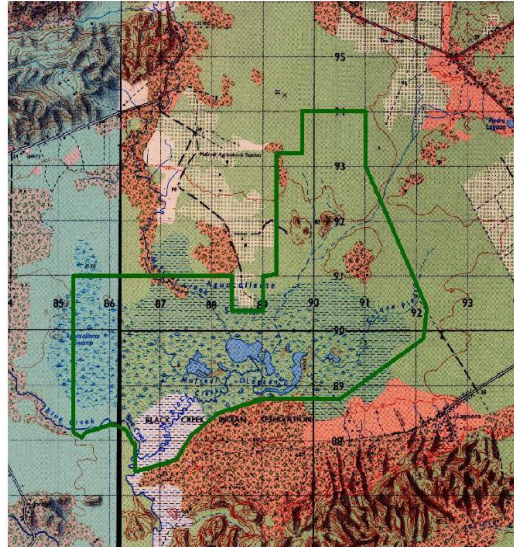


Figure 3. DOS map of Aguacaliente Wildlife Sanctuary and surroundings. Each square represents 1 km²

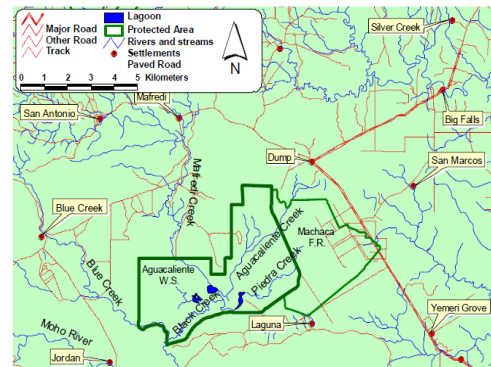


Figure 2. Map of Aguacaliente Wildlife Sanctuary plus surrounding communities, roads, rivers and streams

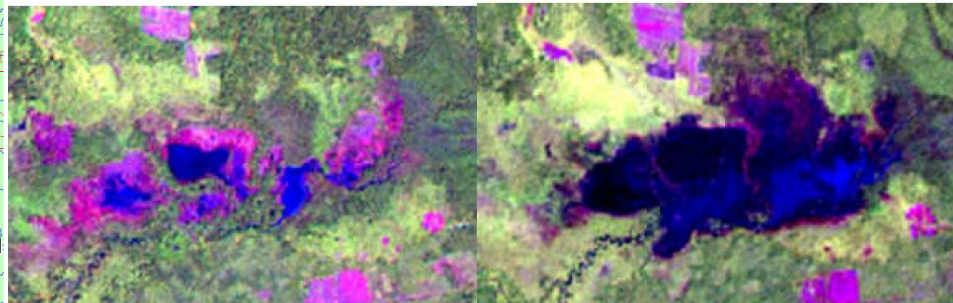


Figure 9. Differences in water level as shown by these two landsat images. Both were taken during the wet season (left: Nov 1999, right: Jan 2004). Blue is water. Pink represents low vegetation, bare soil or cleared fields.

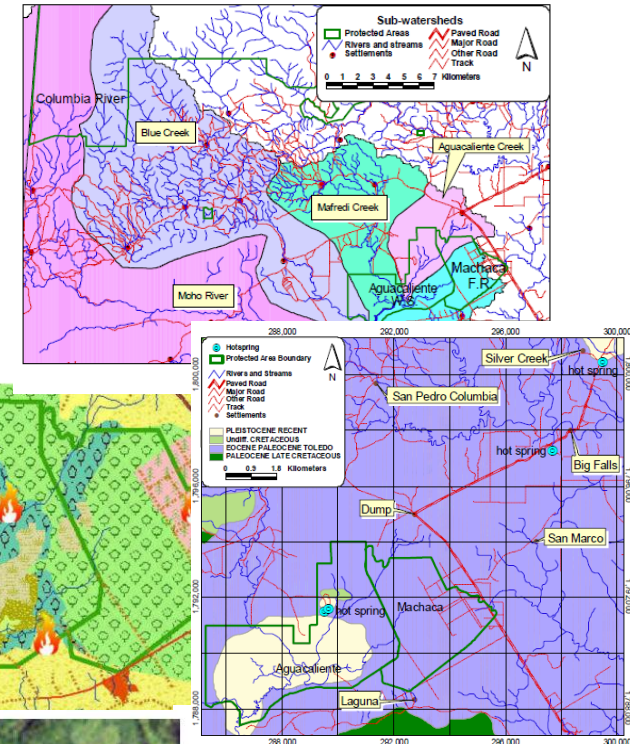
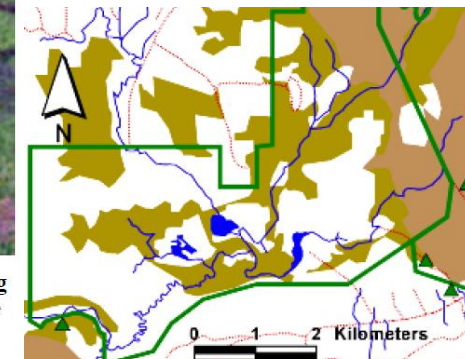


Figure 7. Geology of the greater Aguacaliente Area. Source: Cornejo (undated)



REA: Aguacaliente Wildlife Sanctuary, Belize

(source: Meerman et al. 2006)



Example of findings and recommendations from REA:

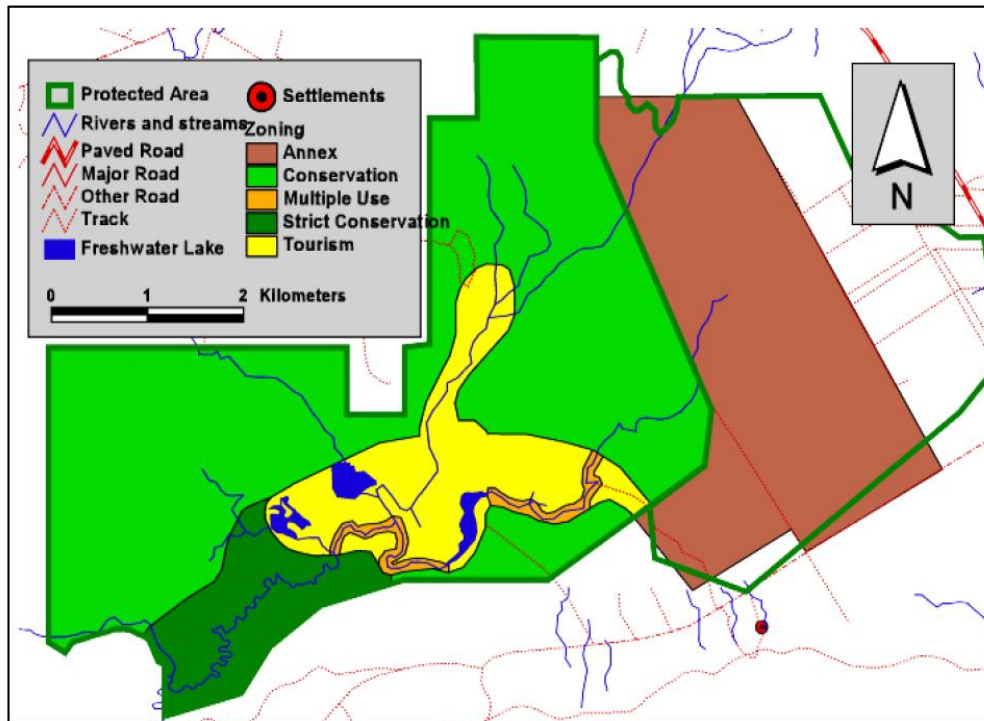


Figure 30, Proposed zonation

- Proposed management zones
- Recommended conservation targets for management
- Identified need for tourism management plan
- Identified potential compatible uses and threats to park
- Recommended improvements to bird monitoring program

REA: High Cliff State Park, Calumet County, WI



(source: Isenring et al. 2008)



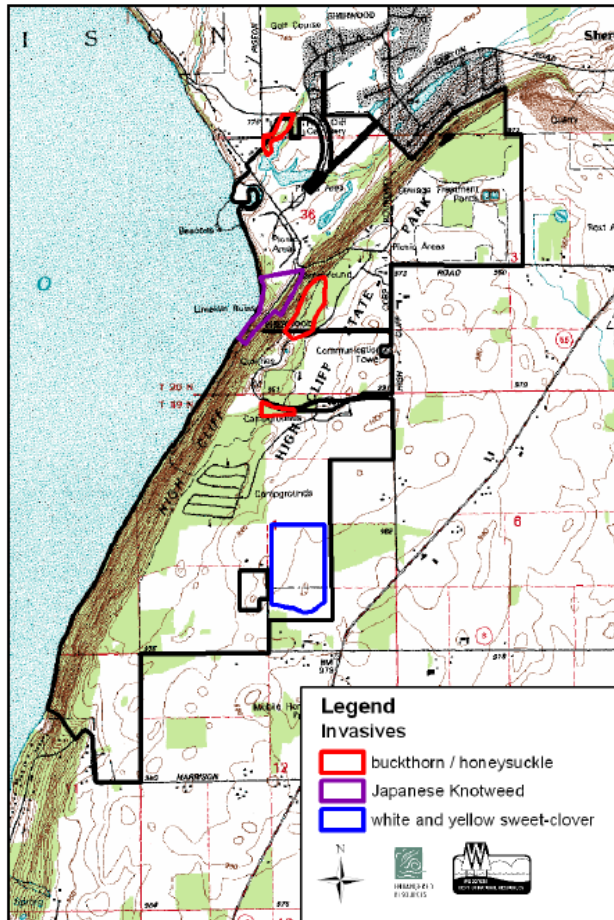
Figure 1

Ecological Landscapes of Wisconsin. The red star shows the approximate location of High Cliff State Park.

- Purpose: Provide biological diversity information to contribute to development of new master plan for park.
 - Obj: Collect biological inventory information relevant to master plan
 - Obj: Analyze, synthesize, and interpret findings for use by master planning team.
 - Obj: Focus on potential habitat use by rare species (concentrates efforts at sites most likely to contain target spp)
- Scale: State Park (480 ha)

REA: High Cliff State Park, Calumet County, WI

(source: Isenring et al. 2008)



Example findings:

- Delineated 3 primary sites for biodiversity conservation
- Identified high weed management areas
- Identified data gaps and future study needs



REA: Solomon Islands Marine Ecosystem



(source: The Nature Conservancy and www.seagrasswatch.org)



(source: <http://www.haimenonline.com>)



(photo: Jim Lounsbury)

- Objective: Conduct a broad-scale REA of the biodiversity and status of the marine ecosystem of the Solomon Islands
- Scale: covered nearly 2,000 nm and 7 provinces in 35 survey days
- Conducted by a team led by The Nature Conservancy and involving local and international government and non-government organizations

REA: Solomon Islands Marine Ecosystem



(source: The Nature Conservancy and www.seagrasswatch.org)

■ Key findings

- Solomon Islands has one of the highest diversities of coral (494 spp) and fish species (1,019 spp) in world; several species are new to science
- Very diverse and large seagrass meadows including one > 1000 ha



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- Solomon Islands is part of the “Coral Triangle” – which has the highest marine biodiversity in the world and was previously thought to extend no further than Indonesia and Papua New Guinea