IAN’s aim is to enable better communication to empower change.

ian.umces.edu
Solving, not just studying environmental problems

**STUDY**
- Dispassionate
- Embrace complexity
- Publish & funding via peer review
- Getting it right

**SOLVE**
- Passionate
- Simplify
- Publish & funding via stakeholders
- Getting it done
IAN Personnel
Recruiting and retaining talented and committed people

• Science Integrators
  – PhD scientists
• Science Communicators
  – MS scientists
• Interns
  – Undergraduate scientists
IAN Themes

- Communicating Science Effectively
- Reporting Ecosystem Status
- Teaching & Training
- Catalyzing Conservation Outcomes
- Advancing Chesapeake Bay Restoration
- Building Strategic Partnerships
- Creating Good Citizenship Models
Communicating science effectively
Creating innovative ways to visually present science

130,561,717 images downloaded
Report Card Examples
What is an ecosystem health report card?

- Broad-level assessments of a region or system
- Communicate complex information
- Based on real data: transparent and defendable
- Provide accountability
- Engage communities
Ecosystem health report cards are an effective communication tool

- Peer pressure is a powerful human motivator

- Educational report cards are a common experience

- Report cards synthesize large amounts of data
Report cards are a five step process

1. **What is the big picture?**
   - CONCEPTUALIZE
   - Create a framework defining key goals, values, and threats.

2. **What do we measure?**
   - CHOOSE INDICATORS
   - Select indicators that convey meaningful information.

3. **What is healthy?**
   - DEFINE THRESHOLDS
   - Define reporting regions and method of threshold attainment.

4. **How does it add up?**
   - CALCULATE SCORES
   - Calculate indicator scores and combine into index grades.

5. **What is the story?**
   - COMMUNICATE RESULTS
   - Communicate results using visual elements, such as photos, maps, and conceptual diagrams.
The report card supports Georgia DNR’s management

- Top tier = Report card
- 2\textsuperscript{nd} Tier = GA DNR management plans
- 3\textsuperscript{rd} Tier = Technical reports, scientific literature
- Base = Data
Why create a report card for Coastal Georgia?

• Provide the public with broad, fact-based knowledge about the condition of Georgia’s coastal resources.

• Highlight the need for continued management of Georgia’s coastal natural resources by Georgia DNR.

• Highlight the numerous monitoring and inventory activities Georgia DNR collects.
Coastal Georgia project goals

1. Provide an overall ecosystem health report card for Coastal Georgia.
2. Communicate monitoring results.
3. Engage communities to increase awareness of environmental issues.
4. Provide recommendations to improve coastal ecosystem condition.
5. Improve awareness of the work Georgia DNR is doing.
Coastal Georgia ecosystem report card timeline

• Workshop (winter 2014)
• Data gathering (spring 2015)
• Final report card (September 2015)
• Report card release (November 2015)
Features in Coastal Georgia

- 14 barrier islands
- Most islands are undeveloped with beaches for sea turtles and shorebirds
- Five rivers feed the coast
- 368,000 acres of saltmarsh provide nursery grounds for animals like fish, shrimp, oysters, and birds
- Hundreds of streams, brackish and freshwater marshes, bogs, and swamps extend inland
- The coastal Georgia landscape is changing with growing development
Coastal Georgia sampling locations

- Five watersheds in the 11 county area where the Coastal Resource Division works
- Many sampling sites in the St. Mary’s/Satilla and Ogeechee watersheds
- Limited sampling sites in the Altamaha, Savannah, and none in the Sewanee
- Analyzed the data for the overall area, and did not separate it out by watershed
How were the indicators chosen?

• DNR project managers met with UMCES IAN staff to determine what data to include in the report card.
• Data needed to be part of long-term monitoring programs, be linked to resource management activities, and needed to be coast-wide.
• Lists of potential indicators were prioritized and final selections were made by DNR staff.
### Indicators in the coastal Georgia Report Card

<table>
<thead>
<tr>
<th>3 Human Health Indicators</th>
<th>3 Fisheries Indicators</th>
<th>6 Wildlife Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>enterococcus</td>
<td>shrimp</td>
<td>american oystercatchers</td>
</tr>
<tr>
<td>fecal coliform</td>
<td>red drum</td>
<td>wood storks</td>
</tr>
<tr>
<td>fish consumption</td>
<td>blue crabs</td>
<td>right whale calves</td>
</tr>
<tr>
<td>advisories</td>
<td></td>
<td>right whale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>population</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sea turtle hatching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sea turtle nesting</td>
</tr>
</tbody>
</table>
## Summary of indicators and thresholds

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Threshold</th>
<th>Time period</th>
<th>Location</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterococcus</td>
<td>70 CFUs</td>
<td>Year round</td>
<td>Beach sampling sites (CRD)</td>
<td>US EPA’s Beach Action Value</td>
</tr>
<tr>
<td>Fecal coliform</td>
<td>43MPN and 14MPN</td>
<td>Year round</td>
<td>Shellfish area sites (CRD &amp; EPD)</td>
<td>National Shellfish Sanitation Program</td>
</tr>
<tr>
<td>Fish consumption advisories</td>
<td>No restrict, 1 meal per week, 1 meal per month, do not eat</td>
<td>2014</td>
<td>Coastal areas, no open ocean samples (EPD)</td>
<td>GA DNR, Fish Consumption Guidelines</td>
</tr>
<tr>
<td>Blue crabs</td>
<td>long-term geometric mean 1995-2014</td>
<td>2014 (March – April)</td>
<td>Coastal trawls</td>
<td>GA DNR EMTS</td>
</tr>
<tr>
<td>Red drum</td>
<td>long-term geometric mean 2003-2014</td>
<td>2014 (June – August)</td>
<td>Estuarine gill nets</td>
<td>GA DNR MSPHS</td>
</tr>
<tr>
<td>Shrimp</td>
<td>long-term mean 1995-2014</td>
<td>2014 (all months)</td>
<td>Coastal trawls</td>
<td>GA DNR EMTS</td>
</tr>
</tbody>
</table>
## Summary of indicators and thresholds

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<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Wood stork productivity</td>
<td>&gt;2.0, 2.0-1.5, 1.5-1.0, 1.0-0.5, 0.5-0</td>
<td>2014</td>
<td>Beach nest locations</td>
<td>1.5 chicks per nest, regional productivity range</td>
</tr>
<tr>
<td>American oystercatcher</td>
<td>&gt;0.5, 0.5-0.32, 0.32-0.2, 0.2-0.1, 0.1-0</td>
<td>2014</td>
<td>Beach nest locations</td>
<td>replacement rate of 0.32</td>
</tr>
<tr>
<td>Sea turtle nesting trends</td>
<td>&gt;2% increase, 1%-2% increase, 0-1% increase, 0-1% decrease, &gt;1% decrease</td>
<td>2014</td>
<td>Beach nest locations</td>
<td>National Marine Fisheries Service and US Fish and Wildlife Service recov. goal = 2% increase over 50yr</td>
</tr>
<tr>
<td>Sea turtle hatching success</td>
<td>&gt;70%, 60%-69%, 50%-59%, 40%-49%, 30%-39%</td>
<td>2014</td>
<td>Beach nest locations</td>
<td>National Marine Fisheries Service and US Fish and Wildlife Service recov. goal</td>
</tr>
<tr>
<td>Right whale population growth rate</td>
<td>&gt;=3.5%, 2.5%-3.49%, 1.5%-2.49%, 0.5%-1.49%, &lt;0.5%</td>
<td>2011</td>
<td>Ocean surveys</td>
<td>National Marine Fisheries Service</td>
</tr>
<tr>
<td>Right whale calf production index</td>
<td>&gt;=0.075, 0.05-0.075, 0.025-0.05, 0.0125-0.025, &lt;0.0125</td>
<td>2011</td>
<td>Ocean surveys</td>
<td>National Marine Fisheries Service</td>
</tr>
</tbody>
</table>
Coastal Georgia received a B+, 76%, a moderately good score.

The human health index scored a 90%, or A, in 2014.

The fisheries index scored a 68%, or B, in 2014.

The wildlife index scored a 69%, or B, in 2014.
Detailed indicator scores

- Fecal coliform: 92%
- Enterococcus: 82%
- Fish consumption advisories: 95%
- Shrimp: 100%
- Red drum: 83%
- Blue crabs: 22%
- American oystercatchers: 46%
- Wood storks: 67%
- Right whale calves: 57%
- Right whale population: 66%
- Sea turtle hatching: 77%
- Sea turtle nesting: 100%

Scoring Legend

- A: ≥80–100% good
- B: ≥60–<80% moderately good
- C: ≥40–<60% moderate
- D: ≥20–<40% poor
- F: 0–<20% very poor
Key messages from the report card

- Coastal Georgia has moderately good ecosystem condition that we want to protect.
- Georgia DNR will keep working to protect and restore coastal Georgia.
- Pressure on Georgia’s coast will increase requiring sustained protection.
- Healthy ecosystems mean healthy natural resources, a healthy economy, and healthy people.
What do the scores mean?

• Final grades are equally divided to provide a clearer picture of health.
• Following the typical school grading scale overall does not provide information about small improvements or declines in ecosystem health.
• The equally divided grading scale allows evaluation of small changes in ecosystem health, even at the very poor, poor, and moderately poor ranges.

A  ≥80–100%
All human health, fisheries, and wildlife indicators meet desired levels. Indicators in these locations tend to be very good, most often leading to preferred habitat conditions.

B  ≥60–<80%
Most human health, fisheries, and wildlife indicators meet desired levels. Indicators in these locations tend to be good, often leading to acceptable habitat conditions.

C  ≥40–<60%
There is a mix of good and poor levels of human health, fisheries, and wildlife indicators. Indicators in these locations tend to be fair, leading to sufficient habitat conditions.

D  ≥20–<40%
Some or few human health, fisheries, and wildlife indicators meet desired levels. Indicators in these locations tend to be poor, often leading to degraded habitat conditions.

F  0–<20%
Very few or no human health, fisheries, and wildlife indicators meet desired levels. Indicators in these locations tend to be very poor, most often leading to unacceptable habitat conditions.
Blue crabs declined in 2014

• Blue crabs scored the lowest of any indicator in the report card.
• This indicator is based on the number of spawning female crabs.
• The decline observed in 2014 is similar to the downward trend seen in commercial harvest and catch per unit effort data.
• DNR’s trawl survey reported a 65% decline in juveniles in 2014 and an 88% decline from the 20-year mean spawning stock.
• In 2014, spawning and larval recruitment success was affected by cooler than normal fall water temperatures and double the average spring rainfall.
Water quality monitoring

- Preliminary water quality indicators were analyzed.
- Dissolved oxygen was not included in the overall report card scoring, but it was scored and communicated in the report card.
- The thresholds are < 2mg/l, 2–5 mg/l and >5 mg/l from EPA’s NCCA.
- Water quality indicators, can be included in future report cards with further research.
Take home messages

• This report represents information gathered by various DNR programs.

• Coastal Georgia’s ecosystem is in moderately good health for 2014.

• Our purpose for preparing a report card is to share with the public what we know about the state of coastal natural resources.
You can help protect coastal Georgia!

<table>
<thead>
<tr>
<th>How you can help</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install a rain barrel for your home to collect water for irrigation</td>
<td>Conserves water which is essential for healthy productive estuaries.</td>
</tr>
<tr>
<td>Inspect and pump out your septic system every 3-5 years</td>
<td>Functioning septic systems keep bacteria from entering waterways, which in turn can help reduce beach advisories and shellfish harvest closures.</td>
</tr>
<tr>
<td>Abide by all beach lighting rules and ordinances during sea turtle nesting and hatching season</td>
<td>Hatchling sea turtles can become easily disoriented and fail to crawl to the water if our homes and flashlights illuminate the beach.</td>
</tr>
<tr>
<td>Know your recreational fishing catch and size limits</td>
<td>These limits help sustain a healthy population of fish species.</td>
</tr>
<tr>
<td>Buy a Georgia hunting or fishing license</td>
<td>License fees support research and conservation of coastal species and habitats.</td>
</tr>
<tr>
<td>Pick up after your pets</td>
<td>Fecal bacteria from pet waste can wash into creeks and rivers, resulting in beach swimming advisories or shellfish harvest closures.</td>
</tr>
<tr>
<td>Participate in monitoring and clean-up activities in local waterways</td>
<td>Citizen data can alert resource managers to potential issues. Visit GeorgiaAdoptaStream.com and Riversalive.com/index.htm.</td>
</tr>
</tbody>
</table>
Thanks!

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GEORGIA
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