Florida Manatee Movements and Habitat Use in the Northern Gulf of Mexico

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USGS Sirenia Project research in the Northern Gulf of Mexico

**Manatee Tracking**
- Analyze existing spatial manatee data
- Capture and tag additional manatees in Crystal River and the northern Gulf

**Habitat Assessment**
- Collect existing habitat base layers
- Describe manatee use habitat based on manatee locations and observations.

**Health /Genetics**
- Examine manatees for health status.
- Collect and process genetic samples from Crystal River migrants and manatees captured in northern Gulf.

**Photo-Identification / Population monitoring**
- Photo-identification of manatees that overwinter at Crystal River and Wakulla.
- Matching of animals photographed in the NGOM
Manatees have historically been seen across much of the Gulf of Mexico, outside of the more common Florida peninsula.
Including sighting reports from areas used extensively by the energy industry.
Including offshore oil platforms
In 2006, the USGS began catching wild manatees in Crystal River National Wildlife Refuge for health assessment and tracking.
Manatee Captures and Health Assessments

With Florida Fish and Wildlife Conservation Commission, UF, and others
Manatees are identified by their unique scar patterns, caused mostly by watercraft collisions. We targeted individuals that were known from locations in the northern GOM for assessment and tagging.
Manatee Captures and Health Assessments

Starting in 2015, locations in the northern Gulf were also targeted for this project.
Manatee Captures and Health Assessments
Manatees were processed and samples collected. All were within generally healthy ranges for the monitored parameters and stressors.
Radio Tagging: during capture or free-tagging
Radio Tagging: during capture or free-tagging

GPS location every 15 min.
GPS locations downloaded from tag
QA/QC to remove invalid locations
All animal data combined
Manatee tracking effort in NGOM

GPS data

<table>
<thead>
<tr>
<th>Dates</th>
<th>Manatees Tracked</th>
<th>Tracking bouts</th>
<th>“manatee years” tracked</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-2013</td>
<td>20</td>
<td>69</td>
<td>19.9</td>
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<tr>
<td>2013-2017</td>
<td>24</td>
<td>87</td>
<td>22.5</td>
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<tr>
<td>2006-2017</td>
<td>43</td>
<td>181</td>
<td>42.4</td>
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</tbody>
</table>

2006-2013: tagged manatees were those that opportunistically travelled north, including Wakulla Spring

2013-2017: Individuals known to travel to NGOM targeted

Total number of data points ~700,000
Making sense of manatee movements
Manatees in winter remain close to warm water refuges. In the northwest these include Crystal River and Wakulla Spring.
Seasonal movement patterns

February

0  75  150  300 Kilometers
In early springtime some manatees begin to move away from winter refuges at Crystal River and Wakulla Spring.
Seasonal movement patterns

April

0 75 150 300 Kilometers
As the weather and waters warm, some manatees continue to travel west, exploiting habitat throughout the northeastern Gulf.
Seasonal movement patterns

August-September

0 75 150 300 Kilometers
Seasonal movement patterns

August-September

Winter refuges are used throughout the year
Those manatees begin their return from summer habitat to their winter refuges in the fall.
Seasonal movement patterns

November

300 Kilometers
Seasonal movement patterns

Manatees returning late in the year often move long distances without stopping.
Seasonal movement patterns

By December, most manatees have returned again close to their winter refuges.
Kernel density analysis shows local habitat use and travel corridors.
Highest habitat use was seen in estuaries and deltas
Seagrass/SAV studies

Characterization of SAV in foraging areas
Assessment of manatee feeding strategies
Species composition
Abundance
Seagrass/SAV studies
Seagrass/SAV studies

**University of Florida Herbarium (FLAS), Gainesville, Florida, USA**

**Ruppiaceae**

**Ruppia maritima** L.  
det. C. C. Jacono, 31 July 2017  
**Baldwin County**: Mobile Delta. Secchi= 70cm Vegetative  
coll. Susan Butler # s.n. 27 July 2017  
with J. Reid, D. Stone  
USGS Northern Gulf of Mexico Manatee Habitat Research  
Common name: Wigeongrass

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**Potamogetonaceae**

**Potamogeton pusillus** L.  
det. C. C. Jacono, 1 August 2017  
**Baldwin County**: Mobile Delta. Secchi= 48cm Vegetative  
coll. Susan Butler # s.n. 25 July 2017  
with J. Reid, D. Stone  
USGS Northern Gulf of Mexico Manatee Habitat Research
Leveraging information from this project

2015: Report to Crystal River National Wildlife Refuge – manatee movements and relative abundance in springs

2016: PhD dissertation chapter – manatee movements from Kings Bay to offshore seagrass over time

2017: Data to inform manatee presence in northwest FL for Environmental Sensitivity Index (ESI)

2017: Analysis of manatee use of springs in CRNWR to inform management plan.