Observing Life in the Sea

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Huge investments have gone into ocean observing systems —
But there is still no systematic effort to observe life in the sea

MBON Goal: Enable the effort to characterize how marine biodiversity is changing and how it affects us
A collaborative NETWORK that links Databases and Datasets to produce Maps and Trends. Filters: Taxa, Space, Time.
Essential Variables

EOVs are the primary observations needed to model and build the EBVs (multidimensional data ‘cubes’)

Pereira et al. (2013)
GEO BON EBVs

Framework for Ocean Observing (2012)
Global Ocean Observing System (GOOS)
Essential Ocean Variables (EOVs)
## Evolving technology matrix

<table>
<thead>
<tr>
<th></th>
<th>Microbes/Phyto</th>
<th>Zooplankton</th>
<th>Fish</th>
<th>Top Predators</th>
<th>Benthos, habitat forming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optics/Imaging</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Animal tracking (satellite, underwater)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Acoustics</td>
<td></td>
<td>X active</td>
<td>X Active, passive</td>
<td></td>
<td>X Tags, passive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X Active, passive (noise)</td>
</tr>
<tr>
<td>Genomics</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Platforms with samplers</td>
<td>AUVs, floats, moorings, satellites</td>
<td>AUVs, moorings</td>
<td>AUVs, moorings</td>
<td>AUVs, moorings, tags</td>
<td>AUVs, moorings, satellites</td>
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<tr>
<td>Data and visualization</td>
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<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Data Management

"Raw" Field Data
• Siloed
• Inaccessible

Quality Controlled & Standardized Data
• Reusable
• Publishable

Hosted Data
• Published
• Standardized

Data Views
• Explorable
• Integrable

**FIGURE 1.** Marine Biodiversity Observation Network (MBON) data follow a generalized flow that ensures adherence to appropriate data and metadata standards and accessibility in machine readable ways for reproducibility and open access. API = Application programming interface.

Benson et al., 2021
Addressing Sanctuary Needs: data tools

Processes and products being shared across programs and regions

Collaboration between sanctuaries, IEA, MBON expanding to Gulf of Mexico

Collaboration of IEA with MBON

U.S. MBON PORTAL
Thank You!

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http://marinebon.org

#MarineLife2030

https://marinelife2030.org/