Wetland Dissolved Organic Carbon (DOC) Fluxes at Small and Large Scales

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Small Scale

- Unmanned Surface Vehicle (USV)
  - Bathymetry
  - ADCP
  - Chl, CDOM fluorescence
  - CTD

- Use SCHISM – salt fluxes
- Convert salt to DOC
Large Scale: Wetland fluxes through Apalachicola Bay and Barataria Bay
Large Scale: Wetland fluxes through Apalachicola Bay and Barataria Bay

Remote sensing from VIIRS

NCOM

7-day average DOC fluxes

3-component mixing model from optics & geochemistry: Seawater, River, Marsh

DOC export by source (g C m\(^{-2}\) yr\(^{-1}\))

DOC-normalized CDOM

DOC-normalized lignin

Field measurements

NCOM: Navy Coastal Ocean Model (for the LA-TX shelf)
Mixing model to apportion DOC to sources, apply to flux model

\[ \text{DOC Flux} = \sum_{i=1}^{n} \sum_{k=1}^{m} \left[ \text{DOC} (i, k) \times U(i, k) \right] dz(k) \, dx(i) \]

<table>
<thead>
<tr>
<th>Month</th>
<th>7-day average DOC flux ( (x10^6 , \text{kg C} , \text{day}^{-1}) )</th>
<th>Net annual DOC export ( (x10^6 , \text{g C} , \text{m}^{-2} , \text{y}^{-1}) )</th>
<th>Blue Carbon DOC export ( (x10^6 , \text{g C} , \text{m}^{-2} , \text{y}^{-1}) )</th>
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</thead>
<tbody>
<tr>
<td>AP</td>
<td>0.144</td>
<td>8.35</td>
<td>0.14</td>
</tr>
<tr>
<td>BB</td>
<td>0.089</td>
<td>7.14</td>
<td>0.95</td>
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</tbody>
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