Techniques for Producing Coastal Land/Water Masks from Landsat and Other Multispectral Satellite Data

Coastal areas and land areas are important for human habitation and economic activities. Understanding land/water masks derived from Landsat and other multispectral satellite data can be useful for various applications such as land use classification, environmental monitoring, and climate change studies.

**Figures:**
- Figure 1: Example of a coastal land/water mask derived from Landsat data.
- Figure 2: Comparison of land/water masks derived from different satellite sensors.

**Table:**
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<th>Satellite Sensor</th>
<th>Land/Water Mask Accuracy</th>
<th>Example Application</th>
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<td>Landsat</td>
<td>High</td>
<td>Coastal change study</td>
</tr>
<tr>
<td>MODIS</td>
<td>High</td>
<td>Water quality analysis</td>
</tr>
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</table>

**Indicators:**
- **RMSE:** Root Mean Square Error
- **Kappa Coefficient:** Measures of agreement between observed and expected values

**Conclusion:**
Techniques for producing accurate land/water masks from satellite data are crucial for various applications in coastal and environmental research.

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**Reference:**
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Coastal erosion and land loss continue to threaten many areas in the United States. Landsat data has been used to monitor regional coastal change since the 1970s. Many techniques can be used to produce coastal land water masks, including image classification and density slicing of individual bands or of band ratios. Band ratios used in land water detection include several variations of the Normalized Difference Water Index (NDWI). This poster discusses a study that compares land water masks computed from unsupervised Landsat image classification with masks from density-sliced band ratios and from the Landsat TM band 5. The greater New Orleans area is employed in this study, due to its abundance of coastal habitats and its vulnerability to coastal land loss. Image classification produced the best results based on visual comparison to higher resolution satellite and aerial image displays. However, density-sliced NDWI imagery from either near infrared (NIR) and blue bands or from NIR and green bands also produced more effective land water masks than imagery from the density-sliced Landsat TM band 5. NDWI based on NIR and green bands is noteworthy because it allows land water masks to be generated from multispectral satellite sensors without a blue band (e.g., ASTER and Landsat MSS). NDWI techniques also have potential for producing land water masks from coarser scaled satellite data, such as MODIS.