

SYNTHETIC APERTURE RADAR REMOTE SENSING OF GROUNDWATER DISCHARGE AND OYSTER REEF IN TIDAL FLAT

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Abstract: Tidal flats form a unique ecosystem, providing habitat for various species of fauna and flora, which play an important role in purifying pollutants discharged from land and in providing marine products such as oyster and many kinds of shellfishes. Oyster in tidal flat usually has rough structures, causing a strong depolarization in microwave backscattering. The signal can be detected using multi-frequency polarimetric synthetic aperture radar (SAR) data. HV and VH cross-polarized microwave signals were significantly increased in the oyster reef area, while those signals were not detected in the surrounding tidal flats. The distribution of oyster reefs in Korean tidal flats was mapped by analyzing these unique scattering characteristics from space-borne SAR data including TerraSAR-X, RADARSAT-2, and ALOS PALSAR. We also investigated why these oyster reefs distributed in those areas and how they generated naturally. We focused on submarine groundwater discharge to relate the distribution of oyster in tidal flat, and found obvious signatures of groundwater discharge (dark patches) along the marginal part of the tidal flat from SAR data.