

REMOTE SENSING OF CHANGING COASTAL MARINE ENVIRONMENTS (RESCCOME)

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Abstract - Within the joint Sino-European project “Remote Sensing of Changing Coastal Marine Environments” (ReSCCoME) we have been developing techniques for the use of Synthetic Aperture Radar (SAR) data for the monitoring of European and Chinese coastal areas. A new neural network has been developed, which is based on the YOLO (You Only Look Once) single network, and which is capable of detecting sub-mesoscale eddies on SAR imagery of ocean surfaces at high precision. We demonstrate that a classification of sediments on exposed intertidal flats is possible, when complex SAR data acquired at different radar bands is used. Single-band SAR data can already be used to generate Digital Elevation Maps (DEM) through an identification of waterlines at different water levels. Here, two approaches, including a new neural network, are yielding promising results. We further demonstrate that SAR wind fields yield a useful and robust tool to assess the potential of possible future wind farms, and to demonstrate the impact of existing windfarms on their surrounding environment, particularly the deficit in local wind speed.

沿海海洋环境变化遥感 (RESCCOME)

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摘要 - 在中欧联合项目“沿海海洋环境变化遥感”（ReSCCoME）中，我们一直在开发利用合成孔径雷达（SAR）数据监测欧洲和中国沿海地区的技术。开发了一种基于YOLO（You Only Look Once）单一网络的新神经网络，能够高精度检测海洋表面SAR图像上的亚中尺度涡流。我们证明，当使用在不同雷达频段获取的复杂 SAR 数据时，可以对暴露的潮间带沉积物进行分类。单波段 SAR 数据已可用于通过识别不同水位的水线来生成数字高程图 (DEM)。在这里，包括新的神经网络在内的两种方法正在产生有希望的结果。我们进一步证明，SAR 风场提供了一个有用且强大的工具来评估未来可能的风电场的潜力，并展示现有风电场对其周围环境的影响，特别是当地风速的不足。