

China's First Blue Carbon Credits Auctioned off in Ningbo

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The first auction for blue carbon credits in China was successfully held in Xiangshan County, Ningbo on February 28, with over 20 enterprises and institutions in attendance from around the nation.

全国首单蓝碳拍卖交易2月28日在宁波市象山成功举行。吸引了全国各地的20多家企业和机构参与。

The auctioned one-year carbon sink volume of fisheries at Xihu Port amounts to about 2,340.1 metric tons. Its auction price started at 30 yuan (ca. \$4.34) per ton and Zhejiang Yiduan Precision Machinery Co., Ltd. concluded with a 106 yuan (ca. \$15.34) per ton winning bid for a total transaction value of 248,000 yuan (ca. \$35,900). Why choose Xiangshan County to stage China's first blue carbon auction? What has Ningbo accomplished in blue carbon trading?

此次拍卖的是西沪港渔业一年的碳汇量，总计约2340.1吨碳汇量，起拍价为30元/吨。最终，浙江易锻精密机械有限公司以106元/吨的单价、24.8万多元的总成交价竞拍成功。那么，全国蓝碳首拍为什么在象山？宁波在蓝碳交易方面已经做了什么？

The salt marsh ecosystem of this coastal county in Ningbo is estimated to have 102,800 tons of carbon sink per year, whereas large-scale algae farming—which predominantly cultivates *Porphyra haitanensis* and kelp—may generate ca. 21,700 tons of carbon per year, and oyster-based shellfish farming ca. 32,200 tons per year. In addition, silt mudflats, island vegetation, and coastal waters store copious amounts of carbon resources. The gross of marine economy in Xiangshan reached 22 billion yuan in 2022, exceeding 30 percent of the county's GDP in that year.

据初步估算，宁波象山的盐沼生态系统碳汇量达10.28万吨/年，以坛紫菜、海带为主的大型藻类养殖碳汇量约2.17万吨/年，以牡蛎为主的贝类养殖碳汇量约3.22万吨/年。此外，淤泥质滩涂、海岛植被、海域水体中也存储着丰富的碳汇资源。2022年，象山海洋经济生产总值达到220亿元，在当年全县的GDP比重中，突破30%。

Since July 2022, Xiangshan has been preparing for the auction of blue carbon credits, including entrusting Ningbo Institute of Oceanography to calculate the carbon sink. The subject matter of the auction is macroalgae (including the fishery carbon sink of kelp, *Porphyra haitanensis* and *Enteromorpha*), which attracts active quotations of domestic businesses for the 2,

340.1 tons of fishery carbon sink. As a maritime hub, Ningbo has 9,758 square kilometers of sea water under its jurisdiction (24% of the total sea water under the jurisdiction of Zhejiang province) and 614 islands (14% of the total islands in Zhejiang). Also, its wetland area totals 3.47 million mu (231,700 hectares), accounting for 20.87% of that in Zhejiang province. "This auction allows more people to understand blue carbon. People will realize that the ecological benefits can be attained and will generate direct economic benefits," explained Xu Nianjun, a fellow and PhD supervisor at School of Marine Sciences, Ningbo University.

去年7月起，象山启动蓝碳拍卖交易工作，委托宁波海洋研究院进行碳汇量核算。拍卖标的物为大型海藻，包括海带、坛紫菜和浒苔的渔业碳汇，吸引国内众多企业关注，并针对本次交易的2340.1吨渔业碳汇踊跃报价。宁波市作为海洋中心城市，管辖海域面积9758平方公里，约占全省24%；海岛614个，约占全省14%。湿地总面积347万亩（23.17万公顷），占全省湿地总面积的20.87%。“此次拍卖让更多人认识和了解蓝碳。大家发现生态效益是可以变现的，会产生直接的经济效益。”宁波大学海洋学院研究员、博士生导师徐年军认为。

In June 2022, Ningbo completed the top-level system design for peak carbon emissions and carbon neutrality. The Ningbo Bureau of Natural Resources and Planning initiated the city's first blue carbon pilot project in 2022 and obtained the expert group's approval of project completion in February 2023.

2022年6月，宁波完成了宁波市碳达峰碳中和工作的顶层制度设计。2022年，宁波市自然资源规划局启动了宁波市首个蓝碳试点。2023年2月，该项目通过专家组验收。

Liu Dahai is director of the Coastal Zone Center of the First Institute of Oceanography (FIO), China's Ministry of Natural Resources (MNR). He and his team collected the distribution pattern of carbon pools, carbon storage, carbon increment, and distribution characteristics of value within the 189.13km² coastal wetlands by testing soil organic carbon and bulk density from 327 samples at 109 field sites. Results show that in the coastal wetlands along the south bank of Hangzhou Bay, the total amount and increment of blue carbon storage amounted to 696,300 tons and 32,700 tons each year, respectively, and its annual value of carbon sink was 1,866,100 yuan (ca. \$270,160).



Xihu Port in Huangbi'ao Township, Xiangshan (Photo by Zheng Kaixia)

项目组在负责人、自然资源部第一海洋研究所海岸带中心主任刘大海的带领下，通过109个现场点位，共327个样品的土壤有机碳和容重测试工作，获取了研究区189.13平方千米滨海湿地内的碳库分布格局、碳储量、碳增量和价值量的分布特征。结果显示，杭州湾南岸滨海湿地蓝碳储量和增量总量分别为69.63万吨和3.27万吨/年，滨海湿地的碳汇价值量为186.61万元/年。

According to the Marine Forecasting Division of Ningbo Municipal Bureau of Natural Resources and Planning, Ningbo will further increase investment in blue carbon surveys. This will include monitoring the tempo-spatial dynamics of multiple-type carbon pools throughout the coastal zone, and predicting the evolution of carbon sink patterns. Construction of demonstration bases for blue carbon will also be accelerated along the coastal wetlands on the south bank of Hangzhou Bay and islands in Xiangshan.

据宁波市自然资源规划局海洋预警处相关负责人介绍，宁波市将进一步增加对全市蓝碳调查监测与综合评估的投入，开展海岸带多类型碳库时空动态监测和碳汇格局演化预测工作。加快建设杭州湾南岸典型滨海湿地、象山典型海岛等蓝碳示范基地。

Extra measures will include cultivating high-quality blue carbon resources and developing high-quality blue carbon sinks. Nowadays, salt marshes and islands make up most of Ningbo's blue carbon resources, whereas natural seagrass beds and mangrove resources are scarce due to restricted hydrodynamic and climatic conditions. Threats such as invasive *Spartina alterniflora* and human destruction should be gradually removed to improve the quality of blue carbon. If permitted, local

plants should be introduced according to local conditions to further enrich blue carbon supplies in Ningbo.

其次，培育高质量蓝碳资源，实现高质量蓝色碳汇。当前，宁波蓝碳优势主要集中在盐沼和海岛，同时，由于水动力和气候条件限制，天然海草床和红树林资源基本不发育。应逐步去除互花米草入侵、人为破坏等威胁，提升蓝碳质量。在条件允许时，因地制宜地开展本地植物种植，进一步丰富我市蓝碳资源。

In addition, Ningbo will take the lead in China to conduct long-term dynamic monitoring of multi-type blue carbon, "storage and flux" assessment of carbon sink for the three-level carbon pool system, value accounting based on blue carbon distribution, and a trading system of blue carbon credits for land-sea coordination. It is aimed to develop a package of technical schemes on blue carbon (i.e., "dynamic monitoring — credits assessment — value verification — trading system") that will provide an information database of blue-carbon resources as well as a service platform for decision-making.

第三，将在全国率先开展多类型蓝碳长时序动态监测、针对三级碳库体系的碳汇“储量—通量”评估、基于蓝碳图件的价值核算和服务于陆海统筹的蓝碳交易体系工作，形成“动态监测—总量评估—价值核算—交易体系”的蓝碳一揽子技术方案，并构建蓝碳资源信息化数据库和决策服务平台。

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