浙江大学海洋学院
OCEAN COLLEGE, ZHEJIANG UNIVERSITY

学术报告

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主 讲 人：Alexander Horner-Devine 教授

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报告题目：The role of sand in wave-supported gravity currents

主讲人简介

Alexander Horner-Devine教授本科毕业于美国普林斯顿大学机械与航空学院，随后在美国斯坦福大学土木与环境学院获得硕士和博士学位。自2004年起就职于美国华盛顿大学土木与环境学院和海洋学院，并担任Harris Hydraulics Laboratory实验室主任一职，主要从事基于结合实验室模拟与实地观测等方法对河口、河口羽流及近海区域的物质输运、内部混合等方面的研究。现任海洋与地球科学领域顶级SCI期刊《Journal of Geophysical Research》副主编，多次担任Ocean Sciences、AGU、IAHR国际会议分会主席，是美国地球物理学会（AGU）、国际水利与环境工程学会（IAHR）、美国土木工程师学会（ASCE）、河口与海岸研究学会（CERF）会员。曾在海洋及流体力学领域国际知名学术刊物（如JPO, JGR, GRL, JFM, POF, LO等）上发表SCI 论文50余篇，曾于2015年受邀在Annual Review of Fluid Mechanics上发表河口羽流综述文章。

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Abstract: Gravitational transport of wave-supported fluid mud is know to play an important role in moving fine-grained sediment across the continental shelf. In these wave-supported gravity currents (WSGC), turbulent stresses from surface gravity waves re-suspend sediment from the seabed, forming a high concentration layer that is carried downslope, even in regions where the shelf slope alone is not steep enough to support gravitational transport. WSGC are typically observed in muddy regions and following high river discharge events, when the shelf experiences high loading of fine sediment that is easily re-suspended and transported seaward. I will present results from laboratory experiments, which suggest that small amounts of sand in the sediment mixture may have a strong influence on the dynamics of WSGC. The sand content can suppress the formation of WSGCs through an armoring effect and also modify the vertical structure of the currents. The laboratory results are compared with observations of a WSGC event off the coast of the Netherlands. The seabed in this region is predominantly sandy, but is know to have transient lenses of mud. Taken together with the laboratory experiments, our results suggest that WSGC can form in regions with high sand content. However, the structure and transport rate are modified compared with that observed in muddier regions.

Dr. Alexander Horner-Devine is a professor in the Department of Civil and Environmental Engineering and adjunct professor in Department of Oceanography at the University of Washington, Seattle, USA. He uses laboratory experiments and field observations to study transport and mixing in rivers, estuaries and the coastal ocean. Dr. Horner-Devine holds a BS degree in Mechanical and Aerospace Engineering from Princeton University, and MS and PhD degrees in Civil and Environmental Engineering from Stanford University. He has been the director of the Harris Hydraulics Laboratory at the University of Washington since 2004 and is currently an associate editor for the Journal of Geophysical Research.

路线图

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