

EnvEast Doctoral Training Partnership

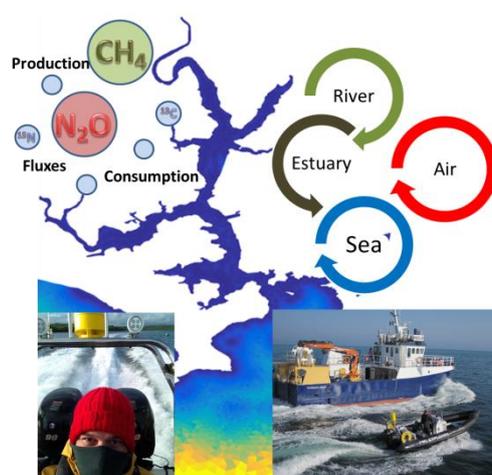
From Farm to Coast: Fluxes and isotopic fingerprints of greenhouse gases in river catchments, estuaries and coastal waters.

Main Supervisor: Dr Andy Rees, Plymouth Marine Laboratory (PML)
Co-Supervisor: Prof. Jan Kaiser, University of East Anglia
Co-Supervisor: Dr Helen Atkinson, Sercon Ltd
Co-Supervisor: Dr Vassilis Kitidis, PML



Background: Nitrous oxide (N_2O) and methane (CH_4) are potent greenhouse gases, which play a part in the depletion of stratospheric ozone and the oxidative capacity of the atmosphere. Despite this importance, the quantification of sources and sinks of these gases and their transport in rivers, inland waters, estuaries and coasts are poorly constrained.

Research methodology and training: This project will use state of the art instrumentation to determine concentrations and the stable isotopic signatures (^{15}N , ^{13}C) of N_2O and CH_4 in streams, rivers, estuaries and coastal waters in southwest England. A sense of adventure is required to deliver a sampling programme using small boats and larger research vessels, which will be embedded in the national NERC research programme LOCATE (Land Ocean Carbon Transfer programme; <http://locate.ac.uk/>). You will determine seasonal and spatial variability in concentrations and fluxes between river catchment and coastal seas, and use stable isotopes to help elucidate the complex biological, chemical and physical transformations occurring, taking into account factors such as nutrient loading, oxygen status and residence times.



You will receive specialist training in the measurement of stable isotopes ^{15}N and ^{13}C using continuous-flow stable isotope mass spectrometry and in the use of gas chromatography and cavity ring down spectroscopy to determine gas concentrations. This will be coupled to broader training in the biogeochemistry of riverine, estuarine and coastal systems. You will also be trained in professional skills, including attendance at UK and international summer schools and conferences.

You will spend the majority of your time with Drs Rees and Kitidis in recently refurbished laboratories at PML, with easy access to the River Tamar and the English Channel, but will also work for shorter periods with co-supervisors Kaiser at UEA and Helen Atkinson at industrial partner Sercon. At all locations, you will be embedded in dynamic teams investigating marine biogeochemistry and related stable isotope applications.

Person specification: We seek an enthusiastic, self-motivated candidate, with a strong aptitude for practical work and intensive field campaigns on small boats. You will have at least a 2.1 BSc in chemistry, physics, oceanography or a suitable branch of environmental sciences.