

## PROJECT IDEA

**The Project Idea Form is a public document, if you wish to keep it private at between the JS and your partnership at this stage, please advise your Facilitator**

Project Name /

**RaNTrans (Rapid Nutrient Reduction in Transitional Waters)**

Name / Nom :

*Dr Gordon Watson*

Organisation / Organisme :

*University of Portsmouth*

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Specific Objective / Objectif spécifique :

Keep only one and erase the others/ *Garder un seul et effacer les autres*

3.2 - Enhance and protect coastal and transitional water ecosystems

*3.2 - Améliorer et protéger les écosystèmes côtiers et les eaux de transition*

**Summary description of the project idea (1 page max.) /*****Description synthétique du projet (1 page max.):***

*Problem:* Large and continuous inputs of agricultural fertilizers, livestock waste and human sewage increase the concentration of dissolved nutrients in water resulting in the excessive growth of plant life (termed eutrophication). In coastal marine environments eutrophication results in the rapid growth of green seaweeds which often settle on the sediment forming mats tens of centimetres deep and covering thousands of hectares.

Coastal inter-tidal mud flats and seagrass beds are critically important habitats for their ecosystem functions such as sea defence; nutrient cycling and as a food source for wading birds. This has led to their protection under EU conservation legislation (Special Areas of Conservation [SACs] and Special Protection Areas [SPAs]). They are also vital to the coastal economy as they act as nurseries for commercial species and are exploited directly for clams, oysters and by recreational fishers.

Yet these habitats are routinely covered by green seaweed mats during the summer and autumn that have extremely negative impacts including reducing invertebrate food for birds, smothering seagrass plants and decreasing bird feeding rates. As the seaweed decays it also reduces the oxygen concentration of the water and sediment and can even produce toxic gases that can be fatal to other shore users including humans.

Across England and France, the Channel region possesses 61% of the marine SPAs and 58% of the SACs that protect mudflats and estuaries. But it also has 60-70% of its waterbodies categorised as 'poor' ecological status due to eutrophication and numerous algal mat 'hotspots' so is an ideal location to test novel intervention strategies. Reducing agricultural fertilizer use, changing crops and better treatment of sewage will be very challenging and costly to do. Upstream changes (e.g. farming practices) via other EU directives will also take several decades to deliver results as underground water can take over 30 years to reach the coast. The WFD requires member states to achieve good ecological status of coastal waters *now*, with a key measure being a reduction in seaweed mats.

*Solution:* In partnership with stakeholders (e.g. fishermen, coastal managers) our approach will be to develop and then test innovative, sustainable and cost-effective methods that will rapidly reduce algal mat coverage and contribute to reductions in nutrient levels leading to improvements in ecological status of transitional waters. RaNTrans will demonstrate and test algal mat removal methods and associated nutrient reduction techniques specific for inter-tidal mudflat areas. Examples include: mechanical removal of seaweed mats; conversion of seaweed mats to aquaculture feed; establishing and optimising seaweed and shellfish (oysters, mussels) aquaculture.

*Impact:* Successful methods will reduce nutrient levels (measured within the local sediment and water) and consequently improve ecosystem services (e.g. invertebrate diversity for bird food) for transitional waters (if scaled up). Additional impacts for the coastal economies will be a) increases in tourism; b) expansion of aquaculture and c) improved fisheries catches.

Using novel approaches and adapting methodologies already developed for the beaches of the French Channel coast by CEVA (Centre d'Etude et de Valorisation des Algues) our stakeholder-scientist partnership will assess the effectiveness, impacts and costs of these approaches and then provide the framework to deliver these new methods at larger (e.g. regional) scales.

**Examples of concrete actions / *Exemples d'actions concrètes* :**

1. Identify Channel transitional water test locations based on previous reports
2. Organise expert workshops to share best practice between French and English partners to develop methods of algal mat management
3. To engage with stakeholders to refine and implement different nutrient reduction methods in key locations
4. To measure the impact of methods on key WFD indicators (seaweed blooms, benthic invertebrates, wading birds) and on co-occurring economic activities e.g. fishing, tourism
5. Undertake an economic comparison of these methods for cost-effective management of algal mats and nutrient reduction
6. Dissemination and promotional events, development of management frameworks for stakeholders, policy makers and coastal managers to facilitate region-wide implementation

**Changes that the project will contribute to / *Changements auxquels le projet contribuera***

We expect that successful nutrient reduction processes identified during the project (once scaled up) will reduce the concentrations of nutrients within coastal waters and lead to the those Channel region water bodies achieving good ecological status within 5 years of implementation.

**Cross border added value / *Valeur ajoutée transfrontalière* :**

Coastal communities in France and England share a water body as well as the same nutrient input methods (agricultural, industrial and sewage) so without trans-national cooperation achievement of good ecological status for dissolved nutrient concentrations will be much harder to achieve. France has significant stakeholder and scientific experience in nutrient reduction methods (e.g. aquaculture and algal mat removal) which will be shared with the English partnership for refinement and testing. At the same time the scientific knowledge of impact assessment (e.g. benthic invertebrate communities, birds) developed by leading researchers in England will be shared with French partners, thus providing true cross-border collaboration: sharing of best practice, skills development for the solutions and their impact on the ecosystem services. The complementary habitat-sediment systems of the two coastlines will also deliver the scenario-specific evidence for ultimate implementation of the most successful cross-boundary approach to reducing nutrient levels in coastal waters.

**Capitalisation on previous initiatives/ *Capitalisation sur de précédentes initiatives*:**

Technology, method development and expertise have been developed within the Europe and the Channel region through previous EU-funded projects (EnAlgae); EUMAC (Eutrophication-Macrophytes) and GIMs (Green intelligent Materials). The research, experts and organisations involved in these projects (e.g. CEVA, University of Portsmouth) will be able to transfer knowledge to the current project. For example, assessing the effects of seaweed mats (EUMAC) or the development of sustainable seaweed culture technologies (EnAlgae) will be critical for success.

### **Sustainability/Durabilité :**

The project will, via the development and assessment of the different nutrient reduction methods, provide a robust and clear set of approaches to impact that can then be implemented at the regional, national and EU levels to achieve rapid but sustained changes in ecological status of transitional water bodies. Using the frameworks developed by other Interreg projects within the region (e.g. CHARM-3, PEGASEAS and PANACHE) outputs from this project will also be central to the evolving management and governance frameworks of both countries well beyond the lifetime of the project. In addition, the benefits to the commercial activities of the coastal communities will ensure a strong economic future.

Partners (with their geographical areas) already involved in the project idea / *Partenaires (en précisant leur zone géographique) déjà impliquées à ce stade d'idée de projet:*

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University of Portsmouth (lead)

University of Bournemouth

Cefas

Environment Agency

Natural England

Marine Sustainable Feeds

Southern Inshore Fisheries Conservation Agency

Potential partners sought (skills wanted) / *Partenaires potentiels recherchés (compétences recherchées) :*

England / Angleterre :

None

France / France :

Skills needed:

Methods of algal mat removal

Shellfish (oyster and mussel) culture

Algal mat identification and processing

Organisations

Centre d'étude et de valorisation des Algues (CEVA)

Academic institution: University of Caen, University of Le Harve, University de Bretagne Occidentale, Station Biologique Roscoff, IFREMER BREST

ONEMA - Office National de l'Eau et des Milieux Aquatiques

Comité des Pêches (*The Fisheries Committees*)

A representative of the oyster/mussel aquaculture industry

Start date and end date of the project / *Dates de début et de fin du projet:*

2017-2020/21

Estimated project cost / *Coût estimé du projet:*

€4-6 million

Other comments / *Autres commentaires :*

Has a programme facilitator from the InterregVA FCE Joint Technical Secretariat provided advice to the project applicant? / *Un coordinateur de l'animation du Secrétariat Technique Conjoint FMA a-t-il conseillé le porteur du projet ?*

Yes

If yes, facilitator's name / *Si oui, quel est le nom du coordinateur de l'animation ?*

Name / *Nom:* Christelle Pereira