

**NWIFCA Technical, Science and Byelaw
Committee**

15th May 2018: 10:00 a.m.

**AGENDA
ITEM NO.**

8

PHD FUNDING PROPOSAL – LANCASTER UNIVERSITY

Purpose: i) to provide information to Members on a proposal for a bid for a PhD with Lancaster University to begin October 2018

Recommendation: i) that Members approve the report;
ii) that Members consider the PhD outline proposal and decide on its merits as a project for NWIFCA science team to develop further;
iii) should Members approve the PhD outline proposal that TSB consider the options for funding.

Background:

1. NWIFCA Science Team have been building a relationship with Lancaster University Environment Centre (LEC) over the past couple of years. In 2017 two projects were undertaken by students into sediment movement and change, and how it affects cockle distribution in Morecambe Bay. One was carried out as the thesis for a M.Sci. degree in Ecology and Conservation, and the other as the thesis for a B.Sc. Geography degree. The intention is to publish the reports from these projects once they have received their final gradings.
2. The second of the theses entitled: “An investigation into the temporal variations of Morecambe Bay’s geomorphology in relation to known cockle bed settlements using integrated remote-sensing” produced some initial interesting findings in relation to remote sensing capabilities to detect change in change in channel position, sandbank elevation over a thirteen year period at the mouth of the Lune Estuary – influencing cockle beds at Pilling Sands and Middleton Sands.

The study took an integrated remote sensing approach, using a combination of Light Detection and Ranging (LiDAR) and satellite imagery from the orbiting satellite Landsat. This was overlaid with mapping from NWIFCA cockle surveys.

Landsat coverage provides worldwide opportunity to observe spatial and temporal changes to landscapes in 2D using satellite images that are produced through the reflection of light radiation from the earth surface. This data source has been used for decades to investigate channel movements.

LIDAR is favoured for coastal and channel mapping, with studies using LIDAR to decipher coastal erosion, beaches and movements. LiDAR is increasingly utilised due to the provision of 3D digital terrain and surface models. However the spatial and temporal coverage of LiDAR is more limited than Landsat.

LIDAR images are of 2m spatial resolutions (horizontally accurate to the nearest 2m), with vertical precisions of 15cm. LiDAR also has high GPS precision geo-referencing. Landsat data used is only accurate to a resolution of 30m.

Although there were caveats around the outputs, results showed accretion of intertidal sand flat at the mouth of the Lune channel over 13 years, as in 2004 the channel mouth and path was wider, and thus the channel was closer to Pilling Sands and Middleton Sands. The waterlines producing this difference were found to have a difference in tidal elevation of 1.05m between 2004 and 2017.

Current Position and Proposal:

3. LEC invited the Senior Scientist to consider further projects this year and in order to discuss funding opportunities she met with two members of the LEC – the Administration and Graduate Placement Manager and the Business Partnerships Manager.
4. For NWIFCA's purposes Masters and under-graduate projects can be useful but do not provide longer term in depth study, which is needed to investigate trends and provide possible answers to issues affecting fisheries management. Therefore the discussion focused around PhD opportunities.
5. Current funding opportunities for PhDs are limited. However one project proposal was considered to be of great interest to two departments within LEC, which would develop the work of the BSc Geography degree in the use of satellite and remote sensing imaging to investigate further the shifting sandbanks and channels in the Bay, and their impact on the ecology of the Bay, focusing in particular on cockle and mussel fishery resources.
6. The Senior Scientist would like to propose this opportunity for further study and enhanced understanding considering the following:
 - i. the impact that shifting sandbanks and channel movements have on the available ground for mussel settlement, their effects on cockle distribution particularly in relation to elevation, their effects on accessibility and practicality for survey, their effects on shrimp, flounder and other important fishery resources;
 - ii. the importance of cockle and mussel fisheries in Morecambe Bay to the work of the Authority and its stakeholders;
 - iii. the importance of cockle, mussel and other fisheries in Morecambe Bay to the ecology and functioning of the Bay as a whole including its designation under the EU Habitats Directive and EU Birds Directive.
7. If possible a further element of study will be included to investigate the effects on geomorphology the placing of physical hard structures has on channel and sediment movement. This would be key information in relation to the number of potential developments in Morecambe Bay and other estuaries nationally and globally, including bridges, hard sea defences, ventilation shafts for undersea tunnels etc.
8. Academics interested in supervising the PhD include Suzi Illic who supervised the 2017 projects (<http://www.lancaster.ac.uk/lec/about-us/people/suzana-ilic>) and another supervisor from the Geospatial Data Science Research Group.

Funding Requirements:

9. The only option available at the present time where LEC have funds to cover a stipend for a studentship which would enable the project to start in October 2018, is for the NWIFCA to contribute a sum of £23600 over the 3.5 years of the PhD. This covers tuition fees and a Research Training Support Grant (RTSG) covering travel, fieldwork, consumables etc.

The RTSG amounts to £8,750 for the 3.5 years equating to £2500 p/a.

The tuition fees are £4260 for first year, and each subsequent year with an increase for inflation.

Resulting in an annual total of around £6800.00

The full year's amount is due for payment at the beginning of each (student) year – ie. September.

10. Information from NWIFCA Finance Manager is that there is £6000 allocated to science work in the 2018-19 budget. The additional £760 could be found from underspend in other areas. However this would subsume the total science work budget for the year.
11. If the Authority approved this funding, LEC would start to recruit students for our project plus one other that has put in for the same pot. They then recruit the best student not the best project from the two. Only one project would receive funding.
12. An alternative is the possibility of funding next year's through ENVISION Doctoral Training Partnerships (<http://www.envision-dtp.org/>) which would start in October 2019. LEC is applying for this now and will find out Sept / October time whether or not their bid has been successful.

The NWIFCA contribution then would around £4000 – 5000 per year over the 3.5 years of the PhD.

Recommendation:

13. That TSB consider the PhD outline proposal and decide on its merits as a project for NWIFCA science team to develop further with Lancaster LEC.
14. Should TSB approve the PhD outline proposal, that TSB consider the options for funding.

Mandy Knott
Senior Scientist
2nd May 2018