PROJECT PROPOSAL FORM

Making the Most of Masters aims to improve collaboration between employers and universities by providing opportunities for masters students to undertake work based projects as an alternative to a traditional university dissertation. Projects should address a real need within the host organisation and be beneficial to both host and student.

The Marine Alliance for Science and Technology for Scotland (MASTS), pools the majority of Scotland's marine research capacity. MASTS members provide Masters courses in a range of marine related disciplines and many of their students are keen to undertake applied projects outside of academia.

Notes on Topic Selection

A relevant academic will work with your organisation to refine your proposed topic and ensure it meets both your needs and the academic requirements of the student. Projects should typically be achievable within a 12–16 week timeframe (including writing the final report).

Your proposed project could be:

- A specific project title or topic for the student to deliver;
- A general idea of a business need which requires further development;
- A core research theme to be developed by the student into a bespoke project;
- An intended outcome for the organisation.

The level of detail you provide will determine the extent to which further discussion may be required with the relevant programme director to ensure suitability.

desk-based/data studies that will easily facilitate remote working and remote supervision are welcome, as well as in person and/or experimental based projects where appropriate.

What's Next?

Please send your completed form to the MASTS Programme Coordinator & Deputy Dean of Grad School, Dr Emma Defew (masts@st-andrews.ac.uk) before **16:00 on Friday 27th October 2023**.

Following submission of the form, it will be channeled to the leaders of the various Masters programmes that operate within the MASTS community and a representative from the most relevant programme or department will get in touch to discuss the project scope, delivery and the selection of an appropriate student. If more than one student expresses an interest in your project, you will need to ensure discussions take place to enable the most suitable student to be matched with your project. The projects themselves usually won't start until May or June.

MASTS - Making the Most of Masters – Project Proposal Form

Name and address of Organisation:

HiDef Aerial Surveying Ltd

Name of the key contact in Organisation:

Jaz Harker, William Peden

Contact e-mail and phone number:

william.peden@hidefsurveying.co.uk – 01313 801836

jaz.harker@hidefsurveying.co.uk - 01946 383611

Title of proposed project:

Investigating the impact of the 2022/23 Highly Pathogenic Avian Flu Virus (HPAIV) H5N1 outbreak on gannet (*Morus bassanus*) in the British Isles

Project outline and intended outcomes:

Seabird populations around the British Isles were heavily impacted by the 2022/23 HPAIV outbreak, with devastating effects on multiple seabird species such as gannet, great skua (*Stercorarius skua*) and gull and tern species (Falchieri *et al.,* 2022). Gannet were one of the most heavily affected species, and with the UK holding a large proportion of the global population, any negative impacts to UK colonies are likely to have far-reaching consequences.

The outbreak was first identified in UK colonies in 2021, although the impact to colonies seemed to be larger over the 2022 breeding season (Lane *et al.,* 2023). Since the outbreak occurred relatively recently, the effect on gannet is relatively unknown, with any attempt to describe and analyse data likely to improve existing knowledge and aid future work.

HiDef collect huge amounts of Digital Aerial Survey (DAS) data on UK seabirds every year, generally contracted by the offshore renewables industry. The survey method is particularly suited to derive species density and abundance estimates while providing additional data such as those on age, sex and behaviour.

During the HPAIV outbreak, the number of dead gannet recorded by HiDef increased considerably compared to previous years, with the cause of death presumed to be HPAI. As of yet, these data have not been analysed, therefore any analysis in terms of regional or seasonal trends and environmental conditions would

be informative.

Gannet are regularly aged from HiDef footage (e.g. adult, juvenile, immature) and the proportion of each age class in the overall data can be derived. It is possible that the age structure derived for dead gannet compared to that for the rest of the observed birds will be different. Assessing differences in age structure regionally would be interesting, in addition to exploring any temporal (seasonal) variation. Potiek *et al.* (2019) present age class information for multiple seabird species in the North Sea, with something similar for gannet being able to be replicated from the HiDef data, in addition to other analyses.

If the student wishes there is potential to do much of the data manipulation/analysis in R; providing valuable skills which will be useful for future career opportunities. Two representatives from HiDef with marine biology and quantitative statistics backgrounds will co-supervise the project along with those from the partner University.

Since the impact of HPAI is still being assessed, it is likely that there may be opportunity for the student to publish in a peer-reviewed paper, if data owners are agreeable.

Falchieri, M., Reid, S.M., Ross, C.S., James, J., Byrne, A.M.P., Zamfir, M., Brown, I.H. *et al*. (2022). Shift in HPAI infection dynamics causes significant losses in seabird populations across Great Britain. *Veterinary Record Open*, 191, 294–296.

Lane, J.V., Jeglinski, J.W., Avery-Gomm, S., Ballstaedt, E., Banyard, A.C., Barychka, T., Brown, I.H. *et al*. (2023). High pathogenicity avian influenza (H5N1) in Northern Gannets: Global spread, clinical signs, and demographic consequences. *Ibis*. doi: 10.1111/ibi.13275.

Potiek, A., N. Vanermen, R.P. Middelveld, J. de Jong, E.W.M. Stienen and R.C. Fijn. (2019). *Spatial and temporal distribution of different age classes of seabirds in the North Sea. Analysis of ESAS database*. Bureau Waardenburg report 19-129. Bureau Waardenburg, Culemborg.

Any additional comments e.g. details of specific disciplines required, methods to be used, travel involved, where the work would take place (i.e. at the host site or at the University), whether you foresee any Intellectual Property or confidentiality issues (and if so, what form might these take?):

The project will likely be most suited to those with a marine biology/ecology background, although those with a quantitative background may be interested if they wish to undertake more complex analysis on the data e.g. adapting population models to assess population-level impacts (this is likely to be challenging considering the relatively short time-frame associated with the project, so prior experience with population models would be necessary).

Since the data are already available the project will be desk-based, however, HiDef have an office in Edinburgh so there will be potential to meet the team and learn more about the data collection methodology and glean support from our data scientists. Regular meetings can be set up between HiDef representatives and the student.

HiDef primarily collect highly confidential data for offshore renewables developers. To conform with client confidentiality, all data will need to be anonymised and collated to broad regions, prior to analysis. This will be done prior to the student having access to the data so no issues are expected to arise.