SIFIDS
Scottish Inshore Fisheries
Integrated Data System

Scottish Inshore Fisheries Integrated Data System (SIFIDS) Project

To enhance sustainability and foster resilience within Scotland's inshore fishing communities an effective system of collecting and sharing relevant data is required. To support business decisions made by vessel owners as well as informing fisheries managers and those involved in marine planning it will be vital to collect a range of information which will provide a robust understanding of fishing activity, the economic value of the sector and its importance within local communities.

Data collection for Scottish Inshore Fisheries

The European Maritime and Fisheries Fund (EMFF) has awarded £1.51 million to develop an integrated system for the collection, collation, analysis and interrogation of data from the Scottish inshore fishing fleet. The ultimate goal being to use data gathered voluntarily from fishermen to aid decision making in fisheries management and marine spatial planning. The Project will build on recent European Fisheries Fund (EFF) funded work to create robust and largely autonomous methods to improve the way Scottish fisheries are managed in cooperation with industry. It will focus on the inshore fleet where data on the location of fishing activity and effort is currently lacking. Coordinated by the MASTS[1] Directorate based at the University of St Andrews, the project will run from December 2016 until May 2019.

With the creation of regional Marine Planning Partnerships, there is now a greater need than ever to gather information on fishing activities and interests in an increasingly busy marine environment. In addition, by 2020, Marine Scotland has indicated that it intends to implement vessel monitoring to inform on the footprint of inshore fishing, and ensure that stocks are exploited sustainably (fished at Maximum Sustainable Yield), while improving stakeholder participation in fisheries governance (Scottish Inshore Fisheries Strategy 2015). The SIFIDS Project was conceived to assist in attaining these goals by working alongside fishermen to develop and test technology to automatically collect and collate data on board vessels, thereby reducing the reporting burden on fishermen.

1) Marine Alliance for Science and Technology Scotland

Overview of Project Work Packages (WPs)[2]

Review of stock-assessment methods

A review of shellfish stock assessment methods will be conducted under WP1 for brown crab, lobster and dredged King scallop. This desk-based study will assess the sampling required to conduct statistically meaningful stock assessments, undertake cost-benefit analysis and make recommendations for prioritising sampling effort within the inshore fleet.

Development of equipment for the automatic collection and processing of fisheries data

WP2 will focus on the development of processes and equipment to electronically record catch and fishing effort data on board creel vessels targeting crab and lobster. This is likely to include the vessel's location, gear deployed, its soak time, quantities of retained and discarded catch, as well as data on the species, sex and size of catch; and potentially environmental factors such as water depth and temperature. A pilot "On-board Central Data Collation System" (OBCDCS) will be developed to automatically record the data (reducing the paper-reporting burden on fishermen). The potential to harvest data automatically from the OBCDCS through secure port-based Wi-Fi connections will also be tested. WP3 will involve the design and field testing of methods for the automated identification and stock surveying of scallop bed locations using sonar technology, Autonomous Underwater Vehicles (AUVs) and towed sensor arrays.

Socio-economic and experiential fishers data

WP4 will assess the economic, social and cultural footprint of inshore fisheries, especially in remote areas. WP5 will focus on how best to gather valuable experiential and anecdotal information from fishermen to identify their motivations, knowledge and beliefs which they use to inform their fishing activities. This WP will also seek information from fishers related, for example, to the prevalence of soft (moulting) crab, egg bearing females, diseased or undersized shellfish, juvenile fish bycatch and interactions with vulnerable species such as cetaceans, seals and seabirds. Methods will also be developed for recording other useful anecdotal information, such as the presence of squid eggs on creels, lobster breeding grounds and the use of lobster tail notching.

Understanding drivers of inshore fishing vessel activity

WP8 will build on previous EFF funded research, in which 274 inshore fishing vessels were fitted with Automatic Identification Systems (AIS) to assess the feasibility of using this system to track vessel movements and infer fishing activity patterns. Further data will be gathered from a sub-set recruited from these vessels using on board observers to understand in more detail operational characteristics and the factors driving fishing activity. Statistical methods (behavioural modelling) will be used to compare the observer gathered information with vessel tracking data to develop fishing activity "fingerprints". These would allow types of fishing activity to be identified automatically from future tracking data using a specified set of vessel behaviours, such as movement patterns and changes in course and speed. Further statistical modelling will be used to investigate how variations in weather, stocks, catch prices and the location of Marine Protected Areas (MPAs) for example, might impact fishing activity. The use of the experiential information gained from fishers will form an important part of this analysis.

### Development of a decision support tool for vessel owners, fisheries managers and marine spatial planners

Using a relational database to collate data on fishing activity, the drivers that influence that activity and relevant economic information will provide the basis for a range of analyses which could be provided to help inform a skipper's business decisions, as well as fisheries management and marine planning. A pilot data resource will be developed under WP6 that will act as a repository for the data collected through the project's WPs as well as other data streams identified as having value through consultation with key stakeholders. Such a resource could form a powerful evidence-base for the industry and regulators to draw upon to help provide more objective information to guide policy and legislative decision making.

Industry involvement in the SIFIDS project

The involvement of the industry will be a fundamental part of the SIFIDS project. By using available and emerging technologies, it is increasingly possible to engage fishers directly in the process of gathering data relevant to their individual businesses as well as being a requirement of responsible fisheries management. Through previous EFF projects and in the SIFIDS project, our dedicated team of facilitators will ensure good communication and contact with fishermen on the ground and feedback at Regional Inshore Fisheries Group and Association level. The project team also works closely with Marine Scotland to ensure that the project will deliver outputs of value to industry, regulation and policy.

For the survey work at sea, we will be recruiting more than 100 vessels of a range of sizes, configurations, gear types, operational characteristics and locations. As well as gathering physical data from these vessels, we will also talk to the skippers about the factors that guide their decision making and other information that they could potentially provide relevant to their day to day fishing experience. On shore, the team responsible for the economics work will be contacting and interviewing all relevant representatives from the inshore supply chain to gain a detailed picture of both the economic value of the

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2) Work Packages relating to project management and facilitation are not specifically mentioned in the text.
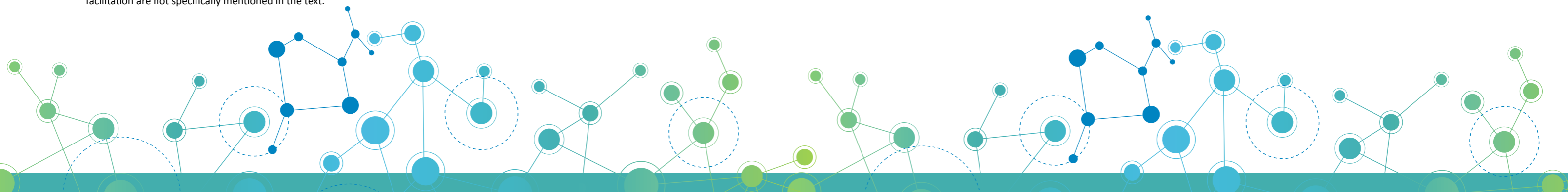
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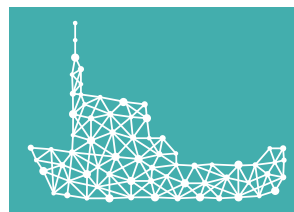
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industry and its importance to the social fabric of local communities.

As part of our consultations with industry and regulators, we will also define the type of information outputs from the data we are collecting that will be of practical use in helping to guide decisions and fulfil statutory data collection requirements.

This partnership approach will ensure that the SIFIDS Project work packages will engage with industry, either at an organisational level or directly with individual fishermen on a voluntary basis with the aim of finding workable, industry-led solutions to inshore fisheries data collection and management in Scotland.