SIFIDS Newsletter

SIFIDS
Scottish Inshore Fisheries Integrated Data System


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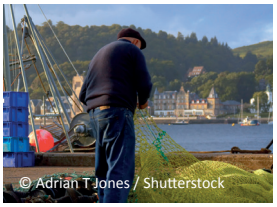
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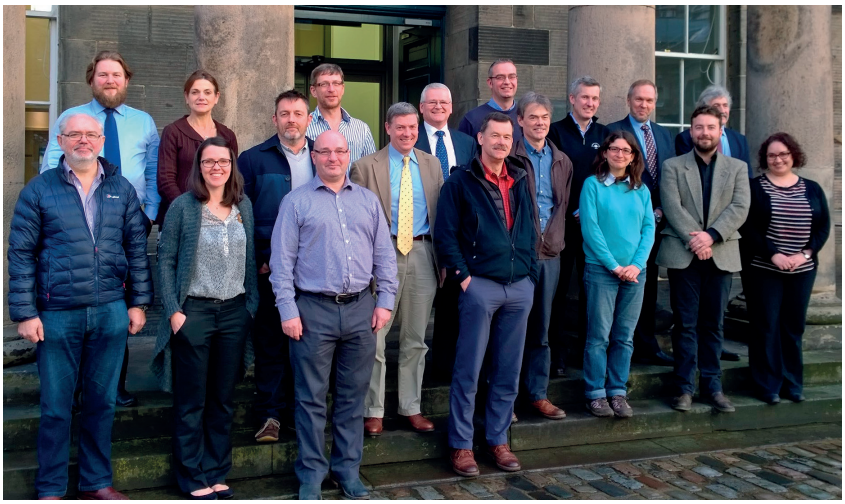


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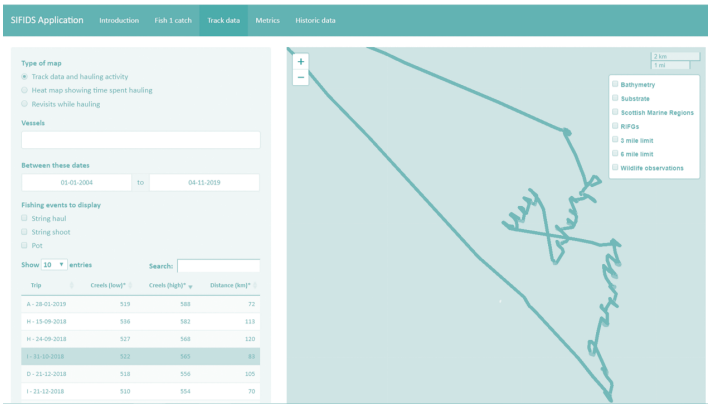
SIFIDS News – End of Project Reporting (2016 - 2020)

A BIG THANK YOU!

The SIFIDS team warmly thanks the many individual fishers, groups and organisations who have contributed to the success of the SIFIDS project. Support and feedback from fishers, industry representatives, Marine Scotland staff and many other stakeholders around Scotland has been pivotal to the SIFIDS Project carrying out wide-ranging work to identify ways to improve data collection across the inshore fleet. Over 130 vessel skippers in 43 ports around Scotland hosted research trips, while others have undertaken longer-term trials including GPS tracking, gear sensing or shellfish scanning devices. Many more took part in the socio-economic and online surveys and several fishers contributed significantly to equipment and software development.

Main Project Outcomes and Recommendations

- A possible blue-print for an integrated, secure and cost-effective system of data gathering and sharing to empower fishers and managers;
- New, prototypic technology to automate data collection and minimise reporting burdens e.g.
  - simple low-cost GPS tracking equipment trialled, with solar-powered options;
  - linking GPS tracks, gear deployment sensors and catch data to assess fishing intensity and Catch Per Unit Effort;
- A world-first prototypic crab and lobster scanner capable of determining the sex and size of live animals at-sea;
- Proposals to enhance methods of shellfish stock-assessments and scallop habitat monitoring;
- Combining socio-economic data with fishing drivers to inform policy and business planning.



Why Do We Need to Improve Data?

Accessible data on the location of fishing, fishing effort, and more timely stock assessments are required at a finer spatial resolution to improve local fisheries management, to fulfil compliance regulations and to help ensure that stocks are sustainably managed. The concept of adaptive management can only be realised when individual fishers and associations also have data needed to monitor and enhance the performance of their own businesses and demonstrate good practice.

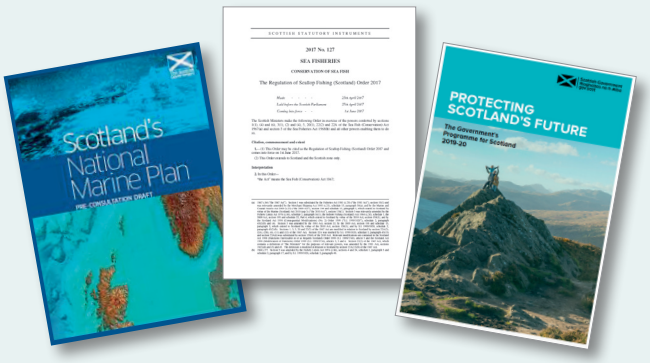
A key Scottish Government and Regional Inshore Fisheries Group priority is to acquire better data through the inshore fleet. Scotland's National Marine Plan, while recognising the importance of the inshore fishing industry to local communities, to Scotland's economy and future food security, underlines the wider range of cross-sectoral data requirements.

It is crucial that any systems and processes designed to address these requirements are proportionate and appropriate for use on inshore vessels. A fundamental principle of SIFIDS has been to identify options that use open-source software and off-the-shelf technologies – minimising the cost and retaining a lot a future flexibility to adapt and develop optimal data collection and analysis solutions.

Policy, Legislative and Regulatory Context

The Scottish Government has explicitly identified as a priority the modernisation of the Scottish inshore fisheries fleet, including the deployment of technologies such as remote electronic monitoring (REM) for scallop fishing vessels and the introduction of tracking systems across the inshore fleet. In October 2020, Marine Scotland published the **Future Fisheries Management: Policy Intent Paper** (https://www.gov.scot/publications/future-fisheries-management-policy-intent-paper) which was subsequently followed by the **Future fisheries: Management Strategy - 2020 to 2030** document published in December 2020 (https://www.gov.scot/publications/scotlands-future-fisheries-management-strategy-2020-2030/pages/2).

The Regulation of Scallop Fishing (Scotland) Order 2017 (RSFO), prescribes for scallop dredge vessels operating in Scottish waters, the specification for REM equipment and its functionality (http://www.legislation.gov.uk/ssi/2017/127/pdfs/ssi_20170127_en.pdf).

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The SIFIDS 'Integrated Data System' Model

The combined results of all the SIFIDS work packages have enabled us to identify a comprehensive package of protocols offering a partially-automated, integrated, cost-effective and low-maintenance system of data collection and reporting. We believe this could meet the requirements of government and the fishing industry, without overburdening fishers in terms of reporting.

This combined data system offers an approach that would involve fishers in the central provision of data needed for the future sustainability of the sector and provide rapid feedback to fishers for dynamic and adaptive management. However, this approach would require a step-change in current practice and thinking.

Understandably the majority of fishers prefer that their data remains confidential. By using mobile phone technology, GPS tracks and other data can be transmitted to a secure database that would provide fishers with access to their own data. An agreed level of access to data would then also be required for statutory/regulatory purposes. Fishers could also elect to provide others with access to their data for operational and business reasons.

The model proposes 5 main advances:

1. **Installing simple GPS tracking systems** on all under-12 metre inshore fishing vessels to provide better information on fishing location and effort, in conjunction with the current statutory records of landings and gear deployed. Ideally, an App, similar to the FISH1 mobile phone App that was developed as part of the SIFIDS project, would be used to provide a daily record of catch as well as landings *(This minimum level of data is expected to provide sufficient information for the majority of the inshore fleet in Scotland, c. 1500 vessels)*

How the **basic system** could work in an operational context (All vessels under 12m)

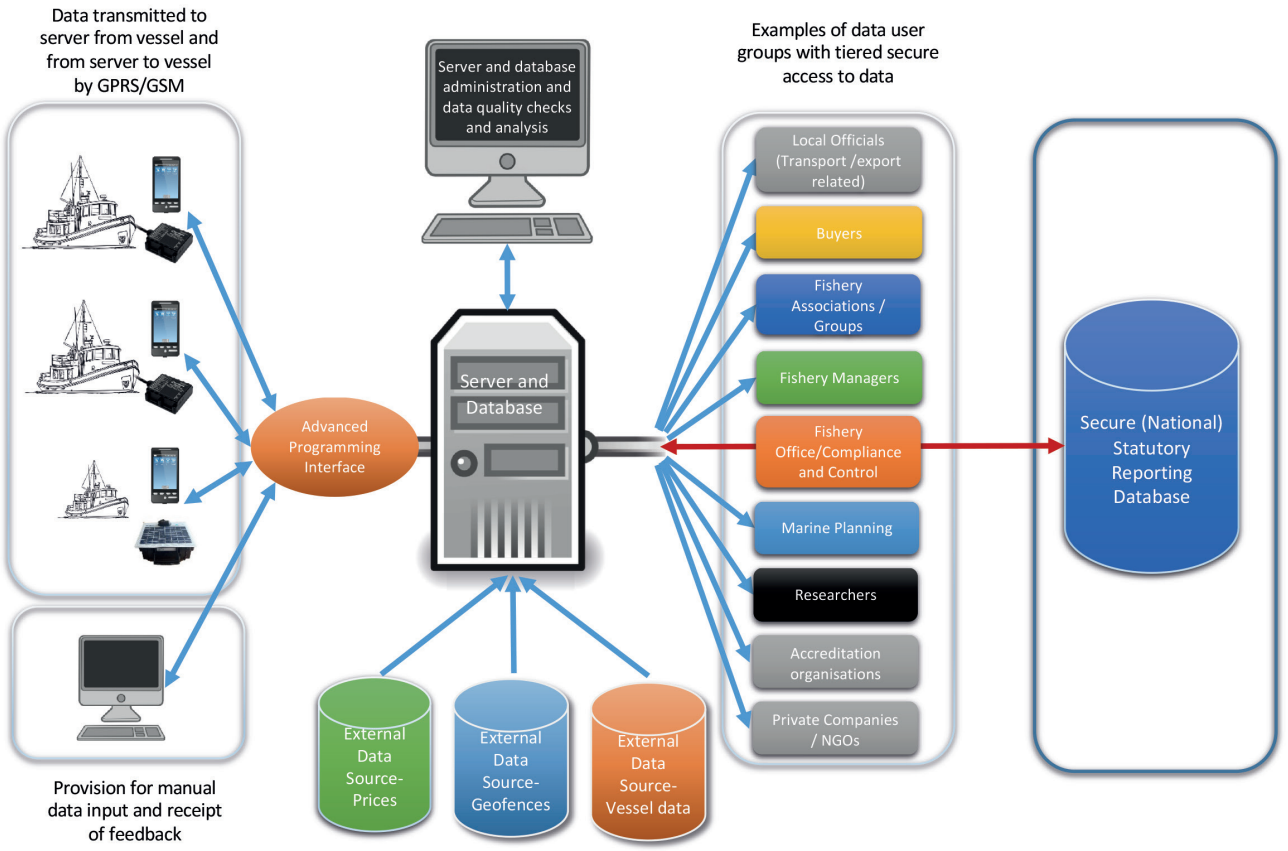
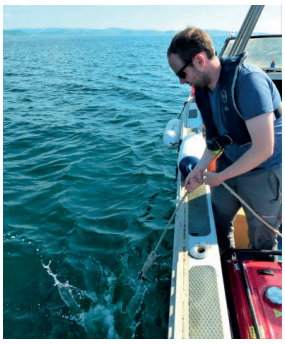
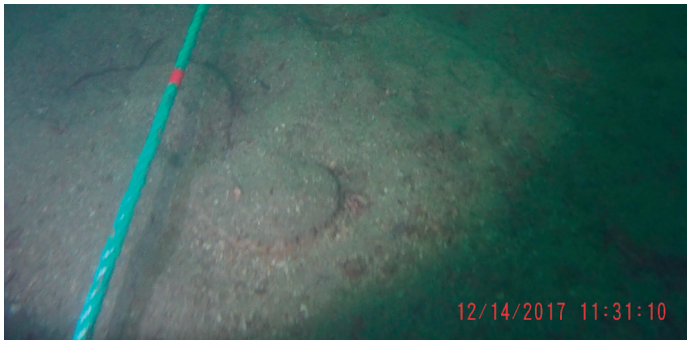


Fig 1: detailing a possible secure fisheries data management system. All vessels under 12m (left hand side) collect data through an App (FISH1 forms and vessel tracks etc). This could feed into a centrally-maintained database (middle section). Statutory data is passed to the appropriate authority. Fishers have access to their own data. Pre-agreed and controlled levels of access allow certain data to be used by other groups such as researchers or marine spatial planners.





2. **Using gear-sensors** to demonstrate when and where gear is being deployed or recovered, for example on some vessels using specific gear types, and/or operating in a sensitive area. SIFIDS trialled off-the-shelf RFID tag sensors, induction sensors, mechanical and hydraulic-hauler sensors. These devices (used in tandem with our On-Board Central Data Collection System (OBCDCS) which has GPS, GPRS and high data storage capacity), can provide near real-time data on when and where individually-identified gear or strings/fleets of gear are deployed or recovered. The extent of reporting or monitoring would be proportionate to the 'risk' level, or overall data needs of the fishery managers (see Fig 2).

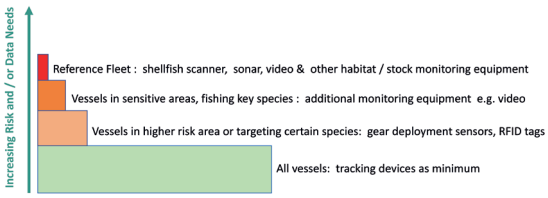


Fig 2: (not to scale) showing a possible tiered system of monitoring requirements for fishing vessels, proportionate to the perceived sensitivity of the fishery and / or local data needs on stocks, habitats etc. – per SIFIDS report recommendations.

3. **Establishing a small 'reference fleet'** to collect data that could assist stock assessments. The fleet would consist of selected fishing vessels that would carry the OBCDCS, gear sensors and occasionally, an operational version of the prototypic Automated Species, Sex and Size Identification System (ASSSID – see below). This system can provide the necessary data for basic stock assessment.

4. **Developing low-cost, non-invasive methods to identify scallop grounds**, that could be deployed from an inshore fishing vessel. SIFIDS tested a range of techniques including state-of-the-art sonar which demonstrated that scallop grounds can be identified non-invasively. However, a simple collapsible tripod equipped with a Go-Pro-like video camera (drop-down camera) has proven an effective and cost-effective option and is, in principle, capable of recording images of scallops on the sea floor which could then be analysed automatically using Artificial Intelligence (AI). A suite of 4,000 scallop images is currently being used to "train" the AI system. If successful, further testing of the drop-down camera system and the trained AI system will be needed to confirm whether it will work effectively for scallop stock-assessment purposes.

5. **Creating a secure, relational database** with a simple user interface (visual display) to allow different user groups to access data in different ways e.g. fishers would see only their own data, MS Compliance could see data required for statutory purposes while fisheries managers and others would see aggregated, anonymised data.

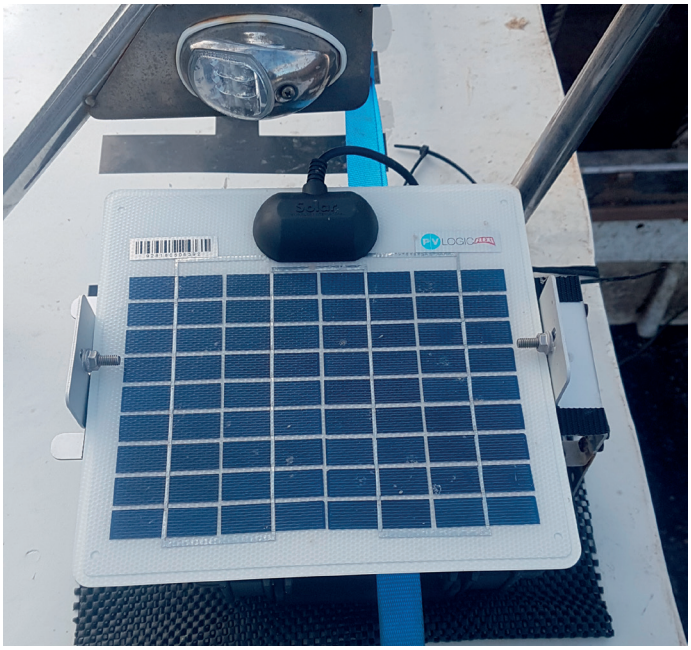
Detail on each component is given across the next 3 sections.

GPS Tracking Trials

The SIFIDS project has built on the results of earlier projects trialling AIS reception and functionality around Scotland (including the 'Establishing the Location of Fishing Activities within Scotland' project (2014-2016) funded through the European Fisheries Fund (EFF)[1]).

SIFIDS investigated the use of simple GPS units, connected to mobile telephone (GPRS) technology, to transmit vessel locations securely, rather than AIS which broadcasts location information using a radio signal that can be picked up by anyone with a receiver. After reviewing some of the iVMS technology available and conducting tests with simple GPS trackers, SIFIDS focused on tracking devices used widely in the road transport sector. As the tracking of commercial vehicle fleets takes place on a global scale, there are many well-tried, robust, and mass-produced tracking units. These sophisticated systems have excellent technical support, are produced in large numbers and are relatively inexpensive. For testing purposes, SIFIDS used Teltonika FMB202 and FMB204 tracking units. For vessels with reasonable power supply, the unit can be fitted directly to the vessel's ignition system. For vessels with poor or no power, a solar-powered version of the tracker has been developed.

Critical to the choice of tracking system was the ability to purchase inexpensive, but well documented and accessible hardware that is not limited by the licence conditions or costs associated with many commercial iVMS and fleet tracking systems. This approach enables the use of open-source software solutions to acquire the data from the tracking devices and to store, process, analyse and display the outputs with complete flexibility.



Results are very encouraging, and units seem to be easy and quick to fit, reliable and inexpensive to use. The solar system trials have provided important feedback which continues to inform ongoing trials over the winter period when low levels of sunlight and low temperatures might be expected to affect battery charging and endurance. The ability to put the tracking devices into "hibernation" when not in use is key to conserving battery power. Further field testing will allow us to refine the way the solar system operates to ensure that it functions seamlessly throughout the year.

Potential Benefits of GPS Tracking for the Industry:

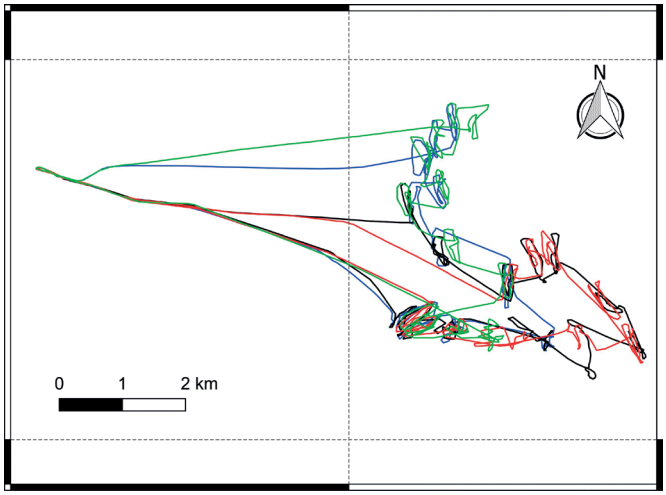
- Allows fishers to accurately document their ongoing use of fishing grounds, important both for fishery management and compliance purposes, and to inform other potential marine users (e.g. demonstrating fishing activity for marine renewable energy developments, aquaculture and Marine Protected Areas).
- GPS tracks are transmitted via mobile phone (GPRS) technology and are not visible to other vessels or to the public, therefore fishing locations remain confidential.
- The track data can be stored (on the tracker) and automatically transmitted when in mobile signal range.
- Cheaper and more flexible to use than AIS, important if we are to maximise the potential to use vessel track data as outlined below.
- Units can be programmed remotely, therefore require minimal attention.
- Vessel track-analysis can predict where gear has been hauled, potentially addressing some of the challenges around gear conflict.
- Catch Per Unit Effort calculations can be produced by combining vessel track-analysis with submitted weekly FISH1 forms.
- GPS track data could help show the provenance of catch for MSC or other certification schemes.

[1] Final project reports and video: https://www.masts.ac.uk/research/sustainable-scottish-inshore-fisheries/

What can a GPS Track tell us about Fishing Activities?

SIFIDS researchers undertook 135 sea trips on static-gear vessels around Scotland, thanks to 117 skippers who volunteered to help, with some hosting both a winter and summer trip. Researchers made detailed, timed observations of the different vessel activities, including steaming, shooting and hauling gear, whilst recording a GPS track. SIFIDS then compared the timings of hauling and shooting activities with the GPS tracks to analyse typical or "signature" patterns of movement, turning angles and speeds when hauling or shooting gear.

As a result, a computer model was developed which has proved to be over 96% accurate in estimating the true spatial extent of creel-fishing activity from GPS tracks alone, (given a 100 metre margin of error). What this means is that by simply collecting and analysing track data it is possible to predict when and where static gear is being recovered.



GPS tracks

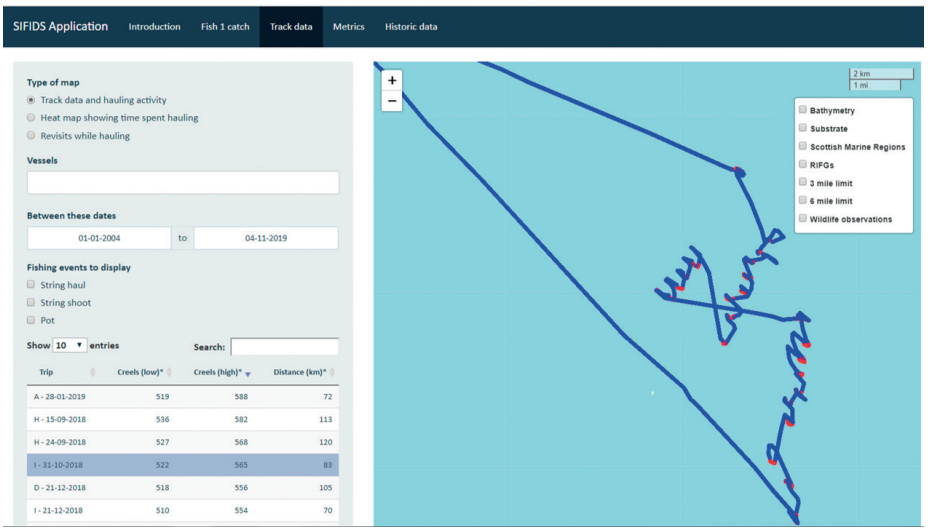
So far, the computer model has only been tested for creel fishing activity. However, a short extension of the project enabled a further fifteen observer trips to be completed on *nephrops* trawl and scallop diving vessels and this data is in the process of being reviewed to see if other fishing methods also show signature vessel movement patterns.

It takes a fraction of a second for the track data from one vessel to be computer-analysed, so the entire inshore fleet's track data for any one day could be analysed in a few seconds. More detailed information is now available in published scientific papers (e.g. Mendo et al., 2019)[2]. In addition to providing information on where fishing is taking place, it is also possible to estimate the number of creels being deployed and the soak time of the gear, providing important measures of "effort".

GPS 'Ping' rates

The GPS trackers used can be set to record a location ('ping') every second, but we discovered that a 'ping' once every 60 seconds provides enough information about creel-vessel movements to accurately estimate activity, without recording (and transmitting) unnecessary data. Other fishing gears may require a different 'ping' rate.

A short project video about the interpretation of GPS tracking is available at https://youtu.be/E2Pc9g2cH9k



Analysed GPS tracks predicting when hauling activity occurred (red sections)

[2] Mendo, T., Smout, S., Russo, T., D'Andrea, L., & James, M. (2019). Effect of temporal and spatial resolution on identification of fishing activities in small-scale fisheries using pots and traps. *ICES Journal of Marine Science* https://doi.org/10.1093/icesjms/fsz073

Mendo, T., Smout, S., Photopoulou, T., & James, M. (2019). Identifying fishing grounds from vessel tracks: model-based inference for small scale fisheries. *Royal Society Open Science, 6*(10), 191161 https://doi.org/10.1098/rsos.191161

James, M., Mendo, T., Jones, E. L., Orr, K., McKnight, A., & Thompson, J. (2018). AIS data to inform small scale fisheries management and marine spatial planning. Marine Policy, 91, 113-121. https://doi.org/10.1016/j.marpol.2018.02.012

Calculating Fishing Effort Through Gear Deployment Sensors

Where it is considered necessary, additional equipment can be used in conjunction with a GPS track such as RFID (Radio Frequency Identification) tags and induction sensors to show exactly when and where gear is being used, as well as to count the number of pots being hauled.

SIFIDS has trialled the fitting of RFID tags to creel fleet buoys, which were swiped past an RFID reader during hauling to identify each creel fleet. Induction sensors that detect when a creel is brought onboard were also tested, providing an accurate creel count for each fleet. Sensors were also attached to haulers to record when they were in operation. All data was collected via the On Board Central Data Collection System (OBCDCS), which contains a GPS tracker connected to the sensors, providing an accurate time and position for gear deployed or recovered. Data was then sent via mobile telephone (GPRS) network to a central, secure computer server to be analysed and made available to the fisher. In an operational system, such data would, where appropriate, also be sent to the Fishery Office or to contribute to (anonymised) national statistics.

Tracking data can be particularly useful in providing estimates of Landings Per Unit Effort (LPUE) by combining data on the predicted duration of time spent fishing, the amount of gear being used and the weekly FISH1 catch landings information submitted to Fishery Offices. Adding data collected on discards (such as undersized or berried lobster and crab) then provides Catch Per Unit Effort (CPUE). CPUE offers those involved in fishery management a clearer understanding of the fishing pressures and status of the targeted stock, and to determine if they are being fished to 'Maximum Sustainable Yield'. This is work in progress and the SIFIDS team are investigating if CPUE information could be used along with weather, temperature, fuel cost, catch price etc., to help fishers understand how their businesses are performing and perhaps inform decisions about the way they operate.

The Onboard Central Data Collection System installed on the wheelhouse of a vessel

The Onboard Central Data Collection System installed under the winch of a vessel, tracking the hauling of the vessel

Electronic Reporting via a Mobile Phone App

The systems and processes described below are in a prototypic phase and do not replace the statutory requirements dictated by a UK Commercial Fishing Licence.

Fishers have called for simpler ways to log their mandatory catch information and SIFIDS rose to this challenge by developing a trial FISH1 Form Android smartphone App. Furthermore, fishers gain valuable scientific and environmental knowledge at sea and it is important that their observations can be recorded in a more scientific way and taken into account as part of managing the fishery.

SIFIDS combined these two reporting needs into one mobile phone and tablet App to:

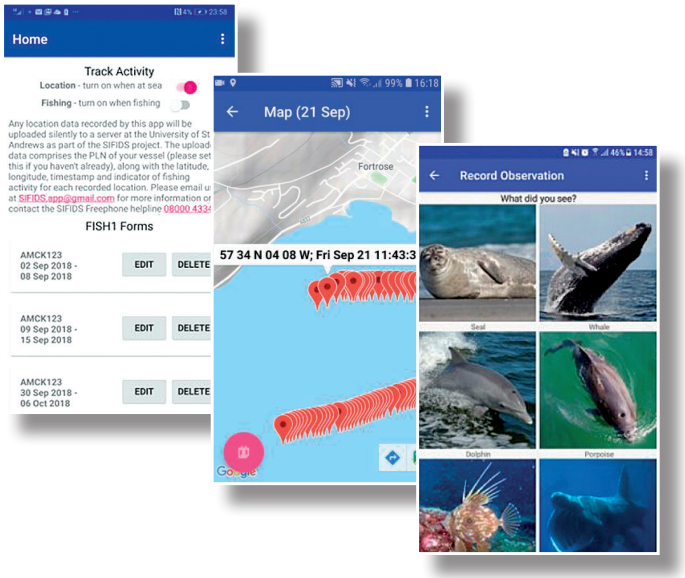
- help fishers complete and submit their FISH1 forms quickly and accurately to the Fishery Office; and
- enable easy and structured reporting of environmental and ecological observations of interest.

Examples of observations that could be recorded on the trial app were sightings of non-native, protected or endangered species (e.g. triggerfish, John Dory, octopus and dolphins). Future versions would enable wider observations such as squid eggs on creels, soft shells on crabs and berried females, sightings of algal blooms or jellyfish swarms, fish spawning areas, or anything else of particular note.

To save fishers time, standard information for the FISH1 form such as the vessel, skipper and owner details, gear type and quantity, buyer registration number, target species etc. was entered only once to the App which automatically populated each week's form, with a facility to amend as required.

An optional GPS tracking function was built into the App to record the start of each fishing area. This automatically entered the specific latitude and longitude readings into the FISH1 form which saved fishers time in completing their returns.

The App became available for trial at the end of 2018 as an Android version and was trialled by twelve fishers, seven of whom regularly sent in their FISH1 forms under a special arrangement with the Fishery Offices.



Benefits reported by the fishers who used the App included:

- improved accuracy in their FISH1 forms
- submitted FISH1 forms on time
- daily catch data easy to access
- if used with tracking option it could potentially provide evidence of gear location

Feedback was very positive with various suggestions from fishers as to how a next version of the App could be enhanced such as:

- integrating with movement and export documents (digitised)
- the option for nominated data-sharing between partner boats or boat and processor
- showing MPAs or other sensitive areas on the map
- adding a geofence so the App starts automatically when the vessel leaves the port
- showing coloured tracks to distinguish between fishing and steaming
- provide a weekly spreadsheet with a summary of each day's data to allow future comparison
- adding more species to the observation list
- bigger on-screen buttons for easier use at sea

A short video provides an overview and fishermen's feedback on the trial app: https://youtu.be/5wCjcjHFVrY

Reference Fleet for Stock / Environmental Data Collection

While SIFIDS has recommended that the majority of vessels would only need a GPS track to provide sufficient data for compliance purposes and to estimate basic effort, we also propose that fishers should be involved in the collection of biological data to feed into stock assessments. A small proportion of the fleet could, where appropriate, have the OBCDCS system together with the Automated Species, Sex and Size Identification (ASSSID) device.

On-Board Central Data Collection System (OBCDCS)

An essential part of the integrated data system is the capacity to collect, store and forward a range of vessel position, fishing activity, effort and other data streams relevant to fisheries management.

SeaScope Fisheries Research developed an On-Board Central Data Collection System (OBCDCS) using 'off the shelf' components. This had to be easy to install and maintain, of low capital and running cost and require minimal power. The system developed provides a standard platform for the acquisition of sensor data and transmits both position and sensor data ashore using mobile phone networks. The system has the ability to accommodate a wide variety of sensors, and links that data with the position and time information.

Thirteen OBCDCS units were built and tested on board volunteer host vessels for up to a year, during which time the system logged over 35 million individual positional 'pings'. Skippers provided invaluable feedback on overcoming various design and operational challenges.

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The RFID tags and inductive sensing kit developed was trialled on 5 vessels. This short video shows the system in operation: https://youtu.be/eS-H-CdrzNw

SeaScope's report identifies how these systems could be further developed and tested as part of a larger-scale roll-out (Report reference: Ayers R., Course G.P. and Pasco G.R., 2019. *Scottish Inshore Fisheries Integrated Data System (SIFIDS): Development of an Autonomous Fisheries Data Harvesting System and Investigations into Novel Technological Approaches to Fisheries Data Collection*).

ASSSID

The Automated Species, Sex and Size Identification (ASSSID) kit is a prototypic automated system created by SIFIDS team Seascope Fisheries Research to sex and measure common lobster and brown crab. The device contains a conveyor system and a 2D laser scanner, which captures and builds a 3D image of the animals passed under the laser on the small conveyor belt. The image is then analysed by bespoke software to rapidly identify the animal (crab, lobster or other), its carapace measurements and its sex. As stock assessments are time-consuming and expensive, the device was designed to be highly portable and can be installed either harbour-side to analyse landings or on the back of vessels to quickly analyse entire catches, or discards if required.


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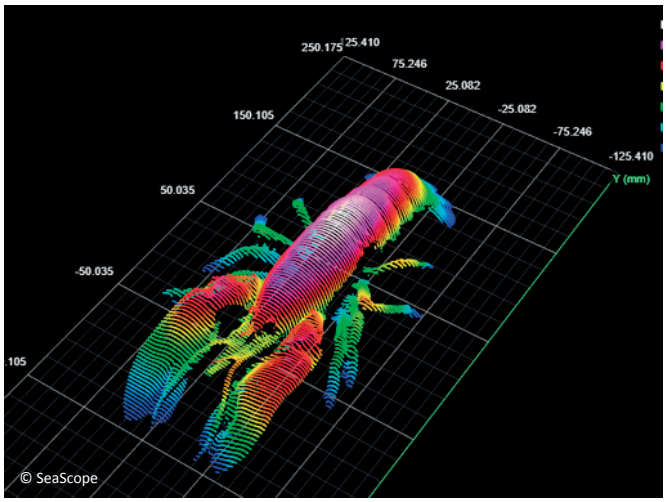
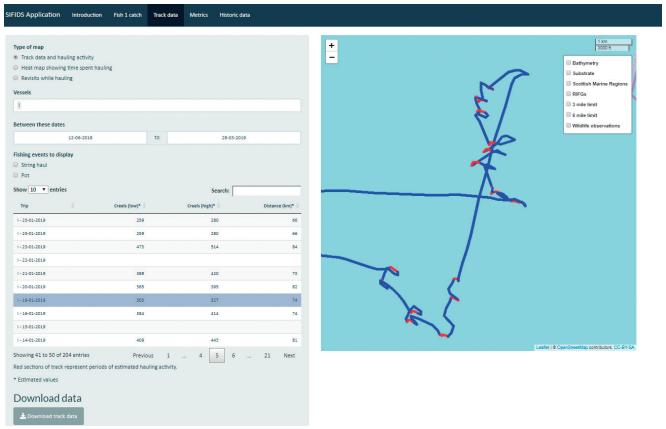


© SeaScope

The ASSSID device can be linked to the OBCDCS to provide a date, time and GPS stamp for each animal scanned before it is either retained or discarded.

Database with User-Friendly Visual Interface for Selected Users

SIFIDS developed a database and an online, easy-to-use interface that would allow different user groups to access data in different ways depending upon the privileges granted to them i.e. a fisher would only be able to see their own data, MS compliance would also see data required for statutory purposes, fisheries managers would see aggregated and anonymised data. This system enables data to be entered once and used multiple times, with controlled access to permit data-sharing while ensuring the confidentiality of individual fisher's data. The interface could provide the Scottish Government and industry with controlled access to meaningful and timely management information in the format required. The ambition is to enable users to interrogate data or to have data and other useful information pushed to their mobile phones or other devices.



Review and Optimisation of Shellfish Data Collection Strategies

Whist SIFIDS has been developing methods to obtain data to feed into shellfish stock assessments it was also important to assess how to conduct statistically robust sampling for the stock assessments themselves.

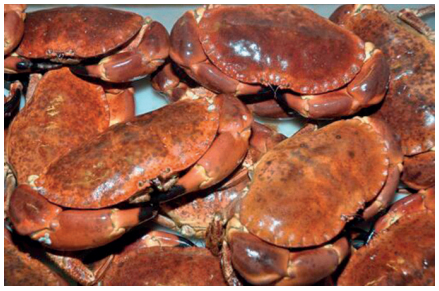
A drawback in the current system is the lack of access to data for local fisheries managers and Regional Inshore Fisheries Groups where this falls outside the current stock-assessment programme. The North Atlantic Fisheries College (NAFC) in Shetland in collaboration with OLSPS Group completed a desktop review of strategies used in Scottish inshore waters to look at what data is currently available and ways to optimise future data collection strategies, for example by collecting data from more vessels or by sampling a smaller number of vessels more often.

The report also looked at whether or not daily catch rates could be used as an indicator of stock abundance in areas where there was a lack of information.

The report proposed a flexible method for optimising data-collection across a range of options that would better suit local needs. It outlines the potential for using inshore fishing vessels to collect a wide range of information and investigates the potential to select a limited number of vessels as a "reference fleet", which would be equipped with additional technology to gather more, high quality data.

There may be no "one size fits all" sampling programme that would suit all national, regional and local management requirements, but the report identifies that there is considerable potential for industry-derived data to make a significant contribution to both stock-assessments (currently carried out by Marine Scotland Science), and to provide valuable time-series data for use in fisheries management .

A clear next step would be to test the operation of such a stock assessment process within a defined area.



Socio-economic Factors and Fishing Drivers

To deliver a better understanding of the significant contribution that the Scottish inshore sector provides to the social, economic and cultural fabric of Scotland, a detailed 'sustainable livelihoods' analysis was undertaken.

A team from SAMS Research Services Ltd (SRSL) & Imani Ltd collected and analysed cultural data in conjunction with already-available socio-economic datasets in a way that could be replicated and updated in future, using the 'Sustainable Livelihoods Approach' (SLA), which recognises both tangible and intangible factors required to make a livelihood sustainable and risk-resilient. Five types of 'capital' were defined which are critical to the function of the industry (Fig 3): ***natural capital*** (e.g. marine ecosystems and weather); ***physical capital*** (e.g. boats, harbours and roads); ***financial capital*** (e.g. income and access to loans); ***human capital*** (e.g. skilled crew and training opportunities); and ***social and cultural capital*** (e.g. community and family relationships and cultural heritage).

Social and cultural factors are important drivers of the industry with clear linkages between these and economic impacts within inshore fishing and across the value chain. Factors such as access to finance in turn influence social and cultural factors such as succession planning. The report shows how important it is that policy-makers understand these links, and the reasons behind them that drive the diversity and related activities in different regions and sectors. For example, fish caught in the North West Highlands may be processed in central Scotland, or the lack of young entrants to the industry may be caused by competition for staff from other sectors.

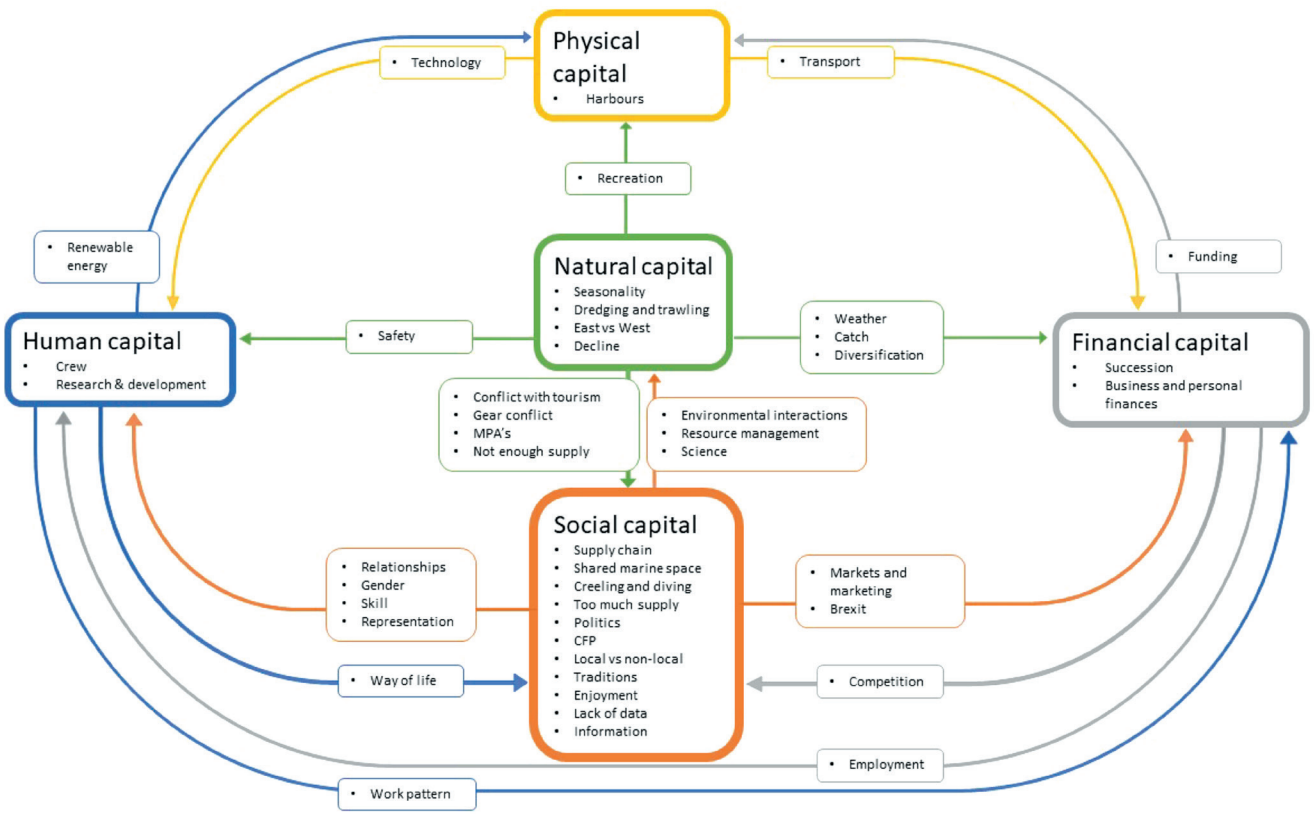


Fig 3: the relationship and linkages of socio-economic and cultural aspects of Scottish inshore fisheries.

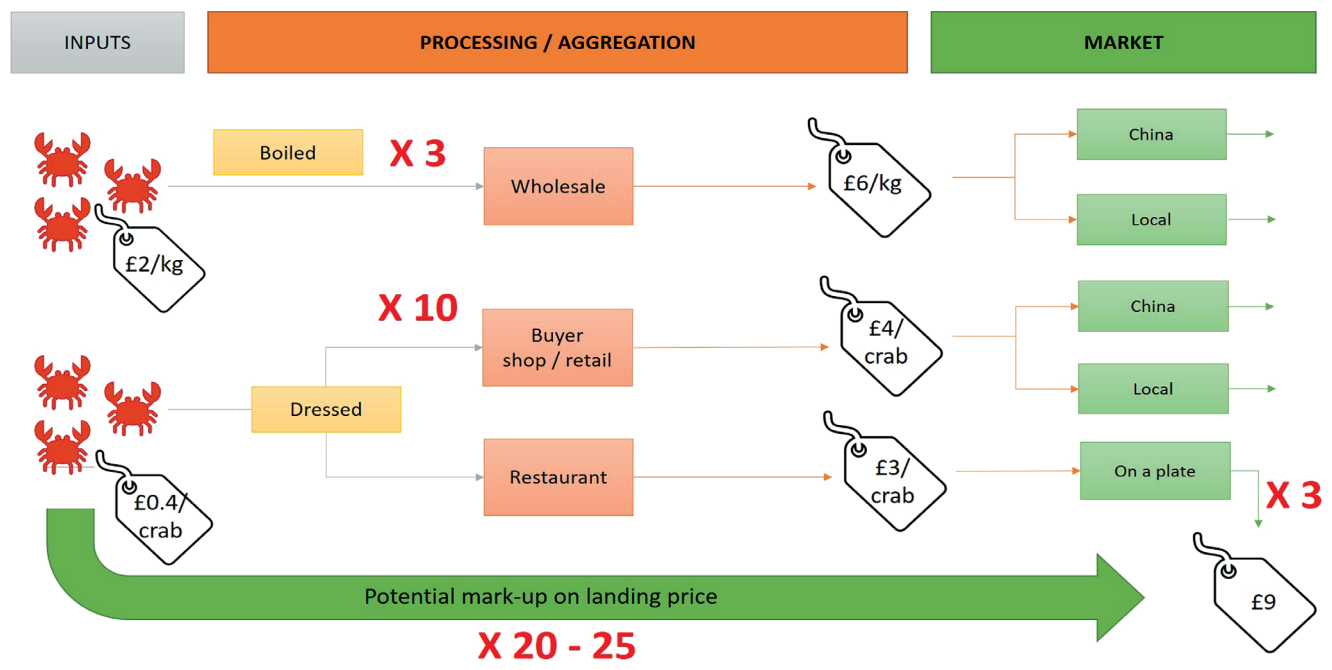


Fig 4: value addition opportunities for inshore brown crab fisheries. Source: Interviews 2017.

From an economic perspective, six different value-chain matrix models were identified and described across the whole **market system** reflecting different supply routes to market and local supply methods e.g. 'from boat to plate, locally' can generate local value addition of ten times or more, but this is a small proportion of the overall market and not always replicable across other volumes. Other supply methods such as direct transport out of region, can have very low additional local impact, although there may be significant added value in other UK areas where processing is carried out.

The figure 4 above illustrates the value added in processing and aggregation (by fishers themselves, or intermediaries) and final sale. While this will vary between products and markets, the importance of inshore products nationally and globally is demonstrated.

Key figures across the inshore fisheries market system matrix showed:

- a total of 3086 were employed in Scotland across this value chain (2374 people directly employed in fishing and 712 additional jobs generated through inshore fishing)
- direct income to inshore fishers was £63.66m, with an additional £38.20m to other sectors, giving a total of £101.85m in Scotland
- local impacts can be limited beyond the landing values unless local processing is undertaken
- often the wider economic impacts are significant but take place elsewhere. This is important for policymakers – jobs in Bellshill, Larkhall and Glasgow depend on inshore fishing – arguably, support for growth in processing could focus on more deprived areas than the fishing ports, though provenance is still a key selling point.

Fishing Drivers

In a related piece of work, we interviewed 105 fishers at 42 ports to better appreciate the main drivers that influenced their business, including why they went fishing on a particular day or placed gear in a particular area. These responses were then used to inform a model that explored fishing behaviour (the probability a vessel would go fishing) based on a number of environmental and economic variables. The list of factors that influence when or whether a vessel goes fishing include changes in weather, wind speed and direction, fish stocks, catch prices, other marine users etc. Smaller vessels and those with a limited range were more likely to be affected. Whilst this work was experimental, the data gathered generated some basic statistical models that could be used to inform decision-making and suggests that more detailed research is merited. Developing a decision support tool could help fishery and marine managers to assess the potential implications of management or planning proposals for fishing activity, the effects of changing climate and extreme weather events, vessel modernisation, etc. It could also help inform the potential compound effects of, for example, the displacement of fishing activity in a given area and the potential knock-on effects for the fishermen and stocks in adjacent areas.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The rate of human-induced change on land and sea is significant. The seas are warming, pH is reducing, and deoxygenation is occurring. The biological consequences of these physical and chemical changes are becoming more apparent, including effects on fish stocks and distribution, with some species migrating northwards into cooler waters. Sea level rise and more extreme weather events may also impact fishers' ability to go to sea. Gathering and understanding the implications of such environmental and socio-economic drivers needs to be aligned with fisheries and other data to provide a comprehensive and ecosystem wide approach.

International Interest in SIFIDS App and Systems Development

There is increasing international interest in the results and in the prototype equipment and processes developed by the SIFIDS project, with presentations made to stakeholders in Italy, Hong Kong, the Azores, Peru and, most recently, Lake Victoria in central Africa. A project designed to reduce by-catch in an artisanal shrimp fishery in Peru is currently underway using an adaptation of the 'FISH1 App' and GPS trackers to record where fishing is taking place, catch and landings.


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Final Reports

All final reports and videos will be uploaded onto the SIFIDS Project website in due course:
https://www.masts.ac.uk/research/emff-sifids-project/

Scottish Inshore Fisheries Integrated Data System (SIFIDS)

– a project co-ordinated by Marine Alliance for Science and Technology (MAST) with funding from European Maritime and Fisheries Fund (EMFF)

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