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TOWARDS RESPONSIBLE TRANSPARENCY: UNDERSTANDING WHY FISHERS ARE CAUTIOUS ABOUT SHARING DATA

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Towards responsible transparency: understanding why fishers are cautious about sharing data

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A report of a workshop on fisheries data confidentiality, held from 30 June to 15 July 2022, organised by the Australian National Centre for Ocean Resources and Security (ANCORS) and Global Fishing Watch.

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The Australian National Centre for Ocean Resources and Security (ANCORS) *is Australia's only multidisciplinary university-based centre dedicated to research, education and training on ocean law, maritime security and natural marine resource management.*

Global Fishing Watch *is advancing ocean governance through increased transparency of human activity at sea. By creating and publicly sharing map visualizations, data and analysis tools, we enable scientific research and drive a transformation in how we manage our ocean.*

Summary for Policy Makers

Transparency is generally seen as good for governance by strengthening government accountability, reducing incentives for corruption, improving the quality of decision making and strengthening trust in governance processes. In extractive sectors, such as fisheries, transparency can help to ensure compliance, build a social licence to operate and build consumer trust for market advantage. Conversely, confidentiality of data and information can erode social trust in institutions.

Greater availability of fisheries data can serve multiple scientific, management and compliance objectives. Data are arguably more powerful when combined with other data by multiple users. Fishery managers and a wide range of stakeholders can improve their understanding of the fisheries and fishery resources, the level of compliance with conservation and management measures and the effectiveness of management regimes. Fishers are, in turn, more likely to trust that compliance is effectively enforced. Third parties, such as researchers, can add to the scientific rigour applied to the fishery and support more effective management. And consumers also increasingly want to know that the seafood they eat has been sustainably and ethically caught and processed.

"Data sharing" does not necessarily mean data are publicly available. Fishers are typically required to provide data to national fisheries authorities and, in regional fisheries, to regional fisheries management organisations (RFMOs). International fisheries law creates duty to share or exchange fisheries data with other relevant States and RFMOs. But data-sharing requirements usually do not mean that data must be shared publicly as open data.

Declaring data as confidential does not explain why. Data are often treated confidentially with good reason. For example, domestic laws typically protect fisheries data under fisheries management and privacy legislation. But in some cases data are regarded as confidential simply because they have been declared to be so. This circular argument conflates "confidentiality" – the extent to which data are protected – with "sensitivity", which refers to the extent to which harm may be caused if data were to be released more widely.

A recent workshop asked representatives of fishing vessel operators and owners, fish buyers and other stakeholders what makes fisheries data sensitive. The workshop was premised on an assumption that some data may reveal vessel-specific competitive advantages, such as skills and knowledge, proprietary corporate information or intelligence and personal information. The workshop sought to investigate this assumption more deeply. There are many types of data generated and collected in fisheries. In this workshop we focused on a small subset of data related to fishing activity in surface and midwater pelagic fisheries:

- Vessel identity and ownership
- Vessel location and movement
- Vessel authorisations and licences
- Transhipments
- Catch and effort data

Some dimensions of data could, in some cases, be altered to reduce sensitivity. These dimensions could include spatial or temporal aggregation, specific redactions and alteration of context-specific differences (e.g. gear type or management regime), and could be adjusted individually or in combination.

Vessel identity, corporate ownership, authorisations and catch and effort data are generally not seen as sensitive in isolation. However, sensitivities would arise when ownership was linked to individuals due to privacy and personal security concerns. Vessel authorisations are also not regarded as sensitive. They are readily available on the websites of RFMOs and are trusted sources of updated information about the fishing

vessel's ownership and history. Catch and effort data when combined with vessel identity are highly sensitive as they provide insights into a vessel or fleet's operations.

Vessel location and movement data are particularly sensitive but can vary with the type of gear or the type of fishery. Sensitivity was largely due to the risk of competitor vessels taking advantage of the skills and experience of other fishers. Sensitivity of fishing location data diminishes over time but opinions vary as to the length of time after which data could be made public. These differences could be explained by the context, including gear types and fishing strategies employed, the type of management regime or for different target species. For example, pelagic longlining activity data was regarded as less sensitive after a single trip while the sensitivity of purse seine activity diminishes after 60 to 90 days, depending on the operations of the vessel. Spatially aggregated data ranging from 1x1 degree to 5x5 degrees is also considered to be less sensitive while still useful for most research purposes. Location data are much less sensitive in fisheries governed by individual output (i.e. catch quota) controls or where there was a high level of cooperation among fishers.

Transhipment data are both sensitive and a source of frustration for operators. Business intelligence could be gathered about a vessel's or fleet's operations by piecing together transhipment data with effort and trip length data. However, a lack of transparency and inconsistent transhipment reporting across fleets means that non-compliant activities were likely going undetected.

Fisheries data were also reported to be sensitive due to operational and business intelligence concerns. Location data is particularly valuable to competing fleets while combinations of catch, effort, transhipment and trip length data and other publicly available information, such as market prices, could provide intelligence about the operations and profitability of a fishing enterprise. That said, some operators are sceptical about the reliability of the assumptions on which such intelligence gathering is based.

Good operators who are more transparent fear they will be more vulnerable to unjustified accusations of bad behaviour. Publicly available data could be misinterpreted, damaging the reputations of good actors and in some cases, leading to security concerns for individuals and assets. Paradoxically, bad operators would carry on unhindered as little information was known about them.

Fishers support full transparency in the long-term but this is tempered by current inconsistencies in the level of transparency and compliance among different operators and fleets. The pathway toward greater transparency needs to ensure that all participants in a fishery are subject to the same reporting and data sharing requirements and that these are enforced fully and consistently. This would mean that a more transparent operator is not placed at a competitive disadvantage compared to a less transparent operator. An important first step would be to ensure that all operators meet current reporting and data sharing requirements to the same standard.

V**essel operators are more likely to respond to calls for greater transparency if the rationale is clear.** Further research is required to more fully understand what data are not available to third parties and why they should be available. Identifying ways to handle data without particular fields, such as vessel identity, may also warrant further investigation. And further work could be conducted into whether releasing vessel monitoring system (VMS) data more widely after 60 to 90 days would be acceptable to vessel operators, and under what circumstances.

Summary of recommendations

Recommendation:

RFMOs and members could consider ways to strengthen data reporting obligations by removing any room to opt out of those obligations and strengthening compliance to level the data collection playing field.

Recommendation:

RFMOs could investigate the extent to which data confidentiality impedes the effectiveness of compliance procedures and identify solutions to overcome those impediments.

Recommendation:

Research should be undertaken to identify which fisheries data the research and NGO community believe are missing and why it would be useful to have those data.

Recommendation:

Further research should assess the value to the fisheries research community of fisheries data in which vessel identity has been redacted.

Recommendation:

Further study could be carried out into whether the sharing of data, generally treated as confidential, with unique vessels identified only by anonymised identifiers that obscure actual vessel identity, would sufficiently reduce sensitivity.

Recommendation:

Recognising that data ownership and authority to make decisions about the release of VMS data is typically vested in the flag State or licensing State, further study could be conducted into whether releasing VMS data more widely after 60 to 90 days would be acceptable to vessel operators, and under what circumstances and by which gear types.

1. Introduction

Fisheries data generated from logbooks, observer records, vessel registries, vessel monitoring systems and catch and/or landing records, are a crucial input into the sustainability of internationally managed fisheries. Verified and verifiable catch and fishing effort, observer and vessel tracking data are essential elements in both formulating scientific advice to inform fisheries management, as well as in targeting regulatory effort to improve monitoring, control and surveillance (MCS) outcomes. They also play a role in administrative and financial processes within regional fisheries management organisations (RFMO) and form the foundations of traceability systems.

A number of RFMOs have adopted rules for the collection, reporting and dissemination of, and access to, these data.[1] Generally speaking, these rules distinguish public domain and non-public domain data. Non-public domain data generally require consent of the flag State to be released for scientific or MCS purposes due to commercial or other sensitivities.

The default approach in these RFMOs is to protect data for commercial reasons ("confidential unless decided otherwise"). There are valid reasons for doing so given fishing location data can reveal knowledge and skills that provide a vessel operator with a competitive advantage. However, these protections generalise many types of fine-scale data as being confidential, potentially restricting data availability beyond what is necessary to protect commercially advantageous or proprietary information. In addition, it is possible that custodians of fisheries data may restrict access in order to control which third parties can conduct primary research.

The consequence of this is that it can be challenging for fisheries managers, fisheries scientists and MCS practitioners to do their work effectively because it limits access to the information they need to ensure international fisheries are managed for sustainability and that participants in these fisheries are in compliance with regulations. This can compromise an RFMO's ability to act in pursuit of its objectives. It also limits the ability of a wider range of stakeholders, including the fish-consuming public, to contribute to research in support of the fisheries, obtain verifiable assurances that fisheries are managed sustainably and trust the institutions that govern them.

In late June and early July 2022, the Australian National Centre for Ocean Resources and Security (ANCORS), at the University of Wollongong, and Global Fishing Watch hosted a virtual workshop to explore fisheries data confidentiality, and the circumstances and rationale that determines data confidentiality, and thereby better understand when and how data might be safely made available to scientists, managers, stakeholders and the public. Our objective was not to investigate the reasons for any failure to meet requirements to share data with national authorities or RFMOs but to explore why fishers are reluctant to make data publicly available.

This report summarises the key findings from the workshop discussions and presents recommendations to RFMOs and national fisheries authorities to support responsible transparency in the interests of sustainable and effective fisheries management. The report starts in Section 2 with an overview of the rationale for transparency and in Section 3 on forms of data sharing. Section 4 outlines the approach to the workshop. Section 5 presents the outcomes of the workshop and Section 6 discusses those results and provides some recommendations for RFMO and national fisheries authorities to consider. Section 7 concludes the report.

1 For example: SPRFMO (2022). Conservation and Management Measure on Standards for the Collection, Reporting, Verification and Exchange of Data. CMM 02-2022, South Pacific Regional Fisheries Management Organisation. Available at CMM 02-2022 (Data Standards) (sprfmo.int); and WCPFC (2021). Rules and Procedures for the Protection, Access to, and Dissemination of Data Compiled by the Commission (as revised by WCPFC18 2021). Western and Central Pacific Fisheries Commission. Available at Rules and Procedures for the Protection, Access to, and Dissemination of Data Compiled by the Commission (as revised by WCPFC18 2021) | WCPFC.

2. The rationale for transparency

Transparency and open data are widely regarded as being good for good governance.[2] Availability of information has been shown to strengthen accountability and responsiveness of governments and improve the operation of markets.[3] More open data has been linked to better science, greater trust in policy-making institutions, greater participation in decision making, and more legitimate decisions leading to a more robust social licence to operate for enterprises that have an impact of wider societal interests.[4] Transparency can act as a force multiplier by allowing wider participation by experts and stakeholders with greater diversity of views at each step in the policy process and by combining multiple data sources to create a more comprehensive basis for decisions and their implementation.[5]

Intergovernmental groups such as the G8[6] and G20 [7] have adopted principles for open data, including a principle of "open data by default". Transparency frameworks have been employed in a range of contexts and sectors,[8] including in natural resources extraction, to improve sustainability and equity as well as reduce corruption (non-government organisations, such as Transparency International, have a well-established record of promoting transparency to combat corruption). One of the most well-known sector-specific initiatives is the Extractive Industries Transparency Initiative (EITI), which focuses on extractive industries relating to oil, gas and minerals.

More recently, the Fisheries Transparency Initiative (FiTI) – a fisheries version of EITI – has launched a standard comprising 12 transparency requirements for what information should be published online by public authorities[9] (Box 1). While broadly aimed at strengthening governance, there is a clear anti-corruption element to FiTI's approach.

Transparency has also been identified as a key element in efforts to combat illegal, unreported and unregulated (IUU) fishing by placing the burden on fishers, rather than the state, to demonstrate that they are compliant and rewarding them through more efficient access to port.[10] The Environmental Justice Foundation (EJF), a non-governmental organisation (NGO), has also identified 10 principles for global transparency in the fisheries sector (Box 1) aimed at combatting IUU fishing and human rights abuse in the fishing industry.[11]

2 Florini, A. (1998). The end of secrecy? *Foreign Policy* Summer Issue 111: 50-4.

3 Islam, R. (2006). Does more transparency go along with better governance? *Economics and Politics* 18(2): 121-67. https://doi.org/10.1111/j.1468-0343.2006.00166.x

4 Harvey, B. and Bice, S. (2014). Social impact assessment, social development programmes and social licence to operate: tensions and contradictions in intent and practice in the extractive sector, Impact Assessment and Project Appraisal 32.4: 327-35

5 Coro, G. et al (2021). An open science approach to infer fishing activity pressure on stocks and biodiversity from vessel tracking data. Ecological Informatics. 64. https://doi.or/10.1016/j.ecoinf.2021.101384

6 G8 2013. G8 *Open Data Charter*. Available at https://www.gov.uk/government/publications/open-data-charter/g8-open-data-charter-and-technical-annex.

7 G20 2014. G20 Anti-corruption Open Data Principles. Available at http://www.g20.utoronto.ca/2015/G20-Anti-Corruption-Open-Data-Principles.pdf

8 Virdin, J., T. Vegh, B. Ratcliff, E. Havice, J. Daly and J. Stuart (2022). "Combatting illegal fishing through transparency initiatives: Lessons learned from comparative analysis of transparency initiatives in seafood, apparel, extractive, and timber supply chains." *Marine Policy* 138.

9 Fisheries Transparency Initiative (FiTI) Standard. Available at https://www.fiti.global/fiti-standard .

10 Long, T., Sjarief W., Wirajuda, H, and Juwana, S. 2020. Approaches to combatting illegal, unreported and unregulated fishing. Nature Food 1: 389-391. https://doi.org/10.1038/s43016-020-0121-y .

11 EJF 2018. Out of the Shadows: Improving transparency in global fisheries to stop illegal, unreported and unregulated fishing. Environmental Justice Foundation. Available at https://ejfoundation.org/reports/out-of-the-shadows-improving-transparency-in-global-fisheries-to-stop-illegal-unreported-and-unregulated-fishing

FiTI: 12 Transparency Requirements	***EJF 10 Principles for Global Transparency***
1. Public registry of national fisheries laws, regulations and official policy documents	1. Give vessels a unique number
2. Fisheries tenure agreements	2. Make vessel tracking data public
3. Foreign fishing access agreements	3. Publish lists of fishing licences and authorisations
4. The state of the fisheries resources	4. Publish punishments handed out for fisheries crimes
5. Large scale fisheries (vessel registry, payments for fishing, recorded catch data)	5. Ban transferring fish between boats at sea – unless carefully monitored
6. Small scale fishing	6. Set up a digital database of vessel information
7. Post harvest sector and fish trade	7. Stop the use of flags of convenience for fishing vessels
8. Fisheries law enforcement	8. Publish vessel; details of the true owners of each vessel – who takes home the profit?
9. Labour standards	9. Punish anyone involved in illegal, unreported and unregulated fishing
10. Fisheries subsidies	10. Adopt international measures that set clear standards for fishing vessels and
11. Official development assistance	
12. Beneficial ownership	

Box 1: Transparency [principles and standards of the Environmental Justice Foundation (EJF) and the Fisheries Transparency Initiative (FiTI)

Calls for transparency to combat IUU fishing are based on the expectation that more open data (namely, ownership, fishing authorizations, transhipment and vessel tracking) should restrict IUU fishing vessels' access to ports. For example, fisheries and port authorities are able to efficiently see where a vessel has been fishing, what authorisations it holds, whether and where it has participated in transhipments and who owns the vessel in a cost-effective manner. A risk profile can then be constructed to assist in the prioritisation of limited inspection resources, providing low risk vessels with easier and more efficient port access to land their catch. Thus, economic incentives drive vessel operators to comply with regulations and to openly demonstrate their compliance. Vessels that do not share data are more likely to attract the attention of fisheries inspectors when they seek to enter port. Similar arguments can be mounted for improvements to the cost-effective deployment of on-water surveillance and enforcement assets. Further down the supply chain, processors, wholesalers and retailers are increasingly seeking assurance that their suppliers have not engaged in IUU fishing by employing traceability systems that rely on shared data.[12]

While this immediate logic for transparency has intuitive appeal, a range of other factors support the rationale for data sharing, extending beyond IUU fishing to deepening understanding of fishery dynamics. First, with technological advances, the amount of data that is available is increasing rapidly, which often means that even the most well-resourced fisheries management and monitoring authorities are unable to effectively analyse and interpret all the data available to them, and in some cases, lack the skills to do so. To supplement their resources may they draw on analyses from third parties, who are often limited to using publicly available data. Second, more open data allows opportunities for mutual enforcement of compliance by fishers. It is in the interests of fishers to have confidence that everyone else is complying with the rules. Open data can help them achieve that aim.

12 Long, T., Sjarief W., Wirajuda, H, and Juwana, S. 2020. Approaches to combatting illegal, unreported and unregulated fishing. *Nature Food* 1: 389-391. https://doi.org/10.1038/s43016-020-0121-y

Third, allowing data access to third parties enables analysis to be contestable, particularly where that analysis is rigorous and subject to peer review. Introducing different perspectives and methodologies can lead to a more rigorous understanding of fish stocks, marine ecosystems and human activity. Similarly, by combining and overlaying datasets in different ways we can gain a deeper understanding of the fishery, including whether measures are working effectively or whether additional or different measures are required.[13] Different sets of data kept in isolation limit possibilities for understanding the fishery and verifying what each data set is telling us.

Fourth, as already noted, more open data can contribute to greater compliance – that is, accountability of vessel operators for their activities in the fisheries.[14] Accountability can and should extend to fisheries authorities, which have a responsibility to use the best scientific evidence available, enforce regulations and adjust policies and regulations where required. Finally, third parties can also add an additional transnational perspective that national authorities may not be motivated to provide.

3. Forms of data sharing

Greater access to fisheries data can come at a cost in terms of personal privacy and commercial competitive advantage. In its Open Data Principles, the G20 acknowledged "that open data can only be unlocked when citizens are secure in the knowledge that openness will not compromise their right to privacy, and that citizens have the right to influence the collection and use of their own personal data or of data generated as a result of their interactions with governments, provided the protection of personal data is assured in accordance to national regulations".[15] Protections for such information are often contained in domestic privacy legislation.

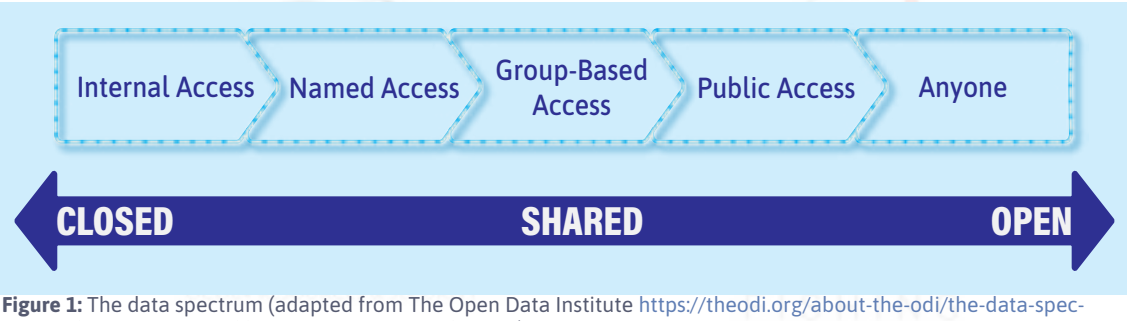

Figure 1: The data spectrum (adapted from The Open Data Institute https://theodi.org/about-the-odi/the-data-spectrum/ The ODI, governed by creative commons licence)

Operators may also be concerned if data reveal a particular competitive edge that is based on specialised knowledge, experience or skills, or risk the security of a vessel and its crew where piracy may be an issue. Governments and operators may also be concerned about the cost of sharing data arising from, say, vetting data and recipients and building websites or other mechanisms through which sharing occurs.

Proponents of transparency tend to focus on why data should be made transparent but less on the costs or risks of transparency. This study aims to address this gap. In doing so, we recognise that data sharing can occur between a limited group or with the public. The Open Data Institute's Data Spectrum places different forms of data sharing on a spectrum ranging from closed to open, with shared data in between (Figure 1). Data may be wholly internal due to national security, personal privacy or commercial sensitivity (internal access). Other data may be shared by providing access to particular organisations or individuals (named access). Fisheries data often falls into this category and is shared with other enforcement agencies for a compliance investigation or enforcement action. Individuals may have access as a member of a group, such as medical records or research data relating to individual patients or research subjects (group-based access). Users must authenticate their membership of the group to have access. Public access, however, may

13 Coro, G. et al (2021). An open science approach to infer fishing activity pressure on stocks and biodiversity from vessel tracking data. *Ecological Informatics*. 64. https://doi.or/10.1016/j.ecoinf.2021.101384

14 Compliance requires multiple factors in addition to data availability, including capacity to analyse data and act on findings through enforcement and prosecutions, and the ability to impose meaningful penalties.

15 G20 2014. G20 *Anti-corruption Open Data Principles.* Available at http://www.g20.utoronto.ca/2015/G20-Anti-Corruption-Open-Data-Principles.pdf. para 15.

be limited through licences (public access) or genuinely free and open access (anyone).[16] Access to data therefore may be qualified differently at different points on the spectrum.

International law establishes a duty to share fisheries data at certain points along the Data Spectrum in order to meet States' obligations to take into account the best scientific information available in adopting conservation and management measures for fish stocks and ensure compliance with those measures. However, this duty relates to limited forms of sharing, not public access. The Convention on the Law of Sea requires data to be "contributed and exchanged on a regular basis through competent international organizations, whether subregional, regional or global, where appropriate and with participation by all States concerned".[17]

The UN Fish Stocks Agreement (UNFSA)[18] develops these provisions much further with respect to straddling stocks and highly migratory stocks.[19] For example, article 5(j) requires States to "collate and share" data for such stocks, including "vessel position, catch of target and non-target species and fishing effort...as well as information from national and international research programs".

Annex I of UNFSA elaborates these requirements and states that "[c]onfidentiality of non-aggregated data shall be maintained...[and that the]...dissemination of such data shall be subject to the terms on which they have been provided".[20] It further requires that "[d]ata collected by flag States must be shared with other flag States and relevant coastal States through appropriate subregional or regional fisheries management organisations or arrangements".[21]

Neither LOSC nor UNFSA assign nationality or ownership to the data but simply require that it be contributed and exchanged.[22] Such data exchange is to be between the collecting State and RFMOs and other States. There are no references in either international legal instrument to making data accessible to the public.

4. About the workshop

The overall objective of the workshop was to understand what makes fisheries data sensitive and under what circumstances the rationale for confidentiality might no longer apply. We define "sensitivity" as the extent to which harm may be caused to a person or organisation if data were to be shared, and "confidentiality" as the extent to which data are protected. Sensitive data should therefore be treated confidentially but confidentiality is not a rationale in itself for restricting access to data. Sensitivity is key.

Although fisheries data can encompass a wide range of data categories, the workshop focused on operational data, specifically:

- Vessel identity
- Vessel location and movement
- Vessel authorisations and licences
- Transhipments
- Catch and effort data

Invitees from across the Pacific (East Asia, Australasia, Pacific islands, and North, Central and South America) were identified through the workshop organisers' professional networks and personal referrals. The workshop involved primarily representatives of fishing vessel operators to ensure that workshop discussions were informed by unmediated perspectives, that is, perspectives that were not conveyed by a third party such as a government agency or RFMO secretariat. Participants included representatives of fishing industry

16 ODI. *The Data Spectrum*. Available at the Open Data Institute https://theodi.org/about-the-odi/the-data-spectrum/ .
17 United Nations Convention on the Law of the Sea (LOSC). Agreed on 10 December 1982. Entered into force on 16 November 1994, United Nations. See article 61(5) with respect to fisheries in a coastal state's exclusive economic zone and article 119(2) with respect to fishing on the high seas.
18 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA), United Nations, Treaty Series Vol. 2167.
19 Edeson, W. R. (2013). Fisheries Data and the Law of the Sea Convention. *Law of the Sea Convention at 30: Successes, Challenges and New Agendas*. D. Freestone, Brill: 147-155.
20 UNFSA Annex 1 Article 1(1).
21 UNFSA Article 7.
22 Edeson (2013). op cit. p149.

associations (vessel operators), individual fishing companies, fish processors and vertically integrated fishing companies reflecting a mix of longline, purse seine and squid jigging interests. A limited number of research and policy community representatives were also invited to provide additional informed contributions.

We acknowledge that the participants were identified due to their interest in transparency, their positive reputations for compliance and their willingness to join the workshop. Some of the participants were active proponents of greater transparency. The views captured in the workshop are therefore likely to be biased toward responses likely to be expected from good actors rather than bad actors. We assume that bad actors want to hide illicit activities and are therefore more likely to provide disingenuous reasons for protecting data.

We provided invitees with a background paper two weeks before the opening introductory session of the workshop. Following the opening session, participants were divided into four breakout groups, which convened at times to suit different time zones across the Pacific. Breakout groups were facilitated by an ANCORS or Global Fishing Watch staff member. Discussions were semi-structured and focused on a series of questions designed to elicit responses to the following questions:

- What makes each type of data sensitive to the extent that public availability would be harmful to someone?
- Can participants provide examples of when "sensitive" data have been released and what were the consequences, or hypothetically, if it were released, what would the consequences have been?
- After how much time would each type of data no longer be sensitive?
- At what level of aggregation would each type of data not be sensitive?
- What specific data fields would need to be removed to make the data no longer sensitive?
- In each type of fishery (gear type, management regime), are the above considerations different?
- Other than time, aggregation, specific redactions and context, what other dimensions could influence whether data are sensitive?

We presented a summary of the discussions to a closing session held two weeks after the breakout groups met and at which we sought feedback from participants. This report summarises those discussions and key findings and proposes some recommendations for the consideration of RFMOs and national fisheries authorities.

5. Workshop outcomes

This section considers the workshop outcomes in relation to each data type.

Vessel identity and ownership

Participants felt that public availability of identity data on individual vessels operating on the high seas and in EEZs and immediate corporate ownership were not sensitive when viewed in isolation. Vessel identity was already available on RFMO websites and on many national websites. However, identity data combined with other data such as catch, fishing effort or location started to reveal sensitivities.

Information on vessel identity was not always available. The workshop heard a view that management of high seas squid fisheries would benefit from the availability of vessel identity data. Of particular interest was the identification by satellite data of unauthorised vessels. For example, automatic identification system (AIS) data[23] was revealing more vessels than were authorised, including some that were using the same vessel identity (e.g. MMSI), which undermined the integrity of vessel identification. Others noted that some distant water fleets turned off their transmission of vessel identity.

On ownership, there were no concerns about the ownership of a vessel at the corporate level, including

23 A requirement to install and operate automatic identification system transmitters for large vessels were introduced in 2000 as a collision avoidance measure under Chapter V, Regulation 19 of the International Convention for *Safety of Life at Sea* (SOLAS). Adopted on 1 November 1974, entered into force on 25 May 1980.

beneficial corporate owners, although this was often difficult to ascertain. However, personal privacy was a serious issue, with several participants noting potential risks to individuals when, rightly or wrongly, they were accused of poor behaviour. Regardless of whether the allegation is ultimately proven true, there was no appetite for exposing individuals to personal risk or infringements to their privacy outside usual legal processes.

Finally, participants observed that culture varies from country to country, so what is viewed as "normal" in one country might not be viewed the same way in others. Therefore, the baseline of sensitivity might be higher in some places than in others.

Authorisations

Like vessel identity and ownership, authorisations were not seen as sensitive and again, much of this information was available on RFMO websites. However, as with ownership, participants believed personal details should be withheld from public documents but should be held by relevant authorities.

There was discussion on the sometimes incomplete nature of authorisations data. For example, when an authorisation had expired, this was not always updated in RFMO records and therefore undermined their integrity. It was suggested that this was the case in the Indian Ocean Tuna Commission (IOTC).

Vessel location and movement

Real-time location data were regarded as highly sensitive, particularly where piracy and other security concerns were relevant. Commercial concerns were also widely held but there were different views on how long or at what scale of spatial aggregation sensitivity would diminish.

Some attendees noted that the availability of near real time public AIS data had effectively made confidentiality of location redundant – it was public and, as one participant put it, a "Pandora's box had been opened". AIS was viewed positively as revealing at-sea transhipment activity, and unauthorised vessels' activity. However, there were also some views that AIS had allowed IUU fishers to monitor the fishing patterns of authorised vessels and encroach on restricted fishing grounds. Ironically, sometimes those IUU fishers left their AIS on, which made them easier to detect.

We heard examples of where AIS was generally required, although some national authorities permitted vessels to turn off AIS when they entered an EEZ to fish, to avoid having foreign vessels monitor their activity. Being able to track legitimate vessels was an opportunity for unauthorised vessels to take advantage of the skills of the skipper of the former to carry out IUU fishing. Paradoxically, turning off AIS had led to some authorised vessels being accused of misbehaving, leading to unwarranted reputational damage (see **Broad themes** below).

While AIS was becoming increasingly accessible to the public,[24] participants noted that it was not universal. The Pacific Islands Forum Fisheries Agency (FFA) had mandated AIS for vessels fishing in FFA waters but RFMOs generally did not require it. Many individual jurisdictions required AIS to be used by fishing vessels so they were still often visible in RFMO-managed waters. While AIS had proven useful, albeit with some challenges, VMS was generally regarded as more robust, although also not infallible.

On the question of what makes location data sensitive, the primary concern was the ability to see competing vessels (who may be from the same fleet or different fleets) and where there were fish to be caught. Participants argued that real time location data were proprietary but recognised that coastal states required real time data in order to protect their sovereign rights. Indeed, most fisheries legislation vested ownership of VMS data in the fisheries authority or the state, not the vessel owner.

Context clearly matters. Participants made a clear distinction between benthic fisheries and other fisheries that are reliant on specific habitats such as sea mounts on one hand, and pelagic surface and midwater fisheries for highly migratory species on the other. This study is focused on the latter but the point underscores the different considerations in different contexts. Indeed, as one participant noted, their national longline fleet held the view that even old data can still be sensitive if it reveals favourable fishing grounds and that fishers would need to be consulted before sharing certain data publicly.

24 Kroodsma et al. (2018). Tracking the global footprint of fisheries. *Science*. 359(6378). 28 February: 904-8. https://doi-org.ez-proxy.uow.edu.au/10.1126/science.aao5646

As expected, in individual output-controlled (i.e. catch-quota) fisheries or cooperative fisheries location was generally seen as less sensitive than in open access, Olympic[25] or non-cooperative fisheries, where competition on the water was more intense.

Gear type also appeared to influence sensitivity but there was no clear consensus. Three days was suggested as a bare minimum but the general view seemed to be that vessels could very well still be fishing in the same area for three or more days so it was unlikely to be long enough. Longlining participants felt that sharing data after a trip was fine but not during the trip.

Purse seiners variously felt that 60 days or 90 days would be a sufficient time lag after which stocks would have moved on and fishing activity would have been complete. Different groups framed the 60-day limit differently – some suggesting it was a benchmark for public release while others felt it was more appropriate for release to national fisheries authorities. However, at least one participant remarked that, as purse seine vessels are highly regulated in the WCPO and generally return to port every two to three weeks outside fish aggregating device closure periods, there was little reason to maintain a 60-day confidentiality period.[26]

One participant suggested that some fishers who objected to a 90-day limit were probably trying to hide the number of FADs that they had in the water. There were mixed views on whether FAD sets made a difference to sensitivity, compared to free-school sets. Although not discussed directly, it was noted that location transmitters on gear itself, such as FADs and longlines, would also reveal fishing location if shared more widely.

Squid jigging was a stationary activity so location was important. The workshop heard that smaller squid boats were sometimes displaced by larger vessels, although the question was raised whether the bright lights used in squid jigging, visible tens of miles away, made it very difficult to hide the vessel's location, regardless. However, participants thought that 1-2 weeks after the vessel had moved on would be enough time to obscure its activities.

One invitee noted outside the workshop that environmental and oceanographic factors could influence the amount of time over which fishing location remained sensitive. Fishers increasingly relied on publicly available satellite telemetry data to identify high-potential fishing grounds.

Spatial aggregation could also obscure the exact location of a vessel even in real time. It was suggested that 5x5 degree or even down to 1x1 degree would help to remove sensitivity. This would likely be sufficient for most researchers[27] and managers would have access to finer scale, real time, confidential data for MCS purposes.

Location data also allowed competitors to easily see trip lengths as part of a business intelligence-gathering exercise (see further **Broad Themes**).

Transhipment[28]

Transhipment data were complex, combining multiple vessels, location and movement, catch and effort data and landings. Overall, participants regarded transhipment data as commercially sensitive when combined with vessel movements, providing competitors with valuable intelligence. Frequency of transhipments could also indicate areas of high productivity. Data should be shared with MCS authorities confidentially but could be released to researchers using spatial aggregation of 5x5 degrees or possibly 1x1 degree after 30 days.

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25 That is, a fishery in which an overall limit is imposed on catches but has not been allocated as individual quotas to participants in the fishery.

26 It was noted that during a FAD closure, purse seine vessels were likely to spend around 45 days at sea because they did not steam at night.

27 There may be some specific exceptions, for example, for research into fishing footprints. See Shepperson et al (2018). A comparison of VMS and AIS data: the effect of data coverage and vessel position recording frequency on estimates of fishing footprints. *ICES Journal of Marine Science* 75(3): 988-98.

28 In September 2022, the FAO's Committee on Fisheries agreed to new Voluntary Guidelines for Transshipment adopted the Voluntary Guidelines for Transshipment. The Guidelines include provisions on data exchange and information sharing (paragraphs 53-6 of the Guidelines), including on the public availability of "information related to transshipment…such as number of events, locations, quantities of fish (by species, product form and catch area) transshipped and landed…" and of authorisations of all donor and receiving vessels. FAO (2022). *Report of the Technical Consultation on Voluntary Guidelines for Transshipment.* Rome 30 May-3 June and 7 July 2022. Food and Agriculture Organisation of the United Nations (FAO) NFIFP/R1386 (En). Submitted to the FAO Committee on Fisheries Thirty-fifth Session 5-9 September 2022 COFI/2022/INF/10. (Advance copy).

There was broad agreement that transhipment regulations were inconsistent across jurisdictions and RFMOs, and inconsistently applied by flag states and their vessels. Notifications, for example, were often slow to be received by RFMOs and often the only public data was whether a notification had been received. This undermined the integrity of transhipment data.

Participants observed that there were many loopholes in transhipment rules which were exploited by operators in some fisheries. Antarctic krill transhipments were given as a good example of the "murkiness" around transhipment – that is, that transhipments were poorly monitored and self-reporting was therefore unreliable. Importantly, in the Western and Central Pacific and Eastern Pacific, purse seiners were required to tranship in port. Longliners could tranship at sea but were poorly monitored, despite the requirement for 100% observer coverage on the receiving vessel from the WCPFC Regional Observer Program.[29] Improvements were nevertheless being considered and made.[30]

While participants broadly recognised that transhipment was economically necessary, it could be a vector for IUU fishing and other maritime criminal activity if not properly monitored. More rigorous data was required especially for at-sea transhipment but in-port as well, which was not without problems.

Participants questioned the need for public disclosure of transhipment data, particularly if the data were accurate. However, one participant noted that the public availability of AIS data had usefully shown that longline transhipments were concentrated just outside EEZs, for example, indicating that transhipments of catch taken within an EEZ may be transhipped on adjacent high seas to avoid closer monitoring. Another pointed to the use of VMS by the WCPFC Secretariat to detect potential high seas transhipments, although these data were not public.[31] Participants felt that third party users of data needed to make the case for why those data were useful when made public, or at least more widely available. For example, one participant noted that in some regions there was quite a lot of transhipment data, but it was not fully analysed by authorities. Wider availability may enable more comprehensive analysis by third parties. Another observed that buyers often use public transhipment or encounter[32] data to understand their supply chains at a detailed level.

Catch and effort data

Catch data on their own were generally not seen as sensitive, although it was noted that for some vessel operators, catch composition (size, species) could be considered valuable information. Catch data were more clearly sensitive when combined with other data such as market prices, vessel identity or trip length, they were able to reveal a commercially valuable story and was therefore highly sensitive. Market prices were highly sensitive to supply, especially in markets for chilled fish, which needed to be landed and sold quickly. Catch data were readily available, aggregated annually by flag or zone but not by vessel. One participant observed that there were challenges in ensuring consistency between catch data and landings data due to onboard processing and relative difficulty in weighing catches on board compared to at landing. Inconsistencies could be misinterpreted by the public.

Participants also noted that in an input-controlled fishery (i.e. effort based limits) catch data were not sensitive, other than for business intelligence gathering. However, fishing effort, like vessel location, was sensitive in real time. Effort and location, however, did not reveal catch landings. Participants noted that some jurisdictions applied a "rule of three"[33] to obscure individual vessel catches or effort.

29 WCPFC (2009). Conservation and Management Measure on the Regulation of Transhipment (CMM2009-06). Western and Central Pacific Fisheries Commission. para 13

30 See for example Japan's proposal to revise the transhipment measure of the North Pacific Fisheries Commission in NPFC 2021. Final Report Rev.1. 6th Meeting of the North Pacific Fisheries Commission (NPFC COM6). Video Conference. 23-25 February 2021. para 15. The International Commission for the Conservation of Atlantic Tunas (ICCAT), the Indian Ocean Tuna Commission (IOTC) and the Inter-American Tropical Tuna Commission (IATTC) have all recently revised their transhipment regulations.

31 See for example, WCPFC (2021). Annual Report on WCPFC Transhipment Reporting. Technical and Compliance Committee, Seventeenth Regular Session, Electronic Meeting 22-28 September 2021. WCPFC-TCC-2021-RP03. paras 23-39. Available at WCPFC-TCC17-2021-RP03 Annual Transhipment Report.pdf

32 "Encounter" here is used to identify instances in which two vessels area are in close proximity to each other at slow speed for a sufficient period of time that could indicate a transhipment has occurred but could also be another event, such as an exchange of supplies or crew.

33 The "rule of three" relates to the minimum number of vessels for which data must be aggregated before it is shared. That is, vessel data may be shared if it is aggregated with at least three vessels.

Other data

Other data that were also mentioned included chartering arrangements, electronic monitoring (EM) and electronic reporting (ER) and subsidies.

On chartering, RFMOs often have charter notification schemes (such as the WCPFC) and charter arrangements by vessel are recorded in public registers. There was some interest in whether EM and ER data could be shared but participants noted that publicly available EM data could have privacy implications. ER would have the same constraints as other sources of the same data (e.g. catches, location, effort).

Subsidies was also mentioned as an important data type for which transparency could be useful. However, this fell into a broader policy realm, rather than operational level data, similar to the work of the Fisheries Transparency Initiative (FiTI).

Broad themes

Vessel operators strongly support a **longer-term vision for full transparency** of many types of data. However, they were concerned that the current level of data sharing was inconsistent between operators, fleets, flags and regions, and that this created commercial sensitivities and different competitive advantages among them. The challenge therefore was to **identify a pathway** from the current situation to the longer-term ambition of full transparency. One participant expressed this challenge as a question of "how do we switch from the default position of all data is confidential unless a decision is made to release or share it, to all data is open unless a specific decision is made to protect it?" This ambition is consistent with positions such as the G20's commitment to "open data by default". In the meantime, the ability to provide downstream supply chain actors with data to inform traceability arguably provided operators with a competitive advantage. However, this required exclusive data sharing rather than public availability of data. Another participant noted that incentives were needed to motivate industry participants to move toward full transparency.

Three themes were closely linked. First, a constant throughout all groups was the need to understand **why data should be shared or made more transparent.** Framed another way, participants were keen to understand that if data were to be shared, what would it be used for that could not have been done otherwise. Participants emphasised the need to be specific about the purpose of data sharing beyond the more general case that was outlined above (**Background**). One participant observed that the need to provide a clear rationale for data collection also applied to requests from fisheries authorities.

Second, participants observed that vessel operators provided a substantial amount of operational data and therefore asked **what data are not available to people who need it?** Noting the possible sample bias identified above (**Methodology**), some of these "missing data" are likely to be those which should be provided by noncompliant operators but are not.

Third, participants stressed the need to consider **with whom data are to be shared?** This question recalls the data sharing spectrum discussed above (see **Background**). A lot of the discussions focused on sharing data with fisheries authorities and regional fisheries management organisations (RFMOs), which participants generally agreed was appropriate, but many made the distinction between making data available to authorities and to the public.

Additional themes included **legislative and bureaucratic barriers** to data sharing, risks related to data sharing, concerns relating to personal privacy and opportunities to gather business intelligence from open data.

Participants noted that legislative and bureaucratic barriers could sometimes prevent adequate data sharing, even within the same government. Privacy legislation can prevent or make it difficult to share data between agencies within the same government. Furthermore, Government authorities may be worried about being sued by vessel operators for improper disclosure of information. Government contracts with external service providers could also restrict data sharing because some data held by corporate third parties were proprietary in nature.

Bureaucratic obstacles were illustrated by an example of a maritime surveillance and enforcement agency not having access to certain datasets that are essential for them to do their job, likely due to them not knowing that the data were available.

Many participants expressed concerns about data being **misinterpreted and misused** to make unfounded claims against an operator or in relation to the status of stocks, management regime or similar.

This resulted in a "paradox of transparency", in which operators who provide more data may in fact be exposing themselves to more criticism **because those data are available to be interrogated,** compared to less transparent operators. This reflected an associated perception that better data collection could reveal an apparently higher incidence of concerning events when in fact the data collection process was simply better at detecting incidents that had previously gone undetected. One participant noted that there were few mechanisms in place to monitor the outcomes of data sharing and whether it was used for the intended purpose and contributed some improvement to the fishery.

In some cases, **personal information** such as names and addresses of vessel owners or operators had been used to threaten individuals and their families. The workshop heard a very consistent view on the importance of ensuring that personal data was available to those who need it for compliance purposes but not make it publicly available. As a result, the workshop revealed a quite different level of sensitivity relating to **corporate data**, a distinction that is important with the increasing attention being paid to collecting information on **persons of interest.**

Participants suggested that public data could be used to gather **business intelligence**. This sort of intelligence gathering drew on operational data and other publicly available data to build a picture of a competitor's overall operations and profitability. The key was the combination of data – such as knowledge of a vessel's well capacity and trip length to estimate costs and catches, combined with market prices and public ownership data. Individual data types may not be sensitive on their own but multiple data sets in **combination can create sensitivities**. However, even vessel trip lengths could be deduced by a keen observer in a port without the need for open data, as such.

Different groups arrived at different conclusions on this concern over business intelligence, with some arguing that assumptions about catch volumes and the purpose of encounters with carrier vessels or port visits were very uncertain and it would be risky to try to draw conclusions about profitability from this type of observation.

While this type of intelligence gathering is arguably a normal part of business whether on land or at sea, fisheries operations are inherently less visible than, say, retail sector operations. Whether this made fisheries a special case for data protection or bolstered the case for relaxation of those protections was not fully explored.

6. Discussion

Vessel operators clearly regard vessel activity, identity and authorisations data as sensitive on both commercial and personal privacy grounds. There is an interest among vessel operators to advance toward greater transparency but that this must occur at a rate and in a way that does not disadvantage one vessel or group of vessels compared to another. Compliant fishers want non-compliant fishers to provide the same data that they do, accurately and in a timely manner and shared with the same users at the same time. This would level the playing field, to ensure that all participants in a fishery comply with applicable conservation and management measures and reporting requirements and face the same risks that arise from exposing their operations. Those risks include the risk of weakening any competitive advantages and the risk of misinterpretation of data.

The risk of data misinterpretation remains a significant one. The workshop raised examples where data were inconsistent or unable to be verified due to, for example, low observer coverage on longliners. Poor data quality likely undermines the robustness of data and increases the risk of misinterpretation. Uneven data provision across vessels and fleets is likely to have a similar effect. Equalising data sharing by all participants in a fishery could reduce the reputational risk to the entire fishery, not just those participants who comply with data reporting requirements.

Data sharing should in itself increase compliance but this can be difficult in a transboundary fishery governed by an RFMO, where compliance processes are often quite political. While not the focus of this study, this finding suggests that a more fundamental reform is required to depoliticise compliance processes, including by ensuring that political sensitivities are not used as a basis to inappropriately treat data as confidential. In the meantime, RFMOs could reduce the level of discretion able to be exercised by members in meeting reporting requirements and ensure compliance by all participants in its fisheries.

Recommendation: RFMOs and members could consider ways to strengthen data reporting obligations by removing any room to opt out of those obligations and strengthening compliance to level the data collection playing field.

Recommendation: RFMOs could investigate the extent to which data confidentiality impedes the effectiveness of compliance procedures and identify solutions to overcome those impediments

While general statements of the benefits of transparency are well-grounded in academic literature, these are usually insufficient to convince vessel operators of the need to release specific datasets relating to their operations. Operators are unlikely to agree to share data outside official institutions that have a legal mandate to require such data – RFMOs and national government authorities – without a clear rationale that identifies the purpose for which the data will be used and the conditions under which that will occur. Operators firmly believe that the burden rests with those third parties to make the case. Participants in the workshop asked, "what data are missing?". In the first instance, therefore, there is an opportunity for the research and NGO community to identify data that they cannot, but would like to, obtain and what it would be used for.

Recommendation: Research should be undertaken to identify which fisheries data the research and NGO community believe are missing and why it would be useful to have those data.

The purpose of data sharing is closely associated with who the user of such data will be. For example, for MCS purposes, real time data are essential to enable MCS authorities to ensure compliance effectively. Compliant fishers are united in their desire to prevent, deter and eliminate IUU fishing so they support effective MCS. However, for scientific research, data such as vessel location are unlikely to be necessary in real time. Actual vessel identity is unlikely to be necessary in most research but a unique identifier that allows individual vessels to be tracked but obscures its actual identity may be useful.

An exception to the lack of need for real-time data by researchers could be found at a meta-level, where, for example, researchers are developing and testing tools that analyse real time data for MCS purposes. Innovations in MCS could be developed by third parties but to do this, real-time data would need to be provided securely and under clear conditions. Researchers would need to make the case for access to such data.

Certain individual data sets are a source of sensitivity. These include data relating to individual persons and personal privacy of crew, skippers and owners. The names of vessel skippers are widely available on RFMO websites but personal details, such as residential address, were not. Corporate ownership, including beneficial corporate owners, however, is not regarded as sensitive.

More generally, individual datasets become more sensitive when combined with other data. Vessel identity appears to play a central role in data sensitivity. With vessel identity removed, operators may be more willing to share data beyond fisheries authorities. It may be possible to overcome sensitivity about access to vessel identity data by third parties, such as researchers, by assigning data points with a unique vessel identifier. Fisheries authorities would be able to connect the unique identifier to the actual vessel identity but third parties would not. The flag of the vessel could be shared to incentivise RFMO member States to enforce compliance by vessels flying their flag.

Recommendation: Further research should assess the value to the fisheries research community of fisheries data in which vessel identity has been redacted.

Recommendation: Further study could be carried out into whether the sharing data, generally treated as confidential, with unique vessels identified only by anonymised identifiers that obscure actual vessel identity, would sufficiently reduce sensitivity.

Data that are associated with skill or particular knowledge provide fishers with a competitive edge. Sharing such data openly can dissipate the private value of those data and any competitive advantage. However, the

value of maintaining data confidentiality generally appears to wane over time. The rate at which that value declines is influenced by the type of fishing and the management regime in place.

Recommendation: Recognising that ownership and authority to make decisions about the release of VMS data is typically vested in the flag State or licensing State, further study could be conducted into whether releasing VMS data more widely after 60 to 90 days would be acceptable to vessel operators, and under what circumstances and by which gear types.

Finally, the question of with whom data should be shared presents an opportunity to plot data types against the ODI's Data Spectrum. Table 1 attempts to do this in a rudimentary way based on the workshop discussions.

Degree of Sharing	Example Data Types
Internal Access	Operator costs; operator knowledge and skill
Named Access	Personal information; vessel track in real time (VMS); catch and effort data by individual vessel in real time
Group-Based Access	Vessel Identity; aggregated catch by fishery; transhipment data
Public Access	Delayed vessel tracks (AIS)
Anyone	Authorisationsl aggregated annual catch and effort data by fishery and flag

Table 1: Examples of data types aligned with the five points on the Data Spectrum.[34]

7. Conclusion

Increasing calls for transparency make intuitive sense in the quest for more effectively and sustainably managed fisheries. Citizens seek greater accountability in the way public resources are exploited by private interests. But data and information about an individual vessel's or fishing enterprise's operations hold considerable commercial value to the enterprise and its public release would represent a loss of value. It may also increase risks or add new risks that were previously low or non-existent. Steps toward transparency must therefore consider commercial and other sensitivities that underlie the confidential treatment of fisheries data, such as vessel identity and ownership, authorisations, vessel location and movement, transhipment and catch and effort data.

This workshop aimed to identify some of the key sources of sensitivity. We identified some clear grounds for sensitivity, particularly in relation to personal privacy and security, and data that reveal skill, knowledge and experience that in turn provide certain operators with a competitive advantage. Sensitivity may vary in fisheries with catch-based controls or a high degree of cooperative behaviour but the exact boundaries require further investigation. The passage of time or spatial aggregation can help to reduce sensitivity but it is less clear exactly what values and under what circumstances this would occur.

Recent developments in the public accessibility of AIS data have meant that the recent and historical location of large fishing vessels is becoming increasingly difficult to hide. Overall, fishers support greater transparency but the pathway to that longer-term objective must not place more transparent operators at a competitive disadvantage. This likely means that the transparency playing field should be levelled by bringing all actors into line with current transparency and reporting requirements before progressing further toward full transparency. Operators also expect third parties who call for greater transparency to make the case for who needs to know, why they need to know and how sensitivities will be managed.

34 Based on ODI. The Data Spectrum. Available at the Open Data Institute https://theodi.org/about-the-odi/the-data-spectrum/.

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