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National Capital Region

Proceedings of the National Peer Review on a National Monitoring Framework for Coral and Sponge Areas Identified as Other Effective Area-Based Conservation Measures

Meeting dates: December 1–3, 2020
Location: Virtual Meeting

Chairpersons: Robyn Jamieson and Lisa Setterington
Editors: James Kristmanson and Alex Tuen

Fisheries and Oceans Canada
200 Kent Street
Ottawa, ON K1A 0E6

October 2022

Canada

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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SUMMARY

Canada, through its commitments to national and international marine conservation targets, has protected 13.81% of its marine and coastal areas through the establishment of marine protected areas and other effective area-based conservation measures (OECMs). Canada currently has 59 OECMs, 38 of which are established to protect cold-water corals and/or sponge benthic ecosystems.

Marine OECMs can include fisheries area closures established for the long-term to contribute towards the conservation of biodiversity. They provide biodiversity conservation benefits, which are benefits for a habitat, species, or other component of the ecosystem resulting from the implementation of an OECM.

A Canadian Science Advisory Secretariat (CSAS) national peer review was conducted December 1–3, 2020 to develop a national monitoring framework for coral and sponge areas identified as OECMs. The process:

1. Characterized corals and/or sponges in Canadian OECMs (for example, by functional group or habitat type) and detailed the available baseline information and knowledge gaps;
2. Provided a review of the known and expected indirect biodiversity conservation benefits (BCBs) of coral and/or sponge habitats, and where possible, linked these to the groups of corals and/or sponges described above;
3. Identified appropriate ecological indicators to monitor coral and/or sponge areas for direct and indirect BCBs along with the strengths and limitations of each indicator; and
4. Identified potential tools, techniques, and/or methodologies for monitoring the direct and indirect BCBs of coral and/or sponge areas, and provided advice on their strengths and limitations.

INTRODUCTION

This Proceedings is the record of meeting discussions, recommendations, and conclusions from the "National Monitoring Framework for Coral and Sponge Areas Identified as Other Effective Area-Based Conservation Measures" (OECMs).

PRESENTATIONS: ABSTRACTS AND DISCUSSIONS

Each presentation reflected an objective seen in the Terms of Reference (Appendix 1).

OBJECTIVE 1: COLDWATER CORAL AND SPONGE CHARACTERIZATION

Presenters: Pam Allen and Curtis Dinn

Abstract

For efficient monitoring, corals and sponges have been grouped based on their characteristics, habitat type, or ecological function. These groupings will facilitate the discussion and development of monitoring plans and aid in understanding coral and sponge biodiversity conservation benefits (BCBs).

One way to characterize corals and sponges is by grouping, which allows indicators to be applied. These groups are defined by collections of organisms that share similar characteristics (for example, physiology, behaviour, or trophic level) or perform a similar ecological function. As research continues in Canada and more data becomes available, additional groups may be created for the purposes of monitoring.

Coral groupings can be defined by ecological function or niche, body size, shape, habitat preferences, and life history traits. For the purpose of this advice, coral groups include gorgonian corals, soft corals, sea pens, black corals, reef-building corals, cup corals, and hydrocorals.

Sponges are difficult to group based on morphology or phylogenetic relationships alone. For the purpose of this advice, groups of sponges refer to easily identified aggregations. Non-obvious aggregations are considered as a mixed category, and monitoring plans will be designed based on appropriate tools for the habitat. Sponge groupings include glass sponge reef species, Vazella sponge grounds, astrophorid sponge grounds, and mixed sponges.

There are data limitations associated with these groups. Efforts to identify coral and sponge species in each region have increased in recent years, though species which occur in OECMs are not well-defined in many areas. Species level identifications of corals and sponges are currently limited due to depth, taxonomic training, and catchability. In deep water other effective area-based conservation measures (OECMs), or where OECM bottoms are difficult to trawl, data is often poor. Collections for taxonomic identification occur infrequently and are inconsistent across regions. Trawl data are limited to biomass in many cases.

Discussion

Sponges are difficult to group due to varied morphology or phylogenetic relationships alone. Examples of a single species can look different.

There is the need to re-evaluate and possibly redefine "functional groups", since the report states that groups are defined based on morphological or physiological groups, or ecological niche, while the table emphasizes size or preferred substrate. Though, there is not much information on distribution of sponges, and no specific taxa for distribution of sponges, and the information on sponges generally lags behind the knowledge of corals. Therefore, for the purpose of this advice, the terminology “group” will be used rather than “functional group”.

The focus of this document is existing OECMs for corals and sponges.

It would be useful to include a figure with some basic taxonomy to show coral groupings.

Because any advice generated from this objective may be used by other countries following Canada's lead, the definition of “functional group” and inclusion of other areas should be as inclusive as possible, with implications for broad application.

OBJECTIVE 2: BIODIVERSITY CONSERVATION BENEFITS

Presenter: Javier Murillo-Perez

Abstract

Biodiversity conservation benefits (BCBs) are benefits for a habitat, species, or other component of the ecosystem resulting from the OECM. The goal is to create a net positive change in, or prevent the loss of, biodiversity. In this situation, direct BCBs are the corals and sponges themselves, while indirect BCBs are “co-benefits” that occur incidentally. Indirect BCBs of coral and sponge habitats include biogeochemical cycling (nutrient cycling and bioturbation), habitat provision, increased diversity, and predator-prey interactions.

Discussion

Carbon cycling by sponges acts as a buffer for ocean acidification and climate change. A consideration was raised to replace "ocean acidification" with "carbon sequestration".

Redfish larvae in sea pens are mostly pelagic so it is difficult to associate them with sea pens as a major habitat. It is uncertain whether redfish can be linked to sea pen coral aggregates and would benefit from further evidence.

Discussions surrounding habitat diversification only include the work performed by trawl surveys, but no closer or inshore surveys, and may vary regionally.

It is uncertain whether patterns in some areas are attributed to data gaps. Certain patterns are detected only in particular seasons but not others. The coastal aspect of gaps is important to consider.

Bioturbation is an observed function, but not necessarily characterized as positive or negative.

Overall considerations should include positive and negative effects, how they could be indicators of change, if predation on corals is present, how the predation on corals affects biodiversity, if that predator can be assigned to a change in the environment, if population increases, or if temperature rises.

OBJECTIVE 3: ECOLOGICAL MONITORING INDICATORS

Presenter: Barbara Neves

Abstract

Indicators need to be identified to develop monitoring plans for OECMs. The identification of indicators was performed in seven steps:

1. Identify conservation objectives;

2. Identify suitable indicators;
3. Identify selection criteria;
4. Evaluate indicators;
5. Assess whether there is redundancy;
6. Agree on the final suite of indicators; and
7. Establish reference levels.

A total of fifteen state and ten stressor indicators were discussed. Most state indicators are applicable to most coral and sponge functional groups. Most selection criteria are considered acceptable for most indicators. Steps 5–7 of the identification of indicators should be regionally applied.

Discussion

There is the need to define if indicators are linked to processes that could be used to address stressors directly. The difference between "conserve" and "protect" should be defined.

Anything that touches the bottom will have an impact. In evaluating impact, it is important to consider bottom contacting activities other than trawling, such as offshore wind energy, even if good information to review doesn't exist.

The indicator section could benefit from setting target, indicator, and level of indicator.

There is a disconnect between biomass and biodiversity, with most measuring abundance and distribution, but not obviously diversity. Conservation objectives for Marine Protected Areas (MPAs) are very large and it is difficult to define an operational indicator.

All probable factors should be considered that may be invoked to explain why there is no recovery when a stressor is removed and the indicator doesn't change.

Any indicators of stress that influence BCBs should be linked.

It is unclear how ecological interactions are considered in choosing an indicator and/or levels.

There are confounding factors in the response of the indicator that may or may not be related to fishing pressure. It is uncertain whether the level of the indicator is related to the stressor or an ecological confounder. For example, an increase in the abundance of sea pens may also increase sea star predators, which confuses the response to management action. Therefore, other indicators should be considered, including abundance relationships, and those that are more precise such as known predators.

With a monitoring approach, it is crucial to identify parameters expected to change, then a strategy to account for observed changes should be developed.

Key species, foundational species, or indicator taxa should be identified that would be good candidates as main drivers for their communities. Establishing examples would be cost-effective and practical for management.

Indicators seem to be linked to species, but it is uncertain whether there are indicators related to habitat, such as sediment, temperature, and oxygen.

In response to participant feedback, a revised version of Table 5 of the Working Paper was presented. The formerly single column for Purpose/Strengths has now been divided into two columns: Strengths and Links. The new Taxa column will be populated when indicator taxa are identified, with assistance from a to-be-published paper on indicators. Table 5 would benefit from being kept simple, while more complicated details should be reserved for the accompanying text. The table or text could be strengthened by mentioning any work performed by other countries, especially international standardized approaches to monitoring that are simple enough for any country to enact without much equipment or taxonomic knowledge.

Climate change as a stressor was not included due to timelines but should be mentioned.

Monitoring a species over a large geographic range will help determine climate change links across the range.

The next workshop to focus on future-proofing MPAs will occur in February 2021 in conjunction with Dalhousie University, with the goal of devising practical decisions for monitoring, modifying existing design, selecting protected areas as studies progress, and obtaining and implementing pragmatic advice.

A peer review publication has been released that shows three different stressors and also lists indicator animals and effects that climate change has on them. This study would help further develop the Working Paper.

The more specific the level of detail for indicators, the better.

The four indicator variables are change in oxygen, change in temperature, change in ocean acidification, and redistribution of primary productivity. Table 5 would be strengthened by incorporating these four indicators.

Spatial considerations should also be included. For example, when attempting to determine ocean conditions in response to sockeye salmon, the oceanography did not strongly overlap with sockeye. As much oceanographic data should be collected as possible. It would be beneficial to consider discussions with oceanographers who are already performing surveys.

Overall considerations include revising Table 5 and the accompanying text, the inclusion of climate change indicators, and capturing these points in the Research Document.

OBJECTIVE 4: ECOLOGICAL MONITORING TOOLS, TECHNIQUES, AND METHODOLOGIES

Presenters: Geneviève Faille and Barbara Neves

Abstract

An overview was presented of various types of imagery and bottom contact non-imagery. Benthic tools across Canada started with an inventory of gear and is a work in progress.

The goal for methodologies is to have a monitoring design be statistically robust so it can allow clear conclusions to be drawn and inform management.

Existing baseline data must be analyzed and carefully evaluated to ensure that they are suitable for the purpose. When using existing data, current monitoring practices should be aligned whenever possible in terms of survey timing, operational methods, equipment, processing, and analysis techniques. When resources allow, seabed characterization with multibeam bathymetry and backscatter should be conducted prior to the development of a sampling design. This is valuable data to classify the benthic habitats.

Considerations for monitoring methodologies include statistical (size and replication, how much to sample, and data independency), temporal (when to sample and frequency of sampling), and where to sample.

Discussion

Statistical techniques and design considerations are the most critical section of monitoring. It is necessary to establish proper sampling area and frequency. There is abundant emphasis on tools but little on process.

It is crucial to understand what variation is. Replicates are required for variation. Strong baseline data is critical for comparisons. Multiple tools are important to ground-truth the datasets, improve the accuracy of raw data, and interpret data as it pertains to monitoring objectives.

Monitoring programs can fail because of lost interest, which affects policy decisions. Also, enacting decisions takes time. Identification of key indicators facilitates quicker management decisions and action.

Hydrophones and machine learning should be considered as conservation tools.

The bigger scope needs to be established, otherwise it is futile to propose and conduct monitoring in the absence of meaningful follow-up actions.

An indicator could be included that would investigate patch connectivity.

There is the need to account for OECMs being variable and non-homogeneous internally and between sites. A standard ecological approach won't work.

It would be helpful to devise a science question to help steer the discussion and to identify what critical indicators must be monitored, what indicators would be nice to monitor, and what baseline information is missing that would affect monitoring the critical indicators.

The three types of monitoring include sentinel, operational, and investigative, which may be useful in discussing monitoring timeframes and approaches.

Components have long-term monitoring needs. It will be important to have applicable indicators to monitor shorter type things like stressors, or to make management decisions, and adapt as necessary.

From a resource management perspective, it is important to be informed about sites to advise new fishing technology and techniques to be used inside the sites. It is also essential to inform management.

The challenge has not yet been met regarding surveying sufficiently and cost-effectively to establish a baseline for variability. A decent baseline facilitates detection of change over time.

A national framework will guide the regions, who will adapt the guidelines due to variability in the regions, including different species and priority sites. To determine priority sites, representativity should be considered. If a proxy is selected for representativity, then sites may be chosen based on the types of habits.

To help increase the cost-effectiveness of the process and to establish consistency across OECMs and MPAs, the Working Paper would benefit from a paragraph covering the use of a tool for structured decision-making processes. Its description would include its basic elements and how it facilitates decisions on how, what, and whether to monitor.

A national glossary for conservation should be created to improve consistency.

Monitoring design should consider how indicators comprise two types: short-term and long-term. Both should be included to inform management actions and long-term biodiversity which could inform future management actions and trigger specific management studies. However, there was difficulty selecting key indicators and classifying them into the two categories.

A definition for short-term should be established. It is typically five years for management cycles. However, with functional groups, the numbers are variable due to dynamic yearly changes in the environment, and not just attributed to fishing pressure. Thus, expected ranges would be useful for the purposes of informing management, but not prescriptive. Establishing actual timeframes is challenging due to multiple factors and unknowns, and timeframes may change as knowledge from monitoring increases. There is the need to balance biological and management expectations.

An example should be included of a short-term timeframe (for example, five years), an example of a management action (for example, restriction or increased resources allocated to additional surveying), and an example of a real indicator. However, the concern is the permanence of making such a statement. Because the situation is never straightforward, a precautionary approach needs to be captured instead. Short-term studies would have an endpoint, but perhaps an endpoint doesn't need to be defined. Vessel tracking datasets could be used to inform fishing pressure after management measures have been established.

When dividing OECMs into categories, it is important to consider whether the area was allowed to recover after being damaged (for example, by trawling) compared to areas that remain impacted. Presumably, this is how these areas were initially designated as OECMs. The Working Paper will include a flowchart that captures variability in OECMs, guides sampling and monitoring decisions based on available data, and how to choose management approaches.

REVIEWER REPORTS

The Working Paper was reviewed by three external experts: Sally Leys, University of Alberta; Anna Metaxas, Dalhousie University, and Evan Edinger, Memorial University of Newfoundland.

SALLY LEYS – UNIVERSITY OF ALBERTA

The flowchart received positive feedback and any accompanying elaboration in the text would only help to further strengthen it.

The introduction section should include consideration of conservation objectives and a clear rationale. Biological and technical aspects were addressed, but less clear is the overarching framework with which they are monitored.

Section 4's conservation objectives could be worded more optimally and clearly. The mechanistic discussion was very well done, but the indicators less so.

The highlights on knowledge gaps were useful, and all gaps might be best captured in a page at the beginning.

Definitions and a glossary would be helpful to include.

There is value in collaboration which could increase cost effectiveness.

While measuring size is doubtful, technology improvements may help, including new developments in 3D imaging. Automated imagery should receive investments to help build baseline data.

Sediment is tricky. There is more research than management focus, so it is difficult to measure and determine the impact.

There is the need for a common set of parameters (common database) that could be compared across the country, serving useful in the long run to develop and establish a national understanding.

ANNA METAXAS – DALHOUSIE UNIVERSITY

The information on sponges was detailed but also succinct.

Table 2 received positive feedback as a great reference. Functional groups could benefit from better definition because factors should be considered other than just the type of substrate and size. Categories could be refined so that they can be reproduced by others.

Section 3 received positive feedback.

Section 4 would benefit from linking broad operational and conservational objectives with indicators. Operational indicators or quantitative indicators could be linked to ecological aspects. Additionally, the metric that should be used is density, rather than abundance or biomass. Clarifications should be made in the Working Paper.

It is important to have strict definitions for patchiness and connectivity. There are statistical ways to define patches, and there are statements about how patches have low variance, but it depends on how patches are chosen. If patches are defined by size, all patches will be the same size and all will have low variance, resulting in inaccuracies. There may be a high variation patch area, but it depends on how the patch is defined. When discussing patch connectivity, the connectivity between patches should be included, because many patches comprise the population or metapopulation. The tool is useful but only when diligently selecting patches. An investigation in the original literature on patchiness would help inform this discussion.

Discussion on tools (Section 5) focused on usefulness and should be considered for a peer review article as nothing is currently available for a wider audience. Areas that could benefit from clarification are Section 5.3's statistical comments which are difficult to follow due to inaccuracies and differing terms, the spatial auto-correlation, the spatial arrangement of organisms, and how scale depends on the organism. The framework for recommendations is missing. The end of each section could be strengthened by clear bullet points for how to make a decision.

EVAN EDINGER – MEMORIAL UNIVERSITY OF NEWFOUNDLAND

Globally it is still unknown precisely what OECMs are, but now they are present and must be monitored. Measuring threats, or the lack thereof, is integral to monitoring. There needs to be an impact and then the recovery needs to be monitored. If no fishing occurs in the area, then effectiveness is demonstrated immediately, but sometimes other activities aside from fishing (for example, oil and gas) can have impacts and be considered threats. For example, climate change can be a threat, so the degree of success needs to be determined when an area is protected against fishing but still undergoes climate change.

The description of coral species is focused mostly on Atlantic animals, and more coverage and comparison of Pacific species would be helpful. The opposite is true for sponges.

Measuring direct and indirect BCBs is a useful overall view to determine the conservation objective of areas. Direct BCBs become the focus, while indirect benefits are more challenging and become a secondary priority. A study design to monitor impacts, such as BACI (Before-After Control-Impact), would be needed, but often the "B" (Before) is lacking.

The tool section is overall well done but could be strengthened by the inclusion of tropical coral reef monitoring performed by other countries, along with their tools and sampling design. The report should provide more information on different available cameras and techniques, such as drop cameras and tow cameras.

The methodology for how to develop a sampling program, supported by the flowchart and table, is a good start. It is important to assess whether the information to be collected to develop a program is already available. With a repeated survey approach, where there are the same places and certain frequency, there are potential problems with repeatability. The appropriateness of random surveys needs to be determined.

Bottom trawling presents a problematic technique. Maintaining time series, and measuring indirect benefits (for example, fish abundance), produces impacts. Research Vessel trawls in closed areas are not a monitoring tool for corals and sponges, but the areas may be visited for time series, and relevant data might as well be collected during the visit.

APPENDIX 1: TERMS OF REFERENCE

A NATIONAL MONITORING FRAMEWORK FOR CORAL AND SPONGE AREAS IDENTIFIED AS OTHER EFFECTIVE AREA-BASED CONSERVATION MEASURES

National Peer Review - National Capital Region

December 1-3, 2020
Virtual Meeting

Co-Chairs: Robyn Jamieson and Lisa Setterington

Context

Canada, through its commitments to national and international marine conservation targets, has protected 13.81% of its marine and coastal areas through the establishment of marine protected areas and other effective area-based conservation measures (OECMs). Fisheries and Oceans Canada (DFO) has also taken steps to conserve benthic ecosystems through its "Policy to manage the impacts of fishing on sensitive benthic areas" (DFO 2009). Canada currently has 59 OECMs, 38 of which are established to protect cold-water corals and/or sponge benthic ecosystems.

Marine OECMs can include fisheries area closures established for the long-term to contribute towards the conservation of biodiversity, referred to as Marine Refuges. Marine refuges that conserve coral and/ or sponge aggregations, prohibit bottom-contact fishing activities in order to protect these fragile, often slow-growing species. Marine OECMs, including Marine Refuges, provide biodiversity conservation benefits (BCBs), which are benefits for a habitat, species or other component of the ecosystem resulting from the implementation of an OECM. It results in a net positive change in, or prevents the loss of, biodiversity in the OECM. BCBs include the focus of the conservation area, a direct BCB, and indirect BCBs or "co-benefits" which can occur incidentally as a result of conservation measures implemented in the area. For coral and sponge OECMs, the direct BCBs are for the coral and sponge species and their habitats. Indirect BCBs for corals and sponges vary by region and type of coral and/ or sponge and will be explored further in this CSAS process. Regional variations of coral and/ or sponge species assemblages and their aggregative propensities influence the types of BCBs and the monitoring techniques that can be used.

Given that monitoring is essential in order to determine if OECMs are effective, the Marine Planning and Conservation and Fisheries Resource Management programs requested national guidance on how to monitor coral and/ or sponge OECMs to demonstrate that they achieve direct and indirect BCBs. This will include advice on the categorization of corals and/ or sponges found within Canadian OECMs (for example, functional groups based on their role in the ecosystem, or habitat groups based on their location), the indirect BCBs that might be inferred from the ecological components being monitored, and indicators, and techniques for monitoring that can be used in these systems.

Objectives

The goal of this science peer review meeting is to develop a national monitoring framework for coral and sponge areas identified as OECMs. More specifically, the objectives are to:

1. Characterize the corals and/or sponges in Canadian OECMs (for example, by functional group or habitat type), and detail the available baseline information and knowledge gaps;

2. Provide a review of the known and expected indirect BCBs of coral and/or sponge habitats, and where possible, link these to the groups of corals and/or sponges described in Objective 1;
3. Identify appropriate ecological indicators to monitor coral and/or sponge areas for direct and indirect BCBs along with the strengths and limitations of each indicator; and
4. Identify potential tools, techniques and/ or methodologies for monitoring the direct and indirect BCBs of coral and/or sponge areas, and provide advice on their strengths and limitations.

Expected Publications

- Science Advisory Report
- Proceedings
- Research Document

Expected Participation

- DFO Science
- DFO Marine Planning and Conservation
- DFO Fisheries Resource Management
- Academia
- Environmental non-government organizations
- Other invited experts, as appropriate

References

DFO. 2016. Guidance on Identifying "Other Effective Area-Based Conservation Measures" in Canadian Coastal and Marine Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep.2016/002.

DFO. 2009. Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas.

APPENDIX 2: AGENDA

CSAS National Peer Review Process:

A national monitoring framework for coral and sponge areas identified as Other Effective Area-Based Conservation Measures

December 1 to 3, 2020

Co-Chairs: Robyn Jamieson and Lisa Setterington, DFO Science

While the agenda is flexible, the tentative meeting schedule is as follows (times are in Eastern Standard Time):

- *11:00 am – 1:00pm*
- *2:00pm – 4:00 pm*

Day 1 – Tuesday, December 1

Time	Activity	Presenter
11:00	Opening Remarks	Co-Chairs
11:15	Introduction	Chloe Ready and Suzanne O'Brien
ToR Objective #1: Characterize the corals and/or sponges in Canadian OECMs (for example, by functional group or habitat type), and detail the available baseline information and knowledge gaps		
11:30	Coldwater coral and sponge characterization	Pam Allen and Curtis Dinn
ToR Objective #2: Provide a review of the known and expected indirect BCBs of coral and/or sponge habitats, and where possible, link these to the groups of corals and/or sponges described in Objective 1		
12:15	Biodiversity Conservation Benefits	Javier Murillo-Perez
1:00	**BREAK**	
ToR Objective #3: Identify appropriate ecological indicators to monitor coral and/or sponge areas for direct and indirect BCBs along with the strengths and limitations of each indicator		
2:00	Ecological Monitoring Indicators	Barbara Neves

Day 2 – Wednesday, December 2

Time	Activity	Presenter
11:00	Review of Day 1	Co-chairs
ToR Objective #3 con'td….: Identify appropriate ecological indicators to monitor coral and/or sponge areas for direct and indirect BCBs along with the strengths and limitations of each indicator		
11:15	Ecological Monitoring Indicators cont'd…..	Barbara Neves
1:00	**BREAK**	
ToR Objective #4: Identify potential tools, techniques and/ or methodologies for monitoring the direct and indirect BCBs of coral and/or sponge areas, and provide advice on their strengths and limitations		
2:00	Ecological Monitoring Tools, Techniques and Methodologies	Genevieve Faille Barbara Neves

Day 3 – Thursday, December 3

Time	Activity	Presenter
11:00	Review of Days 1 and 2	Co-chairs
11:15	Reviewer Reports	**Reviewers:** Evan Edinger Sally Leys Anna Metaxas
12:15	Drafting of Summary Bullets for SAR	ALL
1:00	**BREAK**	
2:00	Drafting of Summary Bullets for SAR cont'd…	ALL
3:15	Research Recommendations, Conclusions and Advice	ALL
3:40	Upgrading of Working Paper to Research Document	ALL
3:45	Closing Remarks	Co-chairs

APPENDIX 3: LIST OF PARTICIPANTS

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