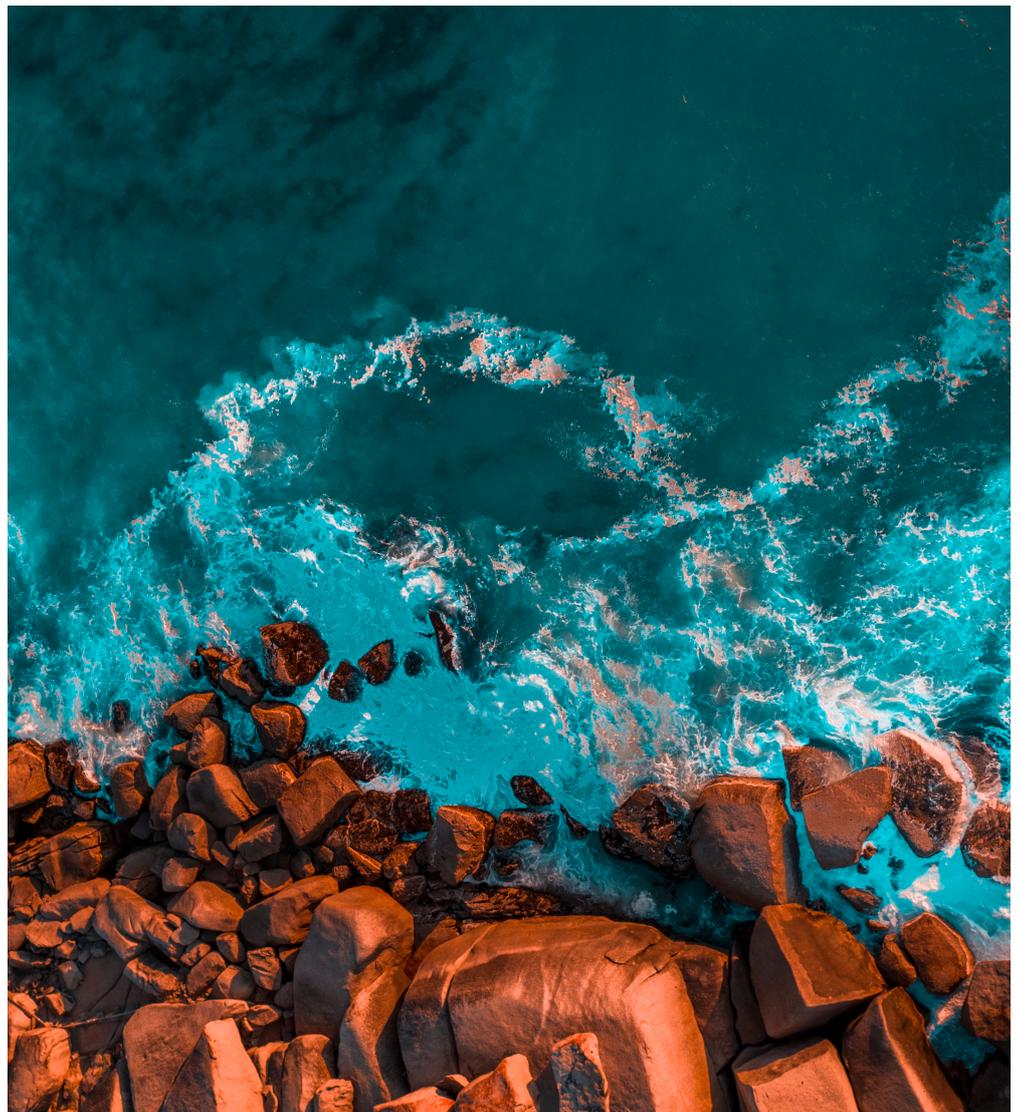# ICES Working Group on SmartDots Governance (WGSMART) Governance framework

Version 1 I June 2022

ICES USER HANDBOOKS

ICES   INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA
CIEM   CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

Recommended format for purpose of citation:

Contents

i Background

ICES Working Group on SmartDots Governance (WGSMART) is a governance group and this document outlines the strategy that WGSMART follows when managing the SmartDots platform. The Terms of Reference define the objectives and the plan of action of the group, this document outlines the strategy, structure, responsibilities, governance process and resources required to fulfil the objectives. The primary audience are the members of WGSMART, followed by the members of the ICES community who use the SmartDots platform.

Changes since the last version

This is the first version of this guidance document relevant to the 3-year term of WGSMART running from 2019 to 2021.

Other relevant information

The document has been drafted by WGSMART with the input from the ICES Data Centre and ICES DIG (Data Information Group). WGSMART are responsible for maintaining and updating the document. The document will be reviewed in parallel with each new three year term of the Governance group.

1 Strategy

1.1 Objectives

The overall objective is to facilitate quality assurance of ageing and maturity through SmartDots (see definitions in Section 6). SmartDots is an important component to the overall Quality Assurance framework of ICES.

Four Terms of Reference (ToR) have been defined for WGSMART in the period 2019–2021:

a) Oversee and advise on the interpretation and prioritisation of recommendations and requests addressed to SmartDots.
b) Provide a platform for end user feedback to the SmartDots system.
c) Elaborate a forward plan for the sustainability of SmartDots as a platform.
d) Oversee development of user guidance and training in SmartDots.

A three-year work-plan with milestones has been formulated to address these ToRs (see Section 4).

1.2 Strategic considerations

The aim is that all ICES member countries will use SmartDots for international calibration and validation events.

The use of SmartDots by non-ICES countries is encouraged to extend the collaboration on this quality assurance tool and to extend the means of support, especially in consideration of European Union – Data Collection Framework requirements.

In the future (2022+), possibilities to extend SmartDots beyond age and maturity (e.g. egg staging, ichthyoplankton identification, fecundity and atresia, otolith shape analysis and reference collections) will be explored.

2   Structure

2.1   WGSMART

Membership:
- One of the chairs of ICES Working Group on Biological Parameters (WGBIOP)
- One member from each country from the core development group (Belgium, Denmark, and Norway)
- One member from ICES Secretariat as the SmartDots web API and the web application host
- Other experts as need be.

The group will meet 3-4 times per year via WebEx and meet physically once per year following the annual WGBIOP meeting.

2.2   Organizational links and dependencies

SmartDots has been developed by the ICES community. The use of SmartDots beyond this community (e.g. General Fisheries Commission for the Mediterranean, Food and Agriculture Organisation) is encouraged, but is dependent on their contribution to resources.

There is a close working relationship with WGBIOP, who are the main end users of SmartDots. WGBIOP members' expertise is in age, growth and maturity studies, addressing quality assurance related issues and coordinating, analysing and reporting on calibration exercises. For this reason, WGBIOP has an important advisory role, and any quality assurance related improvements and developments to SmartDots should be approved by WGBIOP. WGBIOP is also involved in the dissemination of SmartDots inside and outside the ICES community. For this reason, one of the chairs of WGBIOP should always a member of WGSMART. Final decisions on the prioritisation of improvements of SmartDots are made by WGSMART.

The ICES Data Information Group (DIG) oversees all data governance groups. Therefore, WGSMART will provide a report to the annual DIG meetings (in May).

3 Oversight responsibilities

3.1 WGSMART responsibilities

SmartDots is up and running since January 2018 and has already been used in several age reading events. Although it is already completely functional, improvements can be made and many requests, recommendations and questions have been put forward. It is the responsibility of the WGSMART governance group to deal with these requests. The group will interpret the requests, ask for further clarification if needed, evaluate the necessity of a request, and prioritise the requests. Based on this, the annual WGSMART work plan will be updated.

It is the responsibility of WGSMART to define a future plan for the sustainability of SmartDots.

WGSMART is responsible for creating and updating the manuals.

WGSMART is responsible for seeking and allocating resources for the development and maintenance of SmartDots. From 2020 onwards WGSMART will need to actively seek funding either via contributions from participating countries or direct funding applications.

3.2 Hosting and maintenance

The SmartDots platform consists of the following components: image analysis software, web API, web application and reporting tool. See the definitions in Section 6 for further clarification.

ICES is the host and is responsible for the maintenance of the SmartDots web API and the web application.

The SmartDots image analysis software is open source code available on GitHub. There is a shared responsibility for all contributors. As initial developer, Instituut Voor Landbouw - en visserijonderzoek (ILVO) has a responsibility to support other community members who want to contribute to the source code.

The reporting tool is open source R script available on GitHub. For the current WGSMART period, Havforskningsinstituttet (HI) Norway will support development of the reporting R script.

4 Governance process

4.1 Tasks and work plan

The governance group has defined six overarching tasks (Table 4.1).

The work is detailed in the WGSMART GitHub project board[1]. In effect, the WGSMART work plan is comprised of requests taken up by the governance group after an evaluation and prioritisation process. Milestones and assignees (persons responsible) and estimated effort in number of days are given to each request.

Each request in the project board is allocated to one or more of the following modules:
1. Image analysis software
2. Web API
3. Web application
4. Reporting tool
5. Manuals
6. Governance

Table 4.1. WGSMART tasks in 2019-2021

Tasks	ToR	Module	Frequency	Person(s) primarily responsible.
Update the WGSMART project board w.r.t. work completed and future work (https://github.com/ices-eg/SmartDots/projects/3)	a, b, d	1-6	Quarterly	All WGSMART members can add requests. WGSMART chairs will collate requests from WGBIOP, exchanges, workshops, EG's and feedback page and present them for discussion at the quarterly meetings.
Further development of SmartDots for ageing (https://github.com/ices-eg/SmartDots/projects/3?card_filter_query=label%3A%22type%3A+age+reading%22)	c	1-4	Ongoing	ILVO (image analysis software), ICES Data Centre (web API & web application) IMR (Institute of Marine Research) Norway and IPMA (Portuguese institute of sea and atmosphere (reporting tool)
Further development of SmartDots for maturity (https://github.com/ices-eg/SmartDots/projects/3?card_filter_query=label%3A%22type%3A+maturity%22)	c	3-4	Ongoing	ICES Data Centre (web API & web application) IMR (Institute of Marine Research) Norway and IPMA (Portuguese institute of sea and atmosphere (reporting tool)
Update of manuals https://ices-library.figshare.com/search?q=%3Atitle%3A%20smartdots&groups=37194	d	5	Bi-annually	ICES SmartDots Web App. Manual (ILVO) SmartDots User Manual (SLU Sweden)

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[1] https://github.com/ices-eg/SmartDots/projects/3

				SmartDots Web API-technical documentation (ICES Data Centre)
Resource management	c	1-6	Annually	All group members

4.2 Milestones

Table 4.2. WGSMART milestones in 2019-2021

Milestones	ToR	Module	Date	Metric (if applicable)
Development of web application for maturity completed	a	3	2020	See 2020 WGSMART Governance Framework 2020 for the number of maturity stagers expertise in the SmartDots database
First international maturity test event on SmartDots	a	3	2019	The software and WebAPI are tested and feedback provided by coordinator and participants
Development of reporting scripts for maturity	a	4	2020	The reporting module is used to produce a report for an international exchange. Integration is expected in the next term.
Develop and implement procedure for handling user feed-back (https://smartdots.ices.dk/Userfeedback)	b	3	2019	In November 2019 the visibility of the page was improved and it is expected that the number of entries increase
Video tutorials (https://www.youtube.com/channel/UCa4bjXo-eBDfW0cm1oEl-WeQ/playlists)	d	5	2020/2021	The number of views on YouTube
All ICES member countries use SmartDots as participant	c	1-5	2021	Proportion of all ICES member states that have PARTICIPATED in a SmartDots event
Completion of the items on the WGSMART workplan (https://github.com/ices-eg/SmartDots/projects/3)	a	1-6	2021	WGSMART work plan
All ICES member countries use SmartDots as coordinator	c	1-5	2022	Proportion of all ICES member states that have COORDINATED a SmartDots event
SmartDots User Manual (Version 5: https://doi.org/10.17895/ices.pub.7473)	d	5	Bi-annual update (with the exception of major updates)	
SmartDots Web API technical documentation (https://doi.org/10.17895/ices.pub.4604)	d	5	Annual update	
SmartDots web application manual (https://doi.org/10.17895/ices.pub.4603)	d	5	Bi-annual update (with the exception of major updates)	

4.3   Report

WGSMART will report on its activities in March to the ICES Science Committee (SCICOM), the Ecosystem Observation Steering Group (EOSG) and the Data Information Group (DIG).

Annual reports will present an overview of the progress made in relation to tasks and milestones formulated above.

5   Resources

At the 2019 physical meeting it was decided that effort (in time) labels will be given to all issues/tasks once they are prioritised, assigned and milestones set. This will enable a calculation of the total effort, based on the effort labels in the github workplan.

When an issue/task is given priority 1 by WGSMART it is allocated to the responsible members and an effort label given to the issue/task in github. Tasks given priority 2, 3 and 4 will be reconsidered during the subsequent meetings, when most priority 1 issues are closed, when they will be assigned to a member and module and effort labels given.

6   Definitions

SmartDots refers to the entire platform including the image analysis software, the Web API, the web application and the reporting tool.

Image analysis software is a Graphical User Interface which gets and sends annotation data to a Web API. The software is an open source (GPL v3.0) Microsoft WPF application.

The **Web API** is the interface between the SmartDots client and the database, contains all business logic. Consequently it decides who has access, how to process and how to store the data.

The **Web application** is web portal for the SmartDots platform. Actions that go through this portal are (a.o.): view published events; create token for users; create and manage events; add and manage users and expertise.

The **Reporting tool** is developed in R and runs when the event is closed. The tool reads the annotations of the readers, carries out data analysis and creates the standard output which can be used in the final report of the event.

An **event** is a collection of images and associated data for one age or maturity calibration or validation exercise.

References

This section should be used as relevant to list literature referenced in the text, and to list any relevant links, e.g. to databases, further resources, further information,….

Annex 1: WGSMART Resolutions

WGSMART – Working Group on SmartDots Governance

2018/MA2/EOSG01   The **Working Group on SmartDots Governance**[2] (WGSMART), co-chaired by Julie Coad Davies* (Denmark) and Jane Aanestad Godiksen* (Norway), will meet intersessionally, 4 times per year via WebEx and may meet physically once per year, to work on ToRs and generate deliverables as listed in the Table below.

	WEBEX MEETING DATES	**MEETING DATES AND VENUE**	**REPORTING DETAILS**	**COMMENTS (CHANGE IN CHAIR, ETC.)**
Year 2019	1) 7 February 2) 25 April 3) 12 September 4) 14 November	11-12 October Lisbon, Portugal (Venue as WGBIOP)	Interim report by 8 November to EOSG	
Year 2020	1) 14 January 2) 21 April 3) 12 May 4) 23 October	8 September and 26 November (online meetings)	E-evaluation	Agreed upon at WGSMART October 2019 meeting that WGSMART will meet before WGBIOP 2020 and proposes that the first day of WGBIOP is dedicated to overlapping work of WGSMART and WGBIOP
Year 2021	1) 11 January 2) 11 May 3) 2 September 4) 12 October	24-25 November (Online meeting)	Final report by 6 January 2022 to DSTSG	If the approach taken in 2020 works then this will be followed in 2021

WGSMART will report on its activities by the March SCICOM meeting the following year to DSTSG and DIG.

ToR descriptors

ToR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Oversee and advise on the interpretation and prioritisation of recommendations and requests addressed to WGSMART	SmartDots is an operational tool that aims to improve the overall quality of age data delivered to assessment EG's. The tool is now operational and an integral part of the ICES QAQC for aging many fish species for which ICES provides advice, procedure largely under the guidance of WGBIOP. However	3.1, 4.1	3 years/ Generic ToR	A prioritised list of SmartDots related expert group recommendations with a proposed annual work plan to address concerns and implement improvements to SmartDots.

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[2] http://ices.dk/marine-data/tools/Pages/smartdots.aspx

			maintenance and future development of the platform are beyond the scope of the scientific WG's and WK's.	
b	Provide a platform for end user feedback to the SmartDots system. User feedback will be requested from the end users via the GitHub site, exchange/workshop reports, EG'S and committes. Feeback will be compiled by WGSMART and appropriate actions to be taken with assigned responsibilities will be listed and prioritised.	SmartDots will be further developed to meet the requirements of a broad range of end users and thus needs to be responsive to user feedback. This feedback system needs to be independent of WGBIOP as a greater responsiveness (more than one meeting a year) is required to manage the system effectively.	3.1, 4.1	3 years/Generic ToR
c	Elaborate a forward plan for the sustainability of SmartDots as a platform	To achieve a continous quality, SmartDots needs to be developed in line with end users needs. This development requires an input of resources; knowledge, expertise, manpower and funding over a period of time which extends beyond the initial phase. A workplan with clear objectives and milestones can only be sucessfully implemented when the availability of such resources is clear.	4.4, 3.6	3 years/ Generic ToR	A workplan outlining what resources are required for development, support, training and dissenimation of relevant information. An estimated budget including identified funding resouces.
d	Oversee development of user guidance and training in SmartDots	As SmartDots develops overtime a range of users will require various levels of training including step by step user manuals, tutorials and possibly workshops. Documentation of guidelines and procedures in line with WGBIOP will also be necessary.	3.1, 4.1	3 years/ Generic ToR	Annually updated training documentation. Workshops with specific goals proposed and planned where necessary. Relevant fora for dissemination investigated and outreach activities planned.

	Outreach activities will be required.

Summary of the Work Plan

In addition to the ongoing maintenance and improvements by the end of year three we aim to have; the data output and reporting module fully operational, SmartDots maturity staging module fully operational and user manuals updated in line with all developments made.

Year 1	ToR a) and b) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGBIOP and prioritising ToRs c) and d).
Year 2	ToR a) and b) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGBIOP and prioritising ToRs c) and d).
Year 3	ToR a) and b) will be addressed in quarterly WebEx meetings, with the potential annual meetings intended to coincide with WGBIOP and prioritising ToRs c) and d).

Supporting information

Priority	
Resource requirements	A commitment of time from the members of the group consistent with progressing actions identified in the quarterly meetings
Participants	Chair of WGBIOP, one member from each country from the core development group (BE, DK, NO), ICES Secretariat as hosts of International SmartDots, other WGBIOP members as need be
Secretariat facilities	Community Sharepoint site, Remote meeting facilities
Financial	No financial implications
Linkages to ACOM and groups under ACOM	This is an integral component to the overall Quality Assurance framework (of Advice) that ACOM together with the Coordination group are describing
Linkages to other committees or groups	There is a very close working relationship with WGBIOP. There is a strong linkage to DIG as the main umbrella for data/software governance structures.
Linkages to other organizations	EU Commission has partially funded SmartDots and is therefore following its progress, GFCM in the Mediterranean also has interest in this system

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