

# SmartDots: an online international platform for age reading workshops and calibration

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## SmartDots age reading platform (<http://smartdots.ices.dk>)

SmartDots is a platform which facilitates exchanges and workshops to assess fish age readings. The exchanges have a coordinator who manages the event. Reports are compiled by the system for each event) and delivered to the stock coordinators to facilitate the stock assessment.

The platform is composed by four major components:

- a) Web manage interface ([smartdots.ices.dk](http://smartdots.ices.dk))
- b) Web API (web services: <http://smartdots.ices.dk/webapi>)
- c) Software (<https://github.com/ices-eg/SmartDots/raw/master/SmartDots/publish/setup.exe>)
- d) Reporting tool ([https://github.com/ices-taf/2018\\_smartdotsReport](https://github.com/ices-taf/2018_smartdotsReport))

## Web interface

The web interface allows the national coordinators to :

- Manage age readers expertise
- Add age readers to the events
- Set up a new events (Exchange, Workshop, training or a demo)
- Follow the progress of an event

## Software

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

To participate in an event, end-users authenticate using a token. Once successfully logged on they can make annotations on otolith images. Each annotation contains a line with one or more segments and a number of dots representing the annuli. The estimated age of the fish is determined based on the number of annotated annuli.

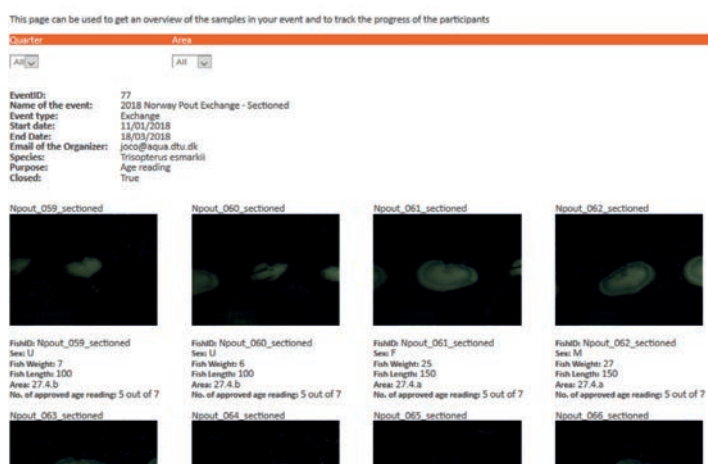


Fig. 1 - The view event page that can be accessed by the event coordinator to follow readers annotations in the event.



Fig. 2 - SmartDots software was initially developed at ILVO (Institute for Agricultural and Fisheries Research) in Belgium. Since 2017 SmartDots is an open source solution published on GitHub.

## Web API

The Web API, 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.

## Reporting tool

The reporting tool is developed in R and runs when the event is closed. The tool reads the annotations of the readers and creates the final report of the event.

## Conclusion

We hope the SmartDots age reading platform to facilitate harmonized data analyses and transmission of results within a quality assured process of age estimations across all laboratories delivering data to stock assessment.

The platform is planned to be used for all intercalibrations and validations of age determination. Once the events are published all data (images, annotations and report) becomes publicly available.

The development of SmartDots within ICES is guided by the Working Group on Biological Parameters (WGBIOP).