

Copernicus FICE 2025

Training on

In situ Ocean Colour Above-Water Radiometry towards Satellite Validation

SeaBASS Format Data Submission

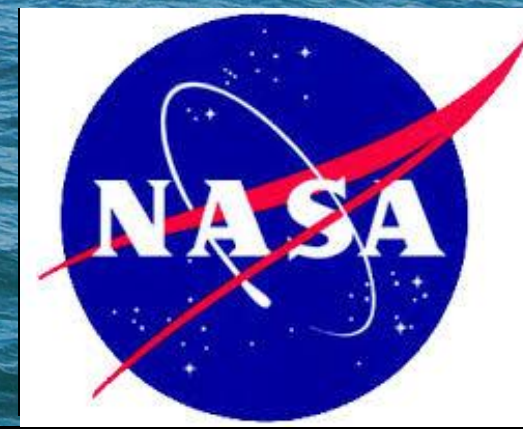
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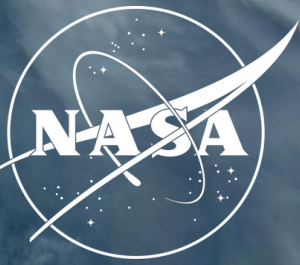
July 7-19, 2025
Venice, Italy



SeaBASS Format and Submission

Dirk Aurin
NASA/GSFC

SeaBASS (SeaWiFS Bio-optical Archive and Storage System)



<https://seabass.gsfc.nasa.gov>

SeaBASS is NASA's publicly shared archive of in situ oceanographic (and some atmospheric) data maintained at the NASA Goddard Space Flight Center.

Submissions are mandatory for NASA-funded PIs but voluntary submissions are most welcome!

Submissions are reviewed by Subject Matter Experts (SMEs) prior to acceptance and/or use in mission validation.

Contacts: Chris Proctor (christopher.w.proctor@nasa.gov)
and Inia Soto Ramos (inia.m.sotoramos@nasa.gov)

Data archived in SeaBASS are collected from ships, moorings, autonomous buoys and other platforms. Measurements come from a variety of instruments, such as profilers, hand-held sensors, and laboratory analyzers.



1



2

Diverse data types include:

- Apparent and Inherent Optical Properties
- Phytoplankton pigments
- Carbon stocks
- Hydrography
- Other biogeochemical & atmospheric measurements



3

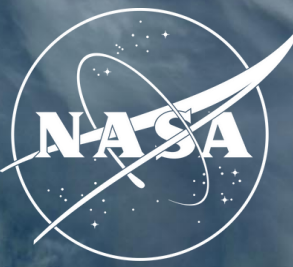


4

<https://seabass.gsfc.nasa.gov>

Images provided by Javier Concha^{1,2,3} and Chris Proctor⁴

How to Submit



The short version

Each PI's lab needs to:

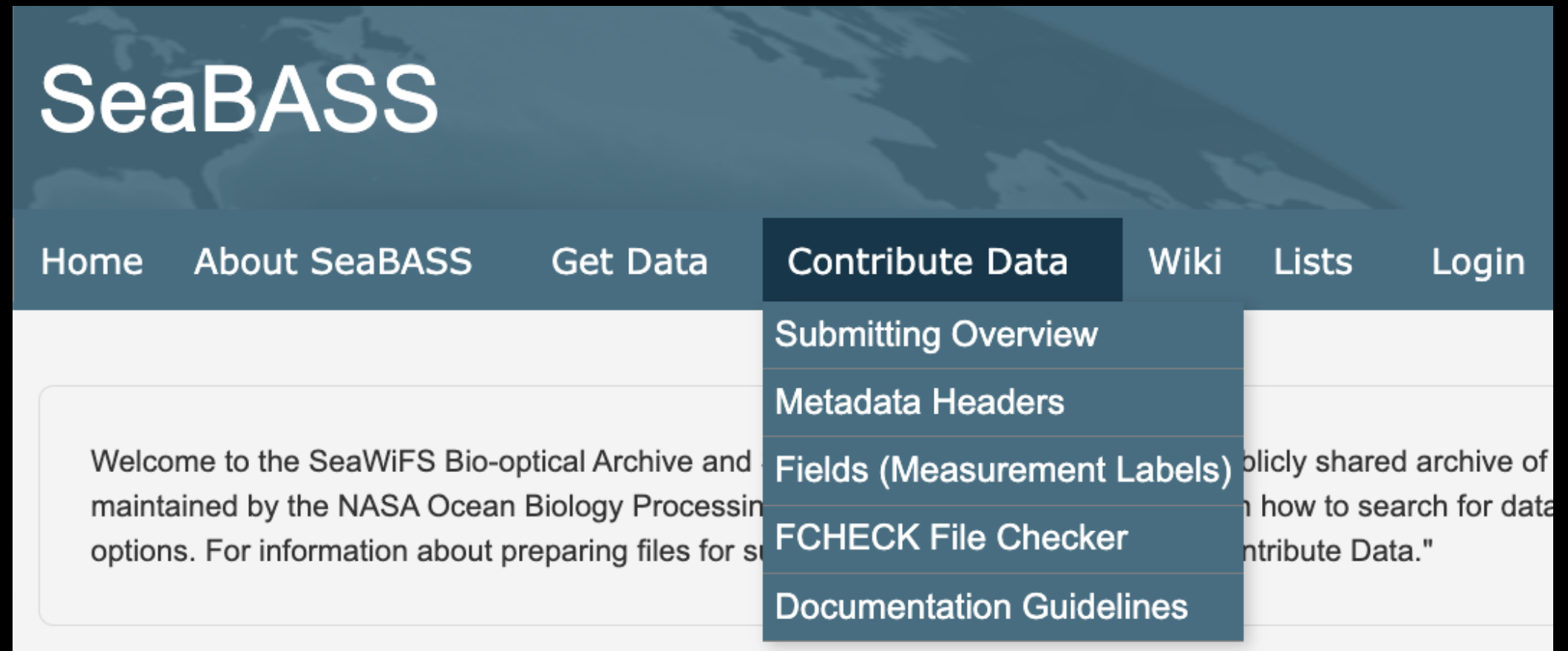
1. Gather and organize **data**

- Convert files to .sb format

2. Gather **documentation** (methods/reports, checklists, cal files, etc.)

3. Register data submitter accounts

- Verify data format with FCHECK file scanner
- Upload data using SFTP accounts



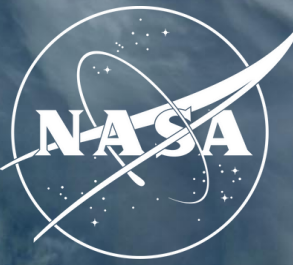
https://seabass.gsfc.nasa.gov/wiki/Data_Submission

Reach out via email first

- 1.Contact SeaBASS staff via email to plan out your submission before you begin formatting data.** SeaBASS staff will respond to your inquiry, typically within 1-2 business days. For routine submissions, you will then be able to proceed with the steps below. For more complex scenarios and data types that are new to SeaBASS, our data managers will require more information and discussion of how to best organize and accommodate your data and documentation. When you email the SeaBASS Staff to introduce yourself, include:
- 2.Your first and last name, and what institution you are affiliated with.
- 3.Please indicate if your project was NASA-funded, or if your submission is voluntary.
- 4.If you are not the PI or person who secured funding for the project within your laboratory or organization, please indicate that person's name and how you are connected.
- 5.Indicate the project name and deployment or cruise names. In SeaBASS data are categorized under a new or existing experiment and cruise name (see Lists in the main menu), which should be coordinated if there were co-investigators.
- 6.Briefly explain the measurement types of the data you wish to submit.

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SeaBASS file format (.sb files)



SeaBASS file format is a NASA Earth Science Data and Information Systems (ESDIS)-approved standard

Files are ASCII text organized into two sections:

- 1) Metadata headers
- 2) Data matrix

A screenshot of the SeaBASS website. The header includes the NASA EarthData logo, a dropdown for "Other DAACs", and navigation links: Home, About SeaBASS, Get Data, Contribute Data, Wiki, Lists, and Login. A search bar is also present. The main content area is titled "SeaBASS" and "Metadata Headers". A dropdown menu is open under "Contribute Data", showing options: Submitting Overview, Metadata Headers (selected), Fields (Measurement Labels), FCHECK File Checker, and Documentation Guidelines. The "Metadata Headers" section explains that standard metadata headers are required in every SeaBASS file, some conditionally, and others optional. It also mentions a table of contents for examples and required headers.

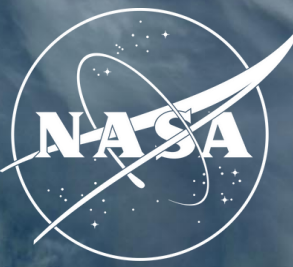
Metadata Headers

```
/begin_header
/keyword=value
/keyword=value,value,etc
! This is a comment
/end_header
```

Data Matrix

Columns of values separated by delimiters

SeaBASS architecture: fields and units



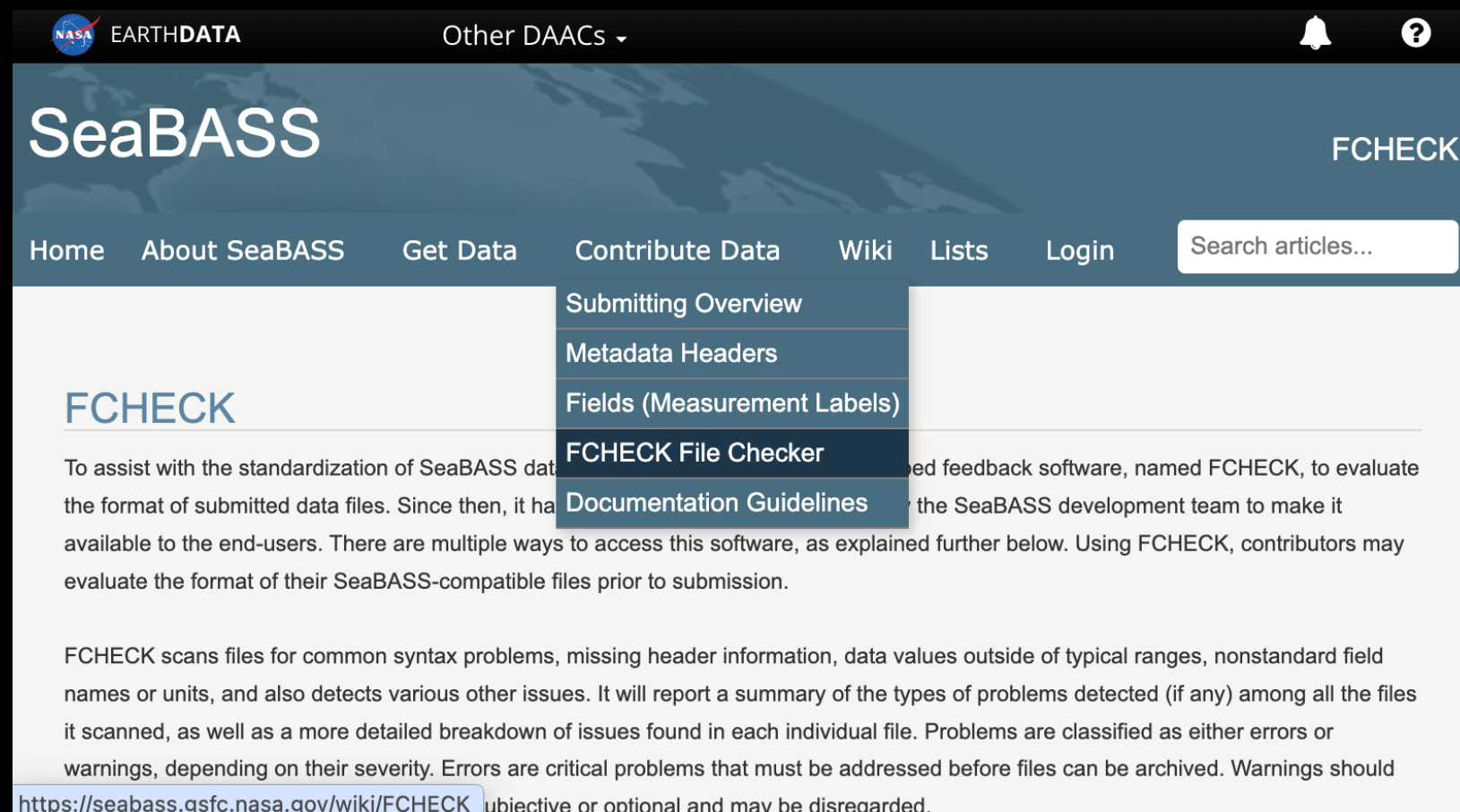
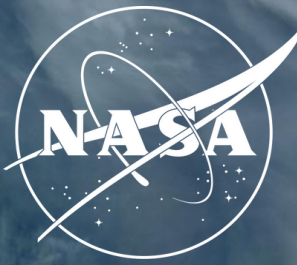
/fields and /units headers identify every column in the data block

Field names are standardized, and paired with specific units:
<https://seabass.gsfc.nasa.gov/wiki/stdfields>

Field name	Units	Description
Chl	mg/m ³	Chlorophyll a derived fluorometrically/spectrophotometrically
Chl_a	mg/m ³	HPLC Chlorophyll a (MV_ChI_a plus allomers and epimers)
POC	mg/m ³	Particulate organic carbon
Rrs	1/sr	Remote sensing reflectance (Lw / Ed)
Wt	degreesC	Water temperature
date	yyyymmdd	Sample date

Multi/Hyperspectral data can have suffixes to identify band when data are written in rows (e.g., Rrs_412) and to identify uncertainties (e.g., Rrs_412_unc). New fields are routinely added to SeaBASS when needed, and new metadata headers are also periodically added.

SeaBASS software tools



FCHECK* File Checker

Automated FCHECK file checking software scans data submissions

Errors and warning messages alert you when required metadata are missing, keywords are misspelled, or files are otherwise malformed

SeaBASS File Readers (e.g., for Python, MATLAB, Perl)

File Converters (e.g., convert SeaBASS files to netCDF or ICARTT format)

Standalone Satellite Match-up Tools can be downloaded for locating coincident ocean color satellite sensor files and then extracting information from those files (available via SeaDAS software)

*FCHECK can be used via email, SFTP, or a downloaded Perl script (my personal favorite). Perl is available by default on Linux and macOS systems but not Windows.

Questions?