

ESS-DIVE Update: New Features, Standards and Community Activities

Charuleka Varadharajan

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NCEAS/DataONE: Matt Jones, Chris Jones, Peter Slaughter

CF Partners: Terri Velliquette, Ranjeet Devarakonda, Sue Heinz, Alistair Rogers, Kim Ely, Ben Bond-Lamberty, Stephanie Pennington, Amy Goldman, Kristin Boye, Pamela Weisenhorn

*ESS PI Meeting
May 19, 2020*



U.S. DEPARTMENT OF
ENERGY

Office of
Science



What is ESS-DIVE?



Data Repository to

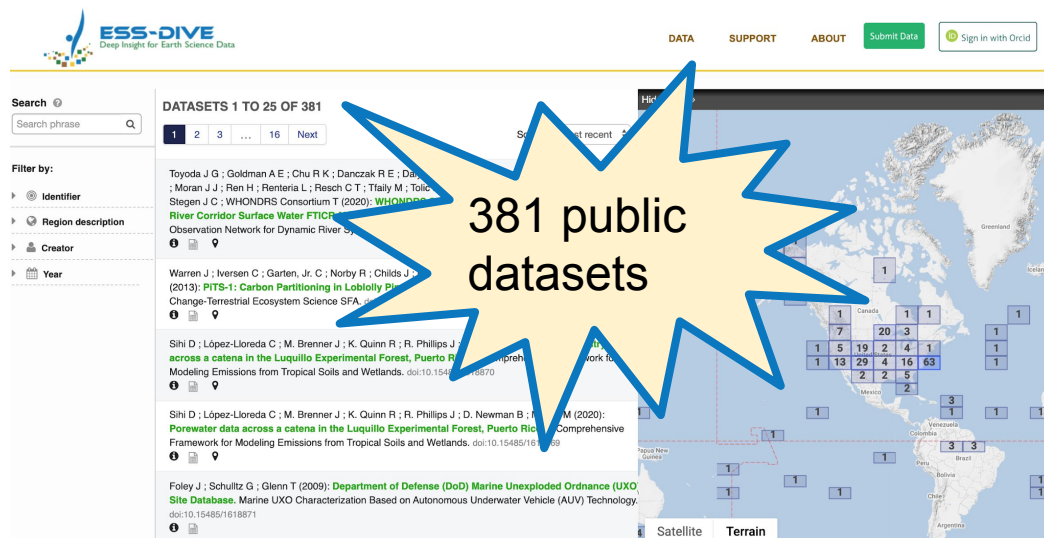
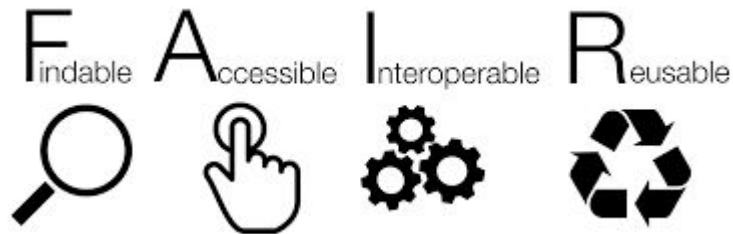
preserve

expand **access** to

and improve **usability** of

ESS data

data.ess-dive.lbl.gov



How to upload and publish data on ESS-DIVE

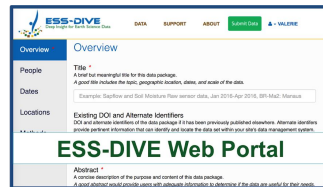


Register w/ ORCID.
Organize **data packages**.



Revision

Revise/Create



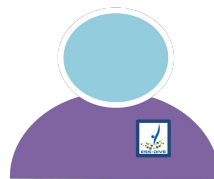
Define **metadata** for data package.



Data Package Metadata

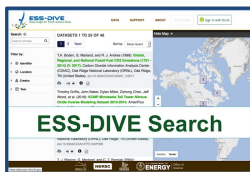
Revise

Submit



ESS-DIVE Project User

Review



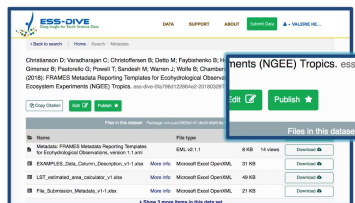
Catalog

ESS-DIVE **review**.
DOI assigned.



Citation Information

Publish



ESS-DIVE Data Package

Submit to save privately.
When ready click **Publish**.

Available for **public**
search/download.

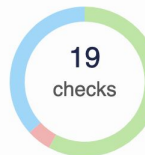
ess-dive.lbl.gov/archive/

New ESS-DIVE Metadata Review Process Combines Automated and Manual Checks



Metadata

After running your metadata
research data by addressing



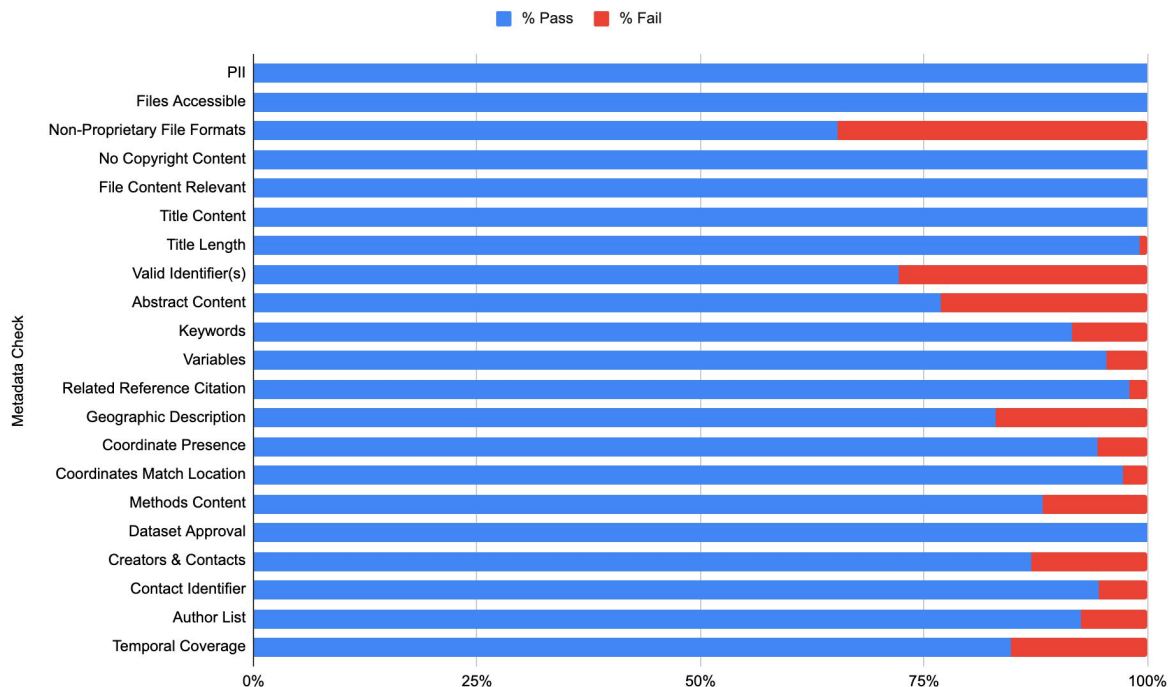
► Passed 11 checks

► Warning for 0 checks

▼ Failed 1 check.

✖ The abstract is c

Percentage pass and fail by check



Metadata

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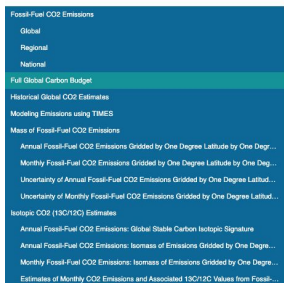
Portals Enable Project or Thematic Collections and Long-term Archival of Project Information



Carbon Dioxide Information Analysis Center



<https://data.ess-dive.lbl.gov/portals/CDIAC/>



This page contains multiple datasets. Tab through the table of contents on the left hand side to skip to a particular dataset of interest. Click the header of any dataset to view the data on the ESS-DIVE archive.

Fossil-Fuel CO₂ Emissions

DOI: 10.3334/CDIAC/00001_V2017
Citation: Boden T, Marland G, Andres R J (1999): Global, Regional, and National Fossil Fuel CO₂ Emissions (1751 - 2014)
doi:10.3334/CDIAC/00001_V2017

Global

Since 1751 just over 400 billion metric tonnes of carbon have been released to the atmosphere from the consumption of fossil fuels. Global carbon emissions, which represent an all-time high and a 0.8% increase over 2013 emissions. The slight increase in emissions is due to a combination of factors, including a decline in coal use in China and a decline in oil use in the United States. Financial Crisis which had obvious short-term economic and energy use consequences, particularly in North America and Europe. Globally, liquid and solid fuels accounted for 75.1% of the emissions from fossil-fuel burning and cement production in 2014. CO₂ gradually increasing global utilization of natural gas. Emissions from cement production (568 million metric tons of carbon in 2014) accounted for roughly 2% of global emissions during the 1970s, now accounts for less than 1% of global fossil-fuel releases.

Data Description

Total Global Carbon Emissions (1751-2014) (one file - ASCII text, tabular format)

Total Global Carbon Emissions (1751-2014) (one file - comma delimited)

Regional

Search

Search these datasets

Sort by Most recent

DATASETS 1 TO 25 OF 226

Blake D (2005): Methane, Nonmethane Hydrocarbons, Alkyl Nitrates, and Chlorinated Carbon Compounds including 3 Chlorofluorocarbons (CFC-11, CFC-12, and CFC-113) in Whole-air Samples (April 1979 - December 2012). doi:10.3334/CDIAC/ATG.002

Prinn R, Weiss R, Arduini J, Arnold T, DelWitt H, Fraser P, Ganesan A, Gasore J, Harth C, Hermansen O, Kim J, Krummel P, Li S, Loh Z, Lunder C, Malone M, Manning A, Miller B, Mitrevski B, Mohr J, O'Doherty S, Park S, Reimann S, Rigby M, Sato T, Salameh P, Schmidt R, Simmonds P, Steele L, Volmer M, Wang H J, Yao B, Yokouchi Y, Young D, Zhou L (2016): History of chemistry and radiatively important atmospheric gases from the Advanced Global Atmospheric Gases Experiment (AGAGE). doi:10.3334/CDIAC/AGAGE.001

Blaug T, J. Brinkmann, C. Marland G H (2004): Estimates of Monthly CO₂ Emissions and Associated 13C/12C Values from Fossil-Fuel Consumption in the U.S.A. (1981-2003). doi:10.3334/CDIAC/FFC.001

Gibbs H K, Brown S (2007): Geographical Distribution of Woody Biomass Carbon in Tropical Africa: An Updated Database for 2000 (NDP-055.2007, NDP-055a). doi:10.3334/CDIAC/LULU.NDP055.2007

Menne M, J. A. C. W. Vose R (2016): Long-Term Daily and Monthly Climate Records from Stations Across the Contiguous United States (U.S. Historical Climatology Network). doi:10.3334/CDIAC/CLN.NDP019

Matthews E (1994): Gridded Surface Albedo. doi:10.15455/7.464233

Jones P D, Parker D E, Osborn T J, Biffa K R (2000): Global and Hemispheric Temperature Anomalies: Land and Marine Instrumental Records (1850 - 2015). doi:10.3334/CDIAC/CLN.002

Johnson K M, Wallace D W R, Wilke R J, Goyet C (1996): CO₂, Hydrographic, and Chemical Data Obtained from the R/V Meteor Cruise 15/3 in the South Atlantic Ocean (WOCE Section AB, February March 1991). doi:10.3334/CDIAC/GO15.NDP018

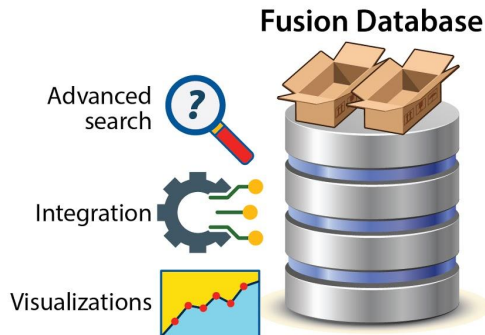
Rica A F, Johnson K M, Alvarez-Salado X A, Arlen L, Biliyar A, Binger L S, Branellec P, Castro C G, Chipman D W, Roson G, Wallace D W R, Kozlov A (2005): Carbon Dioxide, Hydrographic,



Easy Upload Capabilities & Broad Data Availability



**Prototype
Fusion Database:
csv files**



**API: Repeat/Big
Uploads (100 GB)**

NEW FEATURE

Data Contributor



Data Package Upload

Web portal

DATA SUPPORT ABOUT Submit Data

Overview

People
Title
Data
Location
Existing DOI
Modules



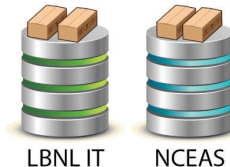
**ESS-DIVE Data
Package Archive**



Standards



Data Preservation



DataONE



- Replication, auditing and redundancy
- Cross-catalog search

Extensive Community Engagement Activities

Join ess-dive-community@lbl.gov



ESS-DIVE Bootcamp

April Webinar

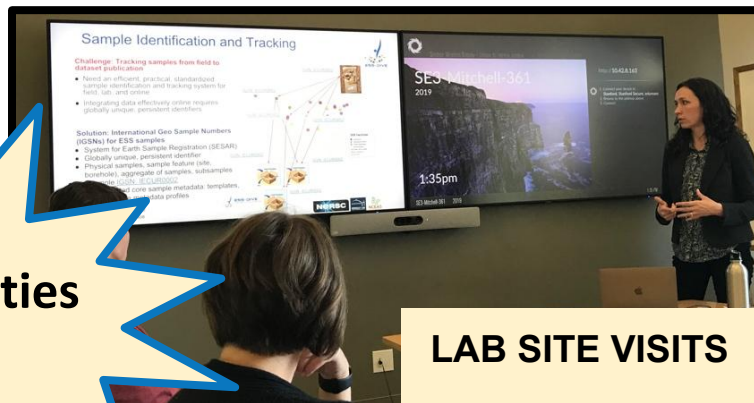
April 27, 2020 10:00-11:00

<http://bit.ly/ess-dive-bootcamp-2020>



MONTHLY WEBINARS

60+ Activities
in 3 years



LAB SITE VISITS



AGU DATA FAIR



ESS PI/CI MEETING TUTORIAL

Standards: Sample IDs and Metadata



2019 ESS-DIVE Sample PID/Metadata Field Pilot Test

SLAC SBR SFA: Kristin Boye, Zach Perzan

LLNL SBR SFA: Mavrik Zagarin, Nancy Merino

PNNL SBR SFA: Tony Goldman

ANL SBR SFA:

LBNL SBR SFA: and TES

Below:

Eoin Brodie **Picardo Eloy**

Alves, Dana Chawick

BNL TES SFA, NCEE Tropics and NCEE Arctic:

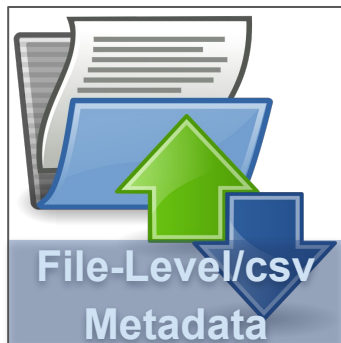
Kim Ely and Alistair Rogers

2476

**Registered
ESS IGSNs**



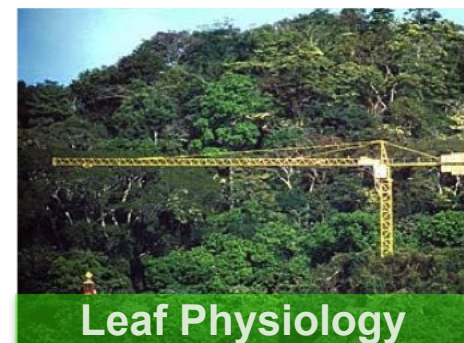
Standards Developed by Community Fund Partners



Velliquette, Devarakonda, Heinz (ORNL)



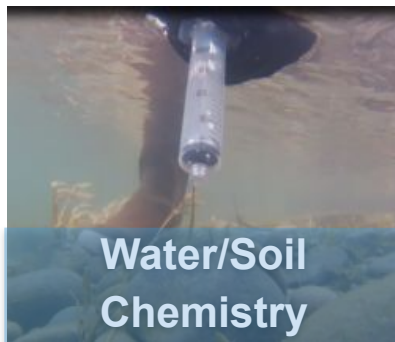
Bond-Lamberty, Pennington (PNNL)



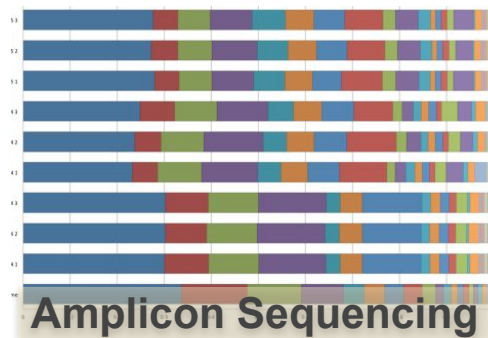
Rogers, Ely (BNL)



Goldman (PNNL)



Boye (SLAC)



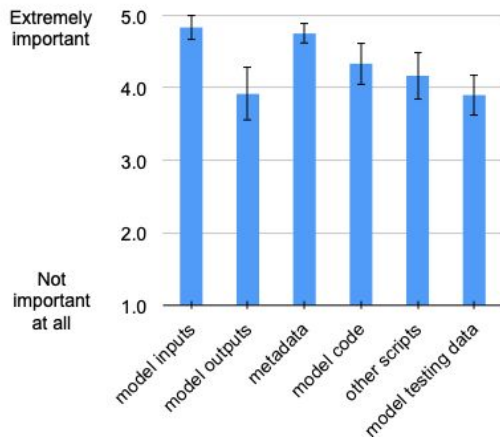
Weisenhorn (ANL)



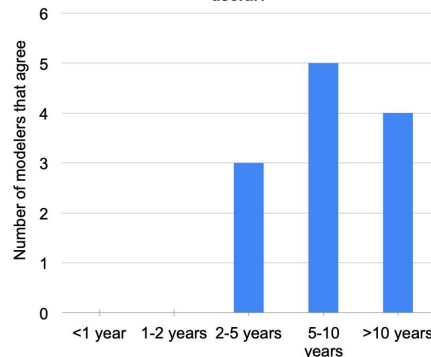
Model Data Archiving Survey and Whitepaper



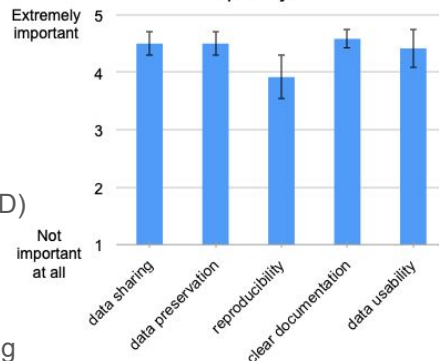
What model data are worth archiving?



How long does archived model data remain useful?



Importance of having these features in the repository?



Models used

- ELM
- ELM-FATES
- ELM-BETR
- CLM
- PFLTRAN
- CABLE
- SDVGM
- GDAY
- ED2
- LPJ-GUESS
- ATF
- ATS
- OpenFOAM (CFD)
- Crunch
- Crunch-Flow
- SWAT
- Machine Learning



ESS-DIVE
Deep Insight for Earth Science Data

This is a non-peer reviewed preprint submitted to EarthArXiv

WHITEPAPER

May 6, 2020

Addressing Model Data Archiving Needs for the Department of Energy's Environmental Systems Science Community

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Abstract

Researchers in the Department of Energy's ESS program use a variety of models to advance robust, scale-aware predictions of terrestrial and subsurface ecosystems. ESS projects typically conduct field observations and experiments coupled with modeling exercises using a model-experimental (ModEx) approach that enables iterative co-development of experiments and models, and ensures that experimental data needed to parameterize and test models are collected. Thus preserving "model data" comprising the outputs from simulations, as well as driving, parameterization and validation data with associated codes is becoming increasingly important. The ESS-DIVE repository stores data associated with the ESS programs and conducted a months long survey of the ESS community to identify need sharing, and utilizing model data. Here, we present the results of the community survey.

doi: [10.31223/osf.io/acdk4](https://doi.org/10.31223/osf.io/acdk4)



Connect With Our Team!



ess-dive.lbl.gov

ess-dive-support@lbl.gov

To stay updated:

ess-dive-community@lbl.gov

[#essdive](https://twitter.com/essdive)

Acknowledgements

Funding: EESSD Data Management

Advisory Groups: ESS-DIVE Archive Partnership Board, ESS Cyberinfrastructure Working Groups

