Overview of the IPCC Inventory Software for National Greenhouse Gas Inventories and its interoperability with UNFCCC CRT

UNFCCC Side Event, UNFCCC COP28

IPCC TFI TSU

ipcc

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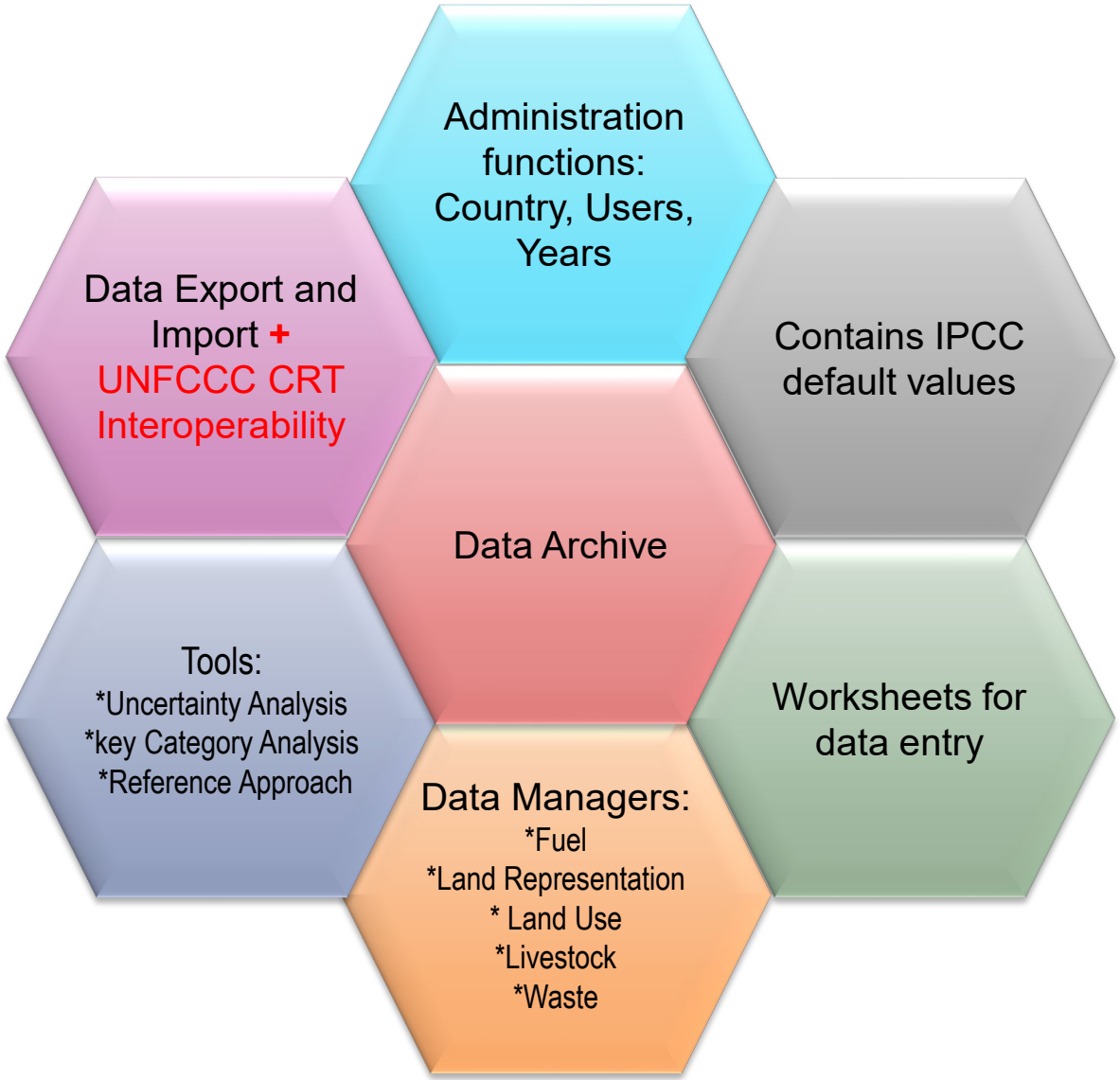
IPCC Inventory Software

- IPCC Inventory Software was first released in 2012. Initially, it was designed to be a simple tool implementing only Tier 1 methods according to the *2006 IPCC Guidelines*
- Latest version, 2.89, has been released on November 28, 2023, for UNFCCC COP28
- Version 2.89 implements the following:
  - all Methodological Tiers & Approaches according to the *2006 IPCC Guidelines*, and its
    - ✓*Wetlands Supplement* (in lilac colour)
    - ✓in addition, some elements of the *2019 Refinement* (in magenta colour) to facilitate Interoperability with the UNFCCC CRT Reporting tool
  - Calculation of Indirect CO_2 and N_2O emissions according to the *2006 IPCC Guidelines and its 2019 Refinement*
  - Interoperability functionality with the UNFCCC CRT Reporting tool (Energy Sector, Waste sector, Agriculture categories)

Version 2.89

- **More features**
  - allows **subnational level of reporting** *(e.g., tracking specific activities or regions)*
  - allows for each source/sink to use either a **single methodological Tier or a mix of Tiers**
  - allows, in each equation, to **input user-specific values for EFs and parameters**
  - allows different categories/sectors to be developed simultaneously
  - implements **AR5 GWP_{100}** values *(and allows any other user-specific metric to be applied)*
  - stores the entire set of information of NGHGI within a single database

Architecture



- MSAccess (ACE OLEDB 12) for WindowsOS
- ACCDB file, *backup function*
- Microsoft .NET Framework 4.6.2
- Password protected

NEVER FORGET PASSWORD!

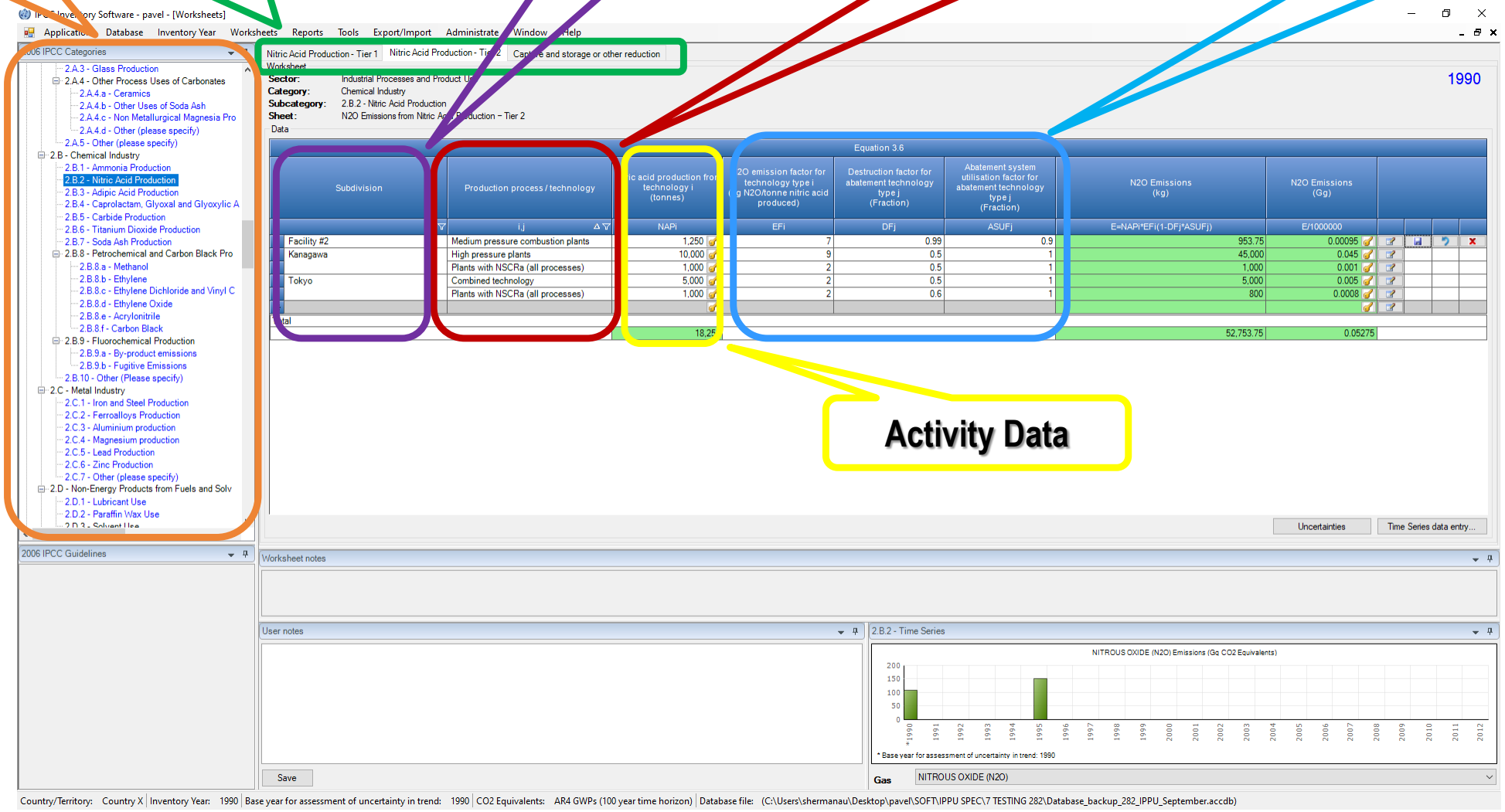
Categories

Worksheets

Sub-divisions

Default or User-defined process/technology

Default or User-defined EF & parameters



Activity Data

Example of a worksheet

Reporting

Main Menu

→ Report

IPCC Report	Level	Contents
Short summary (IPCC)	1.A	Emissions/Removals
Summary (IPCC)	1.A.1	Emissions/Removals
Sectoral (IPCC)	1.A.1.a.ii (most disaggregated level)	Emissions/Removals
Background (IPCC)	1.A.1.a.ii (most disaggregated level)	AD, Emissions/Removals

Main Menu

→ Export

UNFCCC Report	Level	Contents
NAI 1 & 2 (UNFCCC 17/CP.8)	1.A.1	Emissions/Removals

Note: *All reports can be exported as MS Excel file*

Ongoing work

- **Paris Agreement requirements**
  - Interoperability with UNFCCC reporting tool for Common Reporting Tables (*Decision 5/CMA.3*), land categories and IPPU sector
- **Other**
  - Notation Keys
  - Time series export/import
  - Uncertainty Analysis
  - Guidebooks

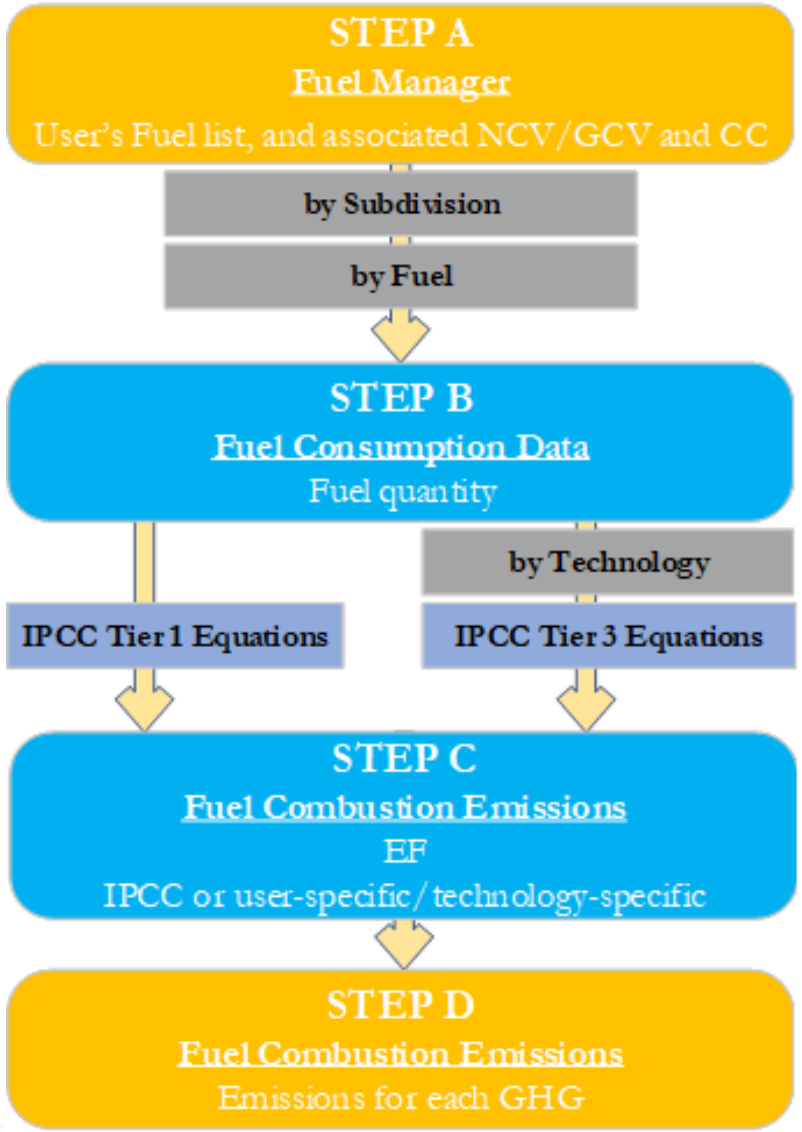
Guidebook - Scope

- Guide to estimate anthropogenic GHG emissions and removals from each inventory category by implementing all methodological Tiers & Approaches according to the *2006 IPCC Guidelines* and its ***Wetlands Supplement*** with elements of the *2019 Refinement*.

- **Software users SHALL be familiar with the IPCC methodologies and read the *Software Manual*** (*downloadable from the "Help" menu*) before going through the Guidebook.

✓ ***The Guidebook does not replace guidance provided in the IPCC Methodology Reports***

Guidebook - Structure



- Category by category, the Guidebook shows the workflow of data input and calculation in each worksheet when implementing any of the available IPCC methodological Tiers and Approaches to estimate anthropogenic GHG emissions/removals

- Guidebook Appendices describe the use of multi-category components (e.g., Fuel manager)

Land Representation

- **Land Representation** deals with:

  I. **Classification of land according to bio-physical** -*climate, soil, vegetation*- **and socio-economic** -*use, management (e.g. age-class)*- **variables** aimed at identifying units of land homogenous for C stocks levels and dynamics [Land use categories/subcategories/subdivisions]

  II. **Identification and tracking across the inventory time series of units of land** –*i.e. land area homogeneous for variables of interest, including current and historical classification*– [Area data to estimate C stock changes and other GHG emissions]

- **It is the most data intensive and thus labour requiring dataset in an NGHGI**

Land Representation Tool

Thus, working on an add-on will provide the following functions:

I. Customization of mask for data collection;

II. Collection of sampling data on land cover/use through multi-spectral and multi-temporal analysis of remotely sensed images;

III. Analysing data collected by producing annual matrices of land use and land-use change (Approach 2) or a dataset of units of land (Approach 3);

IV. Assessing bias and correcting for it, then calculating standard error of adjusted area data;

V. Gap-filling the time series of adjusted annual matrices to ensure a complete land representation;

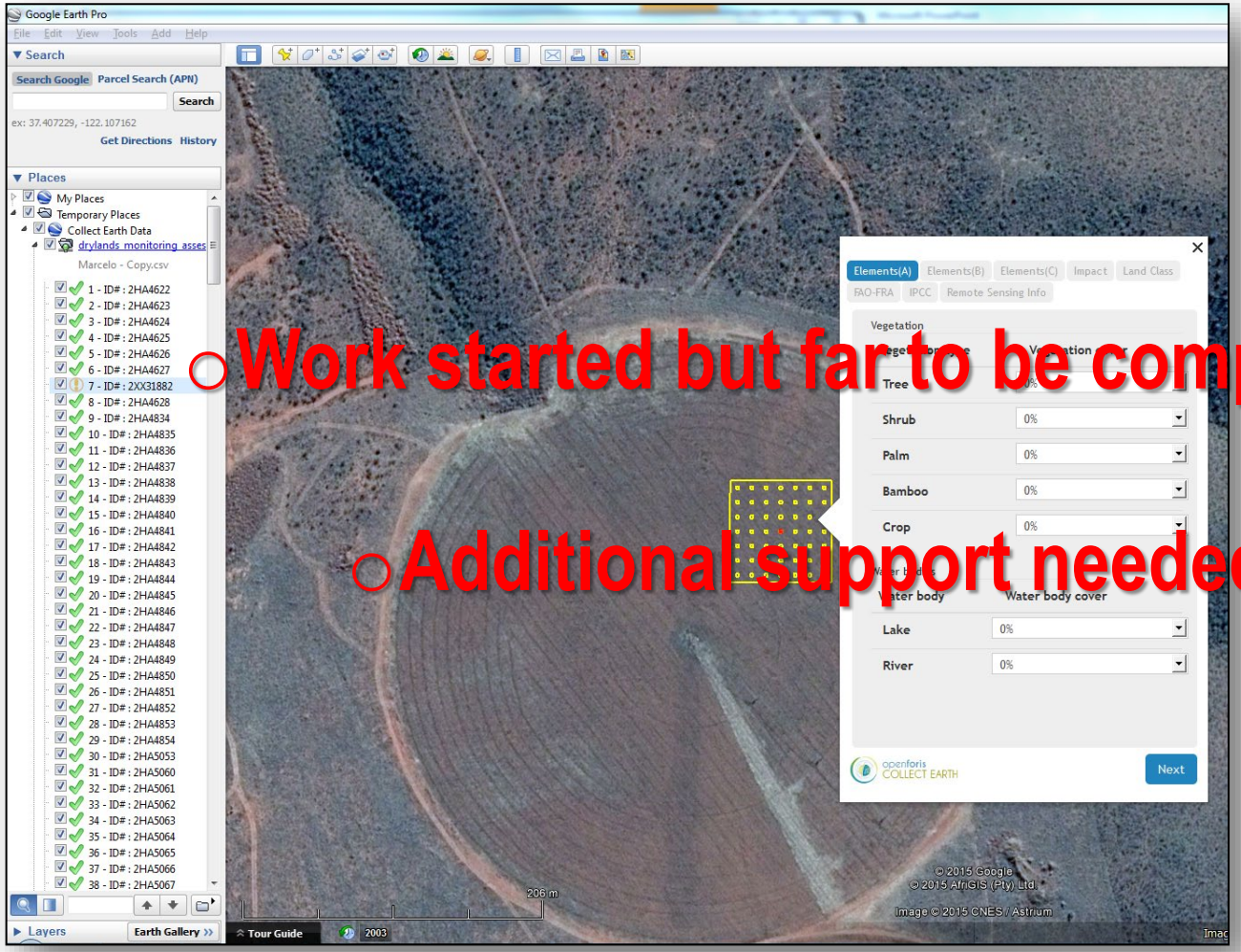
VI. For each year of the time series, producing the land representation, as activity data for each and every land category, with associated uncertainties;

VII. Exporting the land representation in a file readily uploadable in the IPCC Inventory software.

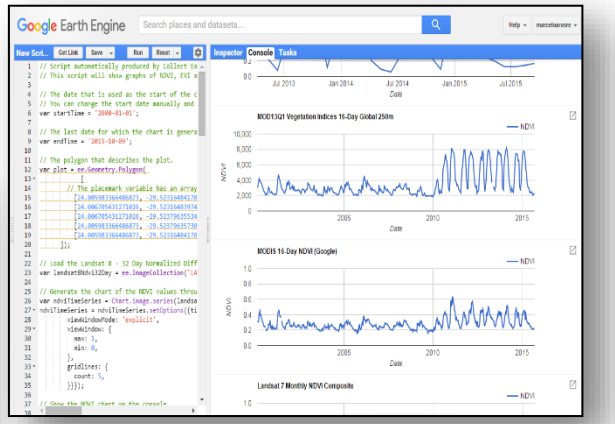
Collect Earth

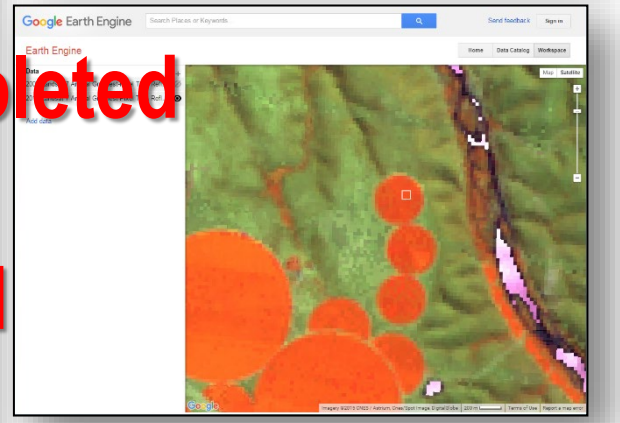
an open source tool for augmented visual interpretation

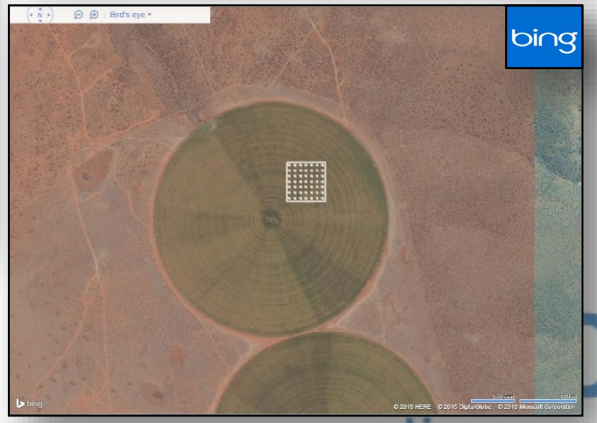
Land Representation Tool

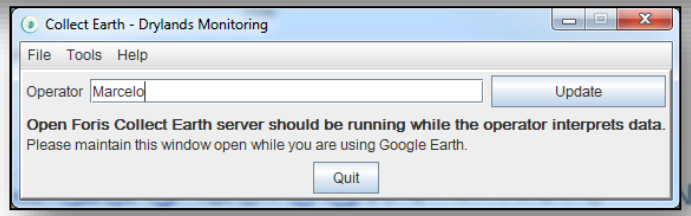


- Work started but far to be completed
- Additional support needed









https://openforis.org/tools/collect-earth/

http://www.mdpi.com/2072-4292/8/10/807

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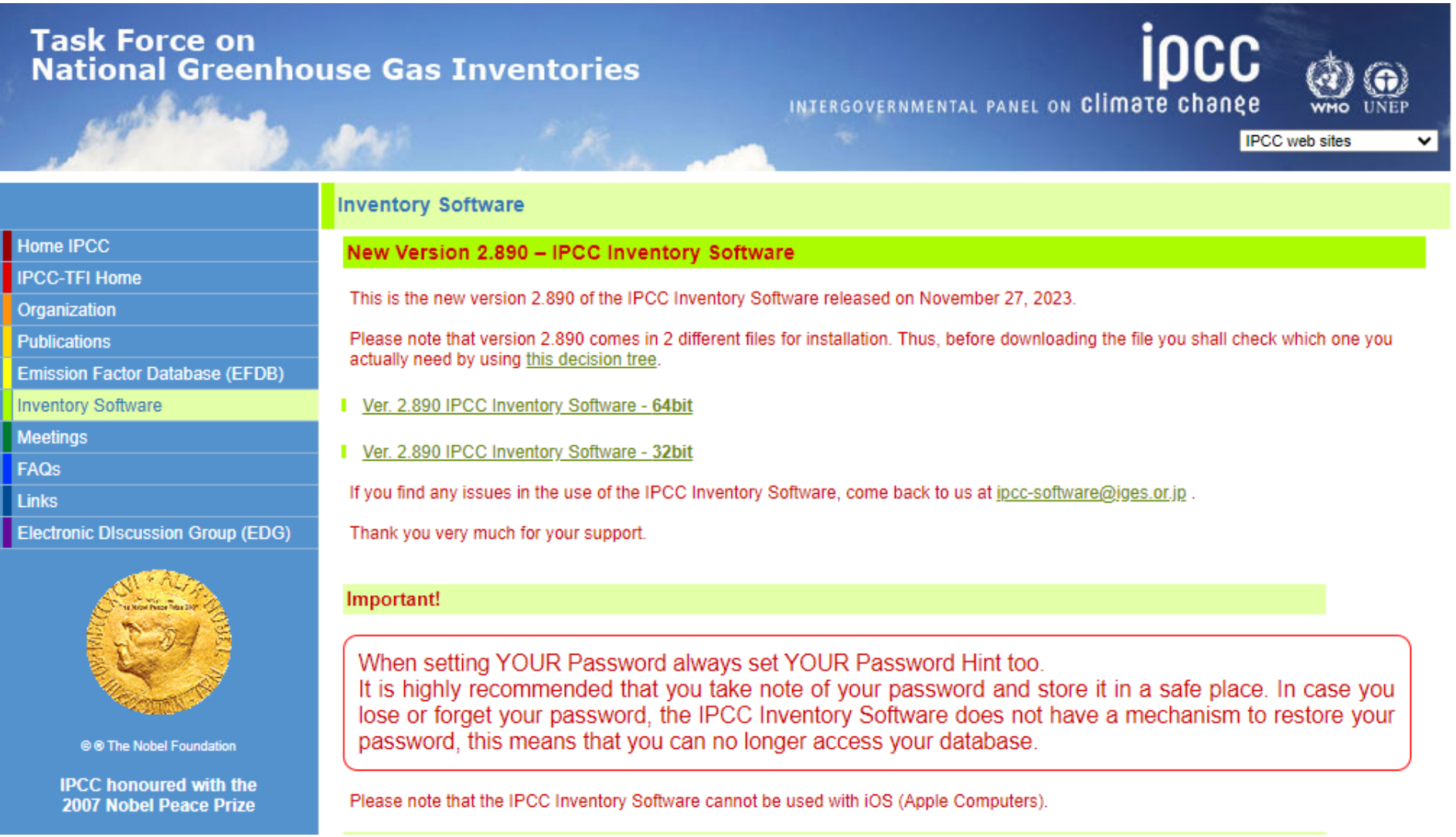
Download

https://www.ipcc-nggip.iges.or.jp/software/index.html



- Version 2.89 of the IPCC Inventory Software comes with two alternative installation packages: 32 bit vs. 64bit.
- Please support by using it and reporting any findings to: ipcc-software@iges.or.jp

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Support

- **IPCC TFI TSU is supporting the IPCC Inventory Software:**
  - **User Manual**
  - **Help Desk: ipcc-software@iges.or.jp**
  - **Pool of voluntary testers**, *to support software development and use*
  - **Cooperation with the UNFCCC at training workshops on the use of the IPCC Inventory Software**
  - **Annual IPCC meetings on feedback from software users**, *including issues where support is needed, or software improvements are envisaged*

Thank you

https://www.ipcc-nggip.iges.or.jp/software/index.html

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