

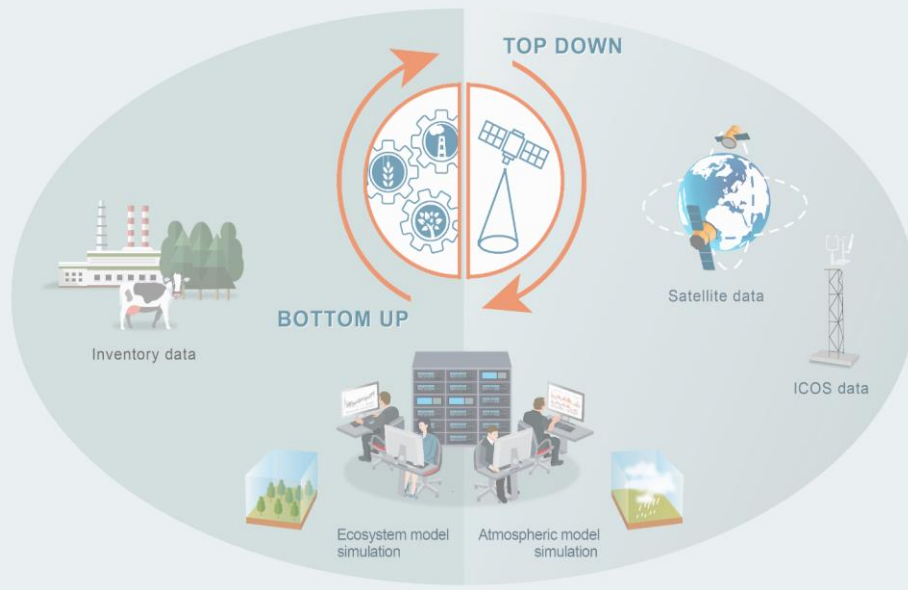


Biomass mapping for more spatially-explicit GHG-I

*WP3 – Martin Herold
Wageningen University*

29. Apr. 2021

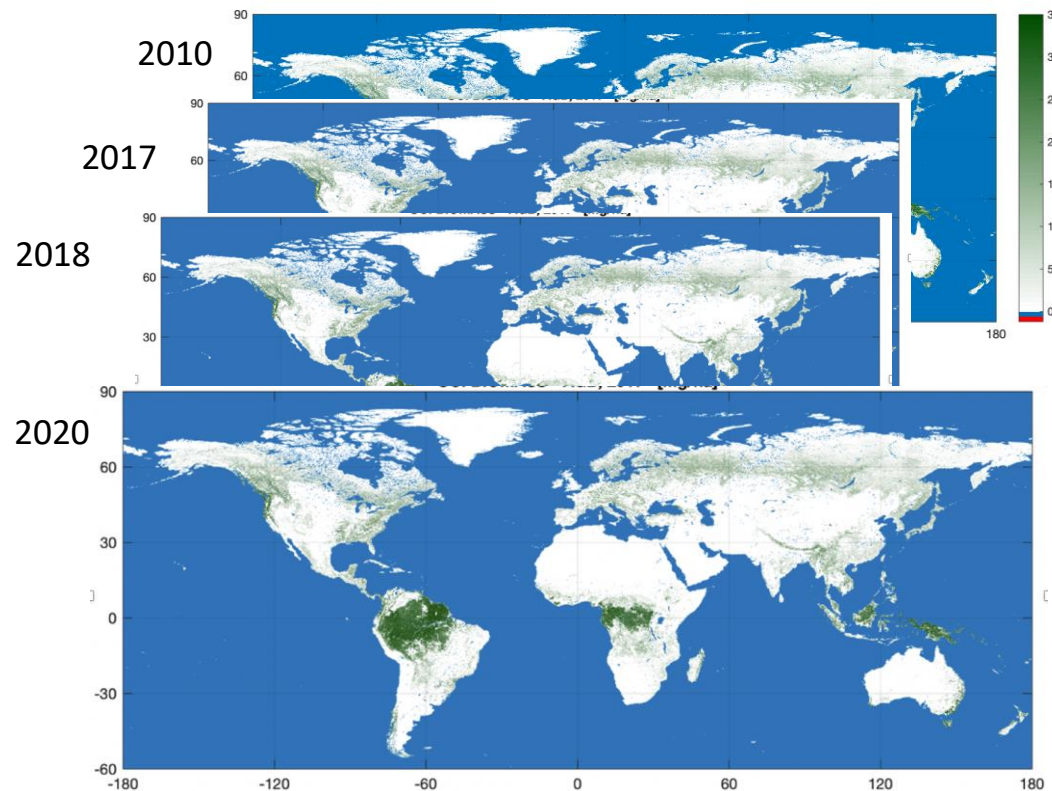
VERIFY GA



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776810

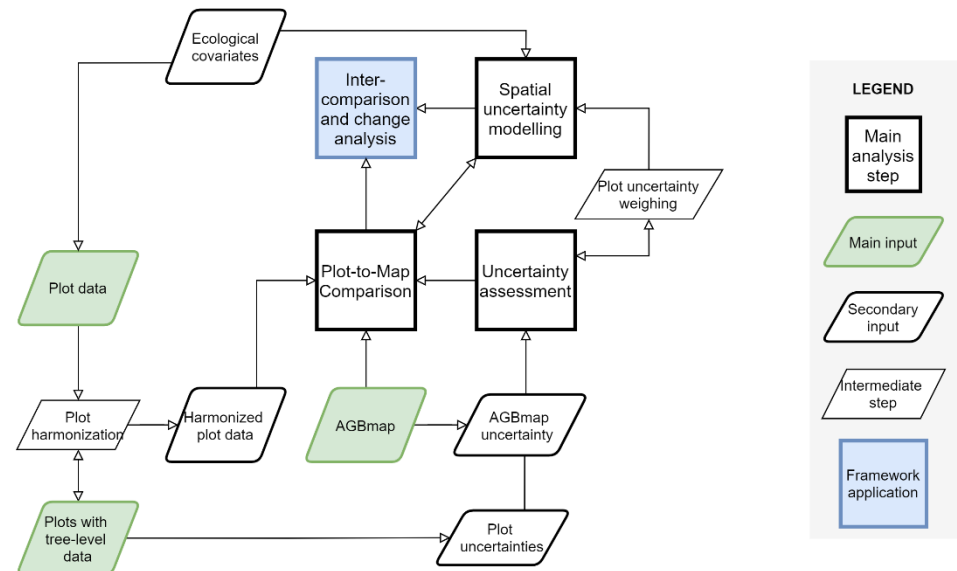
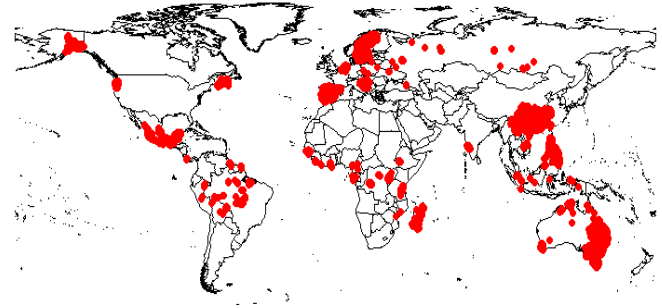
SPACE-BASED BIOMASS MONITORING

- Biomass density maps are wall-to-wall predictions of biomass for woody plants and trees - useful many applications in policy and management*
- Global biomass mapping is progressing (sensors, products, quality)
- Evolution of both static, annual maps and time-series (prototypes)
- Integration with NFIs to improve national GHG inventories based refined 2019 IPCC GPG for AFOLU and GFOI MGD 3.0



Global aboveground biomass derived from satellite data for at 100 m resolution for 2017, also 2010 and 2018, <http://cci.esa.int/biomass>, 2020 is in production

- C Multi-date biomass plot database
- C Tool to pre-process plot biomass data, quantify uncertainties, and perform plot-to-map comparison
- C Main functions include:
 - Removal of forest change plots
 - Temporal adjustment
 - Forest area scaling
 - Plot uncertainty estimation
 - Plot biomass estimation (Biomass-R)



Credit: Arnan Araza
Paper in submission

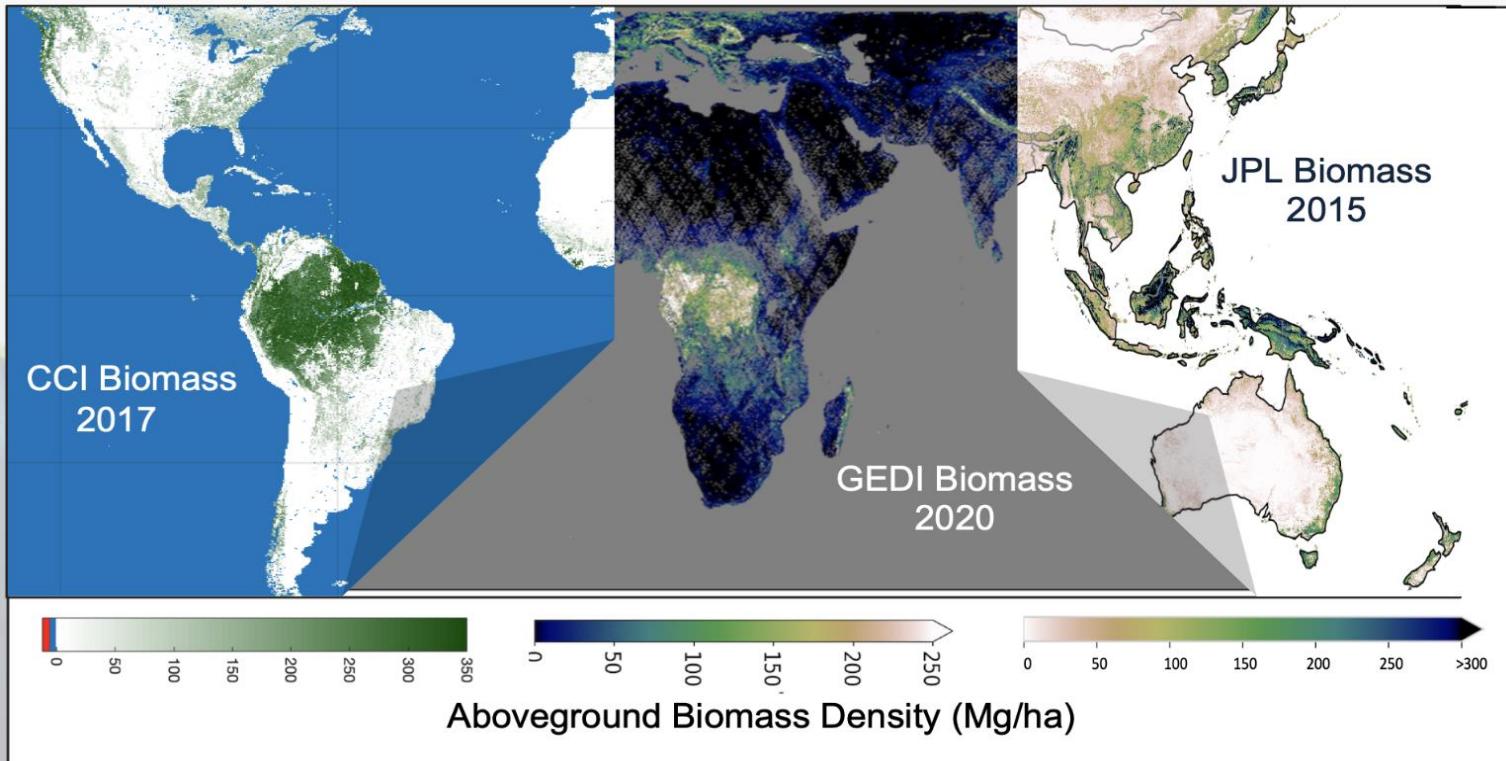
https://github.com/arnanaraza/PlotToMap_Local (Local use)

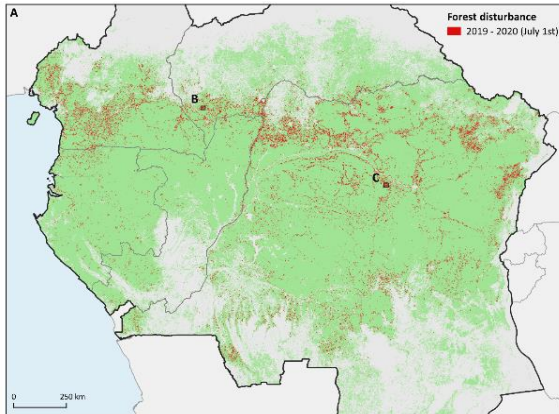
https://github.com/arnanaraza/PlotToMap_Interactive (Interactive, Shiny App)

To be implemented in MAAP

Biomass Product Harmonization Activity for the UNFCCC GST

- Several biomass products will be publicly available in advance of the UNFCCC Global Stocktake (e.g. NASA's GEDI, ESA's CCI Biomass)
- To bolster uptake of these considerable CEOS agency investments, **a single 2020 CEOS-endorsed biomass product is desirable** and demonstrations of space-based biomass uptake with countries





Sentinel-1-based weekly forest disturbance alerts at 10 m resolution for humid tropics in 31 countries (RADD alerts)

Paper: <https://iopscience.iop.org/article/10.1088/1748-9326/abd0a8>

RADD alert app:

<https://gena.users.earthengine.app/view/raddalert>

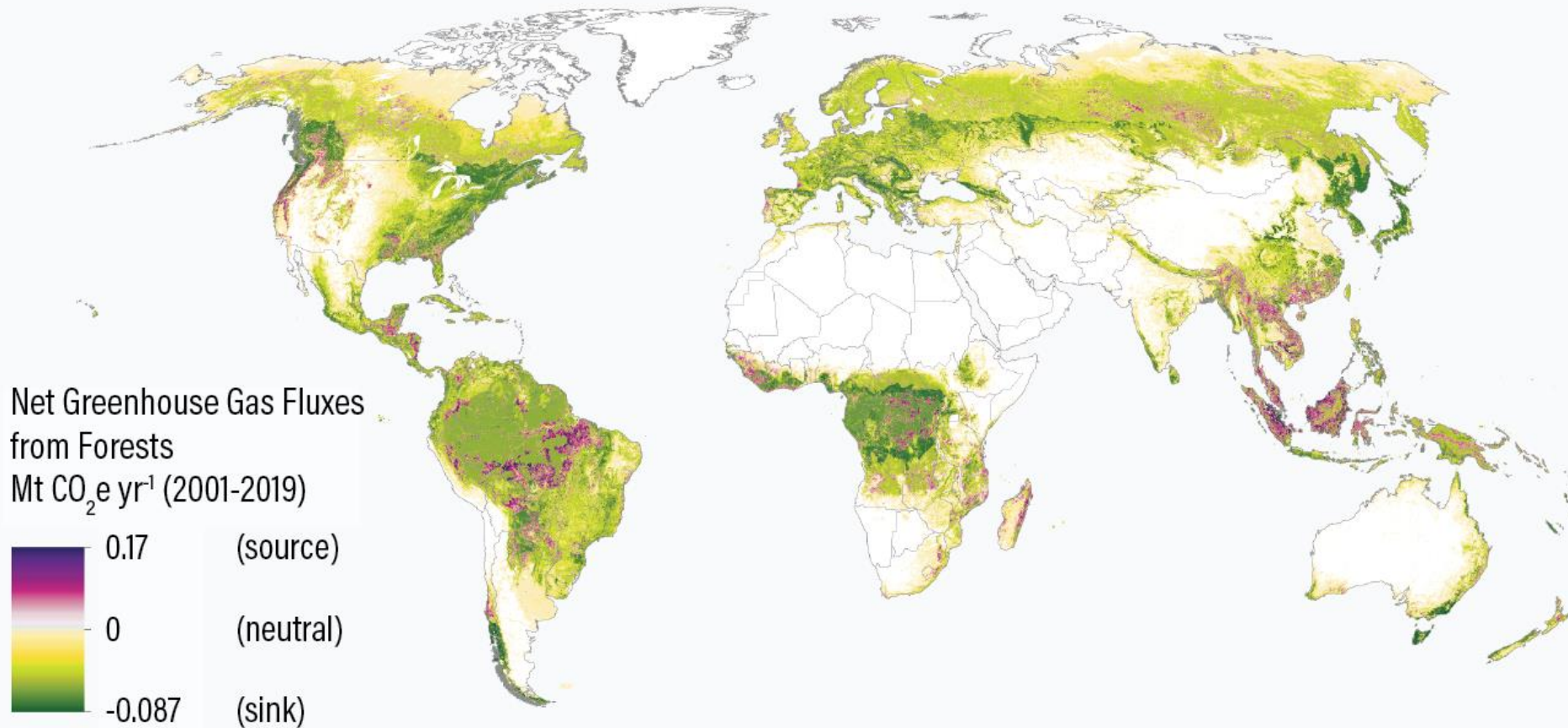
(also available on WRI's Global Forest Watch)

Sentinel-1-based weekly alerts, period Jan. 2019 – April. 2021

<http://radd-alert.wur.nl>



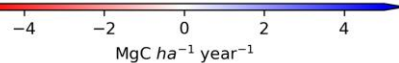
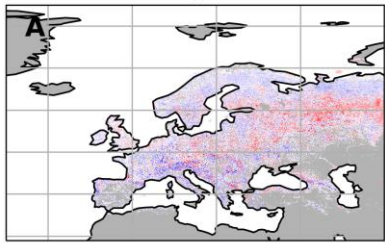
EARTH OBSERVATION DATA-DRIVEN, SPATIAL ESTIMATION OF FOREST-RELATED SINKS AND SOURCES



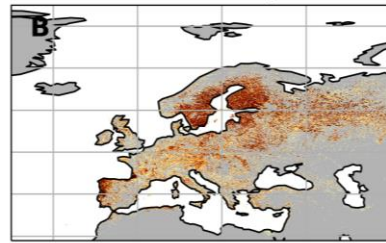
ON THE ROLE OF MANAGEMENT IN CARBON CHANGES OF EUROPEAN FORESTS *BESNARD ET AL. (IN PREP)*

- Carbon changes for the period 2010-2018 using bias-corrected Biomass-CCI data
- Derive proxies/covars. for forest management (e.g., forest management types (Nabuurs et al., 2019), tree cover loss intensity, forest age)
- Understand the role of forest management on carbon changes in Europe for the period 2010-2018 (at 1 km resolution)

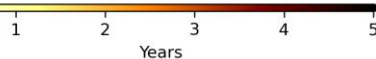
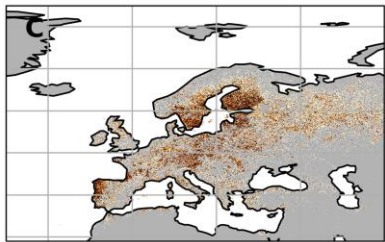
Carbon change 2010-2018



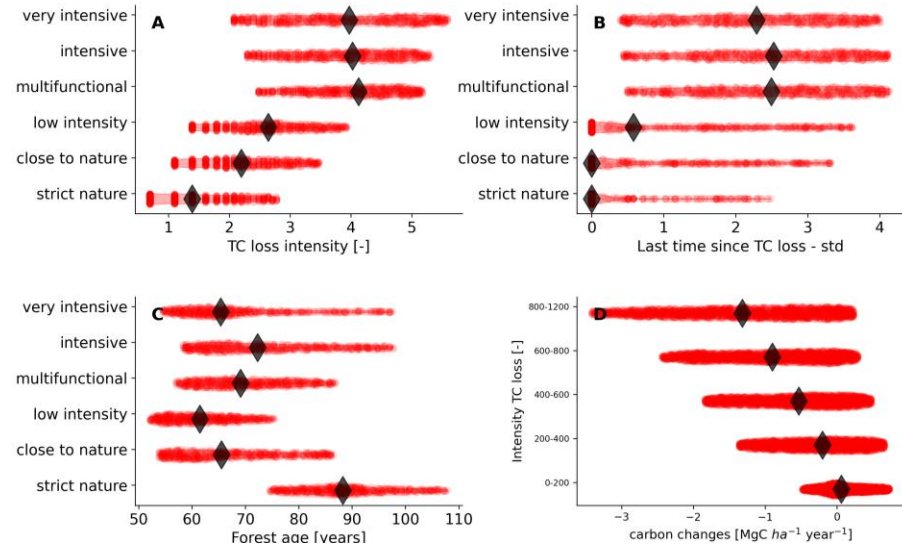
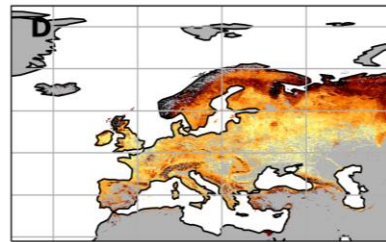
TC loss intensity



Last time since TC loss - std



Forest age





CONSIDERATIONS FOR USING BIOMASS & CHANGE MAPS

- ☛ Global biomass mapping is progressing in terms of space-based sensors (i.e. GEDI, BIOMASS) and new, updated products (i.e. ESA Biomass CCI)
- ☛ Integration in country estimation and reporting: some practical experience and ongoing research
- ☛ What could be the priorities for European GHG-I?:
 - ☛ Provide improved estimates in areas not well covered by NFIs (i.e. Eastern Europe)
 - ☛ New requirements (beyond IPCC GPG) for more localized and more frequent estimation and reporting?, i.e. ETF, EU regulation 841/2018
 - ☛ Links to management and mitigation: GHG assessments at scale of actions
 - ☛ More consistent European perspective (i.e. work of JRC)
 - ☛ Independent data for verification
- ☛ Need of partnerships and joint initiatives among (global) biomass mapping community and country experts