

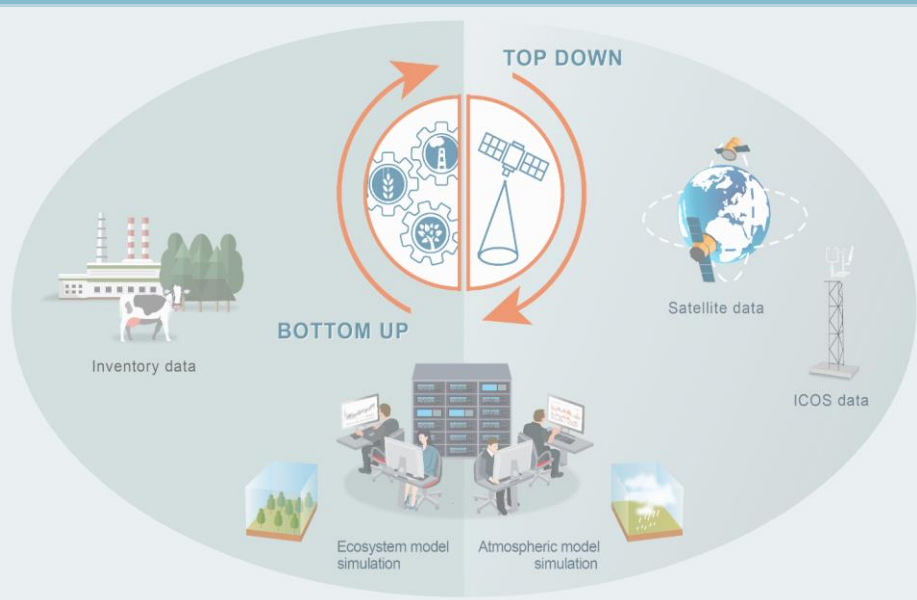


VERIFY General Assembly - 2022

WP8: Management, communication, exploitation and sustainable impacts

May 9th -11th , 2022

WP lead: CEA with ARTTIC



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



WP8 MANAGEMENT & DISSEMINATION

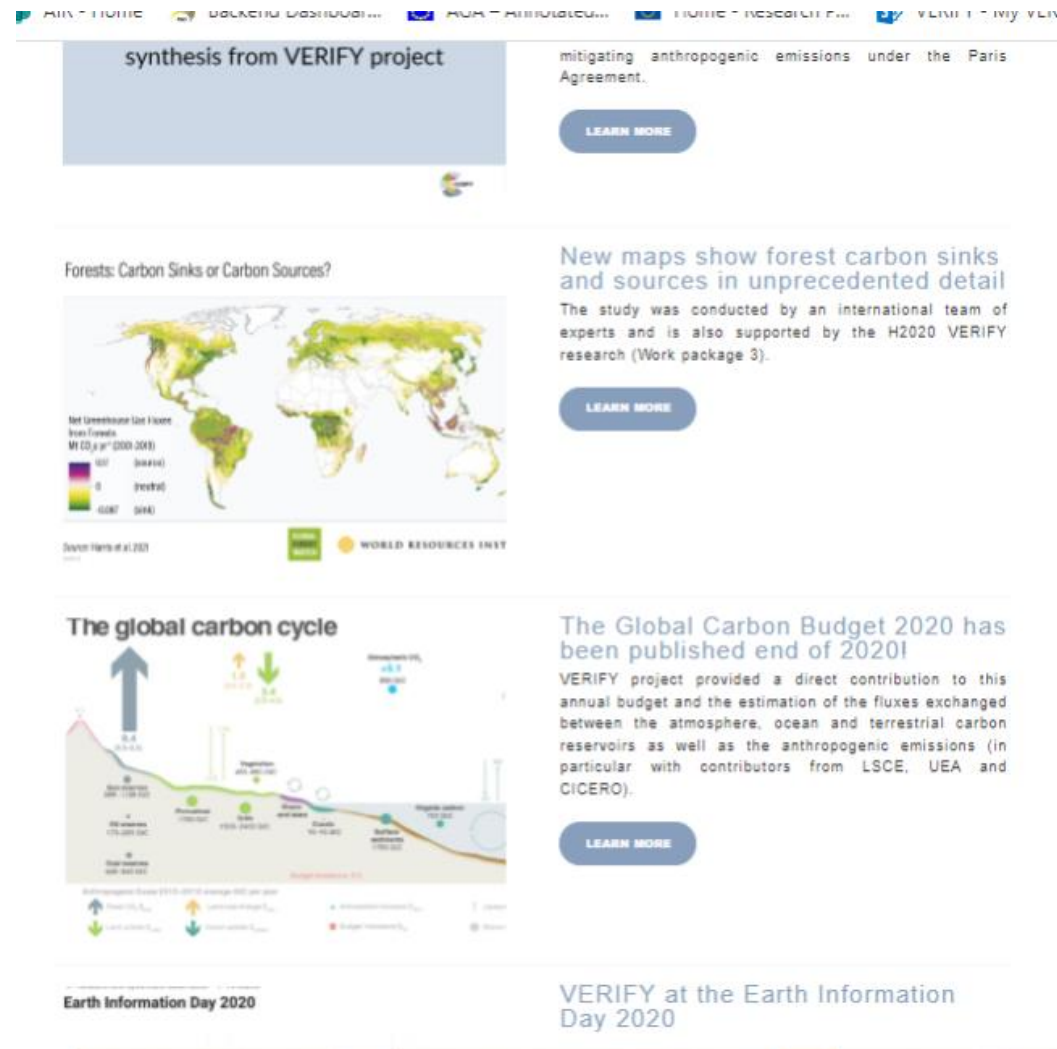
- Dissemination activities during the last 18 months
- Upcoming and final dissemination/exploitation activities
- Management: final reporting/project conclusion
- Deliverable status

Dissemination activities during the last 18 months

- more than 30 participations to national and international events including COP, AfOLU JRC workshops, WMO meetings, GEO events, ...
- still several events to come both virtual and in person

Title	Lead beneficiary	Type of dissemination activity
Validation of regional inverse modeling of greenhouse gases emissions with PM _{2.5} and INEEL	LULCC/CEA	participation to a conference
Assimilating data on co-emitted species in mesoscale to high temporal and spatial resolution inversion systems to improve the quantification of CO ₂ anthropogenic emissions over Europe	LSCE/CEA	participation to a conference
Analysis of the anthropogenic and biogenic NO _x emissions over 2008-2017: assessment of the trends in the 30 most populated urban areas in Europe	LSCE/CEA	participation to a conference
A 10-year analysis of the national scale NO _x and FFCO ₂ anthropogenic emissions from 2008 to 2017 in Europe based on OMI NO ₂ data	LSCE/CEA	participation to a conference
If You Can't Measure It, You Can't Improve It: How Research Community Can Efficiently Support GHG Inventories under the Paris Agreement - Invited speech at AGU	CMCC	participation to a conference
Presentation on the Outcome of VERIFY networking meetings at the CHE workshop	CMCC	Participation to a workshop
COP26 side event at the EU Pavillon with title: Earth observations and Emerging reporting and verification needs under the Paris Agreement (GEO-JRC side event)	CMCC	Participation to a side event
ICOS at WMO IG3IS stakeholder consultation meeting on cities and emissions	ICOS	participation in a workshop
ICOS at Climate Change Dialogues 2020 (virtual non-official SBSTA meeting)	ICOS	participation in UNFCCC meeting
ICOS at June Momentum for Climate Change (virtual non-official SBSTA meeting)	ICOS	participation in UNFCCC meeting
ICOS at ICRI 2021	ICOS	participation in a conference
ICOS at COP26 (Glasgow)	ICOS	participation in UNFCCC meeting
ICOS at GEO XVII (virtual)	ICOS	participation in a conference
ICOS at WMO meeting "Evaluating the performance of the GAW network for GCOS"	ICOS	participation in a workshop
Kick-off of the PAUL - ICOS Cities project	ICOS	organization of a conference
ICOS at SBSTA 56	ICOS	participation in UNFCCC meeting
ICOS Science Conference 2020	ICOS	organization of a conference
28-29 April 2021: VERIFY GA: presentation on WP5 progress and synthesis	VU	Presentation
25 May 2021: USA, CHN and IDN WP5 workshop: presentation: outcome and lessons learned from the VERIFY exercise for EU	VU	Presentation
RECCAP2 meetings (during the year 2021)	VU	participation in meetings
Participation in the AfOLU JRC workshop (15, 18-19 November 2021)	VU	participation in meetings
Claes et al. (2020): The return of the Eastern European carbon sink. AGU Fall Meeting 2020.	LSCE/CEA	Presentation
- Bultan et al. (2022): Tracking 21st century anthropogenic and natural carbon fluxes through model-data integration. 2022 Living Planet Symposium.	LMU	Presentation
- Ganzenmüller et al. (2021): Updated land use and land cover change (LULCC) emission estimates based on new high-resolution LULCC forcing data. EGU General Assembly Conference 2021.	LMU	Presentation
- Rosan et al. (2021): Assessment of land use and land cover datasets for Brazil and impact on C emissions. EGU General Assembly Conference 2021.	LMU, MPI	Presentation
- Winkler et al. (2022): The Eastern European land carbon sink. 2022 Living Planet Symposium.	WUR	Presentation
- Ganzenmüller et al. (2022): Land-use change emissions based on high-resolution data substantially lower than previously estimated. 2022 Living Planet Symposium.	LMU	poster
- P. Regnier, F. Lacroix, and RECCAP2-LOAC group. Coastal Ocean CO ₂ fluxes and C cycle. Ocean Carbon & Biogeochemistry Working Group on Carbon Gaps Virtual Meeting. May 26-27, 2021.	ULB	Presentation
- P. Regnier. The land-to-ocean loops of the global carbon cycle. Symposium "Le cycle du carbone dans l'océan", Collège de France, Paris, June 18, 2021.	ULB	Presentation
- P. Regnier, J. Terhaar, R. Lauerwald, N. Gruber and L. Bopp. Around one third of current Arctic Ocean primary production sustained by rivers and coastal erosion. ASLO 2021 Aquatic Science Meeting. June 27th, 2021.	ULB	Presentation
- M. Maisonnier, P. Regnier, A. Jabbari, R. Lauerwald, T. Maavara and D. Bastviken. CH ₄ emissions from European lakes: budget, drivers and spatio-temporal variability. ASLO 2021 Aquatic Science Meeting. June 27th, 2021.	ULB	Presentation
- M. Maisonnier, D. Bastviken, R. Lauerwald and P. Regnier. A new process-based model for regional-scale assessment of lake CH ₄ emissions: resolving the spatio-temporal variability in diffusive and ebullitive fluxes from European lakes. 36th Congress of the International Society of Limnology, Berlin, August 2022 (to be held).	ULB	Presentation

- **News** page and **Event** page refer to main news and events for VERIFY partners.
- Twitter page is regularly updated with news on events, publications, re-tweets from partners, ...



The screenshot displays the VERIFY website's news section. At the top, there's a navigation bar with links like 'HOME', 'ABOUT', 'CONTACT', and 'VERIFY'. Below the navigation bar, the main content area features several articles. The first article is titled 'synthesis from VERIFY project' and includes a 'LEARN MORE' button. The second article is titled 'Forests: Carbon Sinks or Carbon Sources?' and features a world map showing carbon sinks and sources. The third article is titled 'The global carbon cycle' and includes a diagram of the carbon cycle. The fourth article is titled 'The Global Carbon Budget 2020 has been published end of 2020!' and includes a 'LEARN MORE' button. At the bottom of the page, there's a section for 'Earth Information Day 2020'.

synthesis from VERIFY project

mitigating anthropogenic emissions under the Paris Agreement.

[LEARN MORE](#)

Forests: Carbon Sinks or Carbon Sources?

The study was conducted by an international team of experts and is also supported by the H2020 VERIFY research (Work package 3).

[LEARN MORE](#)

The global carbon cycle

The Global Carbon Budget 2020 has been published end of 2020!

VERIFY project provided a direct contribution to this annual budget and the estimation of the fluxes exchanged between the atmosphere, ocean and terrestrial carbon reservoirs as well as the anthropogenic emissions (in particular with contributors from LSCE, UEA and CICERO).

[LEARN MORE](#)

Earth Information Day 2020

VERIFY at the Earth Information Day 2020



Peer-reviewed scientific articles during the last 18 months

35 peer reviewed publications in 18 months! (Nature, ESSD, PhD thesis, ...)

Title of the scientific publication	DOI	Authors	Year
The consolidated European synthesis of CH4 and N2O emissions for the European Union and United Kingdom: 1990–2017	https://doi.org/10.5194/essd-13-2307-2021	Petrescu, A. M. R., Qiu, C., Ciais, P., Thompson, R. L., Peylin, P., McGrath, M. J., Solazzo, et al.	2021
The consolidated European synthesis of CO2 emissions and removals for the European Union and United Kingdom: 1990–2018	https://doi.org/10.5194/essd-13-2363-2021	Petrescu, A. M. R., McGrath, M. J., Andrew, R. M., Peylin, P., Peters, G. P., Ciais, P., Broquet, G., et al.	2021
Global fossil carbon emissions rebound near pre-COVID-19 levels	https://agupubs.onlinelibrary.wiley.com/doi/10.1002/2021GL092564	RB Jackson, P Friedlingstein, C Le Quéré, S Abernethy, RM Andrew, JG Canadell, P Ciais, SJ Davis, Zhu Deng, Zhu Liu, JJ Korsbakken, GP Peters	2022
A comprehensive and synthetic dataset for global, regional, and national greenhouse gas emissions by sector 1970–2018 with an extension to 2019	https://essd.copernicus.org/articles/13/5213/2021/	an C Minx, William F Lamb, Robbie M Andrew, Josep G Canadell, Monica Crippa, Niklas Döbeling, Piers M Forster, Diego Guizzardi, Jos Olivier, Glen P Peters, Julia Pongratz, Andy Reisinger, et al.	2021
Global Carbon Budget 2021	Just accepted	Pierre Friedlingstein, Matthew W Jones, Michael O'Sullivan, Robbie M Andrew, Dorothee CE Bakker, Judith Hauck, Corinne Le Quéré, Glen P Peters, Wouter Peters, Julia Pongratz, et al.	2022
Gridded fossil CO2 emissions and related O2 combustion consistent with national inventories 1959–2020	https://www.nature.com/articles/s41597-020-00779-6	Matthew Jones, Robbie M Andrew, Glen P Peters, Greet Janssens-Maenhout, Anthony J De-Gol, Philippe Ciais, Prabir K Patra, Frederic Chevallier, Corinne Le Quéré	2021
Emerging reporting and verification needs under the Paris Agreement: How can the research community effectively contribute?	https://www.sciencedirect.com/science/article/pii/S1365200117100109	Lucia Perugini, Guido Pells, Giacomo Grassi, Philippe Ciais, Han Dolman, Joanna I House, Glen P Peters, Pete Smith, Dirk Günther, Philippe Peylin	2021
Fossil CO2 emissions in the post-COVID-19 era	https://www.nature.com/articles/s41558-021-01001-0	Corinne Le Quéré, Glen P Peters, Pierre Friedlingstein, Robbie M Andrew, Josep G Canadell, Steven J Davis, Robert B Jackson, Matthew W Jones	2021
Global Carbon Budget 2020	https://essd.copernicus.org/articles/12/3269/2020/	Pierre Friedlingstein, Michael O'sullivan, Matthew W Jones, Robbie M Andrew, Judith Hauck, Ole Olsen, Glen P Peters, Wouter Peters, Julia Pongratz, Stephen Sitz, Corinne Le Quéré, et al.	2020
A comprehensive quantification of global nitrous oxide sources and sinks	https://www.nature.com/articles/s41586-020-01001-0	Hanqin Tian, Rongting Xu, Josep G Canadell, Rona L Thompson, Wilfried Winiwarter, Parvatha Suntharalingam, Eric A Davidson, Philippe Ciais, Robert B Jackson, Greet Janssens-Maenhout, et al.	2020
The global methane budget 2000–2017	https://essd.copernicus.org/articles/12/1561/2020/	Marielle Saunio, Ann R Stavert, Ben Poulter, Philippe Bousquet, Josep G Canadell, Robert B Jackson, Peter A Raymond, Edward J Dlugokencky, Sander Houweling, Prabir K Patra, Philippe Ciais et al.	2020
Variational regional inverse modeling of reactive species emissions with PYVAR-CHIMERE-v2019	doi:10.5194/gmd-14-2939-2021	A. Fortems-chéiney, G. Broquet, I. Pison, M. Saunio, E. Potier, A. Berchet, G. Dufour, G. Siour, H. Denier van der Gon, S. Delaet and K.F. Boersma	2021
Analysis of the anthropogenic and biogenic NO _x emissions over 2008–2017: assessment of the trends in the 30 most populated urban areas in Europe	doi:10.1029/2020GL092206	Lucia Perugini, Guido Pells, Giacomo Grassi, Philippe Ciais, Han Dolman, Joanna I House, Glen P Peters, Pete Smith, Dirk Günther, Philippe Peylin	2021
Emerging reporting and verification needs under the Paris Agreement: How can the research community effectively contribute?	https://doi.org/10.1016/j.envsci.2021.04.012	Deng, Z., Ciais, P., Tzompas-Sosa, Z. A., Saunio, M., Qiu, C., Tan, C., Sun, T., Ke, P., Cui, Y., Tanaka, K., Lin, X., Thompson, et al.	2021
Comparing national greenhouse gas budgets reported in UNFCCC inventories against atmospheric inversions	https://doi.org/10.5194/essd-14-1639-2022	Bultan et al.	2022
Tracking 21st century anthropogenic and natural carbon fluxes through model-data integration. Nature Communications.	https://doi.org/10.1038/s41467-020-20470-z	Rosan et al.	2021
A multi-data assessment of land use and land cover emissions from Brazil during 2000–2019. Environmental Research Letters 16 (7).	https://doi.org/10.1088/1748-9326/ac08c3	Chini et al.	2021
Land-use harmonization datasets for annual global carbon budgets. Earth System Science Data 13 (8)	doi.org/10.5194/essd-13-4175-2021	Gerstenmüller et al.	2022
Land-use change emissions based on high-resolution activity data substantially lower than previously estimated. Environmental Research Letters.	https://doi.org/10.1111/gcb.15460	Nakhavali M, Lauerwald R, Regnier P, Guenet B, Chadburn S, Friedlingstein P.	2021
Leaching of dissolved organic carbon from mineral soils plays a significant role in the terrestrial carbon balance. (2021) Glob Change Biol. 27: 1083–1096.	https://doi.org/10.1029/2020GB006603	Lacroix, F., Iijima, T., Laruelle, G. G., & Regnier, P.	2021
Reconstructing the preindustrial coastal carbon cycle through a global ocean circulation model: was the global continental shelf already both autotrophic and a CO2 sink? Global Biogeochemical Cycles, 35, e2020GB006603.	DOI: https://doi.org/10.1525/elementa.2020.00180	Bianchi, TS, ... Regnier, P. et al.	2021
What global biogeochemical consequences will marine animal–sediment interactions have during climate change? Elem Sci Anth. 9: 1.	doi:10.1038/s41467-020-20470-z	Terhaar, J., Lauerwald R., Regnier P., Gruber N. and Bopp L.	2021
Around one third of current Arctic Ocean primary production sustained by rivers and coastal erosion. Nature Communications 12, 169.	https://doi.org/10.1029/2021GL095264	Xu, R., Tian, H., Pan, N., Thompson, R. L., Canadell, J. G., Davidson, E. A., et al.	2021
Magnitude and uncertainty of nitrous oxide emissions from North America based on bottom-up and top-down approaches: Informing future research and national inventories. Geophysical Research Letters, 48, e2021GL095264.	https://doi.org/10.1098/rsta.2020.0443	Stavert, A. R., Saunio, M., Canadell, J. G., Poulter, B., Jackson, R. B., Regnier, P., Lauerwald, R., Raymond, P. A., Allen, G. H., Patra, P. K., Bergamaschi, P., Bousquet, P., Chandra, N., Ciais, P., Gustafson, A., Ishizawa, M., Ito, A., Kleinen, T., Maksyutov, S., ... Zhuang, Q.	2022
Regional trends and drivers of the global methane budget. Global Change Biology, 28, 182–200.	https://doi.org/10.1111/gcb.15901	Thompson R.L., Regnier P. and Maisonnier M.	2021
Effects of extreme meteorological conditions in 2018 on European methane emissions estimated using atmospheric inversions. Phil. Trans. R. Soc. A 380: 20200443.	https://doi.org/10.5194/essd-13-4175-2021	Roobaert, A., Resplandy, L., Laruelle, G.G., Liao, E., Regnier, P.	2022
A framework to evaluate and elucidate the driving mechanisms of coastal sea surface pCO2 seasonality using an ocean general circulation model (MOM5-COBALE). Ocean Science, 18 (1), pp. 67–83.	doi:10.1038/s41558-021-01261-w	Zhang H., Chuine I., Regnier P., Ciais P. & Yuan W.	2022
Deciphering the multiple effects of climate warming on the temporal shift of leaf unfolding. Nature Climate Change, 12(2), 193–199.	doi:10.1038/s41558-021-04339-8	Ciais, P., ... Regnier, P., et al.	2022
Definitions and methods to estimate regional land carbon fluxes for the second phase of the Regional Carbon Cycle Assessment and Processes Project (RECCAP-2). Geoscientific Model Development, 15 (3), pp. 1289–1316.	doi:10.5194/essd-13-393-2022	Gommet, C., Lauerwald, R., Ciais, P., Guenet, B., Zhang, H., Regnier, P.	2022
Spatiotemporal patterns and drivers of terrestrial dissolved organic carbon (DOC) leaching into the European river network. Earth System Dynamics, 13 (1), pp. 393–418.	doi:10.1038/s41558-021-04339-8	Regnier, P., Resplandy, L., Najjar, R., and Ciais, P.	2022
The land-to-ocean loops of the global carbon cycle. Nature, 603, 401–410	https://doi.org/10.1038/s41558-021-04339-8	Zhang, H., Lauerwald, R., Regnier, P., Ciais, P., Van Oost, K., Naipal, V., Guenet, B. & Yuan, W.	2022
Estimating the lateral transfer of organic carbon through the European river network using a land surface model. Earth Syst. Dynam. Discuss., https://doi.org/10.5194/essd-2022-4 , 2022	https://doi.org/10.1038/s41558-021-04339-8	Zhang, H., Lauerwald, R., Ciais, P., Van Oost, K., Guenet, B. and Regnier P.	2022
Global change alters the amount and composition of land-carbon deliveries to European rivers and seas. Science Advances, submitted.	PhD thesis	Gommet C.	2022
Carbon fluxes along the European land-to-ocean continuum estimated by models and observations. Joint PhD degree awarded by ULB (P. Regnier, promotor) and UPSaclay (P. Ciais, R. Lauerwald, co-promoters), March 2022.	https://doi.org/10.1080/16000889.2021.1914989	Barbara Széniás, Antoine Berchet, Grégoire Broquet, Arjo Segers, Hugo Denier van der Gon, Maarten Krol, Joanna J.S. Hulleger, Anja Kiesow, Dirk Günther, Ana Maria Roxana Petrescu, Marielle Saunio, Philippe Bousquet & Isabelle Pison (2021)	2021
A pragmatic protocol for characterising errors in atmospheric inversions of methane emissions over Europe, Tellus B: Chemical and Physical Meteorology, 73:1, 1–23			



Peer-reviewed scientific articles during the last 18 months

- But still not all available on the web-site for 2021

SCIENTIFIC PUBLICATIONS

2021

2020

2019

2018

[Fossil CO2 emissions in the post-COVID-19 era](#)

Corinne Le Quéré, Glen P. Peters, Pierre Friedlingstein, Robbie M. Andrew, Josep G. Canadell, Steven J. Davis, Robert B. Jackson & Matthew W. Jones, 2021, Nat. Clim. Chang., doi: 10.1038/s41558-021-01001-0

[Gridded fossil CO2 emissions and related O2 combustion consistent with national inventories 1959-2018](#)

Jones, M.W., Andrew, R.M., Peters, G.P. et al., 2021, Sci Data, 8, doi :10.1038/s41597-020-00779-6

[Global maps of twenty-first century forest carbon fluxes](#)

Harris, N.L., Gibbs, D.A., Baccini, A. et al., 2021, Nat. Clim. Chang., doi :10.1038/s41558-020-00976-6

[The consolidated European synthesis of CO2 emissions and removals for the European Union and United Kingdom: 1990–2018](#)

Ana Maria Roxana Petrescu et al., 2021, Earth Syst. Sci. Data, 13, 2363–2406, doi :10.5194/essd-13-2363-2021

[The consolidated European synthesis of CH4 and N2O emissions for the European Union and United Kingdom: 1990–2017](#)

Ana Maria Roxana Petrescu et al., 2021, Earth Syst. Sci. Data, 13, 2307–2362, doi :10.5194/essd-13-2307-2021



PROGRESS ON DATA BASE AND DATA VISUALIZATION

<https://verify.lsce.ipsl.fr/index.php/products>



Challenges during last 18 months

- COVID-19 pandemics: conference cancellation, adaptation from physical meetings to online and hybrid meetings, creation of delay in results, deliverables, publications, whole project.
- Dissemination activities not always known in advance: please inform coordination team 2
on all last / upcoming events, inform on publications, as we can increase visibility through VERIFY social media/website.



Final Dissemination/Exploitation plan (D8.5)

- D8.5 is an update and the final version of D8.4 dissemination exploitation plan.
- It includes
 - updates from all partners on publications and dissemination activities
 - update on exploitation plan (input from D6.10 on legacy of VERIFY database)
 - target groups and how they were approached
 - list of dissemination tools, statistics on social media
- To be submitted by the end of May and **after receiving final inputs from all partners and D6.10**



FINAL STEPS ON DISSEMINATION

- Poster sessions (3 posters) in the lunch area ?
- A global article summarizing the efforts and results of the VERIFY project is going to be redacted co-authoring all VERIFY partners.
- VERIFY could be present during COP 27 to present the EU carbon budget from 2021 (together with CoCO2 ?).
- “Policymaker Meeting” with EC in Brussels (June) ?
- On-going meetings with various institutions (WMO, ..) and participation to numerous conferences by the end of the project and after the end of the project.
- Final remark: as usual, please make sure you acknowledge the project GA number, disseminate through your institution/personal social media, make sure your articles are: open-access, peer-reviewed, submitted before 31 July 2022 to be funded.



Final step : Final Reporting

- Reporting is considered complete when :
 - Technical report submitted (contributor: wp leaders, all)
 - Summary for publication (contributor: coordinator)
 - All dissemination listed (dissemination activities after 31 July will not be validated/funded)
 - Financial forms submitted (contributor: all) (including adjustment from part FormC)
 - All deliverables submitted
 - All milestones achieved
 - CFS attached to the concerned partners (threshold: 325k€ actual costs)



Final reporting : deadline

- Project end : 31/07/2022
- End of reporting period : 30/09/2022.
- EC will review periodic report during 90 days.
Final balance payment will follow early 2023.
- To anticipate this “difficult” period, templates for financial reporting will be sent in June and we will ask that you fill them for the end of July 2022.
- For the technical reporting, **deadline Early JULY**



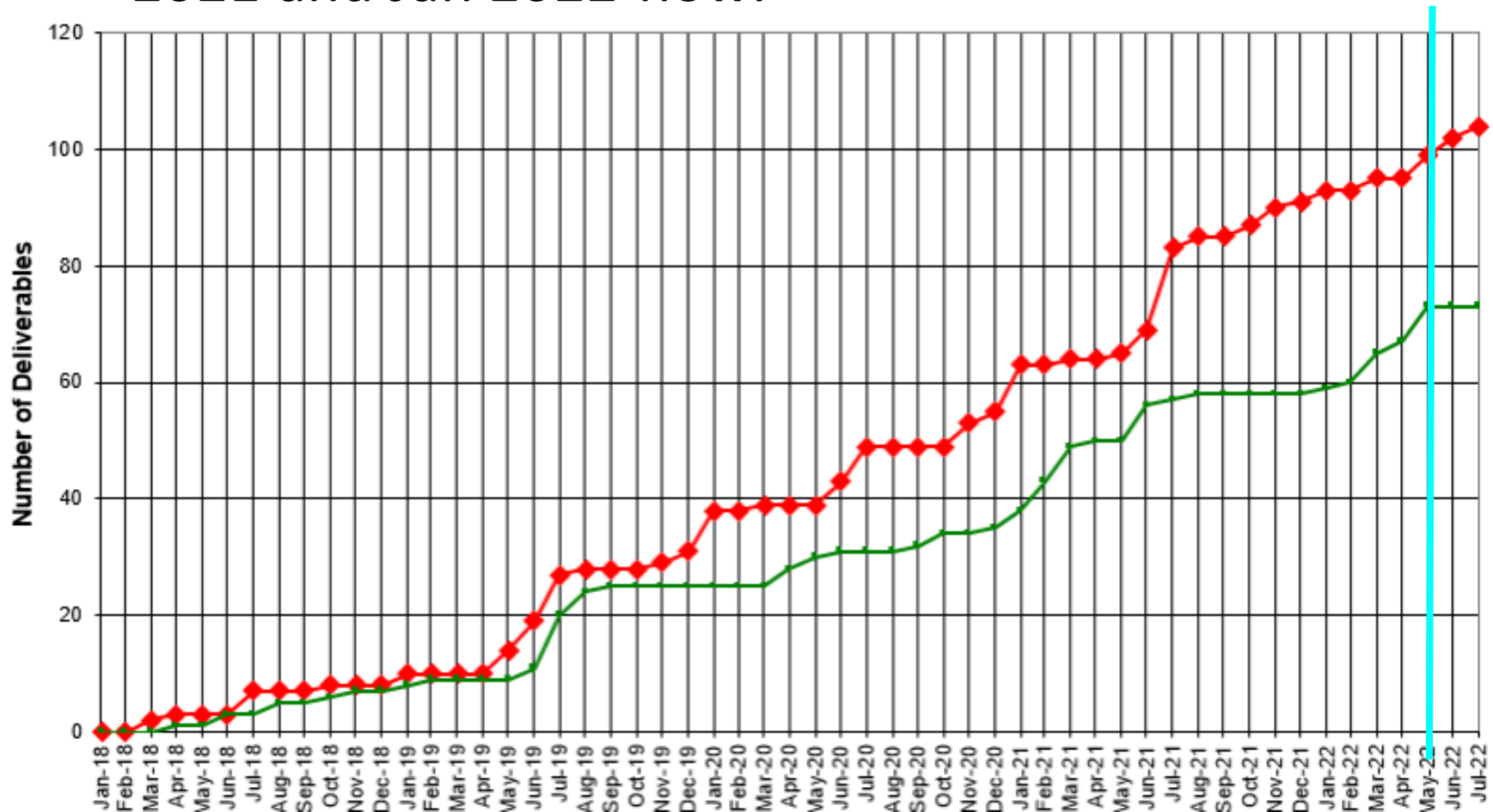
Final budget share....

- Some groups proposed to “share part of their budget” for the last 2022 GHG synthesis !
(following a call from the coordination team)
- Please update us in the coming weeks if you will not use all your budget (especially travel fund !)
- ⇒ Will be re-allocated to partner doing a last round of simulations for GHG synthesis covering 2021 (together with CoCO2)



DELIVERABLE INDICATOR DURING FULL PROJECT

- Delay during COVID pandemics but strong effort to catch up late deliverables between Jan-June 2021 and Jan 2022-now.





Thank you

Any questions?



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COORDINATION, GOVERNANCE & MANAGEMENT

- Milestone status
- Deliverable status
- Main activities during last period
- Main challenges
- How to finish the project



Milestone status

- 31 project milestones
- 6 milestones yet to be achieved

Milest one #	title	lead Beneficiary	Initial due date	Comment
15	Evaluation of model simulations & cont	CEA	31/07/2021	
29	Inversion results for methane by source type using the additional tracers ($\delta^{13}\text{C}$ CH ₄ and ethane)	FMI	31/10/2021	
30	Tested version of CIF working with multiple global and regional models	NILU	31/01/2022	
38	Data visualisation with temporal graphs/ maps	CEA	31/01/2022	
41	Description and comparison of the CCDASs proposed for Eastern flux reanalysis	WU	31/03/2021	linked to D2.13
44	potential of satellite CO ₂ observations for the NEE	CEA	31/09/2021	



Main activities during last period

- 2 amendments (6 month extension, partner updates)
- EB meetings (bi-monthly)
- follow-up with late deliverables
- organisation of large events (COP side events, ...)
- preparation of the reporting/answer to questions
- discussion on budget shift



Main challenges

- Covid-19 impacted the organisation of meetings/conferences, workload organisation
- War in Ukraine (termination of russian partners)
- Annual updates of measurement-based GHG national budgets and inventories (together with CoCO2)
- Synthesis paper with all partners



General information

- Acknowledgement for publications/presentations/posters
 - “This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 776810”
- Send papers to verify_coord@eurtd.com
- Inform verify_coord@eurtd.com of all upcoming dissemination activities
- Make sure publications are open access/ peer reviewed
- Anticipate with us any budget issues ? Escalate budget / time / quality issues before it’s too late (final report)



DISSEMINATION/EXPLOITATION

- Dissemination activities during the last 18 months
- Peer-reviewed scientific articles during the last 18 months
- Challenges for these 18 months
- Exploitation plan (D8.5)
- Final steps