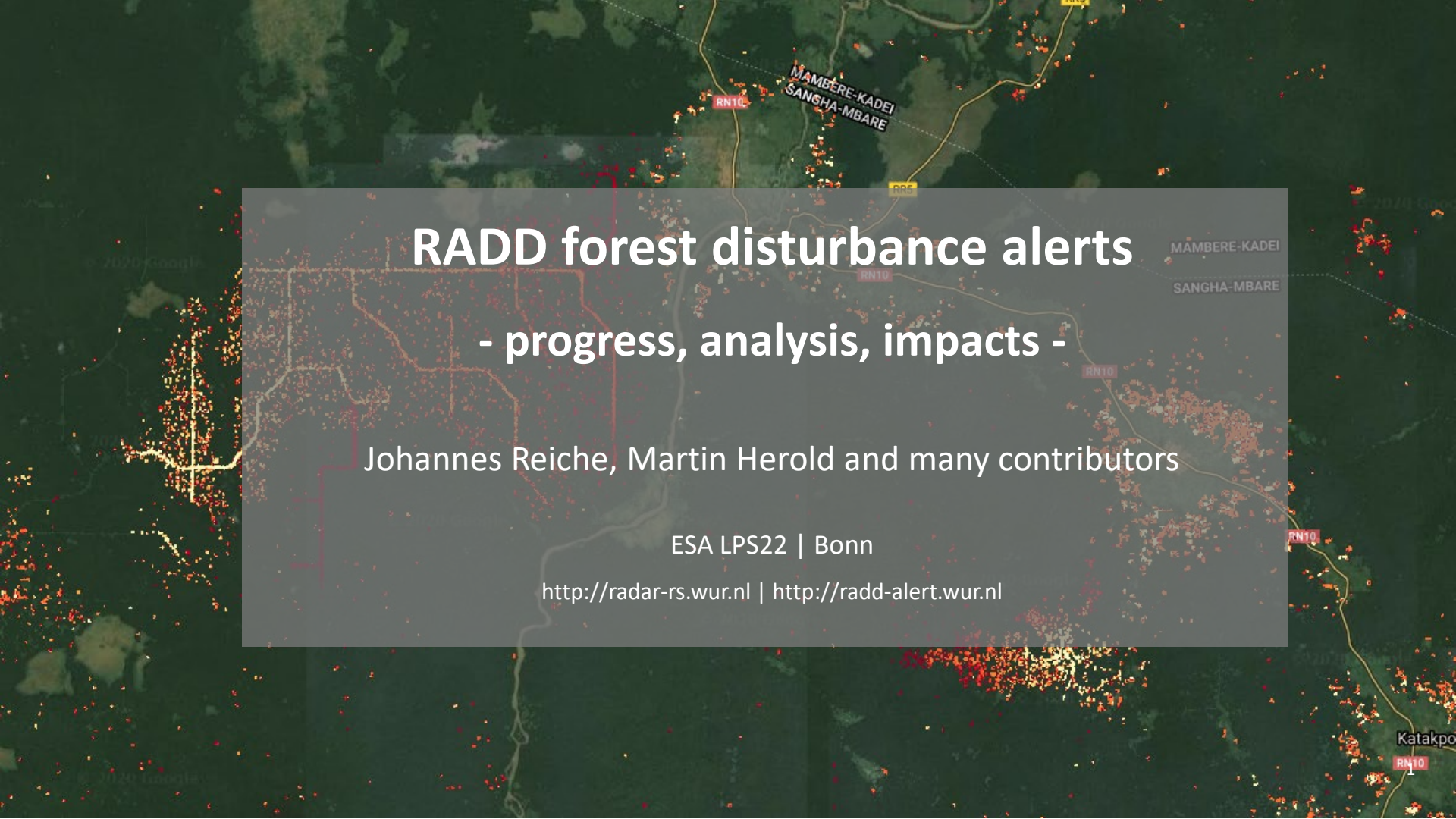


RADD forest disturbance alerts

- progress, analysis, impacts -

Johannes Reiche, Martin Herold and many contributors

ESA LPS22 | Bonn

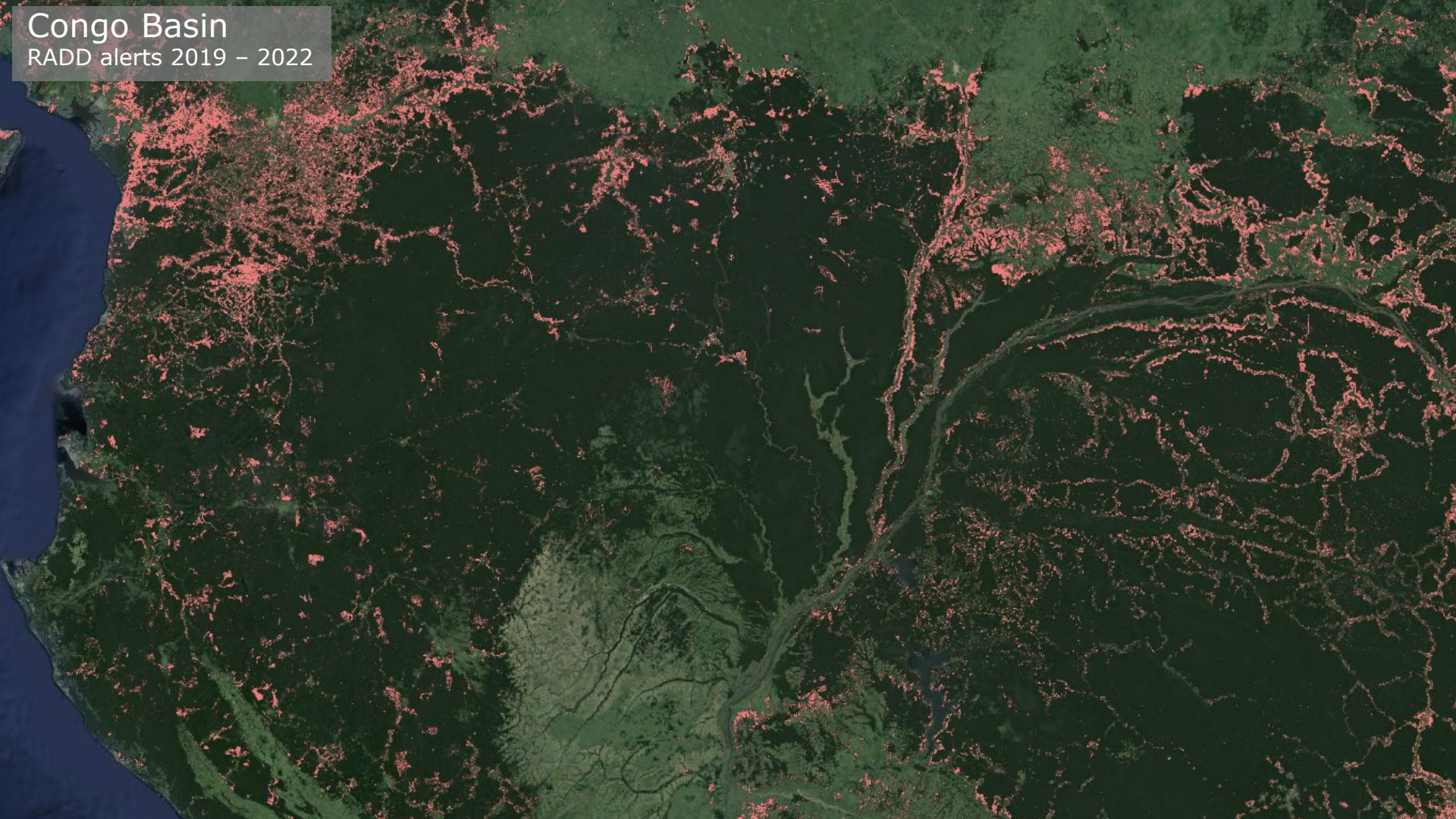
http://radar-rs.wur.nl | http://radd-alert.wur.nl

RADD (RAdar for Detecting Deforestation) alerts

- Forest disturbances alerts for the humid tropics using cloud-penetrating Sentinel-1 radar
- Collaboration with, e.g. Global Forest Watch, Google, UMD, ESA
- Weekly updates available via Global Forest Watch, SEPAL, GEE and http://radd-alert.wur.nl
- Complement existing alerts (e.g. GLAD, JJ-FAST) with the aim to support law enforcement & transparency

Current geographies: South America, Africa & Insular Southeast Asia

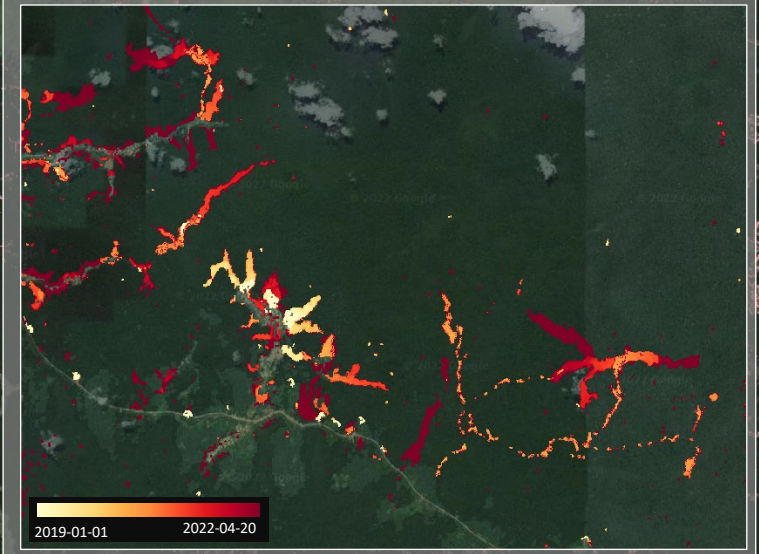
Reiche & many others (2021), ERL


Congo Basin
RADD alerts 2019 – 2022

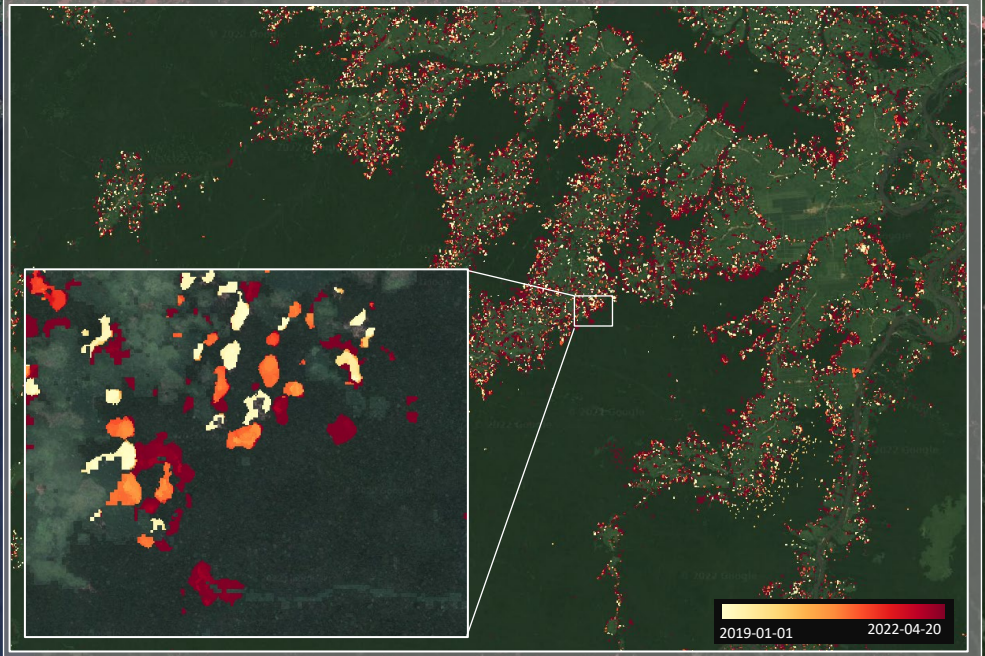
Selective tree logging
(Central African Republic)


January
February
March
September
October
November
Selective logging signal disappears quickly
Planet Labs imagery
Reiche et al., 2021 (ERL)

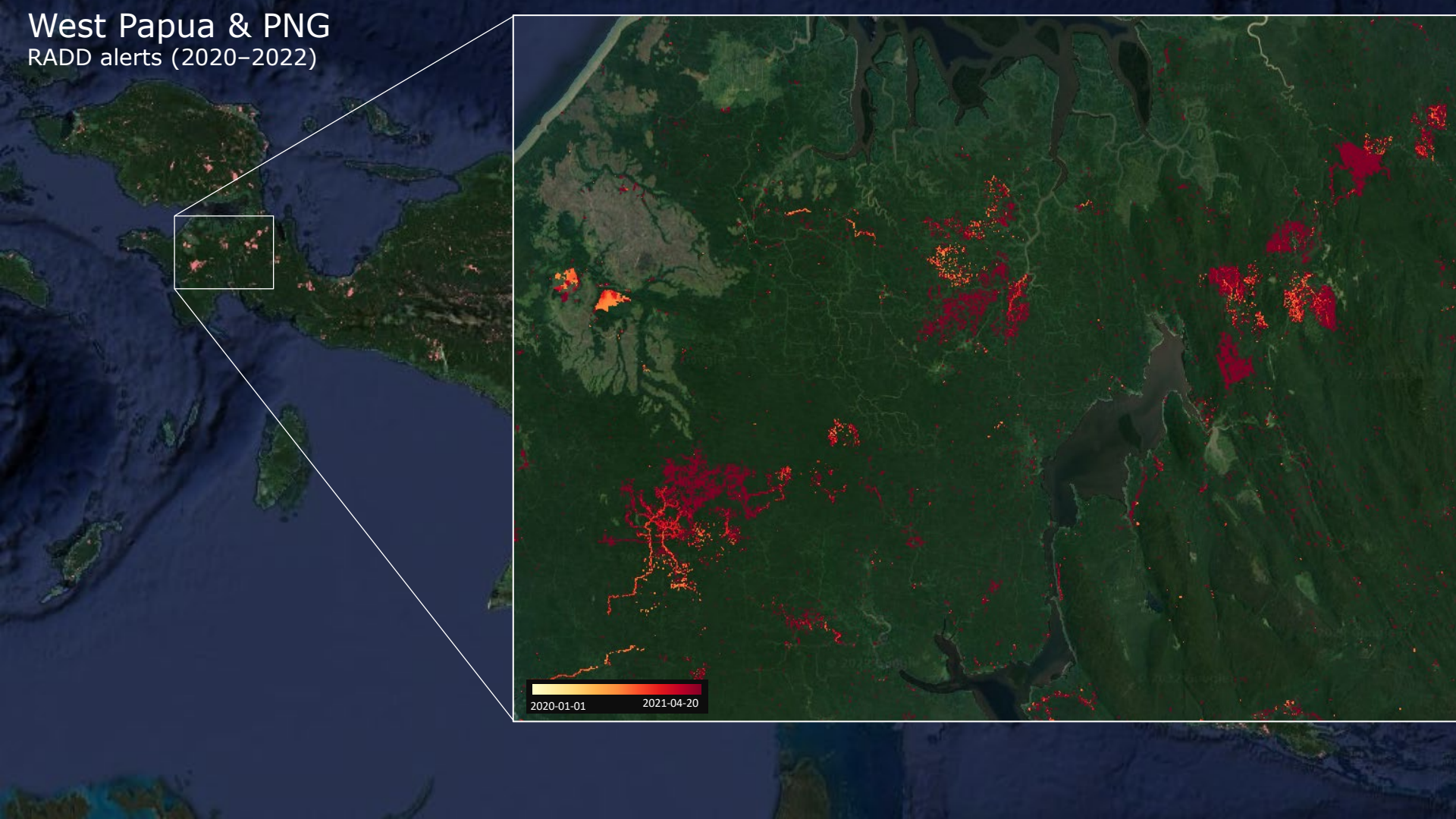
Gold mining (Republic of the Congo)

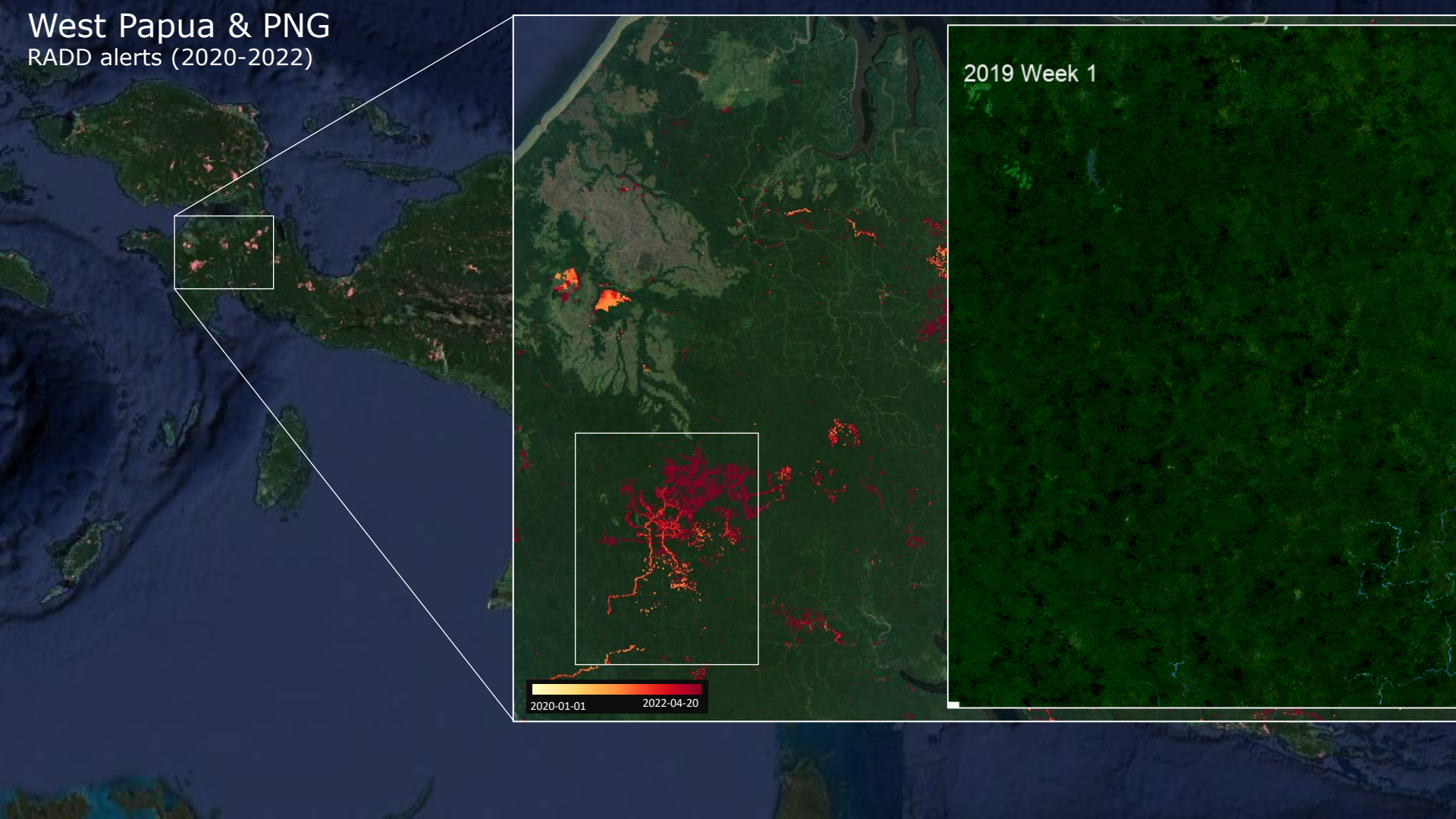


Smallholder agriculture (DRC)




West Papua & PNG
RADD alerts (2020–2022)


West Papua & PNG
RADD alerts (2020–2022)
2020-01-01
2021-04-20


West Papua & PNG
RADD alerts (2020-2022)
2019 Week 1
2020-01-01
2022-04-20

RADD alert improvements and expansion

- Open-source GEE package for generating analysis-ready Sentinel-1 backscatter data (Adugna Mullissa et al., 2021)

- Expansion to Central America (2022) and Continental Southeast Asia (2023)

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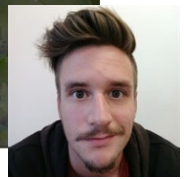
RADD alert improvements and expansion

- Expansion to Central America (2022) and Continental Southeast Asia (2023)
- RADD version 2
  - Improved mapping of large-scale disturbances with radar texture
  - Improved MMU and modelling alert-logging relationship
  - …

Remaining stems/debris after forest clearing

S1 backscatter

S1 backscatter + texture



PhD Johannes Balling

RADD alert improvements and expansion

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- RADD version 2
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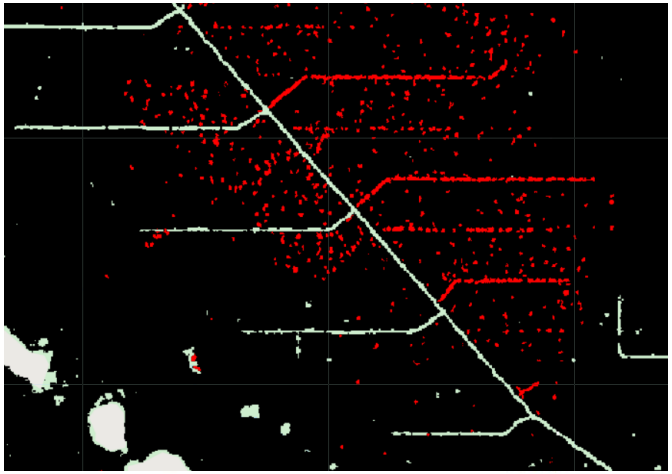
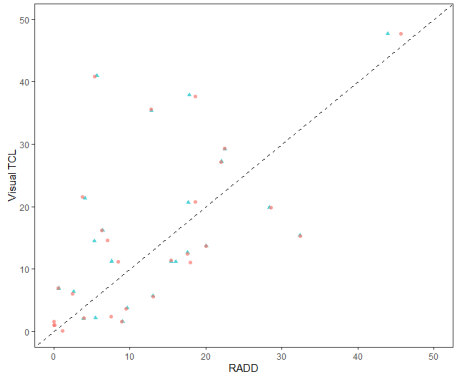
MMU 0.1 ha (current)

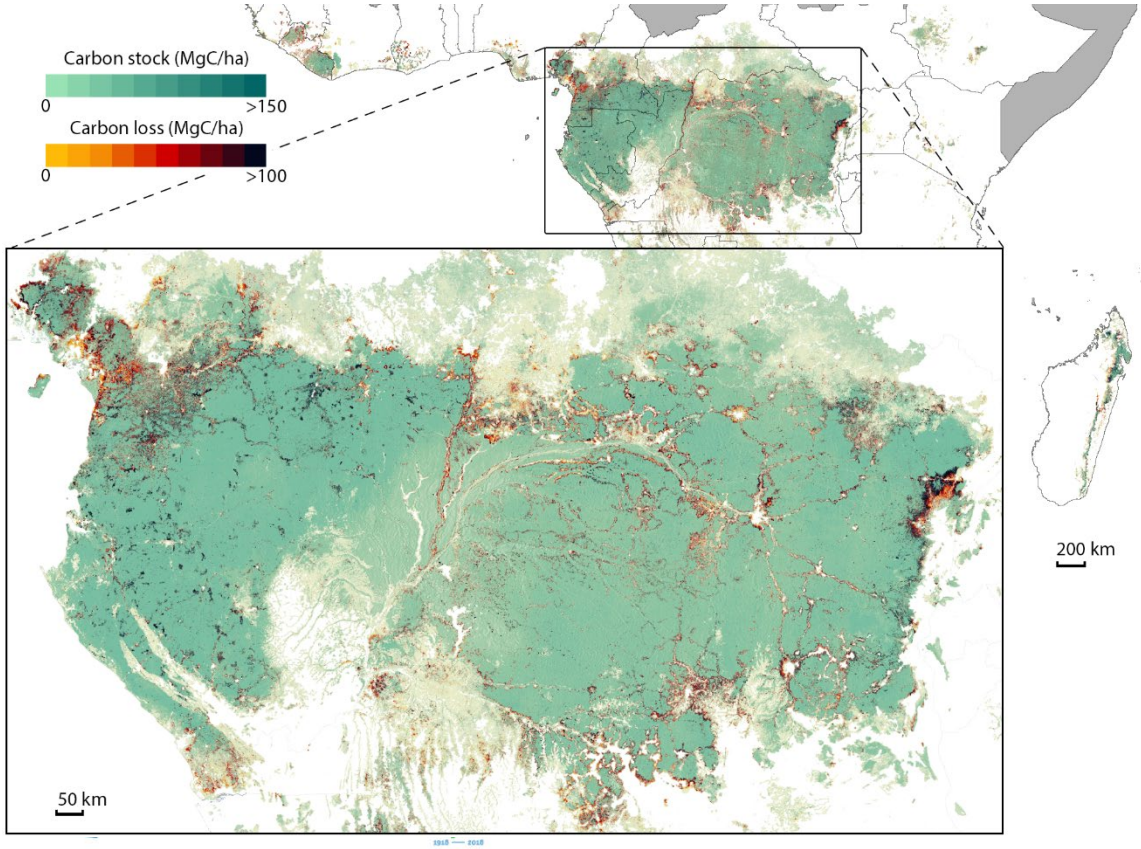


MMU 0.05 ha (version 2)

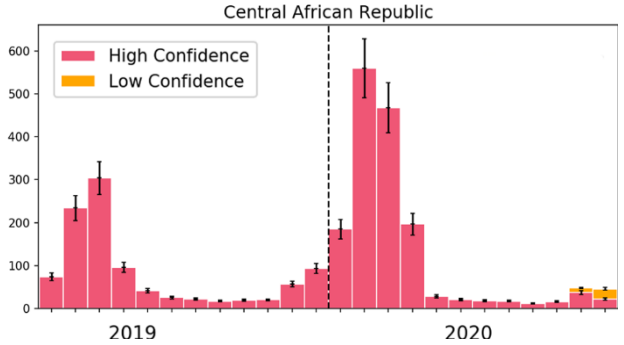


PhD Anne-Juul Welsink

Beyond I: Rapid carbon loss monitoring

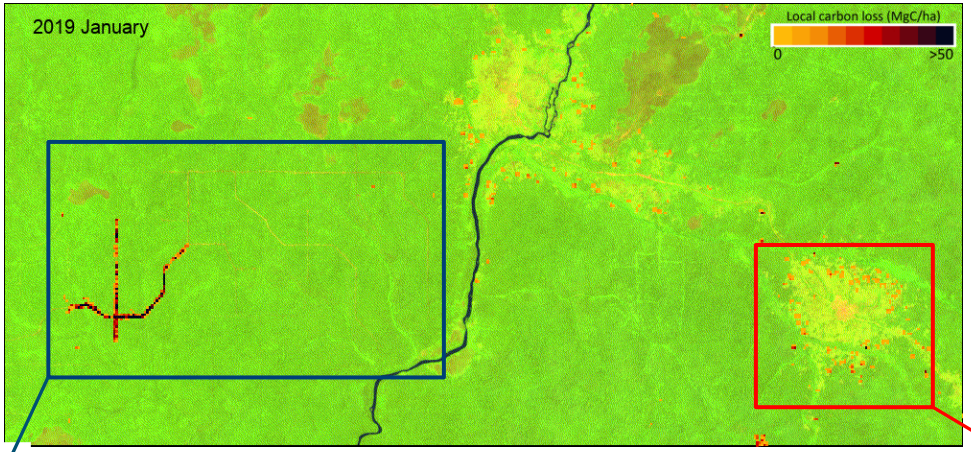


- Combining RADD alerts with new CCI Biomass map *(Santoro et al., 2021)*
- Extensive uncertainty framework



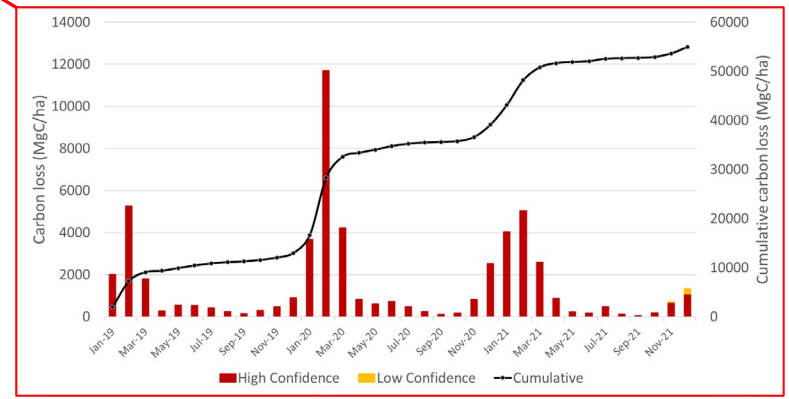
O. Csillik et al., 2022 (Nature CEE)

Beyond I: Rapid carbon loss monitoring

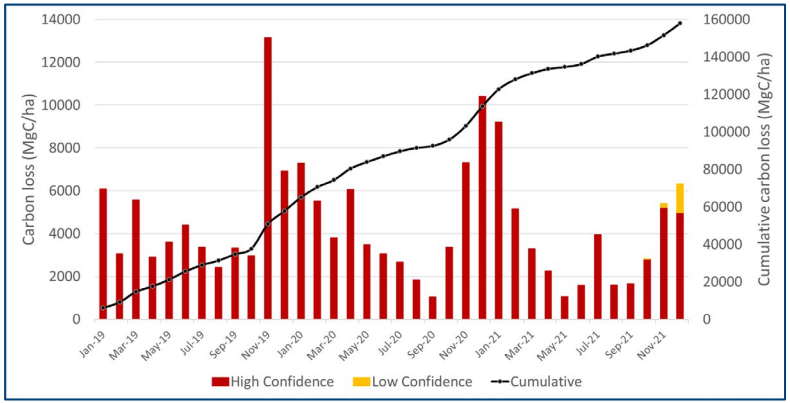


- Strong variations in driver-dependent seasonal dynamics
- Strong negative correlation with rainfall seasonality *(Y. Gou, J. Balling et al., 2022, ERL)*

Smallholder agriculture



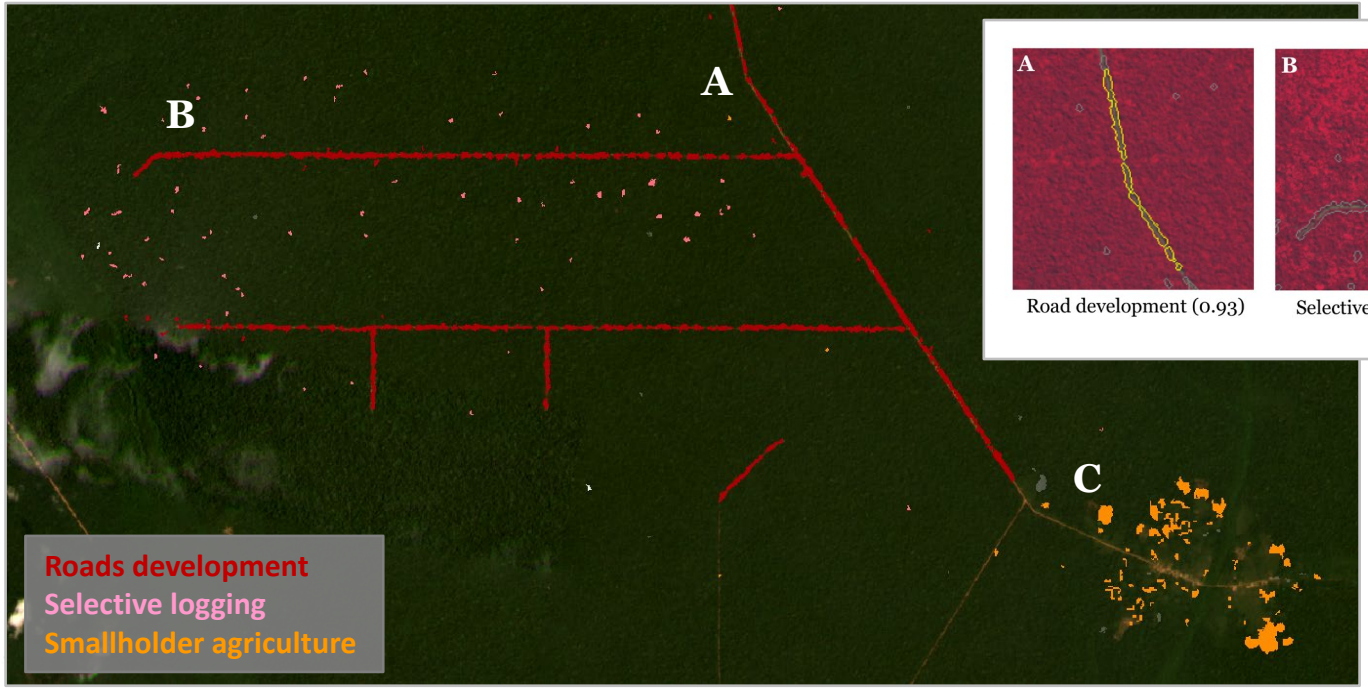
Selective logging

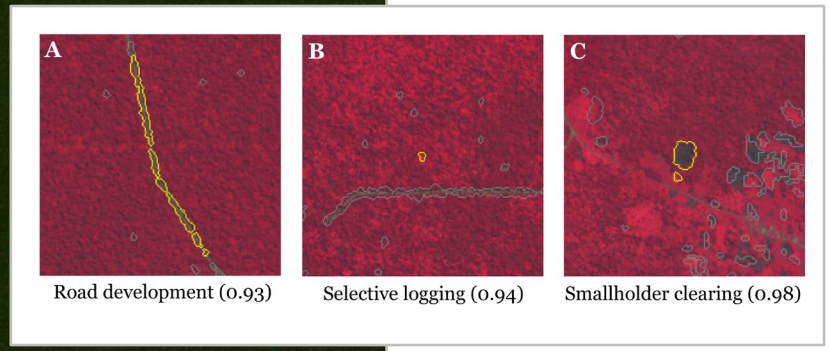


O. Csillik et al., 2022 (Nature CEE)

Beyond II: Rapid driver mapping

- Classifying direct drivers of forest disturbance using deep-learning (RADD+S1+S2)
- Testing results: F1 score >90% (5 classes)





PhD Bart Slagter

Summary, way ahead & vacancies

- RADD alert improvements and expansion
    - RADD version-2 and new geographies (Central America, Southeast Asia)
    - Dry forest and Europe
    - L-band radar (SAOCOM, NISAR)

Summary, way ahead & vacancies

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    - Rapid C-loss monitoring and driver mapping
    - Alert integration
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Summary, way ahead & vacancies

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- Beyond alerting
    - Rapid C-loss monitoring and driver mapping
    - Alert integration
    - Predictions – moving from alerting to predictions
- Vacancies @ WUR Radar team (please contact me)
    - Postdoc – Radar forest monitoring
    - Postdoc – Open-Earth-Monitor data science
    - PhD | young researcher – Radar forest monitoring

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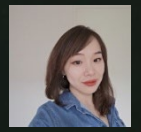
More presentations & posters

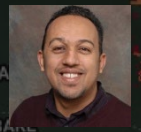
Tuesday (D2.03 EO for Africa: advancements of EO Science and Applications)

- **Yaqing Gou** - Insights and impacts of the **inter-annual relationship** between precipitation and forest disturbance in the African rainforest (Poster)



Thursday (C1.04 AI4EO applications for Land and Water)

- **Adugna Mullissa** - **Tropical Dry Forest** Change Detection Using Sentinel Images and Deep Learning (Poster)



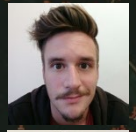
Friday (A3.12 Forest Monitoring)

- **Bart Slagter** - **Classifying direct drivers** of forest disturbance in near-real time, using multi-sensor Sentinel data and deep learning (Oral)

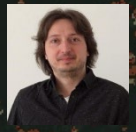
- **Anne-Juul Welsink** - Sentinel-based forest disturbance alerts to map **selective logging intensities** in the tropics

- **Sietse van der Woude** - Towards consistent and high-frequency **European forest monitoring**: Combining Sentinel satellite and ground-based data streams

- **Johannes Balling** - Utilizing dense Sentinel-1 and Sentinel-2 time series for **characterizing disturbances** of humid tropical forests



- **Milutin Milenkovic** -Utilizing Novel Satellite Radar and Lidar Data for Monitoring Amazon **Rainforest Regrowth**



Upcoming

- Meetings and conferences (2022):
  - EARSeL Imaging Spectroscopy workshop (22–24. June 2022 at GFZ)
  - ForestSAT 2022 (29. Aug. – 2. Sept., Berlin)
- Vacancies - Remote Sensing@GFZ:
  - Global monitoring team leader (permanent): https://www.gfz-potsdam.de/en/career/job-offers/job-detail/6143
  - Global monitoring data scientist (4,5 years): https://www.gfz-potsdam.de/en/career/job-offers/job-detail/6136
  - Several post-doc project positions (open soon):
    - FAIR environmental data and monitoring
    - Global and national biomass monitoring