



Core Concepts of Optical Earth Observation Education (CorEO)

Mario Blersch, Johannes Keller, Christian Plass & Alexander Siegmund



Core concepts are emphasizing the function to structure teaching



for Learning Success

- Core concepts are helpful for the **sustainability of learning**:
 - "In short: core concepts, as the deep structures of teaching, can be decisive for the learning success of students.."



for Transferability

- They help learners consciously **transfer** what they have learned **to new contexts**:
 - "Students then not only address factual content but become aware of the subject-specific thinking concepts based on what they've learned, which decisively influences the transferability of the acquired knowledge."



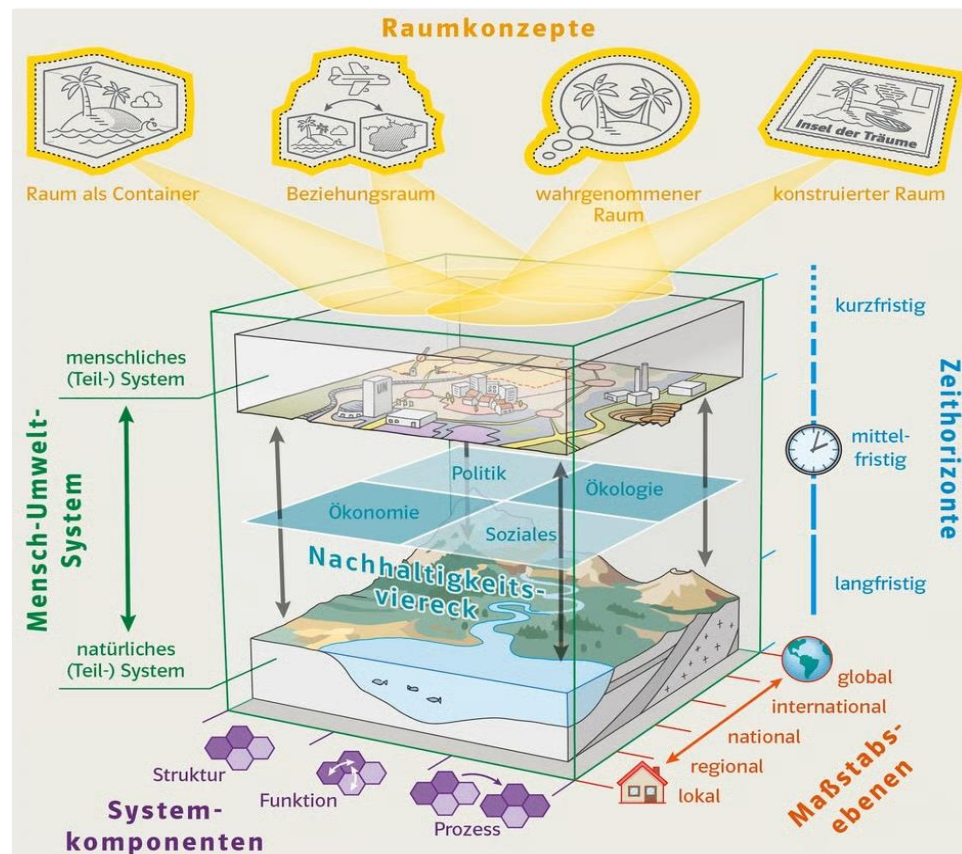
for Teachers

- For teachers, the concepts serve as a **planning tool** to focus on the essentials (as a „**relevance filter**“).

Source: Fögele, J.; Sesemann, O. et Westphal, N. (2021)

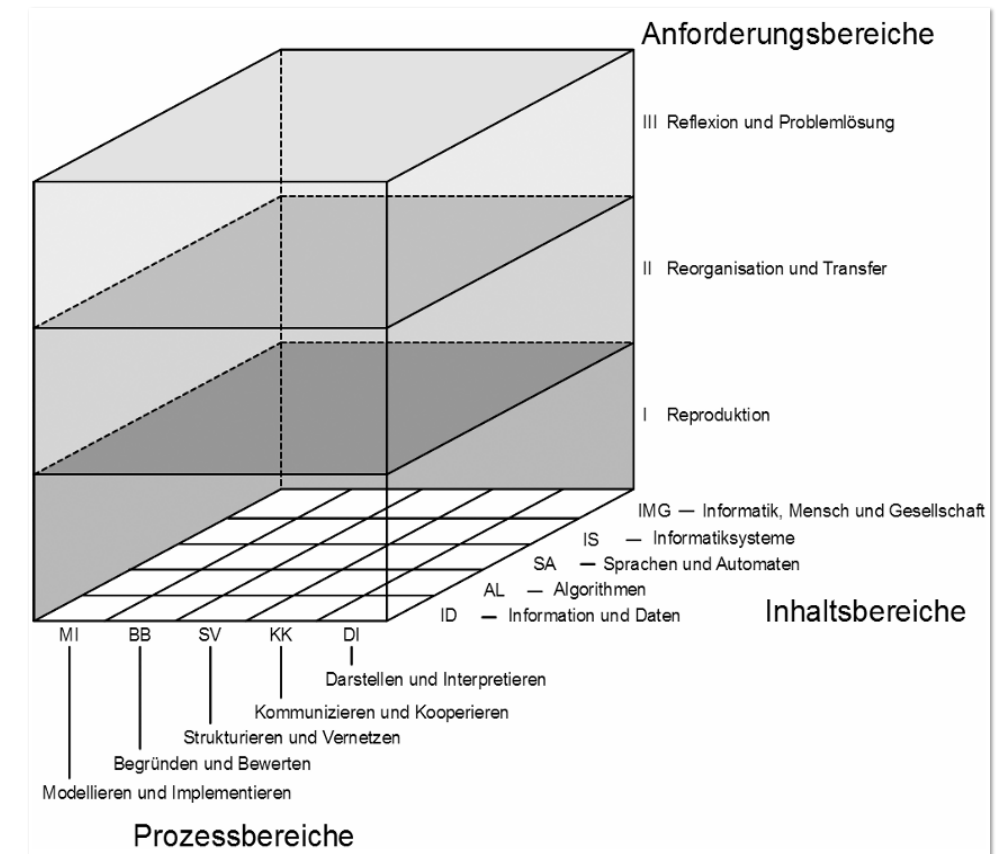


Geographic core concepts



Source: Fögele, J.; Sesemann, O. et Westphal, N. (2021)

Competency model of informatic



Source: Gesellschaft der Informatik e.V. (2016)

Different Approaches in Earth Observation



Spatial

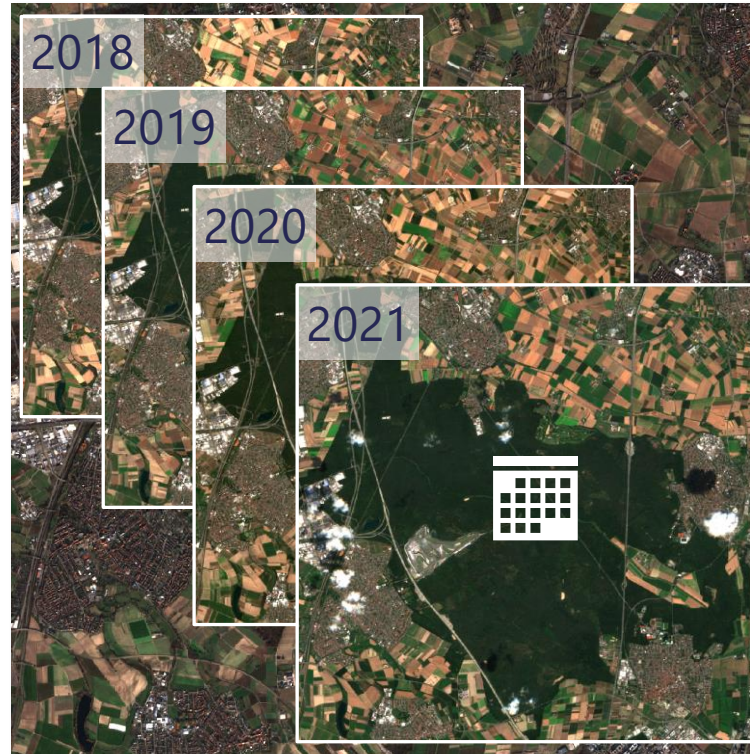
from coarse to fine



Background: Contains modified Copernicus Sentinel data 2023
Foreground: openaerialmap.org Sascha Seidel [CC BY-NC 4.0](#)

Temporal

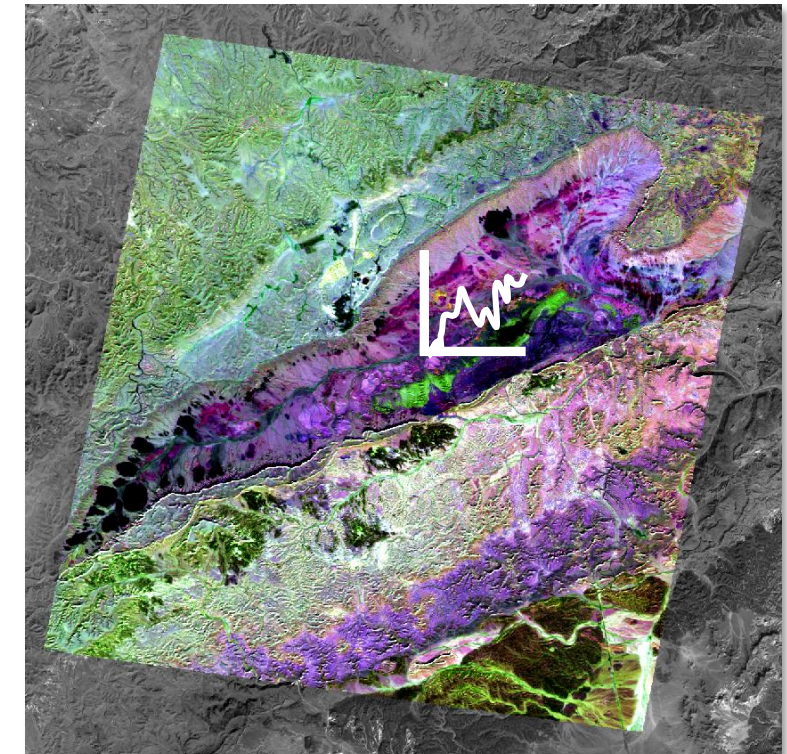
from one point in time to time span



Contains modified Copernicus Sentinel data
2024, 2021, 2020, 2019, 2018

Spectral

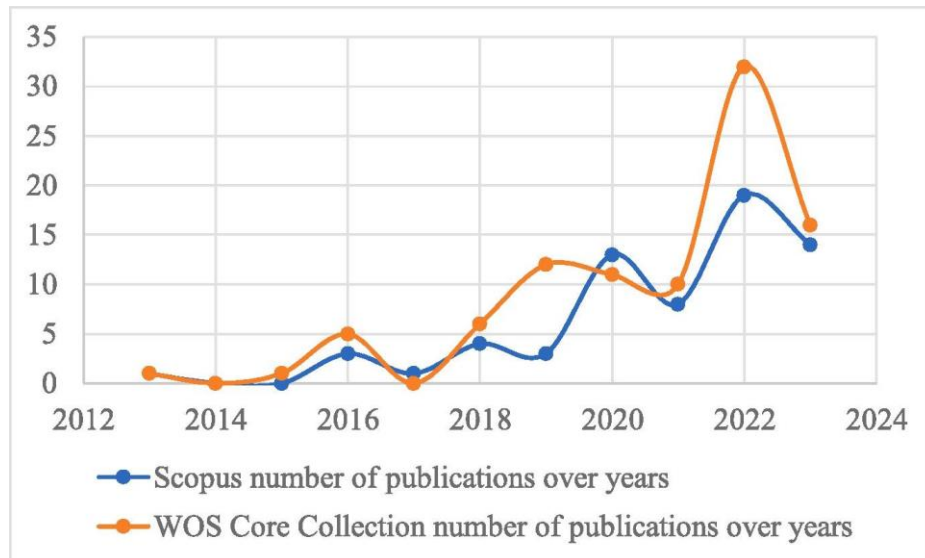
make the invisible visible



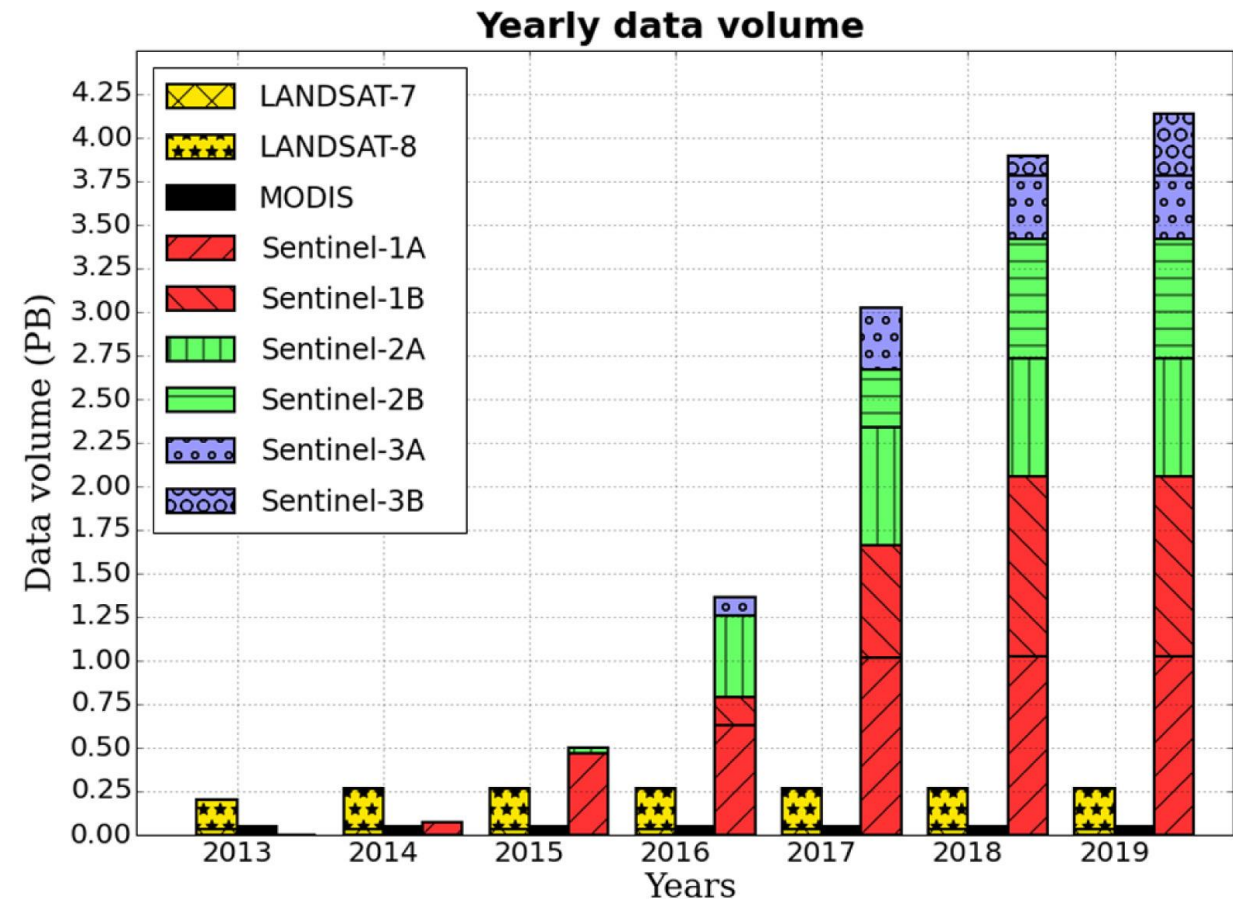
Background: Source: GloVis-USGS Landsat data
Foreground: EnMAP data ©DLR [2024] All rights reserved



Steady growing amount of EO data



Source: Aierken et al. (2024)



Source: Soille et al. (2018)

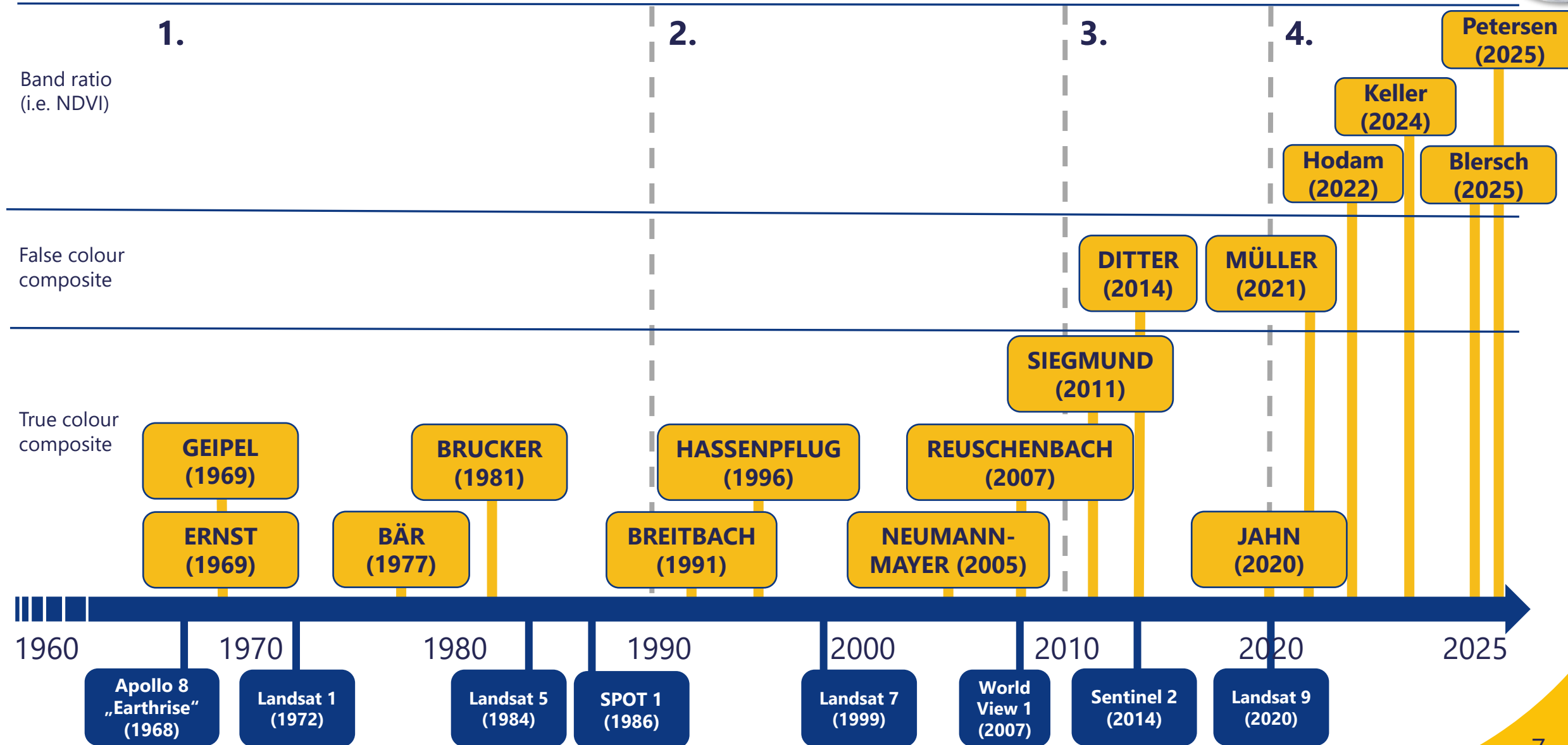


EO didactics in german-speaking area

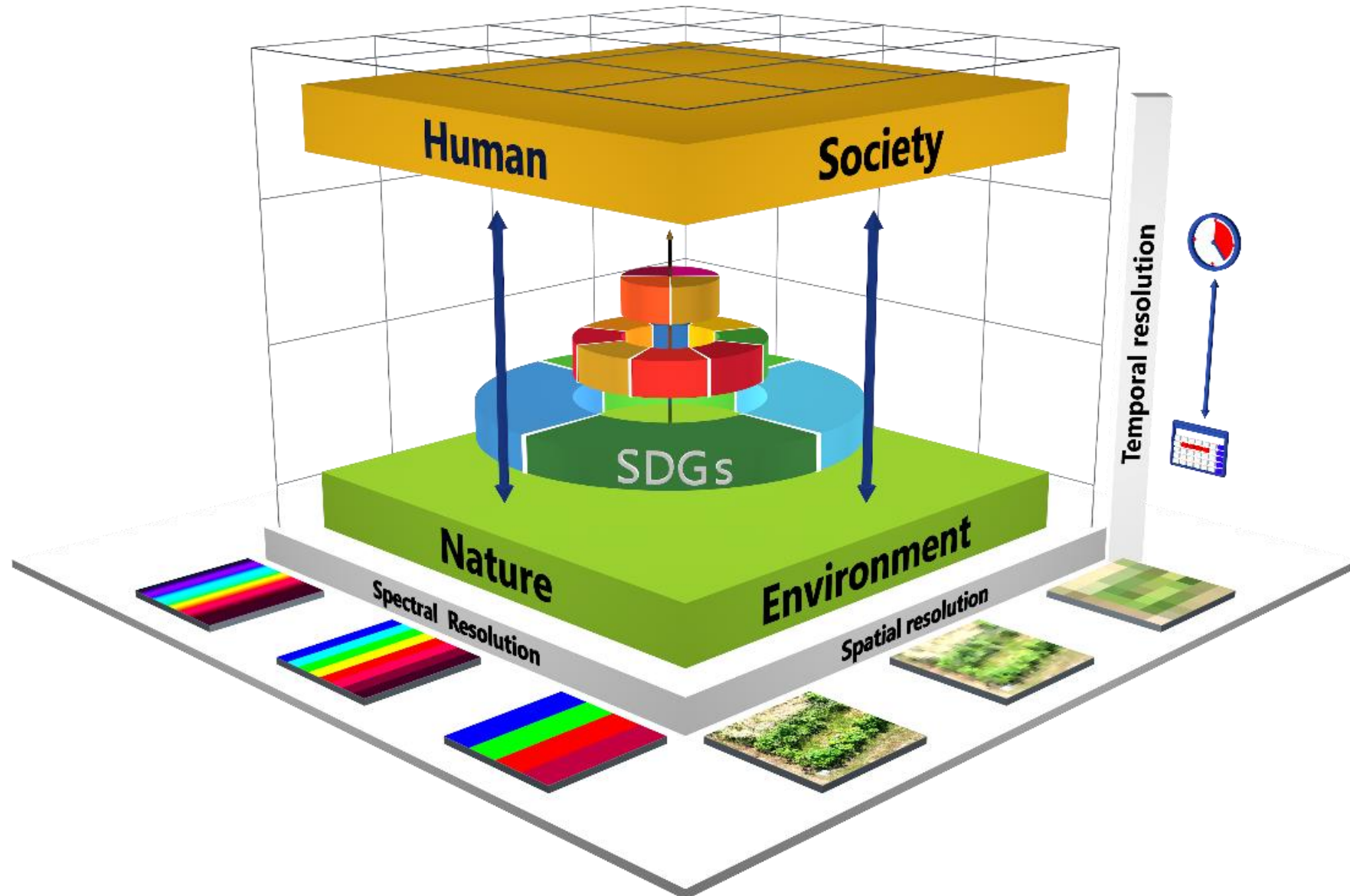
Survey for remote sensing (RS) and earth observation (EO) education, didactics, and didactical core concepts was conducted. Thus far, EO didactics in German-speaking countries can be separated into four phases:

1. Before 1990: **Uprising** of satellite imagery & didactical advantages
2. 1990 to 2010: **Didactical modelling** to teach and learn with RS data
3. 2010 to 2020: **Digital acceleration** and empirical evaluation
4. 2020 till today: **Recent developments**

A brief history of EO education in school context



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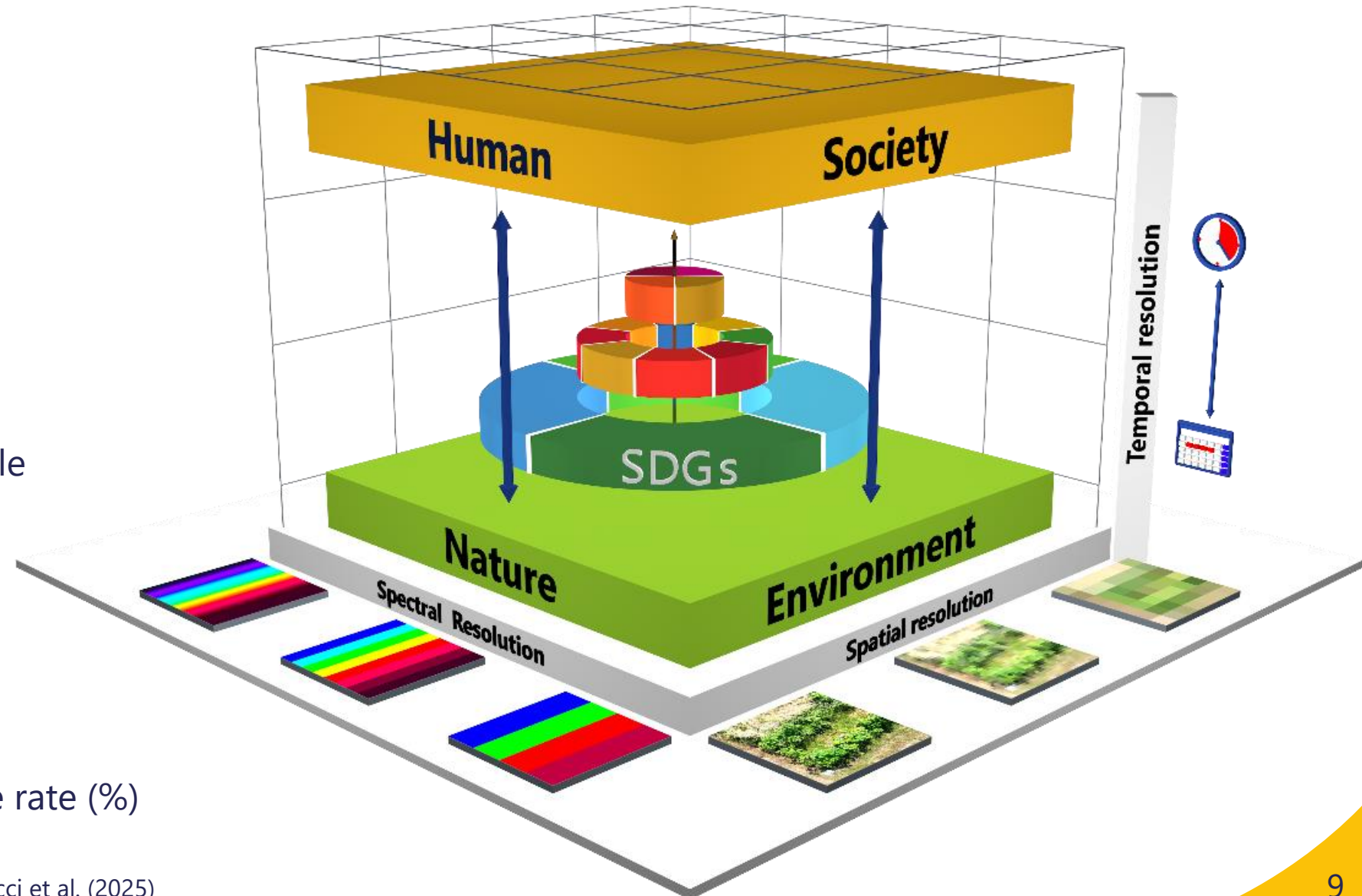


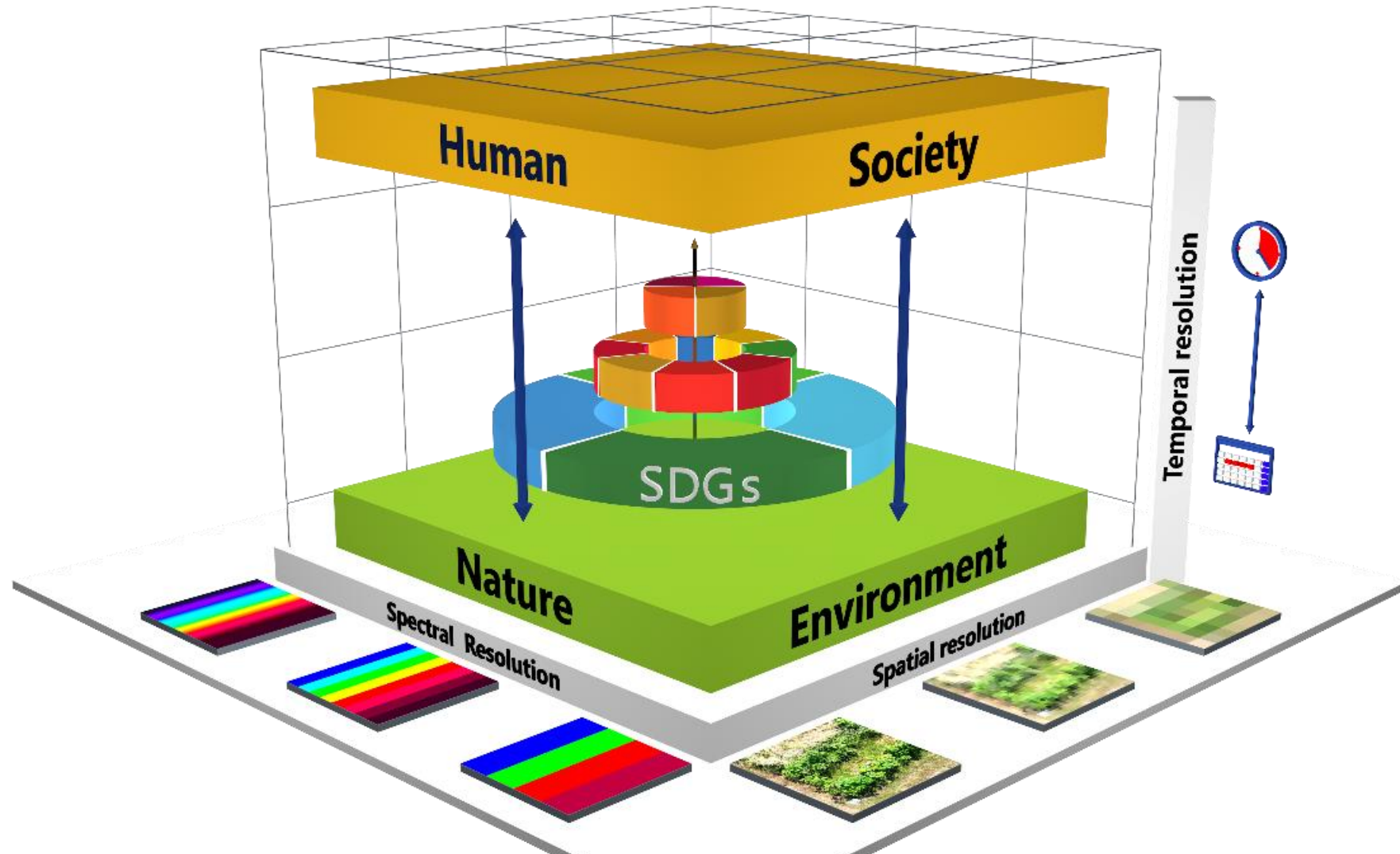
Target 15.2

By 2020, promote the implementation of sustainable management of all types of forests [...].

Sub-Indicator:

- Annual forest area change rate (%)





Thank you!



Thank you!

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- Fögele, J.; Sesemann, O.; Westphal, N. (2021): Mit Basiskonzepten die fachliche Tiefenstruktur des Geographieunterrichts gestalten. In TERRASSE Online, Ernst Klett Verlag. Verfügbar unter <https://www.klett.de/alias/1136693>
- Gesellschaft für Informatik e.V. (2016): Bildungsstandards Informatik für die Sekundarstufe II. In: LOG IN, 36. Jg. (2016), Heft Nr. 183/184.
- <https://doi.org/10.1016/j.future.2017.11.007>