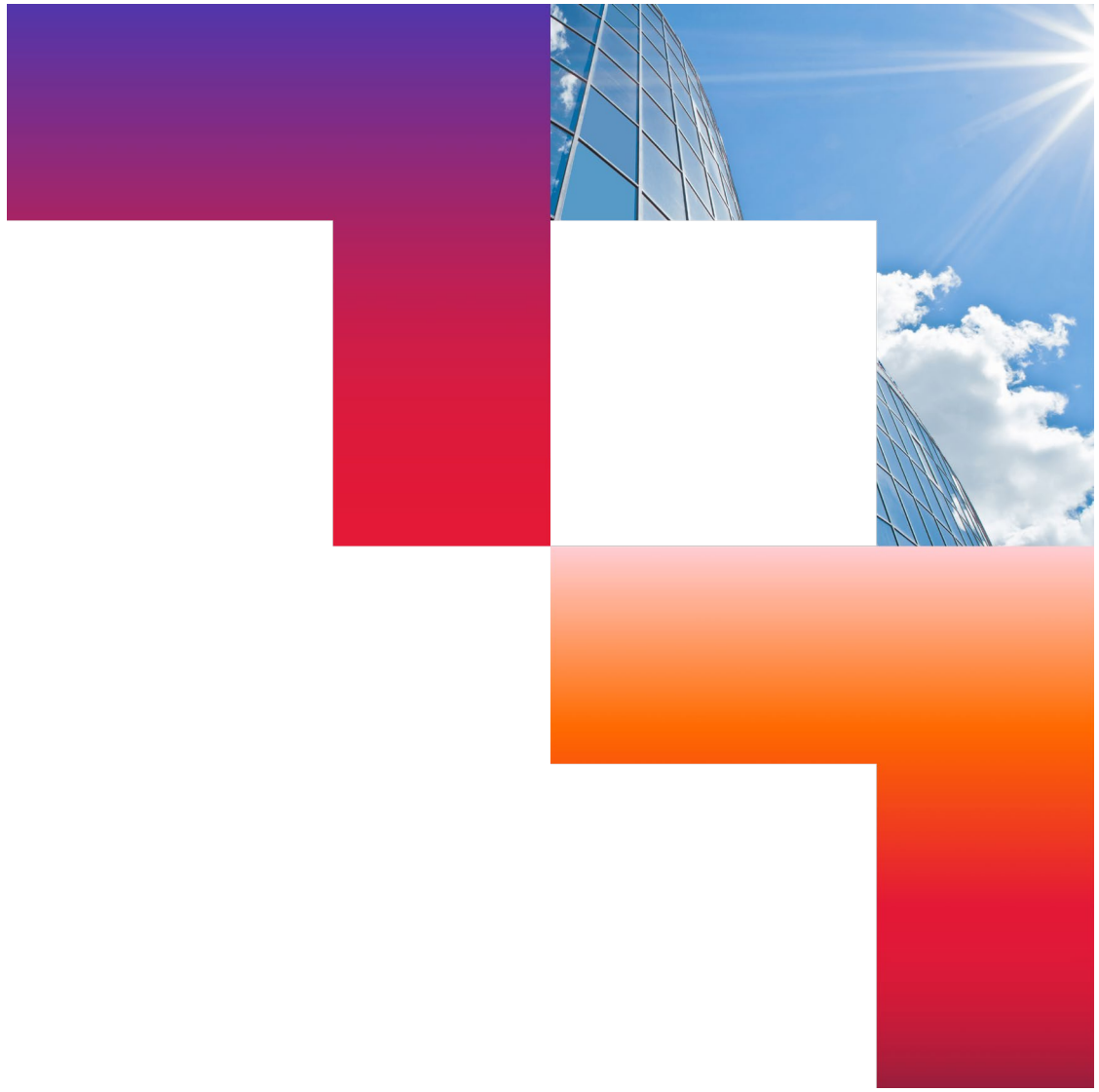
Digital Twin Earth

How satellite data can empower life on Earth and counteract famine



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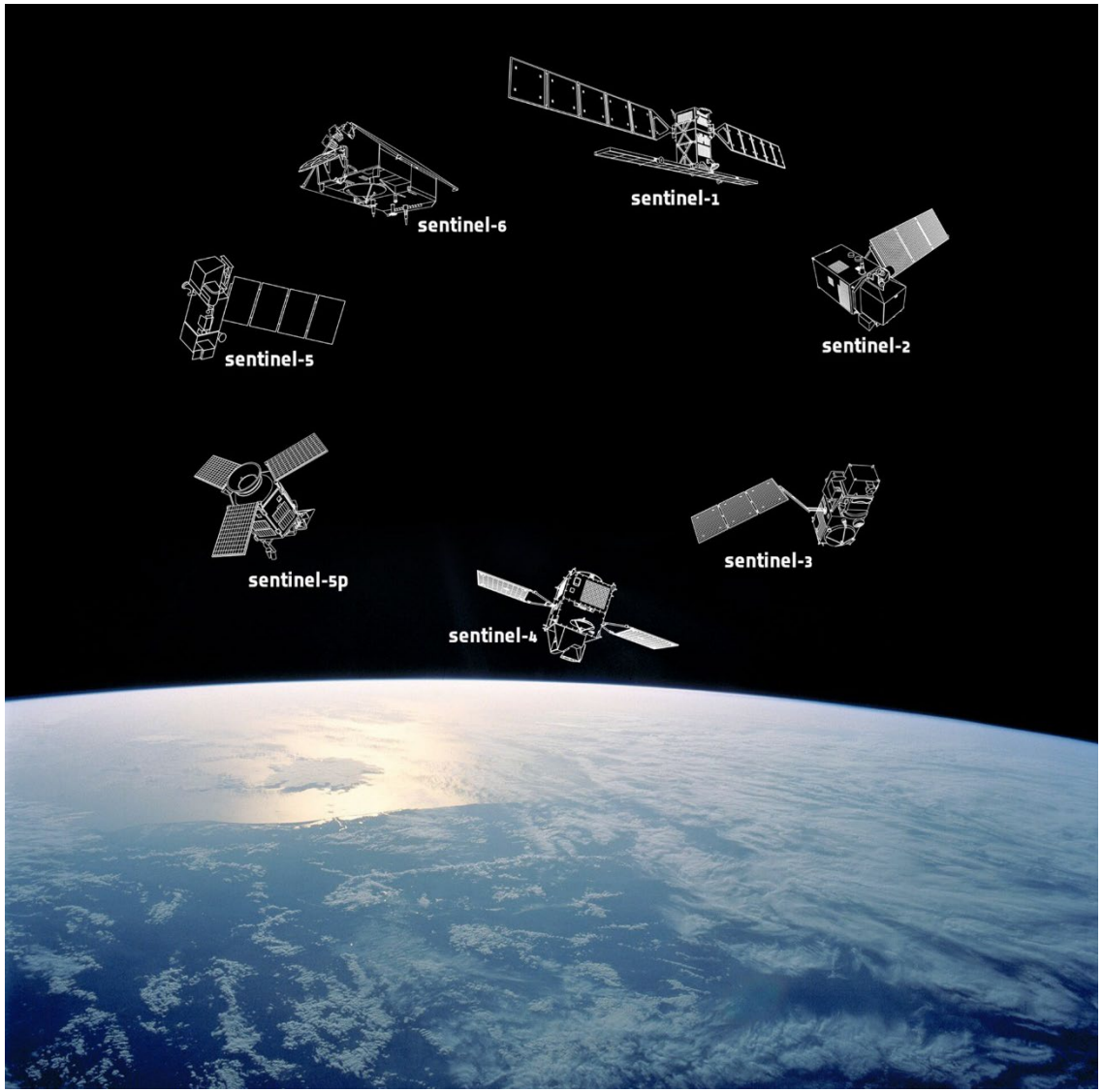
CGI



New Satellite Constellations

Copernicus provides free-access operational quality satellite data for users and businesses

Commercial satellites provide high-resolution and rapid update imagery

New applications are made possible by:

- Guaranteed high quality data
- Fresher data

Image courtesy European Space Agency

Towards DTE

- Digital Twin Earth will help visualise, monitor and forecast natural and human activity on the planet.
- Models will be able to monitor the health of the planet, perform simulations of Earth's interconnected system with human behaviour, and support the field of sustainable development, therefore, reinforcing Europe's efforts for a better environment.
- Includes enhanced Numerical Weather Prediction and Climate Prediction, plus a range of new high-fidelity models in a new era of exascale computing:
  CGI is developing a precursor for simulating food systems

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Raymond Knapman / *Flooded fields near Fairfield farm* / CC BY-SA 2.0

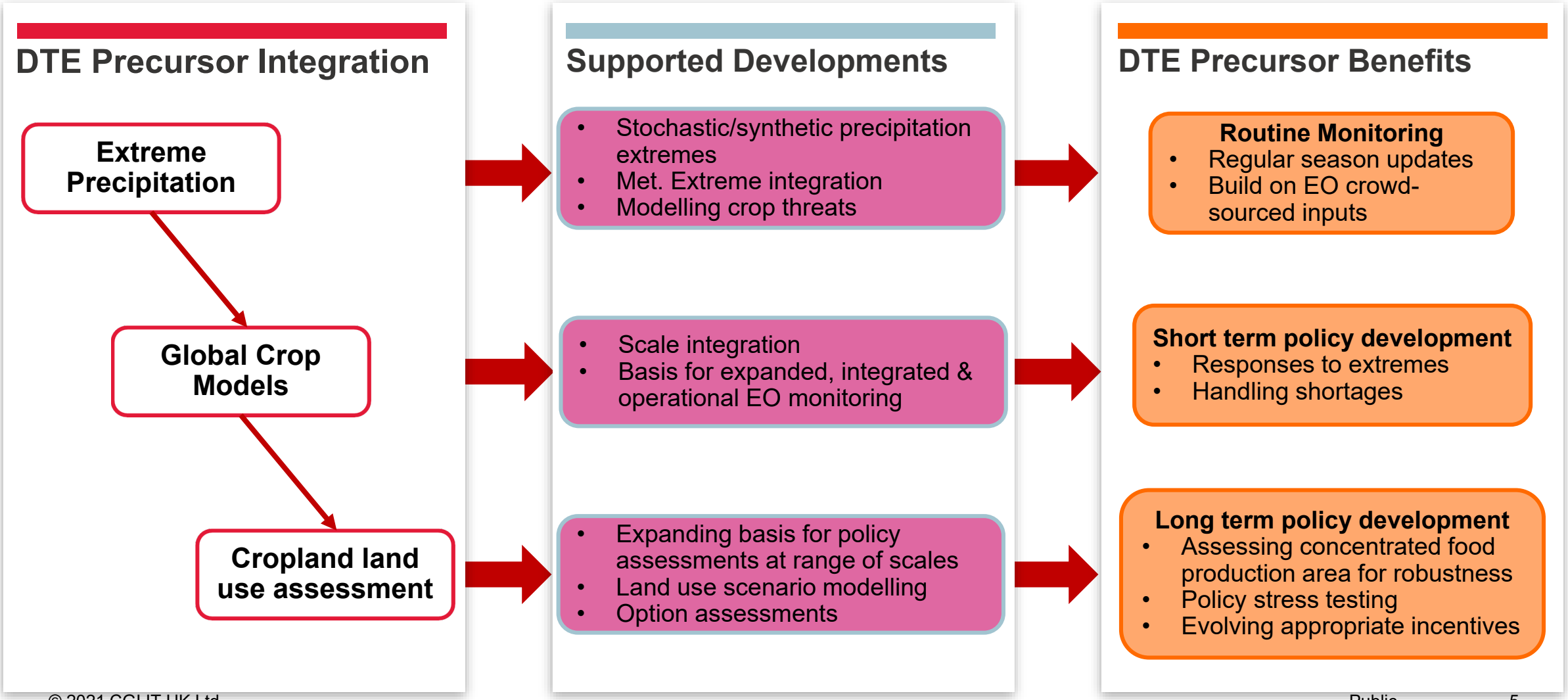
Global Food Systems

- Improving global food systems is vital to create higher levels of food availability, accessibility, utilization, and stability

- Environmental events play a significant role in the stability of food systems:
  - Extreme precipitation
  - Sea level rise
  - Floods
  - Drought
  - Erosion

- Monitoring these events and improving forecasting will lead to:
  - regular seasonal progress reviews
  - improved responses to potential crop shortages
  - assist in long-term policy development

Overview of models and benefits



Summary

- Satellites make regular regional and global scale data readily available
- Combining the data with high performance computing and physical models makes a sophisticated range of new applications possible
- Many of the applications will have both commercial and societal value