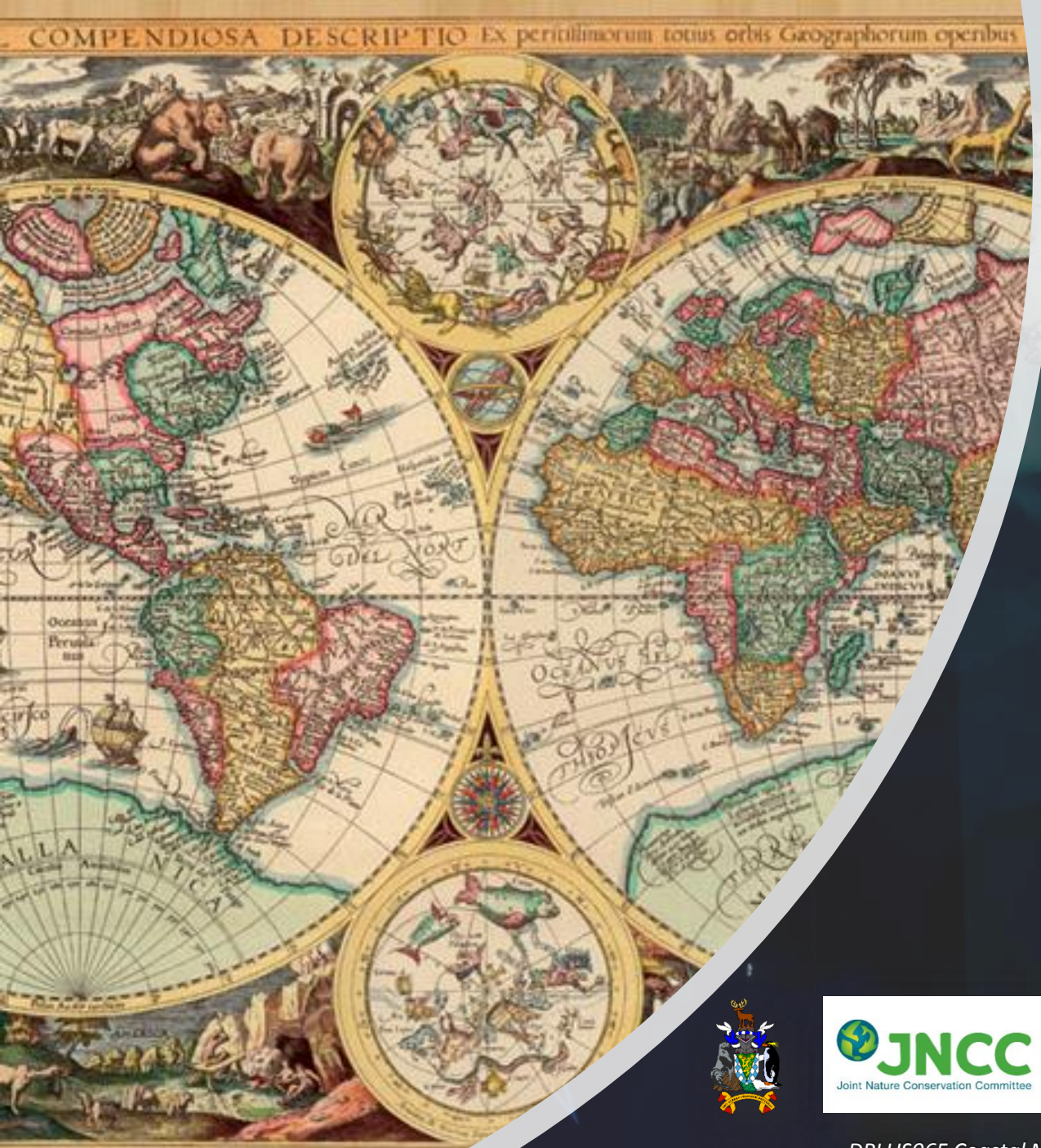

Collaborations: future directions

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DPLUS065 Coastal Mapping Project – Grant aided by the Darwin Initiative through UK Government funding

Technological advances I

Earth observation sensors using passive imaging are increasingly sophisticated.

Sensors are deployed on space-borne and aerial platforms that allow for shorter return periods at higher resolution and cheaper cost.

UAVs are cheaper and more capable than ever carrying affordable multi-spectral and active sensors.

Providers of UAV sensors systems provide complete cloud-based workflow solutions form flight planning to image processing and classification.

Technological advances II

- Cloud-based computing systems create global communities of practice that allow researchers and institutions working in remote locations to access immense computing power utilizing limited bandwidth.
- On-line support from cloud-based providers to analyze the data collected, often using cutting edge machine learning and emerging artificial intelligence technologies.

Technological advances III

- Active imaging satellite systems using high resolution LIDAR or RADAR remain less accessible than multi-spectral systems due to higher costs.
- UAVs and aircraft are increasingly using LIDAR for Earth Observation applications
- LIDAR imagery is becoming more competitive cost wise and applied to a wider range of research and environmental management problems.
- Remotely Operated Vehicles (ROVs) and multi-beam sonar systems are increasingly affordable, deployable and capable.

Implications for UKOT users & providers

- Earth observation data will become a regular component of work programs in UKOT natural resource and agricultural programs .
- The expertise and experience necessary to utilize cloud-based geospatial computing systems is decreasing.
- Organizations no longer have to invest in expensive computer processing power and storage capacity to utilize Earth Observation data.
- Inhouse earth observation data analysis capabilities from the “desirable but non-essential” category to an operational necessity for UKOTS

Applications: General

- High resolution drone and satellite imagery can be used to improve the accuracy of broad scale feature habitat classification in remote environments.
- Freely available medium resolution satellite imagery (e.g. Sentinel and Landsat imagery) is available for nearly every region of the world.
- High resolution imagery can be used to reduce uncertainty in classifications and limit the need for time consuming field work.

Applications: Specific

- Soil and coastal erosion in remote locations;
- Coastal inundation from sea-level rise;
- Invasive species presence or absence detection including developing habitat suitability maps for key invasive;
- Habitat recovery from restoration efforts including invasive species removal and/or vegetation planting;
- Habitat change from climatic change and/or glacial retreat;
- Near shore and intertidal habitat mapping;
- Identification and monitoring condition of archeological and heritage sites;
- Visitor impacts and movements on sensitive and/or high use areas and habitats;
- Pasture and productive land improvement;
- Soil moisture and soil fertility monitoring;
- Vegetation and habitat mapping for restoration following large scale disturbances such as infrastructure construction or minefield clearance;
- Monitor wildlife breeding sites to detect population changes (abundance and location) and possible range shifts; and
- Non-permitted structures and illegal and illicit activities (IUU fishing, illegal forest clearance).

Thank you

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