Australia's National Science Agency

Extracting the signal of biodiversity change from unstructured species-occurrence data

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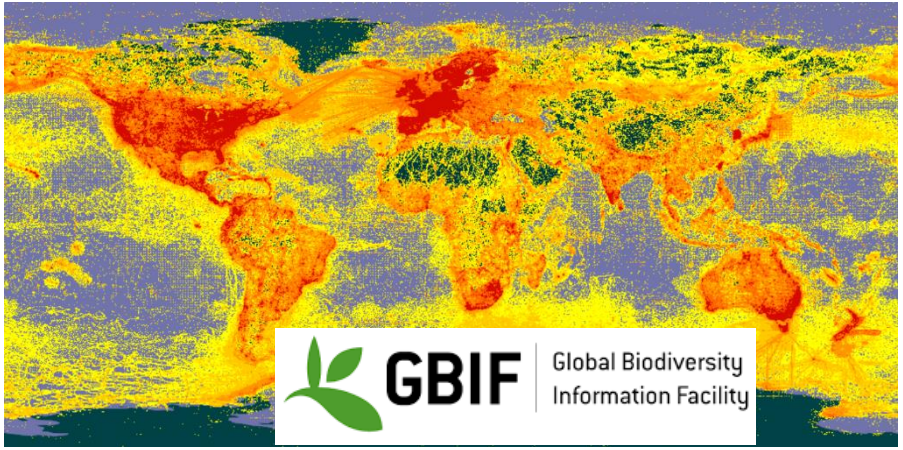
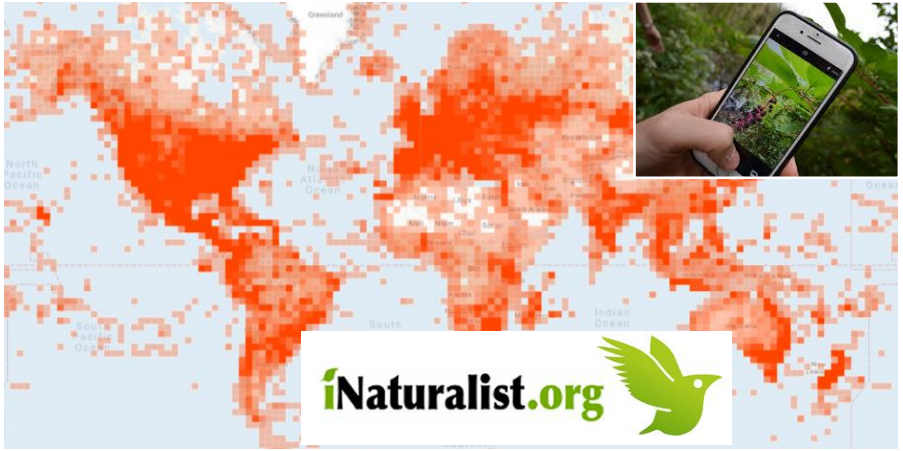
With thanks to: Trevor Dhu (Microsoft), Carlos Zambrana-Torrelio (EcoHealth Alliance), Miguel Fernandez (NatureServe, iDiv)

The challenge of using big unstructured species-occurrence datasets to monitor biodiversity change

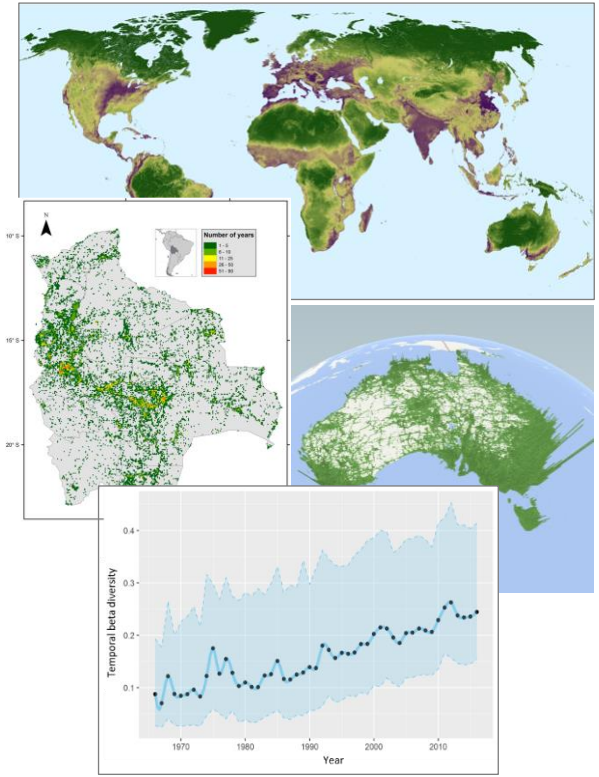
- The ‘gold standard’ of biodiversity monitoring is to apply the same survey technique at the same locations repeatedly over time
- But most of the world’s biodiversity data consist of unstructured species occurrence records, collected at different locations over time
- Can we more effectively extract the signal of biodiversity change from such datasets?





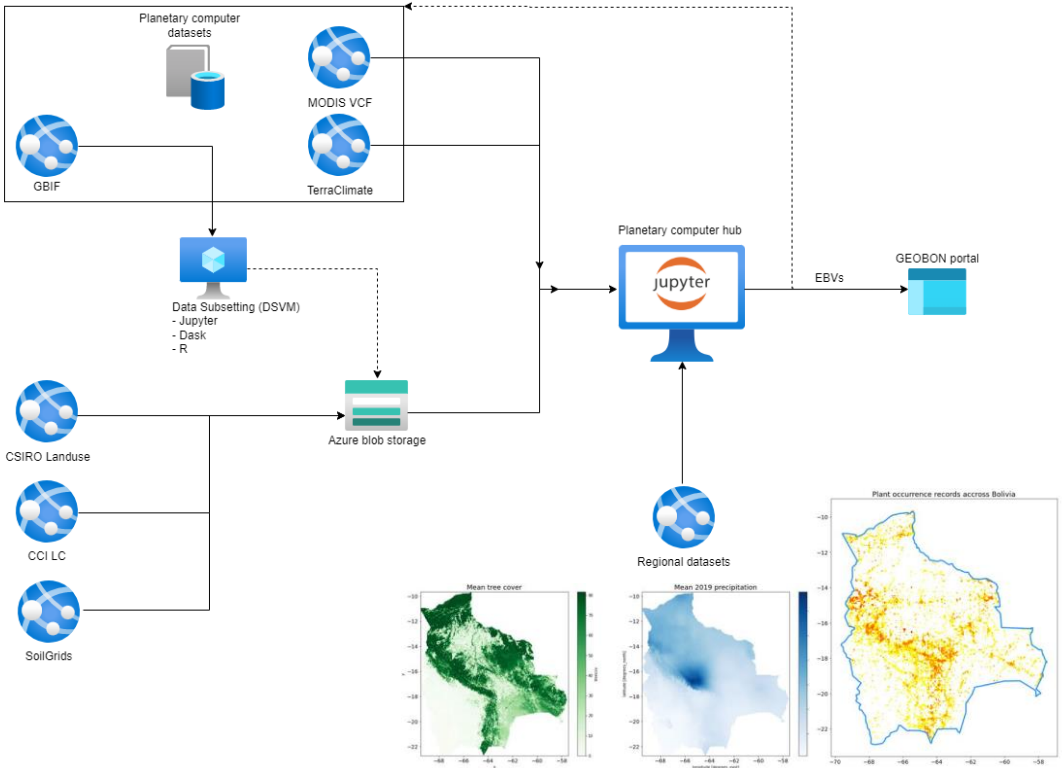
Extracting the signal of change in community-composition Essential Biodiversity Variables (EBVs) from unstructured species-occurrence datasets

- Half-way through two-year project funded by GEO BON & Microsoft AI for Earth “EBVs on the Cloud” initiative
- Working with CSIRO’s *obs-pair*GDM technique to detect change in species composition of communities, as a function of environmental change, across both <u>space and time</u> from <u>unstructured</u> species-occurrence data
- Making this analytical capability more widely available for use around the world, through Microsoft Azure cloud computing
- Demonstrating value through case studies for Bolivia (collaborating with NatureServe and EcoHealth Alliance) and Australia (collaborating with Atlas of Living Australia)



Building community composition EBV capability in the cloud

- Analytical capability accelerated and supported by the Microsoft Planetary computer
- Fuses the best available data describing biodiversity and planetary change with next generation analytical capability



Building community composition EBV capability in the cloud

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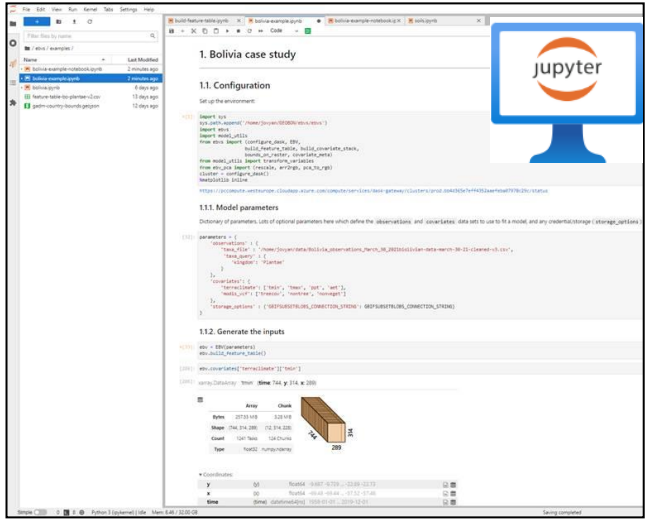
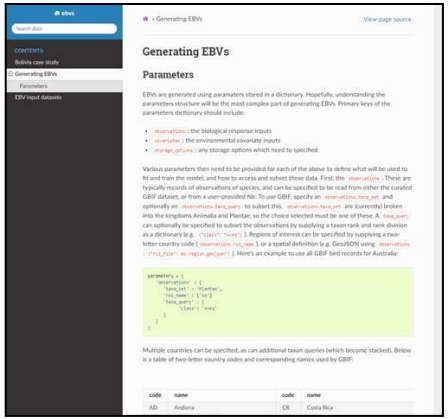
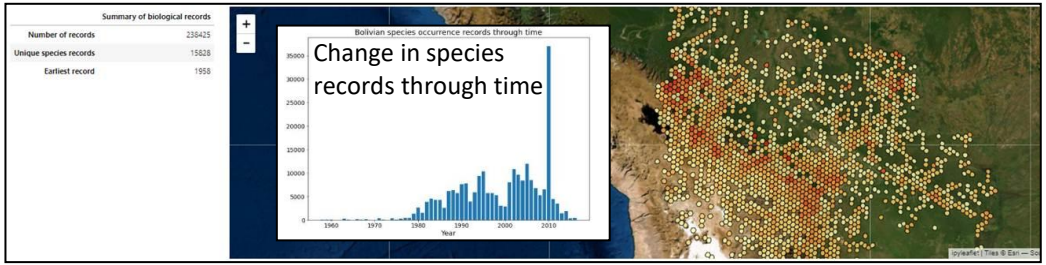
- Fuses the best available data describing biodiversity and planetary change with next generation analytical capability
- Made accessible and repeatable through easy to apply Jupyter notebooks

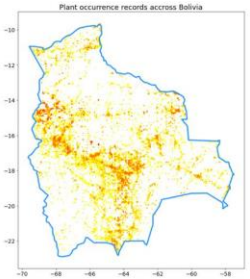


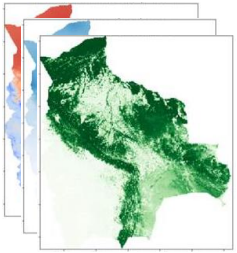




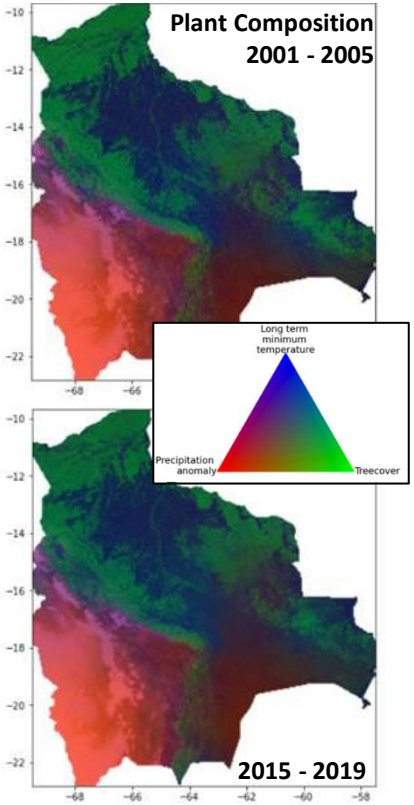
Reporting the change through time in species communities caused by climate change and human modification of the landscape

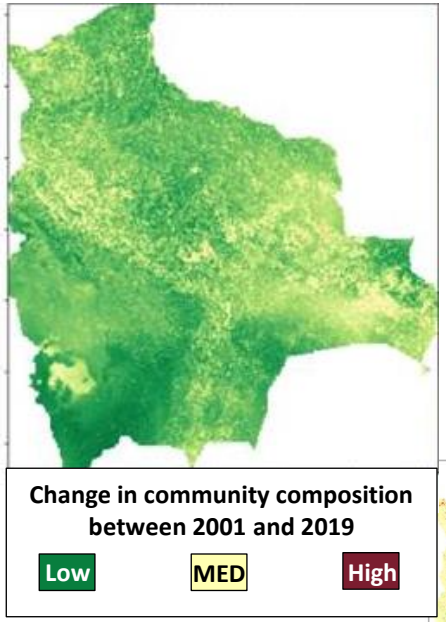
Species occurrence records

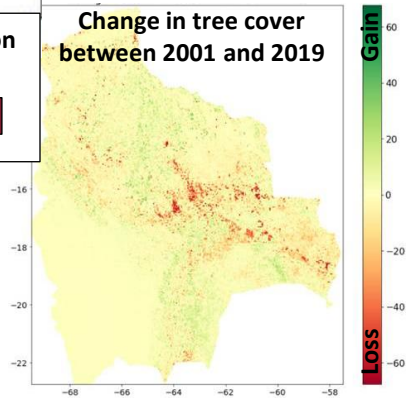




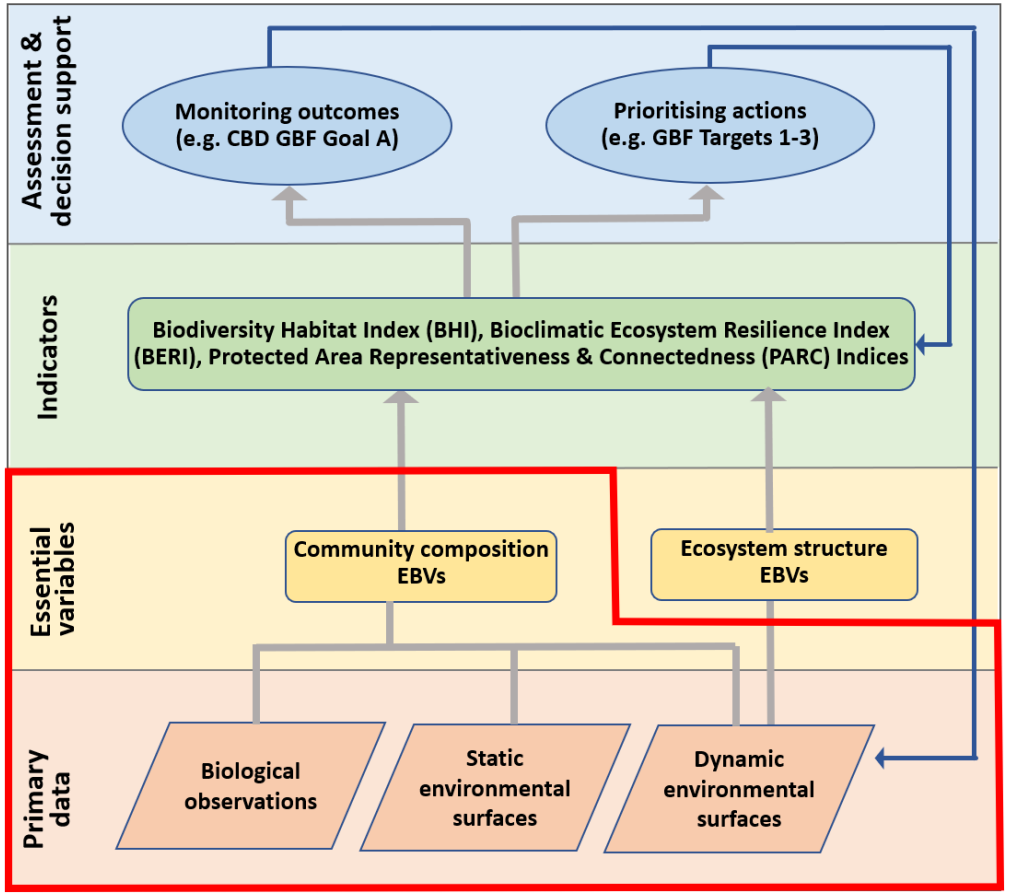
Environmental change datasets







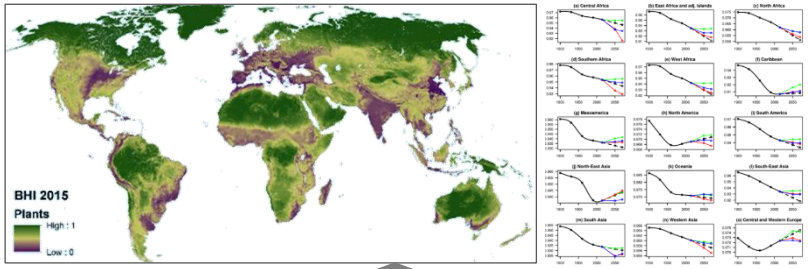
The bigger picture: EBVs generated by this analytical capability will feed into indicators informing assessments at national to global scales

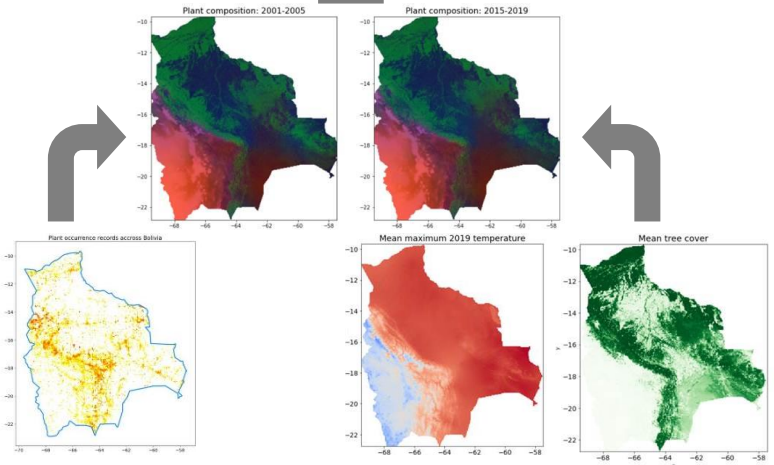


Convention on Biological Diversity

System of Environmental Economic Accounting

SUSTAINABLE DEVELOPMENT GOALS





Thank you

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