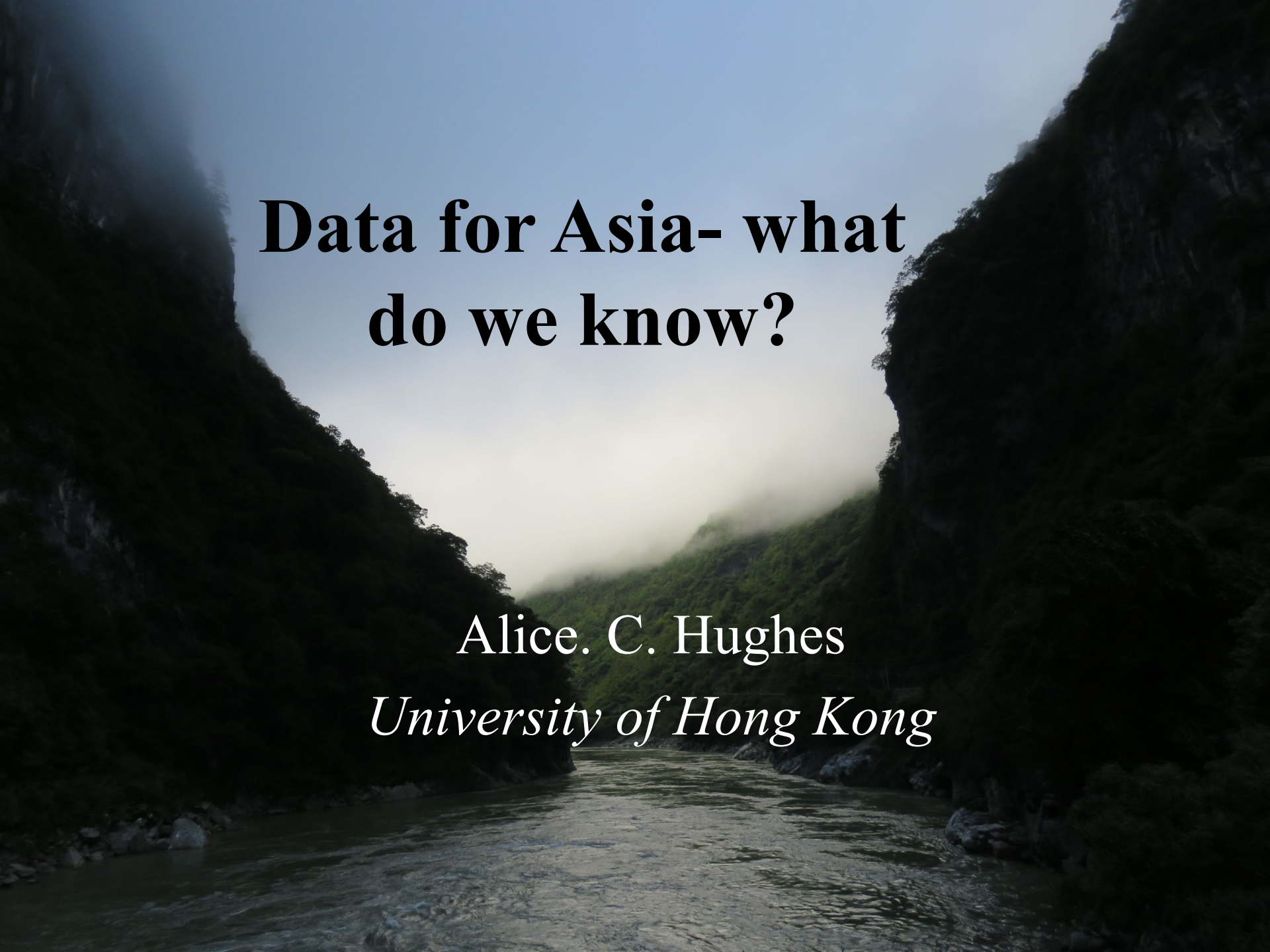
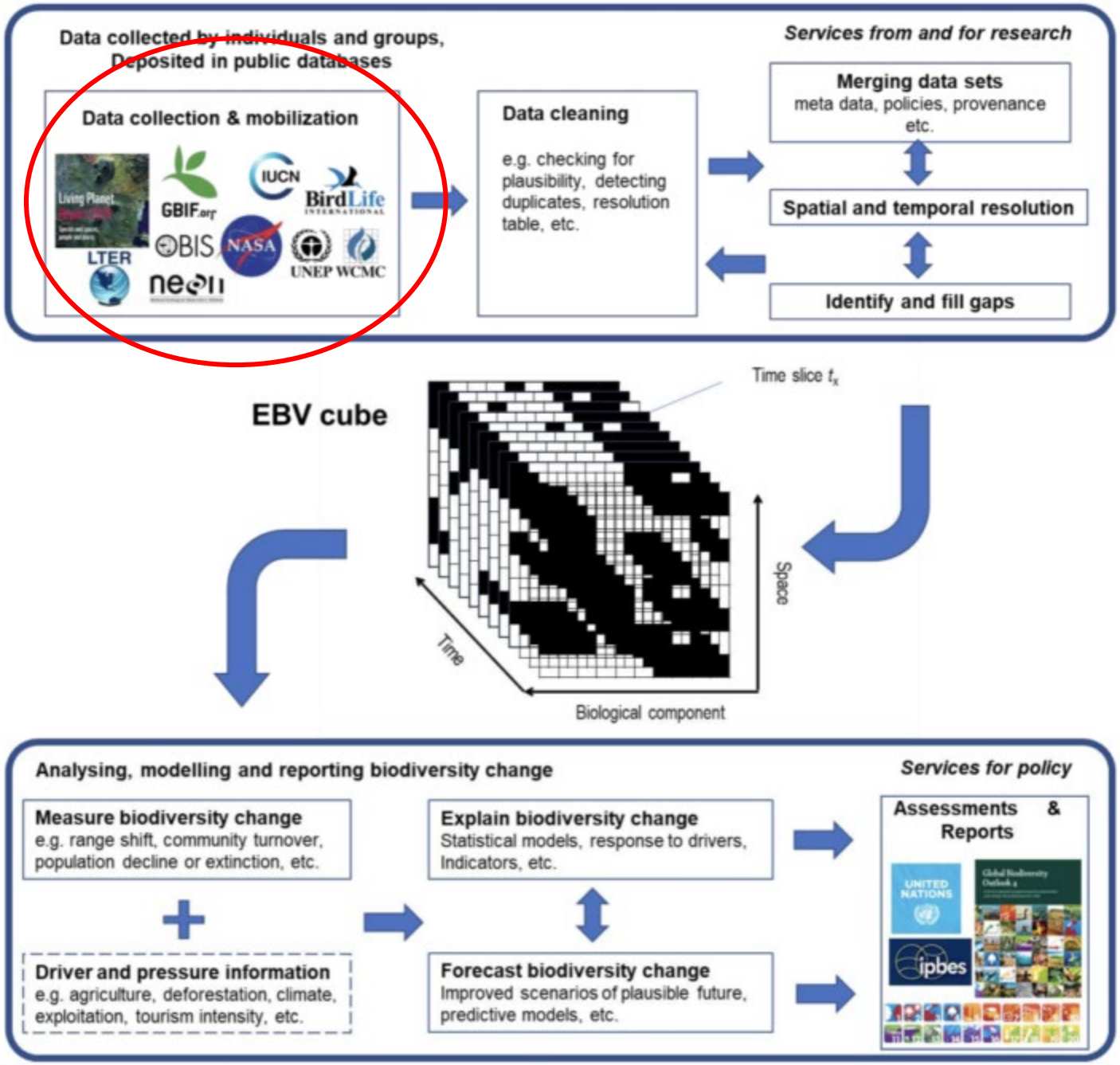


Data for Asia- what do we know?

Alice. C. Hughes

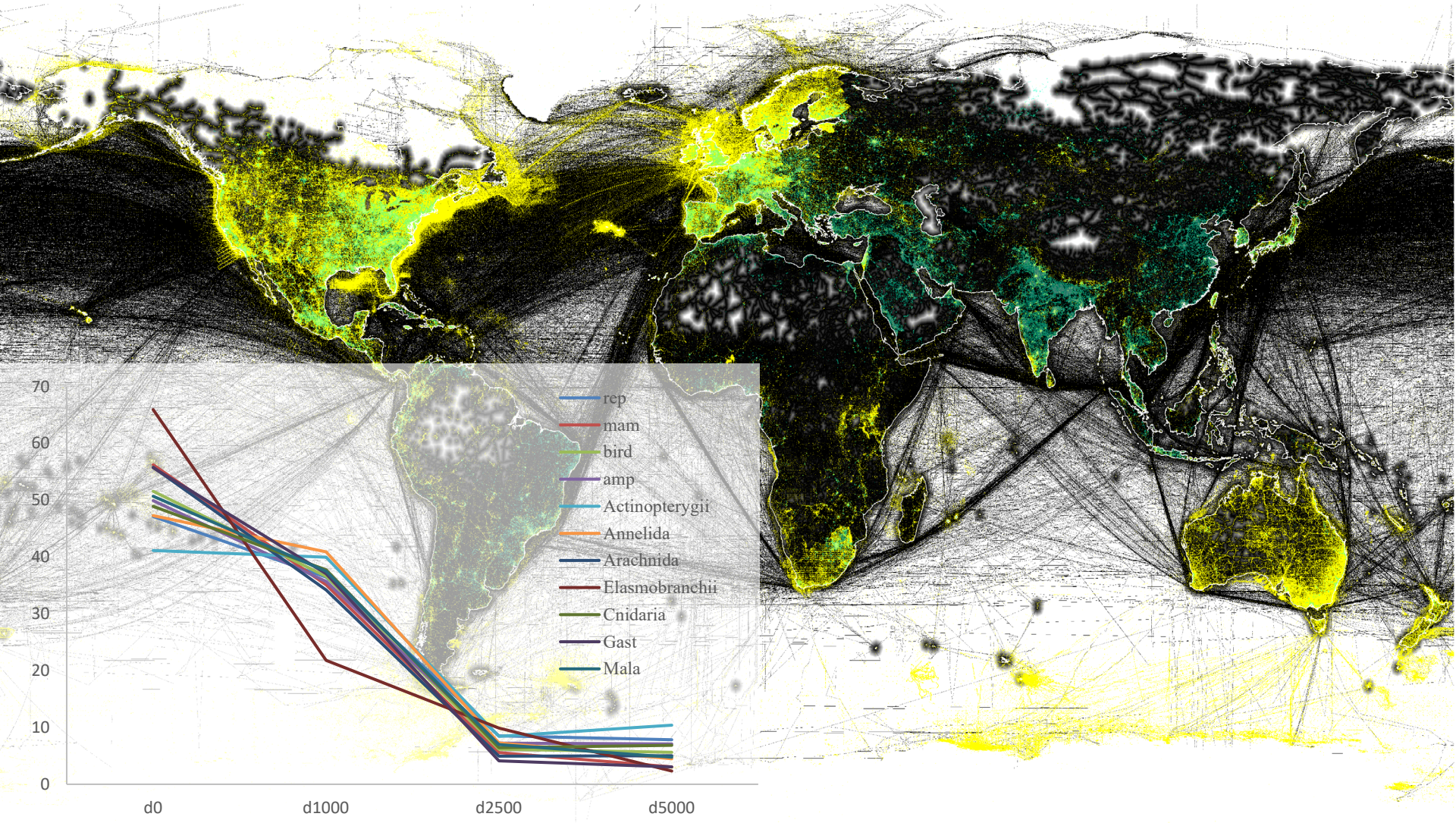
University of Hong Kong

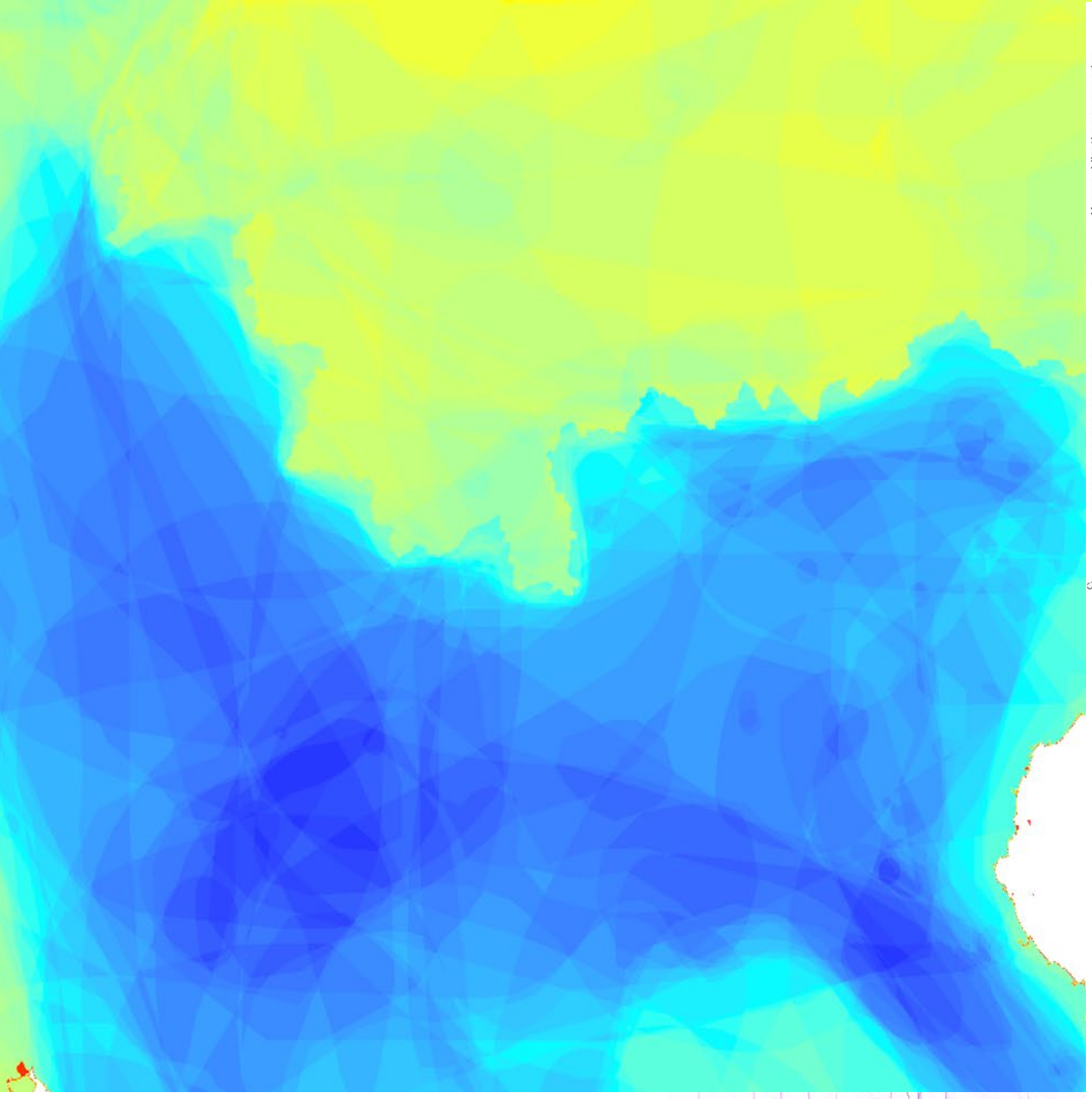

Data collected by individuals and groups,
Deposited in public databases
Data collection & mobilization
Living Planet
GBIF.org
IUCN
BirdLife INTERNATIONAL
OBIS
NASA
UNEP WCMC
LTER
neon
Data cleaning
e.g. checking for plausibility, detecting duplicates, resolution table, etc.
Services from and for research
Merging data sets
meta data, policies, provenance etc.
Spatial and temporal resolution
Identify and fill gaps
EBV cube
Time slice t_x
Space
Time
Biological component
Analysing, modelling and reporting biodiversity change
Services for policy
Measure biodiversity change
e.g. range shift, community turnover, population decline or extinction, etc.
Explain biodiversity change
Statistical models, response to drivers, Indicators, etc.
Driver and pressure information
e.g. agriculture, deforestation, climate, exploitation, tourism intensity, etc.
Forecast biodiversity change
Improved scenarios of plausible future, predictive models, etc.
Assessments & Reports
UNITED NATIONS
ipbes

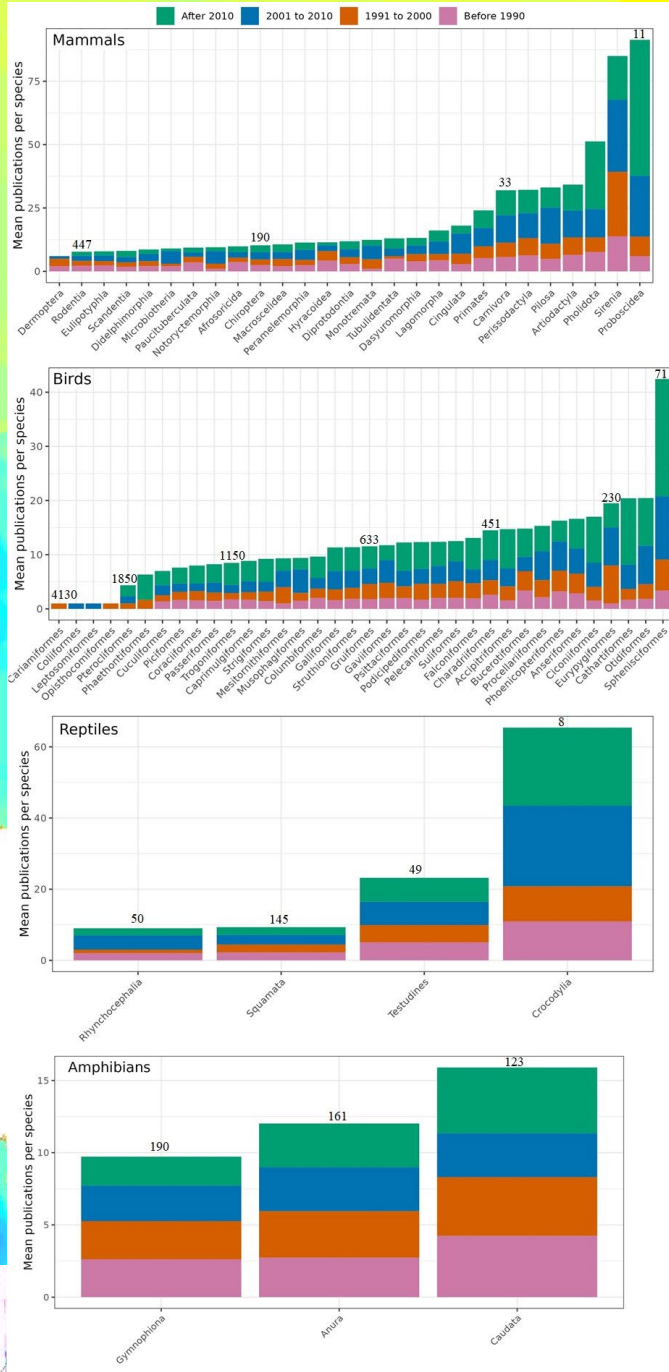
What do we need to know?

EBV class	EBV name
Genetic composition	Genetic diversity (richness and heterozygosity)
	Genetic differentiation (number of genetic units and genetic distance)
	Effective population size
	Inbreeding
Species populations	Species distributions
	Species abundances
Species traits	Morphology
	Physiology
	Phenology
	Movement
	Reproduction
Community composition	Community abundance
	Taxonomic/phylogenetic diversity
	Trait diversity
	Interaction diversity
Ecosystem functioning	Primary productivity
	Ecosystem phenology
	Ecosystem disturbances
Ecosystem structure	Live cover fraction
	Ecosystem distribution
	Ecosystem Vertical Profile

Distribution data is the fundamental unit for calculating diversity patterns

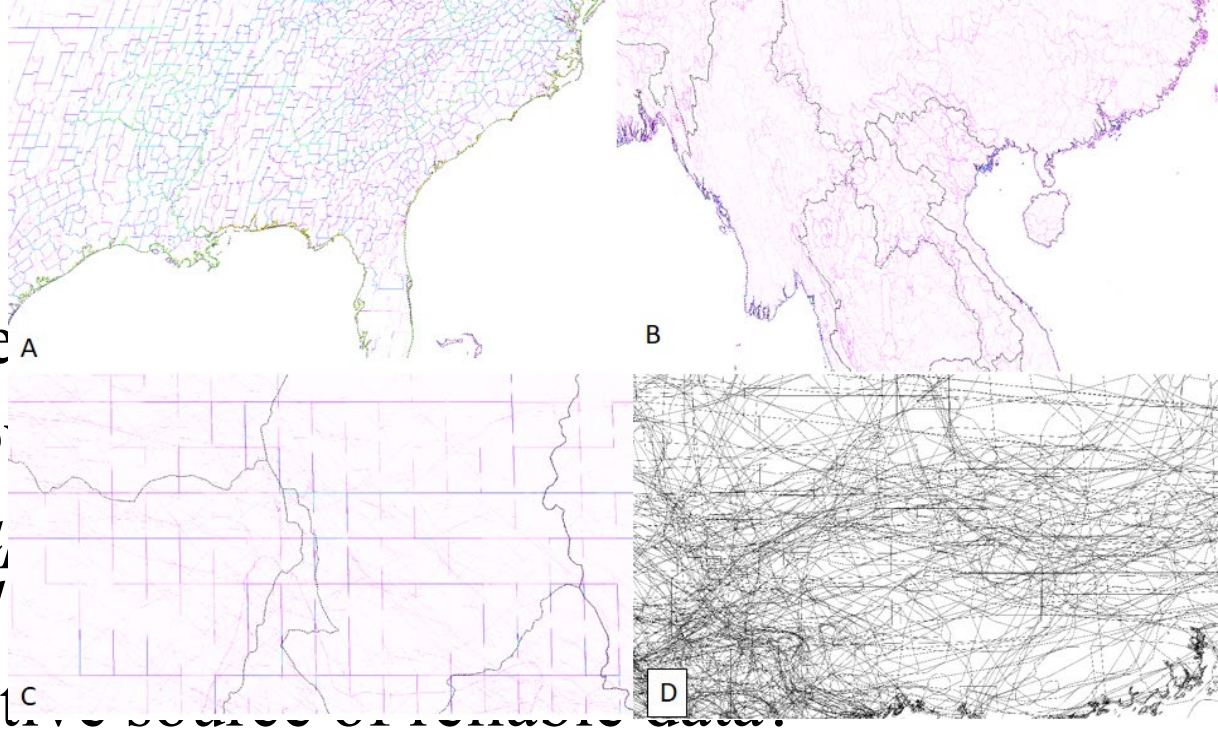






Mean number of publications per species per time period for each order, with the mean number of assessments each cited publication appears in per group shown for select orders

Hughes, A.C., Orr, M.C., Qinmin, Y., Qiao,
biodiversity patterns for different regions an c



- Understanding the
- Does the data allo

No, data is full of ga
does exist it's biased

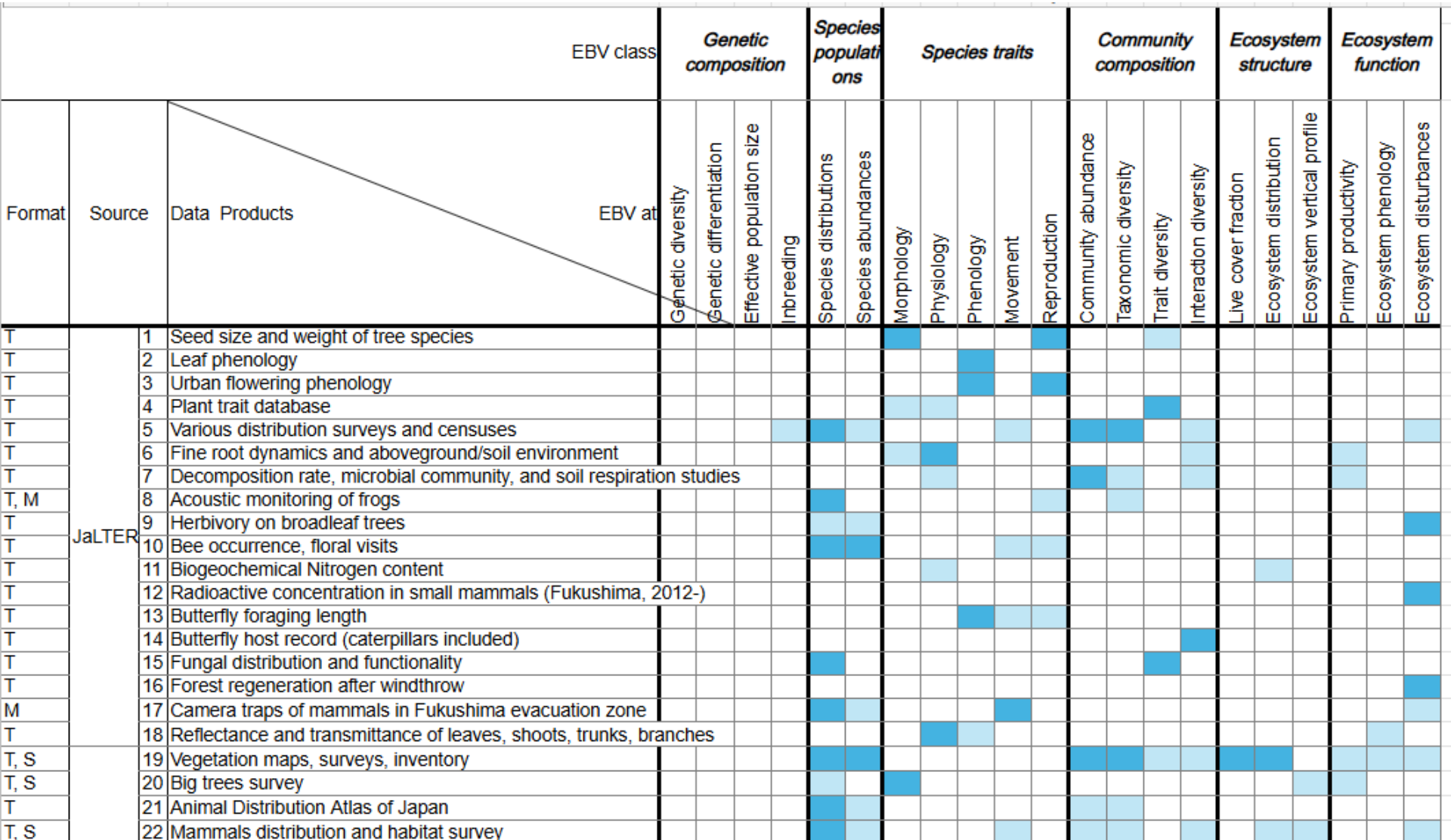
- Is there an alternat

Not really, range maps are not always representative, and have demonstrable biases

- How about those impressive numbers in global reports
- *Unfortunately these are based on non-standardized*

Group	dd	inredlist	%dd	described	estimate	% described species	%estimated species
Fungi	22	285	7.72	120000	12000000	0.22	0.0022
Plantae	2774	40468	6.85	390900	7000000	9.64	0.5385
Arthropoda	3735	13170	28.36	1000000	7000000	0.94	0.1348

Species populations



Format	Source		Data Products	Genetic composition				Species populations		Species traits					Community composition				Ecosystem structure			Ecosystem function		
			EBV class																					
			EBV at	Genetic diversity	Genetic differentiation	Effective population size	Inbreeding	Species distributions	Species abundances	Morphology	Physiology	Phenology	Movement	Reproduction	Community abundance	Taxonomic diversity	Trait diversity	Interaction diversity	Live cover fraction	Ecosystem distribution	Ecosystem vertical profile	Primary productivity	Ecosystem phenology	Ecosystem disturbances
T	JaLTER	1	Seed size and weight of tree species							■				■			■							
T		2	Leaf phenology									■												
T		3	Urban flowering phenology									■		■										
T		4	Plant trait database							■	■						■							
T		5	Various distribution surveys and censuses				■	■	■				■		■	■		■						■
T		6	Fine root dynamics and aboveground/soil environment							■	■							■				■		
T		7	Decomposition rate, microbial community, and soil respiration studies								■				■	■		■				■		
T, M		8	Acoustic monitoring of frogs					■						■		■								
T		9	Herbivory on broadleaf trees					■	■															■
T		10	Bee occurrence, floral visits					■	■				■	■										
T		11	Biogeochemical Nitrogen content								■									■				
T		12	Radioactive concentration in small mammals (Fukushima, 2012-)																					■
T		13	Butterfly foraging length									■	■	■										
T		14	Butterfly host record (caterpillars included)															■						
T		15	Fungal distribution and functionality					■									■							
T		16	Forest regeneration after windthrow																					■
M		17	Camera traps of mammals in Fukushima evacuation zone					■	■				■											■
T		18	Reflectance and transmittance of leaves, shoots, trunks, branches								■	■											■	
T, S		19	Vegetation maps, surveys, inventory					■	■						■	■	■	■	■	■			■	■
T, S		20	Big trees survey					■		■											■		■	
T		21	Animal Distribution Atlas of Japan					■	■						■	■								
T, S		22	Mammals distribution and habitat survey					■	■				■		■	■				■	■			■

Genetic data

- Data has improved, but is limited over the region
- Much data is from insects (from disease studies)
- Phylogenetic based metrics are largely unavailable
- Population size, or calculations of inbreeding are virtually absent outside select species

Ecosystem data

- Whilst there are active space centres across the region, much data for ecosystem monitoring relies on global data
- EO data is being used more in some regions, such as China where drones can be used for more precise analysis (degradation, diversity)
- Lidar and plot based data is becoming more available-but limited

Situation in Asia

- Many datasets exist
- BUT
- Most are private or government
- We need to work harder to liberate data, or find ways to create data products to reflect the biodiversity status of the region
- Asia also lacks the equivalent data mobilisation approaches which have been developed elsewhere in the world

Moving forwards

- Landscape and ecosystem variables are generally a reasonable quality for Asia-but better data on habitat quality is needed; better measures of degradation
- Species data requires more inputs from National bodies, much data for the region is not accessible
- Genetic data; more representative data is needed
- Longterm monitoring programs are needed
- More local-level data is needed from plots to understand dynamics
- More movement data is needed to understand connectivity
- Few species have migration data (mainly birds on EAAF)

Understanding and overcoming challenges

- Many countries do have National level monitoring programs-but this data is held by governments
- Companies also commission EIAs-but data normally remains private
- Monitoring of habitat loss limited to afew commodities
- New technologies, such as bioacoustics with deep learning are being developed for some regions

APBIOS?

- Understanding what makes data sensitive and how to either overcome sensitivity or provide easy tools to provide secondary products without sharing
- Developing common-standards to enhance data interoperability
- Reporting standards and access
- Federated networks to facilitate sharing and creation of larger data products
- The role of regional nodes (such as ACB) in helping find the balances
- How can these tools make tracking progress easier, what is the appeal to governments?
- The use of newer technologies-capacity and access


Thank you