



ISEC 2022

INTERNATIONAL STATISTICAL ECOLOGY CONFERENCE
CAPE TOWN, SOUTH AFRICA 27 JUNE - 1 JULY 2022

BREAKWATER LODGE, CAPE TOWN, SOUTH AFRICA
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Delivering policy-relevant indicators: South Africa's Biodiversity Data Pipeline for Wetlands and Waterbirds

Francisco Cervantes, Stojanov, Y., Strobbe, F., Brooks, M., Altwegg, R.

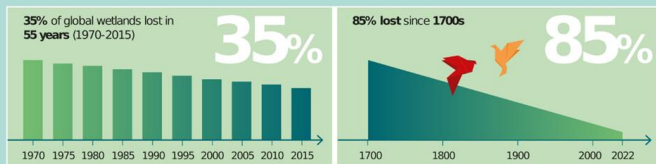
International Statistical Ecology Conference 2022

Cape Town, South Africa

WETLANDS

A CALL FOR ACTION

NATURAL WETLANDS ARE DISAPPEARING THREE TIMES FASTER THAN FORESTS



WHAT LOSS OF WETLANDS MEANS

FOR PEOPLE

- Water scarcity
- Exposure to flooding and extreme weather events
- Lost livelihoods and well-being
- Food insecurity



FOR THE PLANET

- Biodiversity decline
- Increased carbon and methane emissions
- Loss of natural freshwater filtration



TAKE THREE ACTIONS

VALUE WETLANDS
 BIODIVERSITY HOTSPOTS
 FRESHWATER STORES
 CARBON SINKS
 SOURCE OF LIVELIHOODS

STOP DRAINING
 THE LIFE FROM WETLANDS
 USEWISELY

REWET
REFOREST
RESTORE
WETLANDS

SOME WETLANDS TO LOVE

PEATLANDS Pastaza-Marañón Foreland Basin - Peru	CORAL REEFS Great Barrier Reef - Australia	MANGROVES Sundarbans - Bangladesh
MARSHES Okavanga Delta - Botswana	FLOOD PLAINS Pantanal - Brazil, Bolivia, Paraguay	ESTUARIES Severn Estuary - UK
COASTLINES Amalfi Coast - Italy	SWAMPS Everglades - USA	BOGS Cuvette Centrale - Republic of Congo



VALUE - MANAGE - RESTORE - LOVE

#WorldWetlandsDay #actForWetlands www.worldwetlandsday.org

World
Wetlands Day
2 February 2022



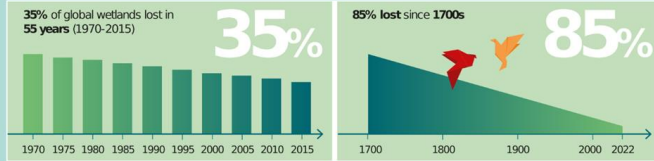
Wetlands Action for People and Nature



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frontiers
 in Environmental Science

REVIEW
 published: 02 June 2020
 doi: 10.3389/fenvs.2020.00061

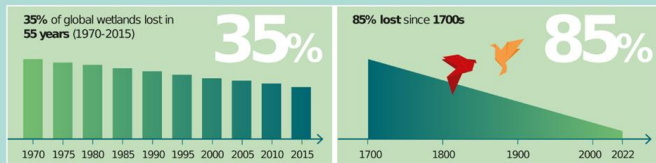


The Use of Traditional and Modern Tools for Monitoring Wetlands Biodiversity in Africa: Challenges and Opportunities

P. J. Stephenson¹, Yaa Ntiama-Baidu^{1,2,3*} and John P. Simaika^{1,4,5}

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SABAP2



Southern African Bird Atlas Project



Coordinated Waterbird
Counts

frontiers
in Environmental Science

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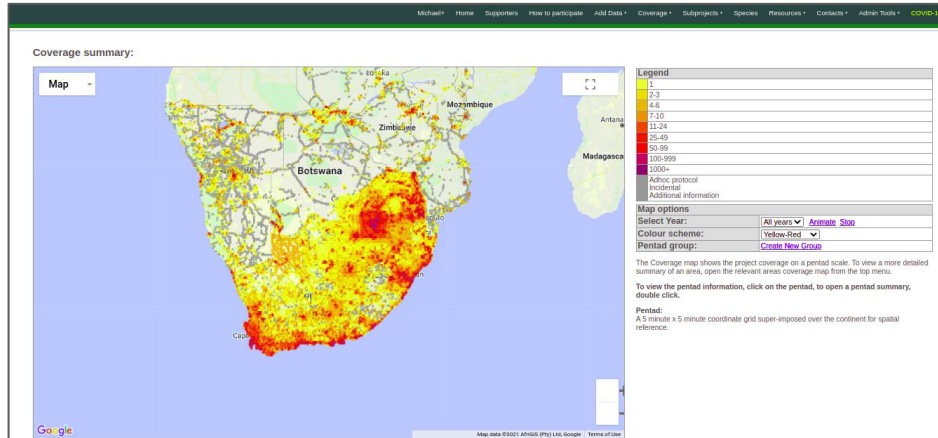
The Use of Traditional and Modern Tools for Monitoring Wetlands Biodiversity in Africa: Challenges and Opportunities

P. J. Stephenson¹, Yaa Ntiama-Baidu^{1,2,3*} and John P. Simaika^{1,4,5}

Southern African Bird Atlas Project



- 2007-ongoing
- Detection/non-detection
- ~17.6 million records
- 14061 of 16708 pentads (5' x 5')



Project

Other

SABAP2



Coordinated Waterbird Counts



- 1992-ongoing
- Abundance
- ~347,000 records
- 739 sites

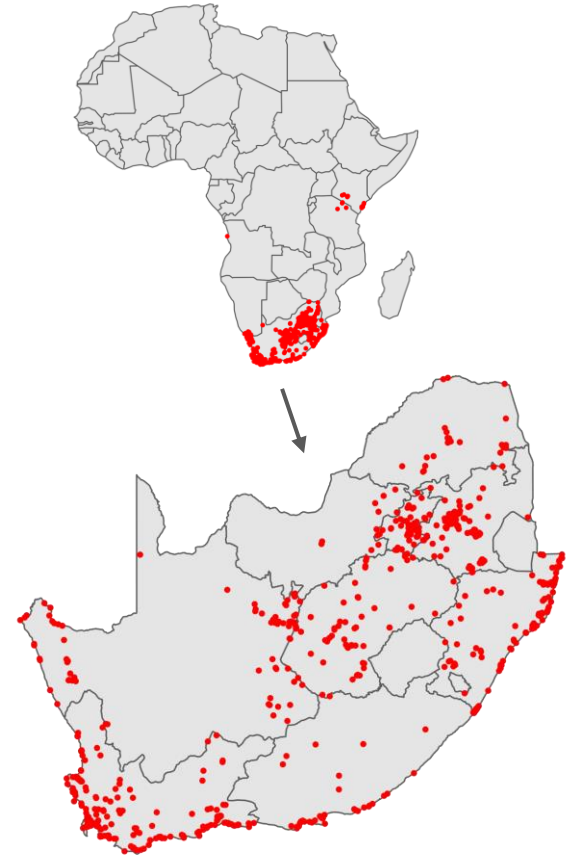
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[API](#)

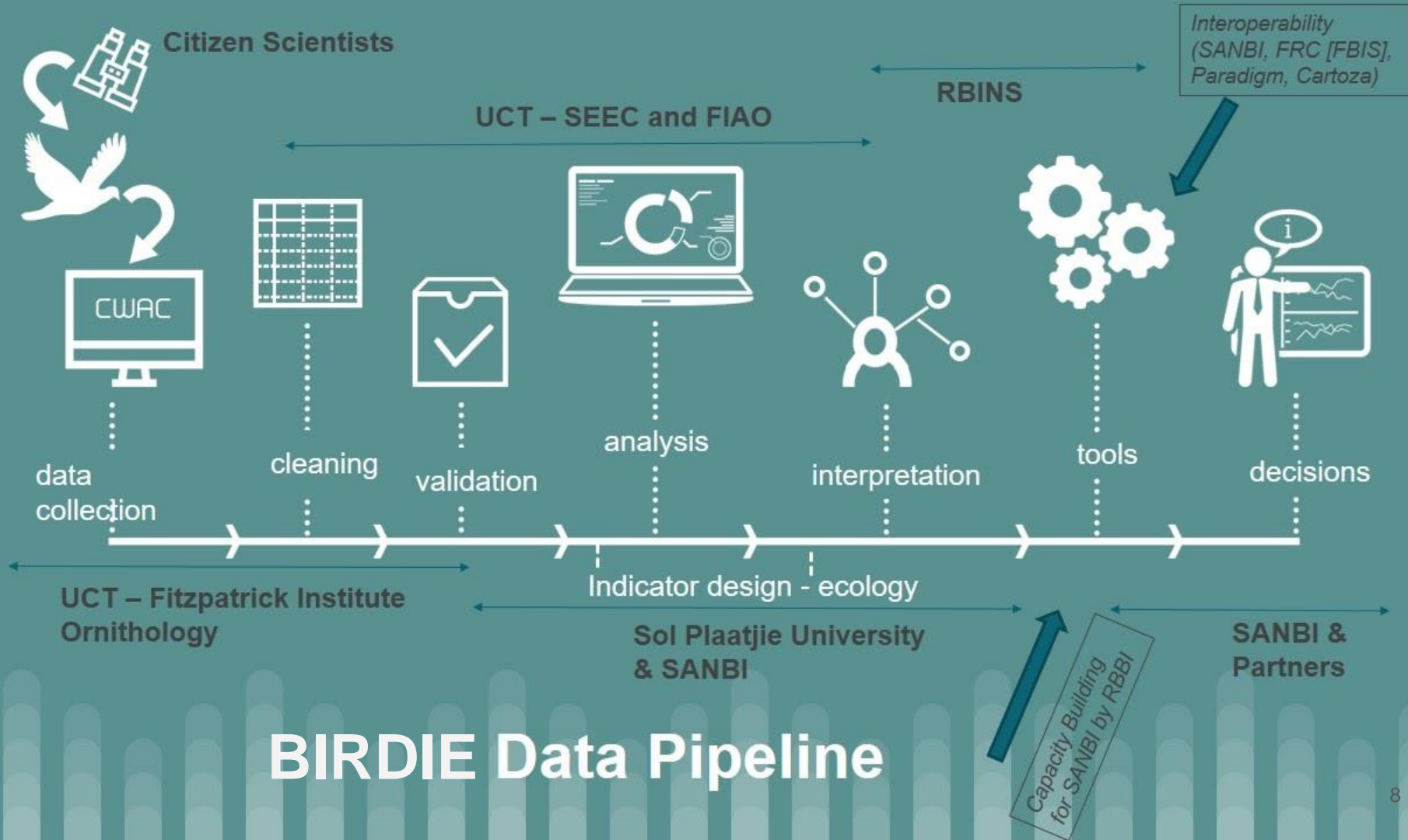
Langebaan: South Marsh (33111806)
Western Cape
CWAC status: REGISTERED-COUNTED REGULARLY
Authority: South African National Parks & Private
Management status: NATIONAL PARK
Conservation status: PROTECTED
IBA information: SA105 - WEST COAST N.P. & SALDANHA BAY ISLANDS
Ramsar information:
Heritage information:
View Cards: [Click here](#)
[Add a new card](#)

Map **Satellite**

Information [Edit Site information](#)
Date registered
2005-07-15

Spp	Common name	Taxonomic name	Min	Avg	Max	IBA	Subregional IBA	RAMSAR
256	Ruff	Calidris pugnax	1	17.00	45			
255	Sanderling	Calidris alba	3	139.67	409			
269	Avocet, Pied	Recurvirostra avosetta	4	46.73	220		125	
212	Coot, Red-knobbed	Fulica cristata	12	12.00	12			
48	Common Cane	Rhacocorax capensis	1	18.75	87			



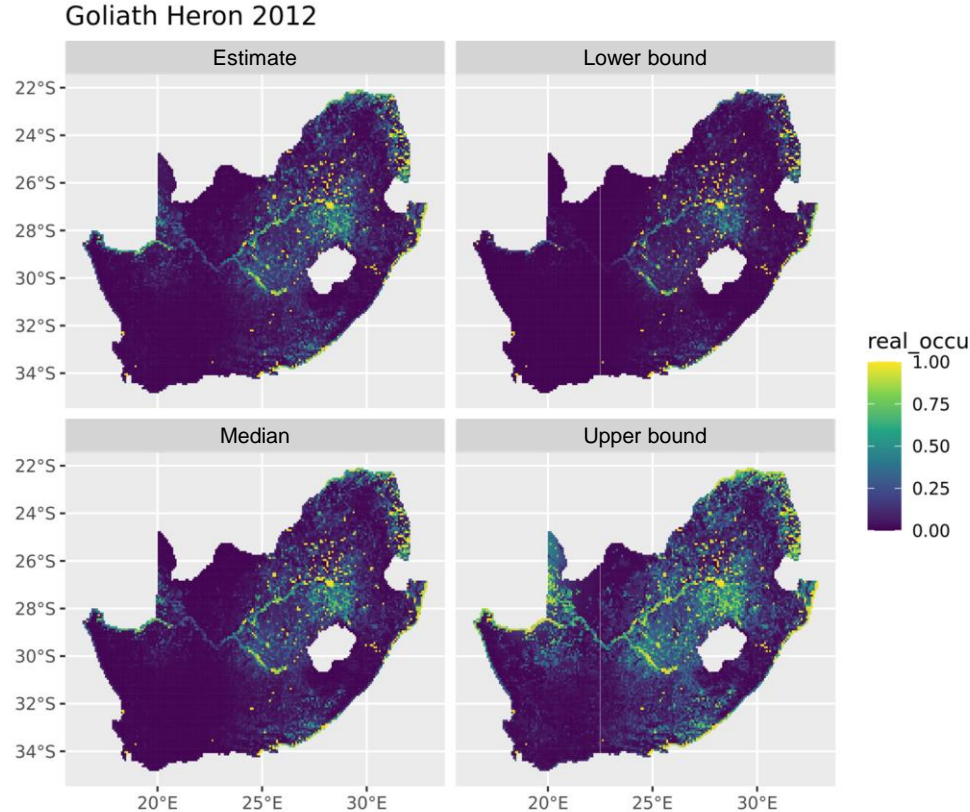


Who is BIRDIE intended for?

- International agreements: Ramsar, AEWA, ...
- National programmes: Biodiversity Assessments, Red Listing,...
- Site-specific programmes
- Researchers
- General public: birders, naturalists, ...
- ...

Species distribution

- Occupancy models for ABAP
- Spatio-temporal effects using splines (occuR package*)
- Moving three-year window
- Derived indicators:
 - Area of occupancy
 - Extent occurrence
 - ...

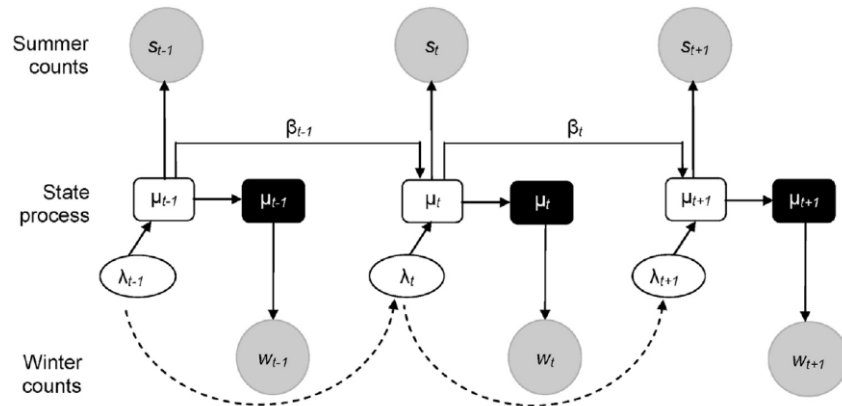


Species abundance

- State-space model for CWAC
- Species- and site- specific models
- Aggregate results to obtain abundance at larger scales

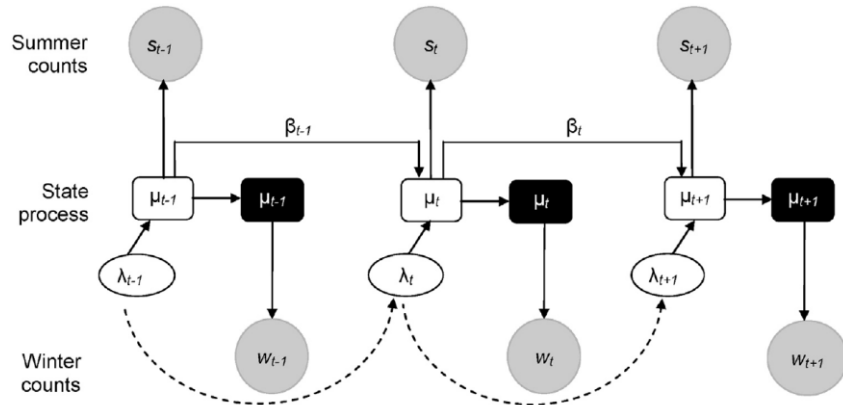
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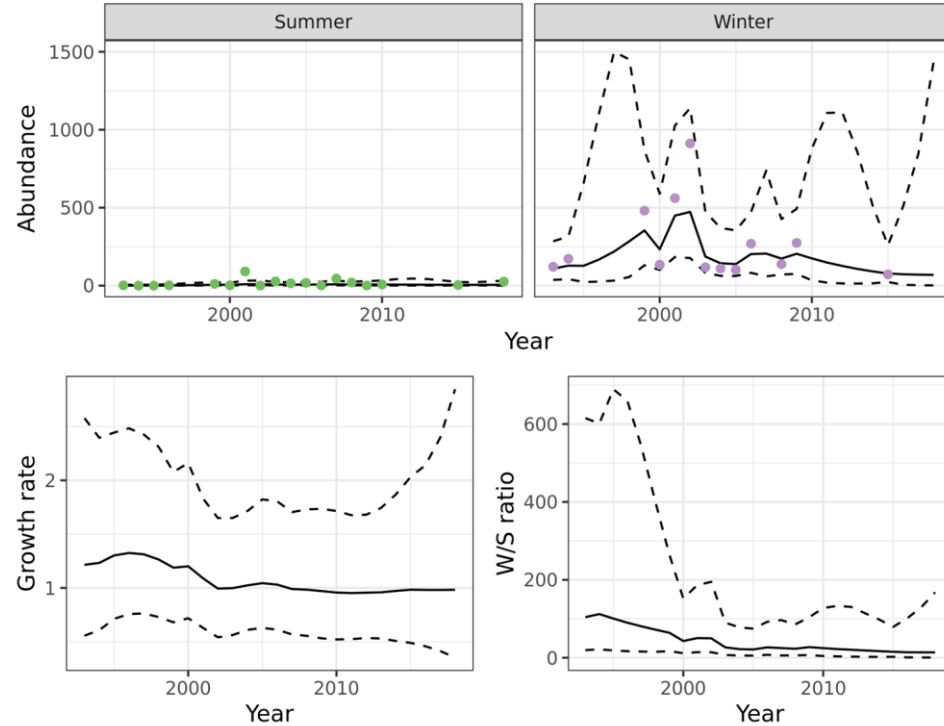


Species abundance

- State-space model for CWAC
- Species- and site- specific models
- Aggregate results to obtain abundance at larger scales



Little Grebe



Community diversity

- Waterbird Conservation Value (Harebottle *et al.* 2016, Ostrich 87)
- Living Planet Index (see Loh *et al.* 2005, Phi. Trans. Roy. Soc. 360)
- Hill's numbers (Hill 1973, Ecology 54)
- ...



Progress and challenges

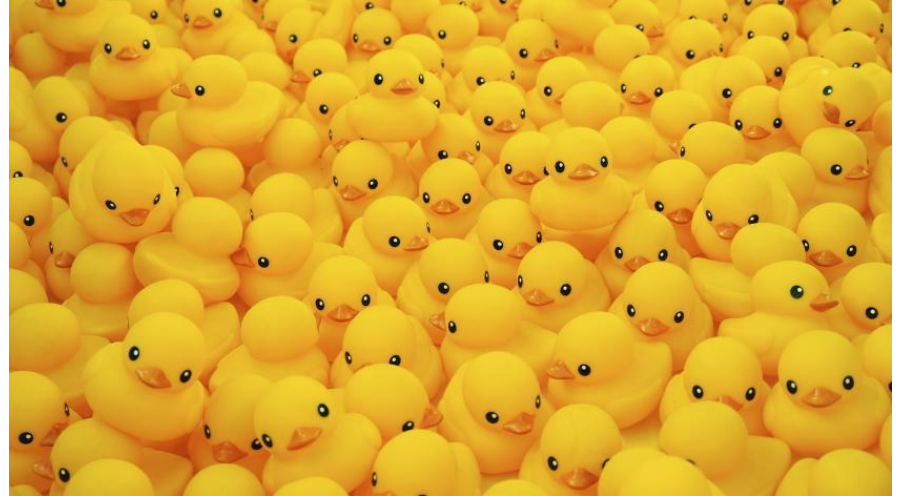
Progress and challenges

- “One model” to fit them all



Progress and challenges

- “One model” to fit them all
- Running time



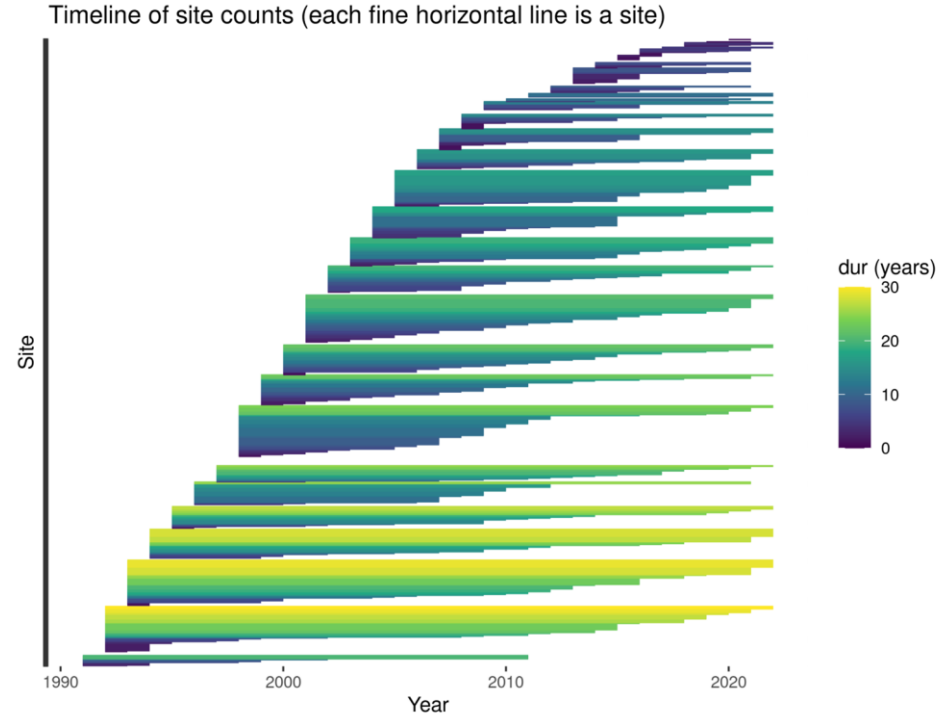
Progress and challenges

- “One model” to fit them all
- Running time
- Species with few detections



Progress and challenges

- “One model” to fit them all
- Running time
- Species with few detections
- Irregular monitoring across sites



Thank you!

Carol Poole (SANBI)
Nancy Job (SANBI)
Andrew Skowno (SANBI)
Sediqa Khatieb (SANBI)
Brenda Daly (SANBI)
Doug Harebottle (Sol Plaatje University)
Michael Brooks (FIAO UCT)
Res Altwegg (SEEC UCT)
Vernon Visser (SEEC UCT)
Francis Strobbe (Seascape Belgium)
Yvan Stojanov (RBINS)
...

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**SOL PLAATJE
UNIVERSITY**



seascape
BELGIUM

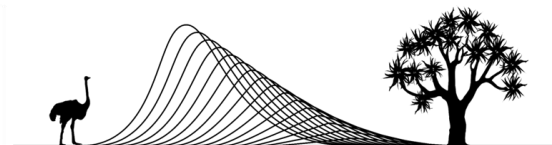
SANBI

Biodiversity for Life

South African National Biodiversity Institute



Royal Belgian Institute of Natural Sciences



SEEC - Statistics in Ecology, Environment and Conservation