

Samuel Thompson

DATA SCIENTIST / RESEARCH ASSOCIATE

School of Molecular and Life Sciences, Curtin University

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About me

I use novel sampling methods, computers and large genetic datasets to answer biological questions, typically in marine vertebrates. My research has focused on the development and deployment of a novel sampler capable of simultaneously collecting environmental DNA (eDNA), stereo-video imagery and oceanographic data, investigating the spatial distribution of marine vertebrate species in the context of anthropogenic change; especially the presence of restricted-access marine areas such as Marine Parks and offshore infrastructure. I am particularly passionate about the development of novel software tools to standardise and automate the analysis, reporting and display of ecological data, particularly eDNA metabarcoding data.

Education

University of Western Australia

Perth, Australia

PHD

2020-2024

- Environmental DNA (eDNA) metabarcoding PhD with the Marine Ecology Fisheries Research Group and the Jarman lab
- Developed a sampling system capable of collecting 360-degree stereo-video, water samples and oceanographic data at depths up to 600m
- Designed a family-specific eDNA metabarcoding primer set for Lutjanidae (snapper)
- Developed multiple bioinformatic pipelines and data science tools for processing genetic, visual and oceanographic datasets
- Worked extensively with industry (BHP) and fishing industry

University of Southampton

Southampton, United Kingdom

MASTER OF OCEANOGRAPHY

2017-2018

- Studied all forms of oceanography with a focus on biological oceanography and deep-sea ecology
- Research project focussed on characterising deep-sea megafauna of the Kiribati region with towed-camera systems (published in Frontiers in Marine Science 2019)

University of Kent

Kent, United Kingdom

BACHELOR OF BIOCHEMISTRY (FIRST CLASS WITH HONOURS)

2010-2014

- Studied general life sciences with a focus on genetics and molecular biology
- Research project focussed on using novel bioinformatic tools to understanding genome duplication events in chordate species
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Employment

Curtin University

Perth

DATA SCIENTIST / RESEARCH ASSOCIATE

2023-present

- Data scientist / Bioinformatician for eDNA Frontiers, TrEnD Laboratory and eDGES Program at Curtin University
- Single-handedly building a full software stack (PostgreSQL, AWS, R/Python) to automate the analysis, curation, storage and display of large eDNA datasets
- Contributing data science expertise to the Fish Ecology Laboratory at Curtin University
- Communications manager for the eDNA for Global Environment Studies (eDGES) project at Curtin University

Minderoo Foundation

Perth

RESEARCH ASSISTANT (PART-TIME)

2021-2024

- Research assistant with the Minderoo OceanOmics team during offshore expeditions
- Working onboard the Pangaia Ocean Explorer, conducting environmental and genomic DNA sampling, extraction, amplification, purification, sequencing and data analysis
- Opportunity to undertake knowledge transfer of eDNA techniques to traditional ranger groups
- Has provided me with a unique opportunity to conduct end-to-end sampling to sequencing on an offshore vessel
- Conducting onboard bioinformatics analysis using a high-performance computing system

University of Western Australia

Perth

LABORATORY DEMONSTRATOR (PART-TIME)

2021-2022

- BIOL1131: Plant and Animal Biology
- Laboratory demonstrator and tutor for both face-to-face and online delivery formats
- Marker for marine and genetics components
- Guest Lecturer: Amphioxus: A model for developmental biology

RPS MetOcean

DATA SCIENTIST / OCEANOGRAPHER

Perth

2019-2019

- Working in the data sciences department
- Work processing, QCing and interpreting large oceanographic datasets through a linux environment, custom software and shell scripts
- Data from instruments including: ADCPs, CTDs, LIDAR buoys, Wave rider buoys

Royal Perth Yacht Club

WINDSURFING AND SAILING INSTRUCTOR (PART-TIME)

Perth

2019-2020

- Working as a dual qualified windsurfing and sailing instructor at a prestigious Perth yacht club
- Delivering both practical and theoretical lessons to groups of all ages and abilities ranging from age 8 up to 70

Mylan

ANALYTICAL CHEMIST

Kent, United Kingdom

2015-2017

- Key research team member during the ANDA submission to the FDA for a generic Advair drug product
- Conducted inhalation-specific lab techniques including aerodynamic particle size distribution, dissolution and emitted dose testing
- Use, calibration, maintenance and troubleshooting of analytical chemistry instrumentation including HPLCs and Raman spectrometers.
- Worked abroad in Dublin training new staff and setting up equipment in a new, purpose built QC lab

Skills

Coding languages

R, SQL, PYTHON, HTML, CSS, JAVA, BASH

- Shell scripting; building and running pipelines for processing large bioinformatic and oceanographic datasets via command-line
- Highly proficient in full-stack development, AWS (EC2, S3, RDS) infrastructure, MySQL / PostgreSQL databases and R/Python shiny frontend
- Highly familiar with wide variety of R and Python packages, particularly for bioinformatics, ecological statistics and spatial analyses
- Highly familiar with spatial analyses in arcGIS or qGIS
- Highly familiar with multivariate statistical analyses in both R or Primer
- Highly familiar with version control and containerisation systems: Git, Docker and Singularity
- Familiar with HTML and CSS for the design and styling of reports and websites

Practical Skills

ELECTRICAL, MECHANICAL, WOODWORK, ROPEWORK, BOATWORK

- Highly proficient at building and troubleshooting 12v automotive and marine systems
- Highly proficient at troubleshooting software/hardware related PC issues; I have built multiple desktop PCs and completed many initial OS installs and setups using various windows and linux distributions
- Intermediate mechanical knowledge; especially 4x4 and diesel automotive systems
- Basic ropework / winch operation skills
- I have participated >1000 deployments of marine sampling equipment on a variety of vessels from the Southampton Solent to the Southern Ocean

Licences & certifications

First Aid + Advanced resuscitation

OXYGEN PROVIDER AND CPR

PADI

2023-2024

4WD training

RIIVEH201D: OPERATE LIGHT VEHICLE, TLIC1051: OPERATE COMMERCIAL VEHICLE, TLIC2025: OPERATE FOUR WHEEL DRIVE

VEHICLE, TLIF2010: APPLY FATIGUE MANAGEMENT STRATEGIES, RIIVEH305E: DRIVE AND RECOVER A FOUR WHEEL DRIVE

2020

VEHICLE, PMASUP236: OPERATE VEHICLES IN THE FIELD

Recreational skippers ticket

DOT

2020

Advanced Open Water Diver

PADI

2017

Dinghy sailing instructor

RYA

2014

Safety boat

RYA

2013

Powerboat level 2

RYA

2012

Start windsurfing instructor

RYA

2012

Scientific voyages

Sydney -> Brisbane

RESEARCH ASSISTANT - MINDEROO OCEANOMICS / CSIRO

RV Investigator

2024 (26 days)

Perth -> Abrohlos

RESEARCH ASSISTANT - MINDEROO OCEANOMICS / UWA DEEP-SEA RESEARCH CENTRE

RV naturaliste

2024 (14 days)

Perth -> Ningaloo Plateau

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Pangaea Ocean Explorer

2023 (8 days)

Christmas Island -> Cocos Keeling Islands -> Fremantle

RESEARCH ASSISTANT - MINDEROO OCEANOMICS / UWA DEEP-SEA RESEARCH GROUP

Pangaea Ocean Explorer

2023 (30 days)

Fremantle -> Abrolhos Islands -> Fremantle

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Pangaea Ocean Explorer

2023 (10 days)

Esperance -> Albany

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Immortalis

2023 (10 days)

Fremantle -> Cocos Keeling Islands

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Pangaea Ocean Explorer

2022 (22 days)

Carnarvon -> Ningaloo Marine Park

RESEARCH LEAD - UWA MARINE ECOLOGY GROUP. SURVEYING PALEOCOASTLINE FEATURES WITH STEREO-BRUVs, NOVEL SAMPLERS, CTDs AND ENVIRONMENTAL DNA

Keshi Mer

2022 (12 days)

Fremantle -> Abrolhos Islands -> Fremantle

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Pangaea Ocean Explorer

2022 (10 days)

Esperance -> Israelite bay -> Fremantle

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Pangaea Ocean Explorer

2022 (14 days)

Coral Bay -> Exmouth Gulf

RESEARCH ASSISTANT - MINDEROO OCEANOMICS

Pangaea Ocean Explorer

2021 (10 days)

Dongara -> Onslow, WA

PHD STUDENT - UWA MARINE ECOLOGY GROUP. SURVEYING MARINE PARKS, PROPOSED PARK ZONES AND OFFSHORE OIL AND GAS INFRASTRUCTURE USING STEREO-BRUVs, NOVEL SAMPLERS, CTDs AND ENVIRONMENTAL DNA

Adrianus

2021 (28 days)

Presentations and Guest Lectures

Curtin University BioBlitz: Community metabarcoding

TECHNICAL LEAD

Curtin University, Bentley and

Singapore campuses

2024-present

Simultaneous eDNA and visual surveying of the marine environment

ECR PRESENTER

Australia and New Zealand eDNA

conference

2023

Amphioxus: A model for developmental biology

GUEST LECTURER

UWA - BIOL1131: Plant and Animal

Biology

2021

Research update

STUDENT PRESENTER

UWA: School of Biological Sciences

2021

Research proposal

PHD RESEARCH PROPOSAL

UWA: School of Biological Sciences

2020

Awards and Funding

Grant: Biodiversity and societal benefits of restricted access marine areas	<i>BHP/UWA</i>
WITH PROF. JULIAN PARTRIDGE, PROF. SIMON JARMAN, PROF. GARY KENDRICK, DR. TIM LANGLOIS, DR MATT NAVARRO. TOTAL FUNDING: AUD \$666,524.	2020-2024
Award: CSIRO Early-career researcher conference bursary	<i>CSIRO</i>
GRANT TO ATTEND THE 2023 AUSTRALIA AND NEW ZEALAND EDNA CONFERENCE IN HOBART. TOTAL FUNDING: AUD \$600	2023

Publications

Benthic Observation Survey System (BOSS) for surveys of marine benthic habitats	<i>Methods in Ecology and Evolution</i>
T LANGLOIS, C SPENCER, BA GIBBONS, KJ GRIFFIN, K ADAMS, C ASTON, ...	2025
In vitro passive eDNA sampling provides a cost-effective alternative for large-scale sampling	<i>Environmental DNA</i>
S THOMPSON, S JARMAN, K GRIFFIN, M HEYDENRYCH, J PARTRIDGE, T LANGLOIS	2025
A novel drop-sampler for simultaneous collection of stereo-video, environmental DNA and oceanographic data	<i>Ecology and Evolution</i>
S THOMPSON, S JARMAN, K GRIFFIN, C SPENCER, G CUMMINS, J PARTRIDGE, ...	2024
Preliminary observations of the abyssal megafauna of Kiribati	<i>Frontiers in Marine Science</i>
E SIMON-LLEDÓ, S THOMPSON, A YOOL, A FLYNN, C POMEE, J PARIANOS, ...	2019