GEOGRAPHY BULLETIN

TEACHING RESOURCES

The Geography Teachers Association of NSW & ACT Inc.

Volume 53 No1 2021

IN THIS ISSUE:

WEB RESOURCES

- OCEAN ATLAS
- TIME FOR GEOGRAPHY
- TWEED SAND BYPASSING – Schools package
- WHAT IS Profile.id?
- SHEMAPS – STEM Education Blog
- MURRAY-DARLING BASIN – Lesson packages

DIGITAL RESOURCE

- Mt Resilience

EXPERIENTIAL LEARNING

- EVENT: OXFAM HUNGER BANQUET
- FIELDWORK: USING GEOGRAPHICAL FIELDWORK TO TACKLE PRECONCEPTIONS ABOUT PLACE

RESOURCE

- VISUAL CAPITALIST:
  - – Visualizing Countries by Share of Earth's Surface
  - – Visualizing the Biggest Threats to Earth's Biodiversity
  - – How To Spot Fake News
- TEACHING GUIDE: INTERCONNECTION & THE COTTON INDUSTRY
- DOCUMENTARY: 'WILD AUSTRALIA – AFTER THE FIRES"

PROFESSIONAL DEVELOPMENT

- SPATIAL TECHNOLOGY – Landscape and Landforms in Google Voyager
- STEPPING OUT INTO GEOGRAPHY – Reflection and direction

PROJECTS • REPORTS • RESOURCES • ARTICLES • REVIEWS

EXECUTIVE 2021

GEOGRAPHY BULLETIN

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Cover: Golden Hands Bridge, Danang Vietnam. Source: Shutterstock

The Geography Bulletin is a quarterly journal of The Geography Teachers' Association of NSW & ACT Inc. The 'Bulletin' embraces those natural and human phenomena which fashion the character of the Earth's surface. In addition to this it sees Geography as incorporating 'issues' which confront the discipline and its students. The Geography Bulletin is designed to serve teachers and students of Geography. The journal has a specific role in providing material to help meet the requirements of the Geography syllabuses. As an evolving journal the Geography Bulletin attempts to satisfy the requirements of a broad readership and in so doing improve its service to teachers. Those individuals wishing to contribute to the publication are directed to the 'Advice to contributors' at the back of this issue.

GEOGRAPHY BULLETIN

Volume 53, No 1, 2021
EDITOR: Lorraine Chaffer

EDITORIAL 2
CONFERENCE UPDATE 3
PRESIDENT'S REPORT 6
WEB RESOURCE: OCEAN ATLAS WEB DOSSIER and PDF 11
DIGITAL RESOURCE: Mt Resilience 17
WEB RESOURCE: TIME FOR GEOGRAPHY 22
WEB RESOURCE: TWEED SAND BYPASSING SCHOOLS PACKAGE 25
EXPERIENTIAL LEARNING EVENT: OXFAM HUNGER BANQUET 29
EXPERIENTIAL LEARNING FIELDWORK: USING GEOGRAPHICAL FIELDWORK TO TACKLE PRECONCEPTIONS ABOUT PLACE 31
PROFESSIONAL DEVELOPMENT: STEPPING OUT INTO GEOGRAPHY – REFLECTION AND DIRECTION 34
WEB RESOURCE: WHAT IS Profile.id? 36
RESOURCE: VISUAL CAPITALIST 41
- Visualizing Countries by Share of Earth's Surface 42
- Visualizing the Biggest Threats to Earth's Biodiversity 44
- How To Spot Fake News 46

PROFESSIONAL DEVELOPMENT: SPATIAL TECHNOLOGY LANDSCAPES AND LANDFORMS IN GOOGLE VOYAGER 50
WEB RESOURCE: SHEMAPS STEM EDUCATION BLOG 59
WEB RESOURCE: MURRAY-DARLING BASIN Lesson Packages 64
RESOURCE: TEACHING GUIDE INTERCONNECTION & THE COTTON INDUSTRY 67
RESOURCE: DOCUMENTARY 'WILD AUSTRALIA – AFTER THE FIRES" 76
2020 AGM: ANNUAL REPORT 81
ADVICE TO CONTRIBUTORS 88

EDITORIAL

Lorraine Chaffer, Editor

EDITORIAL

Welcome to the first edition of the Geography Bulletin for 2021. GTA NSW & ACT is busy preparing new resources to support Geography teachers and students throughout the year.

Term 1 is a busy one for teachers with time to find new resources often limited. This edition contains a number of resources (digital, hard copy and experiential) recommended by members of the GTA NSW & ACT Council.

Many thanks to the following councillors for their contribution to Resource Edition 1.

Digital Resources	Author recommending the resource
Ocean Atlas	Lorraine Chaffer
Tweed Sand Bypassing: Schools package	Lorraine Chaffer
Visual Capitalist	Lorraine Chaffer
SheMaps BLOG	Lorraine Chaffer
Mt Resilience	Katerina Stojanovski
Time for Geography	Katerina Stojanovski
Google Voyager	Katerina Stojanovski, Dr Paul Batten
Profile.id	Karen Bowden
Murray Darling Basin Resources	Sharon McLean
Interconnections in the Cotton Industry	Martin Pluss
Wild Australia: After the fires	Grace Larobina
Experiential Learning	
Using geographical fieldwork to tackle preconceptions about place	David Latimer
Oxfam Hunger Banquet	Catherine Donnelly

Edition 2

A similar theme will be used for 2021 Edition 2. The content focus areas for the second edition will be:

- Aboriginal and Torres Strait Islander Histories and Cultures
- Asia

Resources about people, places and environments that suit any topic will be welcomed.*

* Each contributor who is not a GTA Council member will receive copies of exciting new posters printed by GTA NSW & ACT.

Lorraine Chaffer, Editor

CONFERENCE UPDATE

Lorraine Chaffer
2021 Annual Conference Convenor

I am excited to share with you the news that two high profile Keynote Speakers will present at the GTA NSW and ACT Annual Conference.

THURSDAY 13 MAY

DAMON GAMEAU: DIRECTOR, WRITER, PRODUCER, PRESENTER

'Damon's film, 2040, is an innovative feature documentary that explores what the future would look like by the year 2040 if we embraced the best solutions already available to us to improve our planet.'

Damon's full biography is on the conference website.

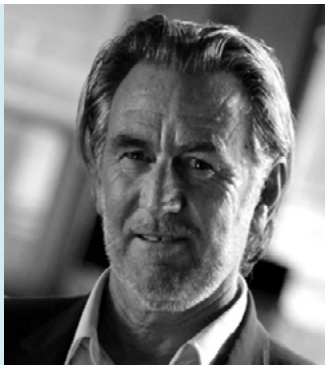
Damon is a sought-after speaker and spoke at the 2019 UN Climate Action Summit in New York. Damon has also addressed numerous Governments around the world and spoken at organisations such as GOOGLE, BP, PWC, ANZ, ZURICH, ATLASSIAN, UTAH CLEANENERGY, MASTERCARD, CREDIT SUISSE and many more. He was a NSW nomination for Australian of the Year in 2020.

FRIDAY 14 MAY

IVAN MOTLEY: FOUNDER, DIRECTOR AT .id

Ivan will relate the story of himself as a Geographer who founded .id (informed decisions) which for over 20 years has been an innovator and set and maintained the industry standard for delivering demographic and economic online tools for locational decision making.

In a message for all Geography teachers Ivan will explain that simply providing data has a low-level impact and to have an influence, we can give geographic data a soul through storytelling.



Ivan's Keynote abstract is on the conference website.

CONFERENCE SPONSORS

- AUSTRALIAN MOBILE TELECOMMUNICATIONS ASSOCIATION (Mobile Muster) – Major Sponsor Thursday 13 May
- SYDNEY OLYMPIC PARK – Conference Bag sponsor and 1 x Teacher Scholarship
- SYDNEY WATER – Water bottle sponsor
- EDUCATION PERFECT – Lanyard sponsor

CONFERENCE CHARITY

PICTURE YOU IN AGRICULTURE / ARCHIBULL PRIZE

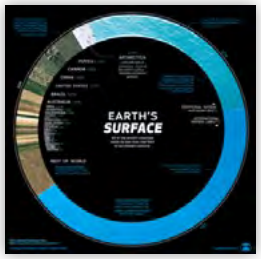
https://pictureyouinagriculture.com.au

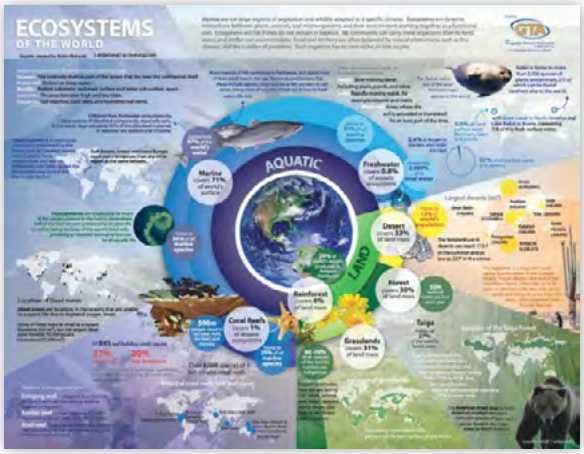
POSTER GIVEAWAY FOR CONFERENCE ATTENDEES

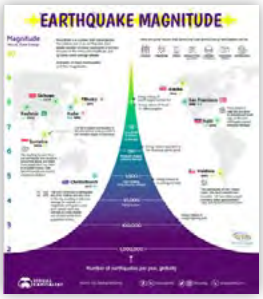
GTA has produced posters for Geography classrooms. Selected posters will be distributed free to all conference attendees. Upon registration at the conference, teachers will receive poster vouchers each day they attend.

Posters can be selected from:

- *Ecosystems of the World*
- *Geoscience for the future*
- *Earthquakes*
- *How to Spot Fake News*
- *UN Sustainable Development Targets*
- *Earth's Surface*







Get Kids into Survey flat packed posters will also be given away free.
https://www.getkidsintosurvey.com/resources/

ALL CONFERENCE REGISTRATIONS and APPLICATIONS ARE NOW OPEN

The Geography Teachers Association of NSW & ACT is excited to announce early details about the Annual Conference 2021. An exciting program is in development which will offer teachers a range of professional learning and networking opportunities.

Geography 7–12 – Stadium Australia, Sydney Olympic Park

DATES: Thursday 13 and Friday 14 May

TIMES: Thursday 8.30 – 3.30 (5.5 hours professional learning)
Friday 8.30 – 3.00 (5 hours professional learning)

REGISTRATION (Prices include GST)

- Members $330 1 day & $550 2 days
- Pre-service teachers $110 per day
- Non-members $440 1 day & $660 2 days
- All conference attendees will receive free classroom posters printed by GTA NSW & ACT on each day of their attendance. GTA poster packs can be pre-ordered and paid for at registration – for collection at the event (no postage). Cylinders will be provided to protect your posters.
- Parking in SOP Parking stations can be included in registration @ $25 per day

NOTE: Individual registrations are essential.
It is not possible for teachers to 'share' a 2-day registration.

SCHOLARSHIPS

Scholarships will be available through a submission process and decided on merit. Applications will be open to permanently employed teachers who

For more details and registration link click HERE

NESA ELECTIVE HOURS

The GTANSW & ACT Annual Conference qualifies for inclusion as NESA ELECTIVE Professional Development.
The conference satisfies the following:

- NESA priority area – Delivery and assessment of NSW Curriculum
- Elective PD Criteria (Enhances teaching practice; Relates to improving student outcomes; Provides for collaboration, transference, application; Involves feedback and reflection; Is research and evidence based)
- Interim Principles of effective professional Learning.

In 2021, GTA NSW & ACT is offering several scholarships to attend the Annual Conference at Stadium Australia on Thursday 13 and Friday 14 May

Who can apply?

Scholarships are available only to GTA NSW & ACT members.

Scholarships are available through a submission process and decided on merit.

Applications are open to permanently employed teachers who meet ONE OR MORE of the following criteria:

- are teaching Geography in the ACT
- have never previously attended a GTA NSW & ACT Annual Conference
- are teaching Stage 6 for the first time
- are in the first 5 years of teaching
- are teaching 'out of field'

For the successful applicants, scholarships will cover conference registration fees. Additionally, and only where appropriate, the scholarship will also cover one night accommodation at Sydney Olympic Park and a contribution to reasonable travel costs (such as coach, rail or car travel). The scholarship does not include costs associated with social events or other additional expenses incurred.

Applications will be shortlisted by a 'Scholarship team' of GTA NSW & ACT Councillors. The shortlist will be circulated to the GTA Council and a preferential vote will take place to determine the successful recipients. Winners will be notified by telephone during week starting 19 April 2021.

It is a requirement that scholarship recipients will report back to GTA NSW & ACT about how they shared what they had learned at the conference with their colleagues and include a teaching activity and or resource they implemented in their classrooms. The report should be between 250–500 words.

Selection criteria

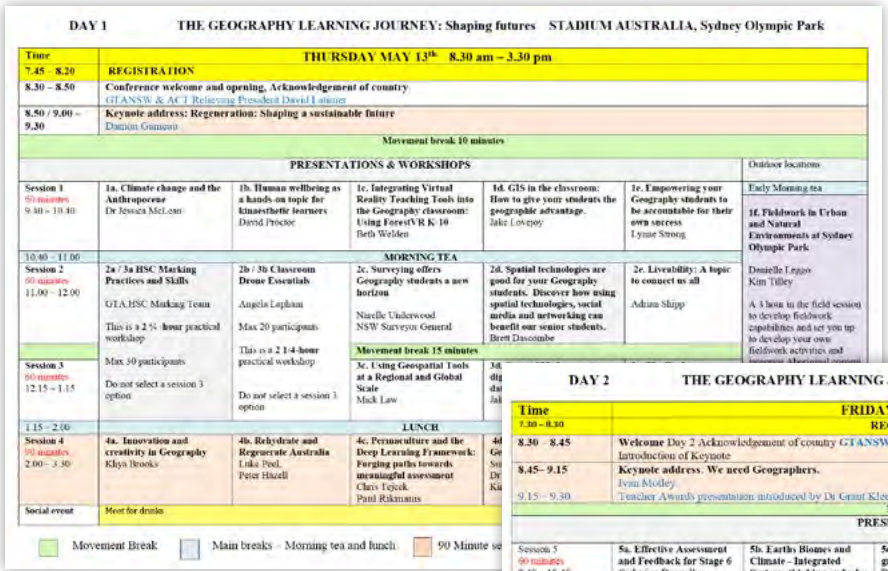
Applicants are required to address the following:

- **Identify and justify** your perceived strength(s) in the teaching of Geography (200 Words)
- **Explain** two challenges you are encountering in the teaching of Geography (200 words)
- **Explain** why you believe attending the 2021 Annual Conference will help improve your capacity as a Geography teacher. Make reference to the conference program in your response to this question (200 words minimum - 400 words maximum).

It is an expectation of the GTA NSW & ACT Council that any application would include reference to NESA syllabus requirements and clear examples of recent teaching or professional experiences, where appropriate.

The application is to be completed online using the following link **CLICK HERE**

Closing date for entries is **6pm, Friday 1 April, 2021**. Enquiries can be addressed to Katerina Stojanovski via email at **gta.admin@ptc.nsw.edu.au**



DAY 1 THE GEOGRAPHY LEARNING JOURNEY: Shaping futures STADIUM AUSTRALIA, Sydney Olympic Park

Time	THURSDAY MAY 13th 8.30 am – 3.30 pm					
7.45 – 8.20	REGISTRATION					
8.30 – 8.50	Conference welcome and opening, Acknowledgement of country GTANSW & ACT Relieving President David Latimer					
8.50 / 9.00 – 9.30	Keynote address: Regeneration: Shaping a sustainable future Damon Gameau					
	Movement break 10 minutes					
	PRESENTATIONS & WORKSHOPS					Outdoor locations
Session 1 60 minutes 9.30 – 10.40	1a. Climate change and the Anthropocene Dr Jessica McLean	1b. Human wellbeing as a hands-on topic for kinaesthetic learners David Proctor	1c. Integrating Virtual Reality Teaching Tools into the Geography classroom: Using ForestVR K-10 Beth Welden	1d. GIS in the classroom: How to give your students the geographic advantage. Jake Lovejoy	1e. Empowering your Geography students to be accountable for their own success Lynne Strong	Early Morning tea 1f. Fieldwork in Urban and Natural Environments at Sydney Olympic Park Danielle Leggo Kim Tilley A 4 hour in the field session to develop fieldwork capabilities and set you up to develop your own fieldwork activities and
10.40 – 11.00	MORNING TEA					
Session 2 60 minutes 11.00 – 12.00	2a / 3a HSC Marking Practices and Skills GTA HSC Marking Team This is a 2 ¼ hour practical workshop Max 30 participants Do not select a session 3 option	2b / 3b Classroom Drone Essentials Angela Lapham Max 20 participants This is a 2 1/4-hour practical workshop Do not select a session 3 option	2c. Surveying offers Geography students a new horizon Narelle Underwood NSW Surveyor General Movement break 15 minutes	2d. Spatial technologies are good for your Geography students. Discover how using spatial technologies, social media and networking can benefit our senior students. Brett Duscombe	2e. Liveability: A topic to connect us all Adrian Shipp	Danielle Leggo Kim Tilley A 4 hour in the field session to develop fieldwork capabilities and set you up to develop your own fieldwork activities and
Session 3 60 minutes 12.15 – 1.15	3c. Using Geospatial Tools at a Regional and Global Scale Mick Law					
1.15 – 2.00	LUNCH					
Session 4 90 minutes 2.00 – 3.30	4a. Innovation and creativity in Geography Khya Brooks	4b. Rehydrate and Regenerate Australia Luke Peel Peter Hazell	4c. Permaculture and the Deep Learning Framework: Forging paths towards meaningful assessment Chris Tejcek Paul Rikmanis			
Social event	Meet for drinks					

Movement Break | Main breaks – Morning tea and lunch | 90 Minute se

DAY 2 THE GEOGRAPHY LEARNING JOURNEY: Shaping futures STADIUM AUSTRALIA, Sydney Olympic Park

Time	FRIDAY MAY 14th 8.30am – 3.00 pm				
7.30 – 8.30	REGISTRATION				
8.30 – 8.45	Welcome Day 2 Acknowledgement of country GTANSW & ACT Relieving President: David Latimer Introduction of Keynote				
8.45– 9.15 9.15 – 9.30	Keynote address. We need Geographers. Ivan Molloy Teacher Awards presentation introduced by Dr Grant Kleeman. Brock Rowe, Geoff Connolly, Life Member.				
	Movement break. 10 minutes				
	PRESENTATIONS & WORKSHOPS				
Session 5 60 minutes 9.40 – 10.40	5a. Effective Assessment and Feedback for Stage 6 Catherine Donnelly	5b. Earths Biomes and Climate - Integrated Systems thinking and why Geography is the key to solutions Luke Peel	5c. Fieldwork in your school grounds for place and liveability David Proctor	5d. Map my school Angela Lapham	5e. Increasing student engagement through fieldwork and data collation. Donna Elias Jaye Dunn
10.40 – 11.00	MORNING TEA				
Session 6 60 minutes 11.00 – 12.00	6a. Environmental Children's Books – holistic assessment in a modern age. Chris Tejcek	6b. Seaweed production as a socio-economic enterprise aligned with the principles of a circular economy Dr Pia Winberg	6c. Spatial technologies are good for your geography students. Discover how using spatial technologies, social media and networking can benefit our senior students. Brett Duscombe	6d. Using "Tools of the Trade" for Geographers Ivan Molloy	6e. Fieldwork for a liveable, resilient and water sensitive city Louise Roberts
Movement break	Movement break 15 minutes				
Session 7 60 minutes 12.15 – 1.15	7a. A case study from the Willandra Lakes Region. Managing the Fossil Trackway site through increased aridity and climate change. Leanne Mitchell **	7b. Operation Crayweed and Operation Posidonia: engaging local communities and restoring underwater forests and meadows Adriana Verges	7c. Engaging Stage 4 with Geographic skills GTANSW & ACT Team led	7d. Environmental change and different perceptions of land management. Alexandra Heagney Matthew Nelson	7e. Collecting geospatial data in the field...there's an app for that! Mick Law
1.15 – 2.00	LUNCH				
Members Room 60 minutes 2.00 – 3.00	8a. Building confidence with the tougher HSC Geography skills GTANSW & ACT Team	8b. Storytelling with maps: An introduction to Story Maps Jake Lovejoy	8c. Shifting sands. Using Climate Change adaptation to support the vision for Worimi Conservation Lands. Janine Tarrant	8d. Human wellbeing as a hands-on topic for kinaesthetic learners David Proctor	8e. Embedding spatial technologies into your Stages 5 and 6 Geography courses. Now is the time! Mick Law
	EVALUATION				

Repeated from Thursday ** See note in Abstracts Document

Click on each image to access further conference information

PRESIDENT'S REPORT

Welcome everyone to a new year of teaching Geography. Hopefully our experience of adapting to and working with a range of uncertainties during last year will instil confidence in ourselves as responsive practitioners.

As I commence my second year as President, I would like to use this report to firstly set the scene for the year ahead, and secondly to acknowledge both recent and upcoming events for the Association.

GTA NSW & ACT is a known and effective leader in advocacy for decisions affecting the quality of Geography education in schools. There is an advocacy section on the Association website https://www.gtansw.org.au/about-gta-nsw/advocacy/. During mid-December 2020, in support of PTC NSW and to protect the integrity of GTA NSW&ACT developed professional learning events, we released a Council-endorsed response to NESA and the Minister of Education about proposed changes to accreditation of professional learning providers https://www.gtansw.org.au/wp-content/uploads/2020/12/Final_GTANSWACT-Response-to-NESA-about-changes-to-accreditation-fo-professional-learning-providers.pdf. As appropriate we will continue to keep you updated about accreditation of Association events.

In looking ahead, whilst it is important to ensure the Association caters specifically for the needs of Geography teachers in NSW and ACT, it is also important to continue to ensure we do so in alignment with the bigger picture of and for the discipline of Geography. During last year I spoke many times about the Decadal Plan for Geography, *Geography: Shaping Australia's Future* (National Committee of Geographical Sciences, 2018). This document offers a framework for engaging research, teaching and industry that aligns strategically with contemporary social, economic and environmental challenges of our region. Chapter 13 is targeted at Geography in Australian Schools and there are key recommendations to ensure the future of Geography flourishes within the school education context. The recommendations of Chapter 13 continue to frame the focus for Association activities over the next 12 months, particularly around Geography and STEM, and collaboration between school and university geographers. If you have not yet had the opportunity to do so, I encourage you to download and read *Geography: Shaping Australia's Future* https://www.science.org.au/files/userfiles/support/reports-and-plans/2018/geography-decadal-plan.pdf as part of your professional reading and if time is tight, please ensure you have a read through Chapters 1, 2 and 13.

The 2020 Annual General Meeting (AGM) occurred on 5 December 2020 in blended form; hosted on Eora Nation, the unceded lands of the Cammeraygal People. I verbally presented the Annual Report of the Association to those in attendance. The full written report is available in this edition and I encourage you to read through the activities we were able to adopt and adapt during extraordinary times. The attributes of agility, care and responsiveness were at the forefront of our thinking as we worked together to make decisions about how to best respond to the challenges of teaching in a pandemic-era. The AGM confirmed the fee structure for the Association will remain the same for 2020 - 2021 as for previous years. However, the AGM also brought some changes to our Council for the year ahead, and we both farewell and welcome Councillors. For 2020 – 2021 the governance of Council is shown in Table 1 and this information will also be available on the Association website.

Table 1: *Governance of GTANSW&ACT Council for 2020 – 2021*

Name	Position
Susan Caldis	President
Lorraine Chaffer	Vice President (Immediate Past); Journal Editor
Dr Grant Kleeman	Honorary Treasurer; Public Officer
Dr Paul Batten	Vice President
David Latimer	Vice President
Alexandria Warnock	Vice President
Katerina Stojanovski	Minutes Secretary
Michael Da Roza	ACT representative; Councillor
Catherine Donnelly	Councillor
Keith Hopkins	Councillor

Grace Larobina	Councillor
John Lewis	Councillor
Sharon McLean	Councillor
Alexandra Pentz	Councillor
Martin Pluss	Councillor
Rebecca Sutcliffe	Councillor
Paul Alger	Co-opted
Karen Bowden	Co-opted
Drew Collins	Co-opted
Adrian Harrison	Co-opted
John Petts	Co-opted
Katherine Simpson	Co-opted (February 2021)

The GTA NSW & ACT Council for 2020 – 2021 remains strong with reach across the ACT and regional NSW, including the Riverina and Hunter regions. I would like to take the opportunity to thank David Proctor and Louise Swanson for their time and contribution to the Association and work of Council. We know our paths will continue to cross and we wish you both the very best in your endeavours beyond GTA NSW & ACT. I would also like to acknowledge the sustained contribution of Sharon McLean as Vice President and coordinator of the webinar program for several years. Sharon will remain on Council as a Councillor and the webinar program continues, however, the enactment of both will occur in a different form for 2021. Sharon, thank you for your wisdom and caring ways, and for your contribution to the Executive group. The Executive group changes slightly for 2020 – 2021 with Dr Paul Batten and David Latimer being new to the Vice President roles. I would also like to welcome two new members, Rebecca Sutcliffe (Councillor) and Katherine Simpson (Co-opted), we have much to learn from your recent entry into the profession and we look forward to you both sharing your insights during the year.

There is much to look forward to in our program for 2021. A couple of examples are identified below:

- the Annual Conference
- the introduction of the Young Geographer Award
- new online learning courses
- plans for more purposeful collaboration with academic geographers, for example with the Council and membership of the Geographical Society of NSW, via the introduction of an academic Geography stream to the webinar series, and when COVID-safe restrictions are more stable, the establishment of localised fieldwork and study tours.

In closing, I would like to let you know that until August I will be stepping back from some President responsibilities to concentrate on completion and submission of my doctoral thesis. During this time, I'm delighted to let you know David Latimer will fulfil the role of Relieving President. David brings with him a wealth of experience in leadership and geography teaching together with important ideas about how the Association can continue to evolve and meet the needs of our membership.

Susan Caldis
President, GTA NSW & ACT

GTA NSW&ACT Webinars in 2021

In 2021 the webinars will be co-ordinated by a small team: Susan Caldis, David Latimer, Alex Pentz and Beck Sutcliffe.

Due to recent changes in accreditation processes, the webinars will be available as 'Elective PD' to complete as part of your ongoing professional learning. As greater clarity and certainty emerges about accreditation of professional learning, the webinar team will take steps to ensure accreditation of the program is possible.

Webinars will operate in Terms 2, 3 and 4, between 4.30pm – 5.30pm and cost $20 (members and non-members).

The webinar team are excited to announce two concurrent themes to the webinar program:

- **From the Academy**, where Geographers from universities around Australia will present their research, with pre-reading, in alignment with a syllabus focus; and
- **From the classroom**, where Geography teachers (and perhaps their students!) will share their practice, spark curiosity, and prompt dialogue amongst practitioners. A call for presenters was issued recently via social media

Coming soon!

Although dates are to be confirmed and further information will be available shortly, we are delighted to announce the following program so far:

- Chris Betcher, Program Manager, Google for Education, will be the first presenter for the 'From the Classroom' series, and he will present about Google's Geo tools.

Presenters for the 'From the Academy' program will include:

- Professor Sue Jackson and Dr Lana Hartwig, from the Australian Rivers Institute, Griffith University, QLD will share their research findings about Indigenous water management in south-eastern Australia (April 22, registrations to open soon)
- Dr Susannah Clement and Dr Carrie Wilkinson, Australian Centre for Culture, Environment, Society and Space (ACCESS), University of Wollongong, NSW; Founder of 'Geographers Declare….A climate emergency?'
- Dr Dallas Rogers, School of Architecture, Design and Planning, University of Sydney, NSW; Founder of City Road Podcast
- Associate Professor Fiona Miller, Associate Professor Donna Houston, Dr Jessica McLean, Discipline of Geography and Planning, Macquarie University, NSW; Shadow Places Network

An exciting year is ahead for the webinar program and we look forward to your participation.

POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS

The Geography Teachers' Association of NSW & ACT

GEOGRAPHY POSTERS FOR SALE

GTA NSW & ACT has printed a number of infographic posters for classroom use.

Posters are linked to topics studied in Geography K–12 for the Australian Curriculum and NSW Syllabuses.

- A **bank of questions** for individual and groupwork will be accessible via Google Drive to all schools /teachers purchasing posters.
- Posters can be purchased in **pre-packaged sets** or as **individual posters**.
- **New posters** will be added to the website throughout the year.

SOURCES AND PRICING

Posters have been sourced from organisations including the Geological Society (UK), Visual Capitalist and Graphic News. GTA NSW & ACT has also commissioned some posters.
Posters are being sold in sets of 4 or 5 to make postage viable. Affordability was a key consideration when determining pricing.
Administration, printing and distribution, licensing and design costs where relevant are incorporated into the cost of each pack.
Postage includes the cost of cylinders. A maximum of 5 posters will be packaged in any postage cylinder.

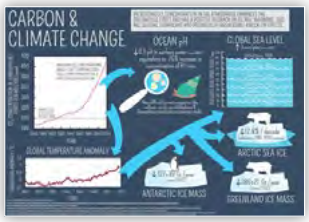
PACK 1: THE CARBON CYCLE – $70 includes p/h

Contents:

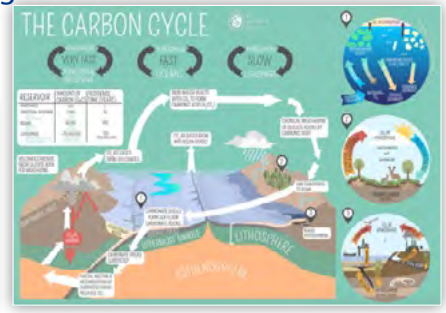
Click here to order Pack 1

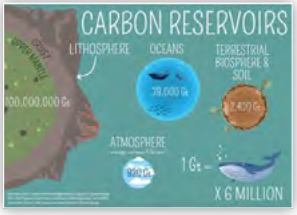
1 x A1 poster: **The Carbon Cycle**

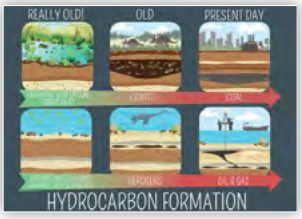
4 x A2 posters: **Carbon Set**



– Carbon & the Greenhouse Effect
– Carbon Reservoirs
– Hydrocarbon Formation
– Carbon & Climate Change







The Geography Teachers' Association of NSW & ACT

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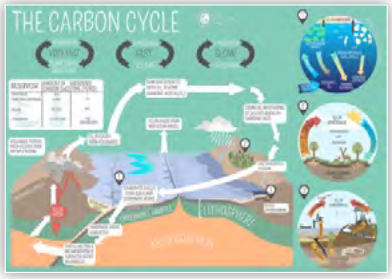

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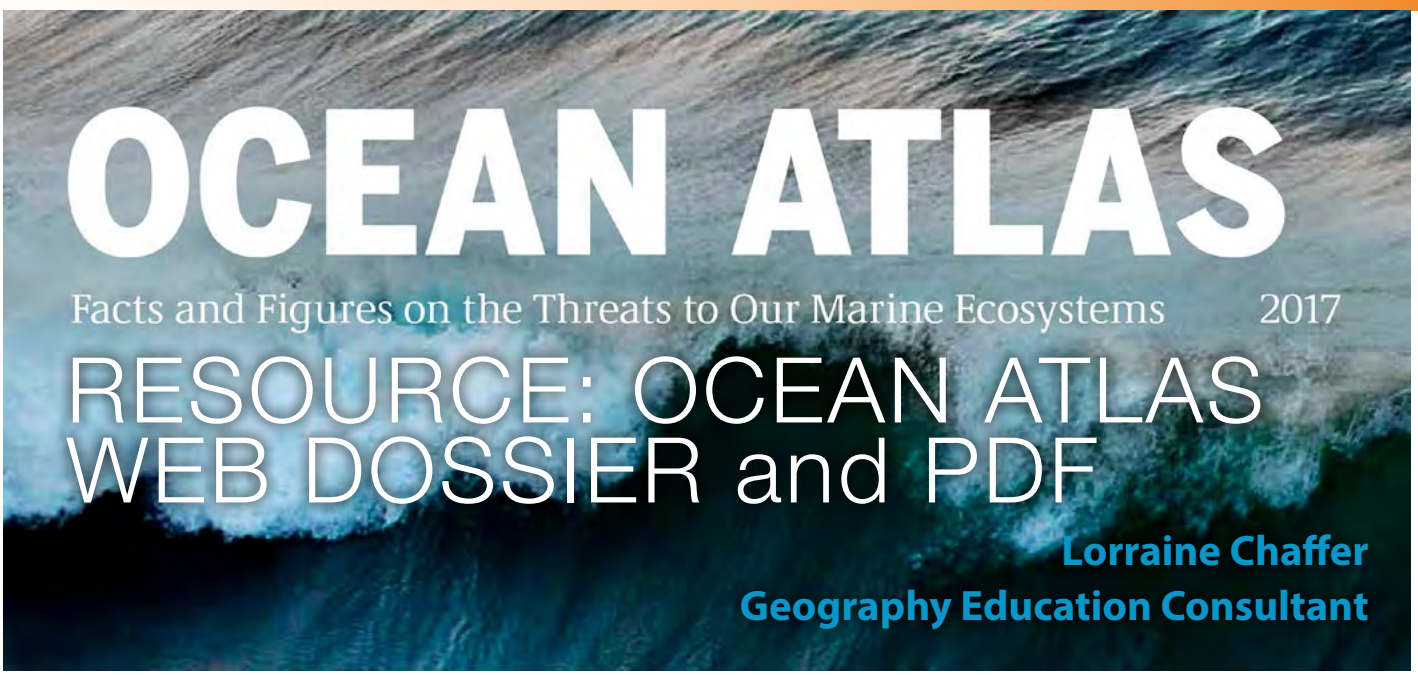
WEB RESOURCE



RESOURCE: OCEAN ATLAS WEB DOSSIER and PDF

Lorraine Chaffer
Geography Education Consultant

The Ocean Atlas is published in a printed version, as a PDF (Download here https://www.boell.de/en/2017/05/30/ocean-atlas-facts-and-figures-about-our-relationship-with-the-ocean?dimension1=ds_ocean_atlas) and a web dossier (https://www.boell.de/en/oceanatlas).

The Ocean Atlas gives an insight into the state of, and the threat to the seas and the possibilities for protecting it. The Ocean Atlas 2017 contains 17 contributions and 50 graphics containing relevant facts and figures about the ocean. Images such as Fig. 1 can be downloaded.

The material in this resource is suited to many topics from Stages 4 to 6. See Table 1

Each topic is two pages making it perfect for a lesson or two with built in discussion and inquiry.

The graphics are excellent and can be used to develop inquiry questions and stimulate classroom discussion. It is easy to import selected images into a PPT presentation or a document for class use.

Website
https://www.boell.de/en/oceanatlas

Image downloads
https://www.boell.de/en/2017/05/30/downloads-ocean-atlas?dimension1=ds_ocean_atlas

All graphs of the Ocean Atlas are published under a Creative Commons License CC BY SA 4.0. and can be continued to be used, processed and published under these conditions. Downloads available in various formats (png, pdf):

- All graphics as PNG (ZIP/3,34 MB) – ideal for websites and presentations
- All graphics as PDF (ZIP/MB)
  - Package 1 (page 8–27) (ZIP/49,58 MB)
  - Package 2 (page 28–50) (ZIP/46,14 MB)

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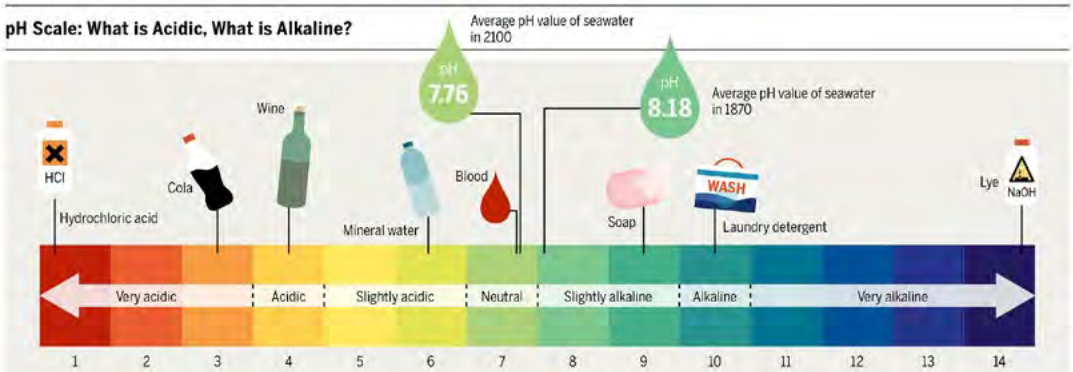
Figure 1: ACIDIFICATION: A CORROSIVE FUTURE



The difference may seem small, but the decline in the pH value from 1870 to 2100 would mean a 170 percent increase in acidity. Much smaller changes already pose problems for many sea creatures.

Table 1: Links to Syllabus topics for Stages 4 to 6

CHAPTER	GEOGRAPHY TOPIC
Fisheries Management: fish – almost out of stock?	Stage 5: Sustainable biomes Stage 5: Environmental Change & management Stage 6: Natural resources
Aquaculture: Are fish farms the future?	Stage 5: Sustainable biomes Environmental Change & management Stage 6: Natural resources People & Economic Activity
Eutrophication: Fertilizer for the dead zones	Stage 4: Interconnections Stage 5: Environmental Change & management
Pollution: Trash in the surf, poison in the sea	Stage 4: Interconnections Stage 5: Environmental Change & management
Plastic waste: The microplastic problem	Stage 4: Interconnections Stage 5: Environmental Change & management
Biodiversity: The danger of declining diversity	Stage 4: Interconnections Stage 5: Environmental Change & management
Climate change: How the ocean slows climate change	Stage 5: Environmental Change & management Stage 6: Biophysical Interactions
Warming: Warming waters and rising risks	Stage 5: Environmental Change & management Stage 6: Biophysical Interactions Ecosystems at risk
Coasts: Life in the danger zone	Stage 5: Environmental Change & management Stage 6: Biophysical Interactions Ecosystems at risk
Acidification: A corrosive future	Stage 5: Environmental Change & management Stage 6: Biophysical Interactions Ecosystems at risk
A look into the past: Exploitation and protected areas	Stage 5: Environmental Change & management
Ocean governance: Who owns the ocean?	Stage 5: Environmental Change & management Stage 6: Natural resources
Deep-sea mining: Global hunger for natural resources	Stage 6: Natural resources
Energy from the ocean: Where does the future lie?	Stage 6: Natural resources
Marine tourism: Destination Ocean	Stage 4: Interconnections Stage 5: Environmental Change & management Stage 6: People & Economic Activity
Maritime transport: World trade and price wars	Stage 4: Interconnections Stage 6: People & Economic Activity
Circle of sustainability: Living with the ocean	Stage 5: Sustainable biomes Environmental Change & management Stage 6: Natural resources People & Economic Activity
The world must act together: Towards a new governance of the ocean	Stage 5: Sustainable biomes Environmental Change & management Stage 6: Natural resources

STAGE 4 / 5 Elective geography: Oceanography

Sample graphics

Figure 2: TWELVE BRIEF LESSONS ABOUT THE OCEAN AND THE WORLD

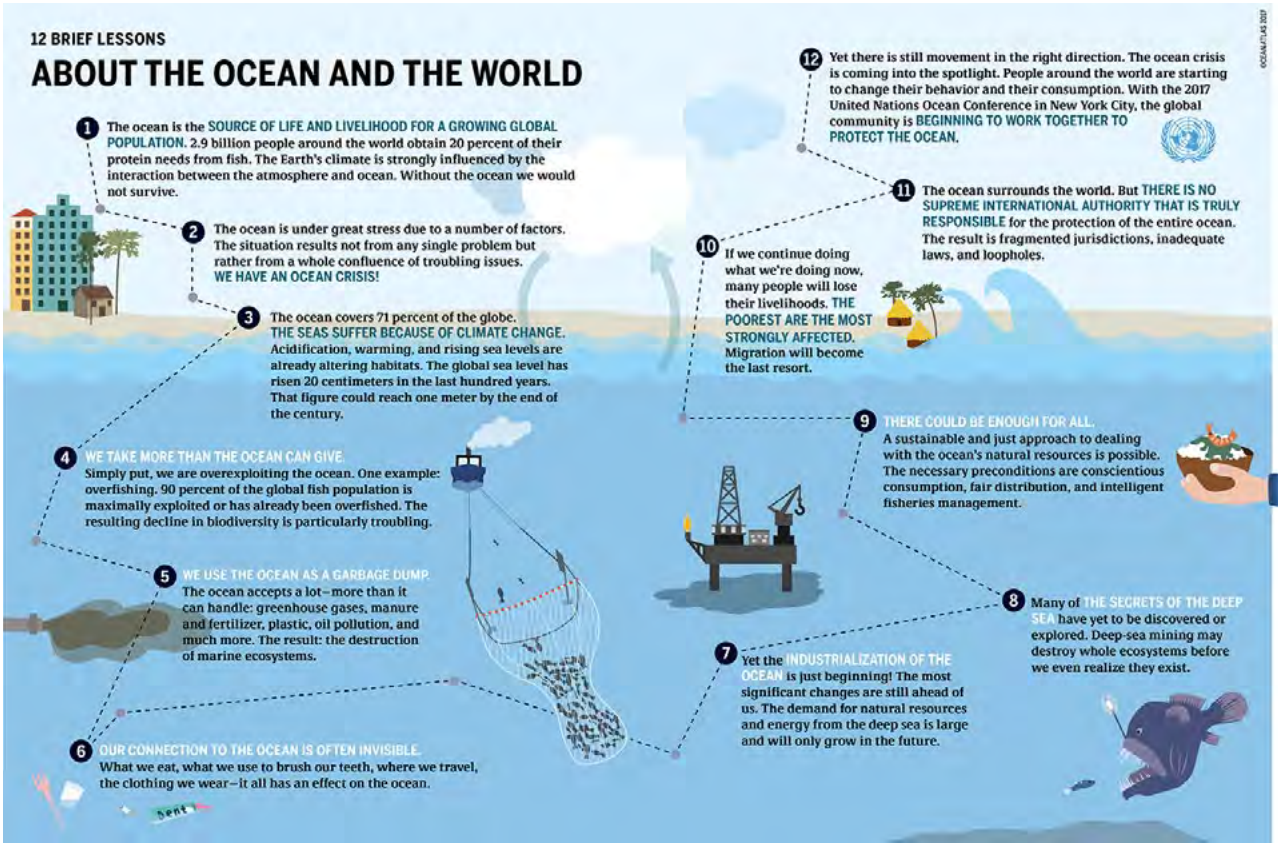


Figure 3: FISH: ALMOST OUT OF STOCK

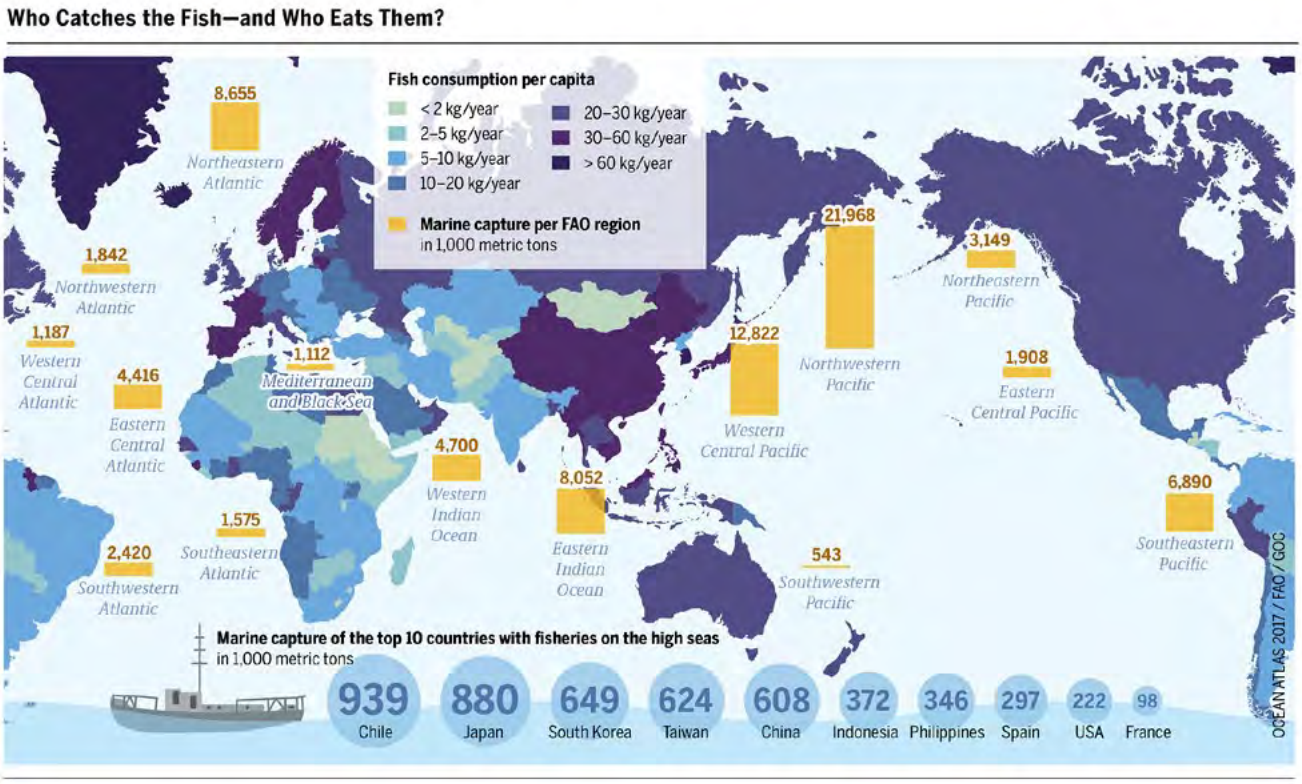
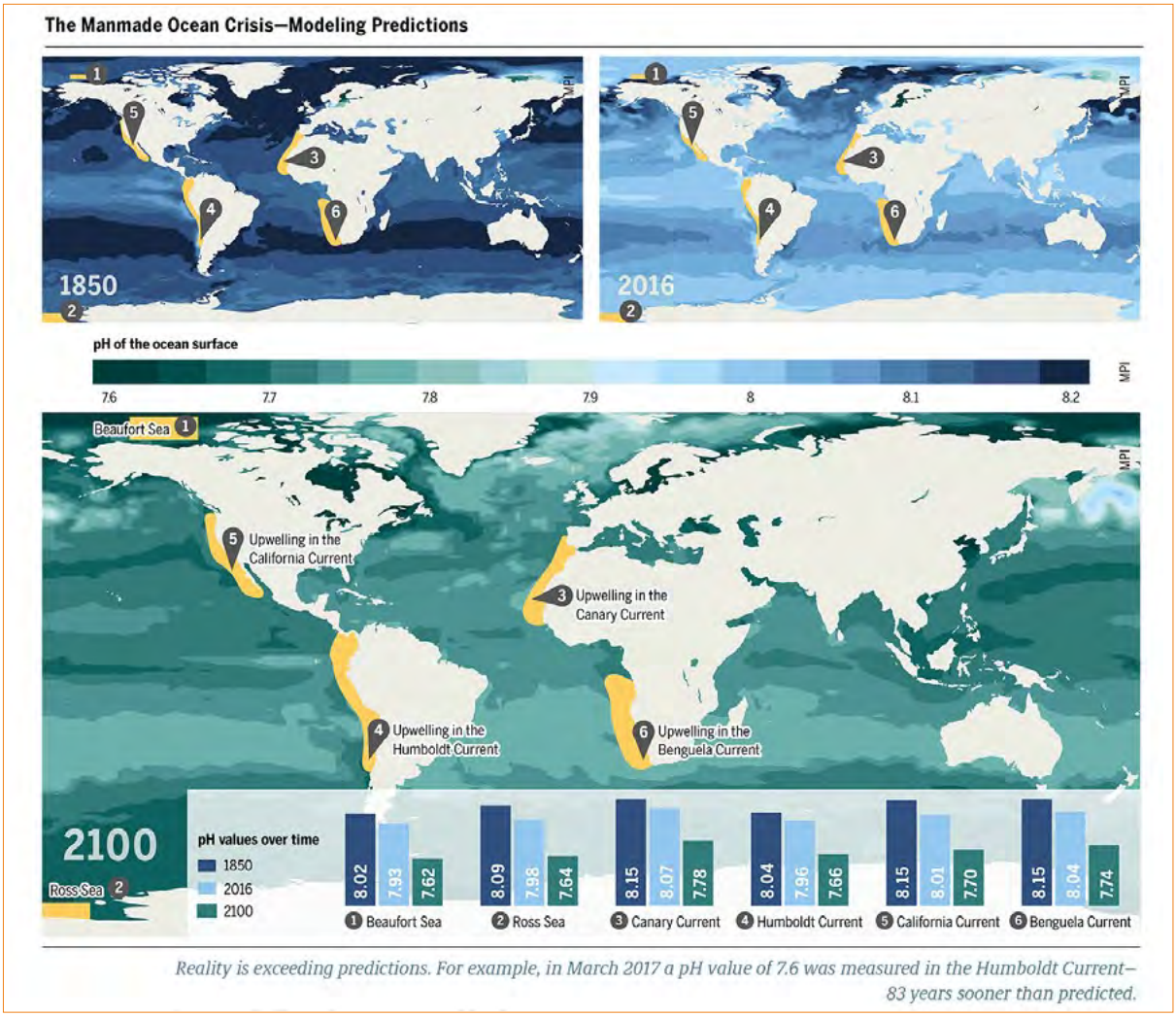
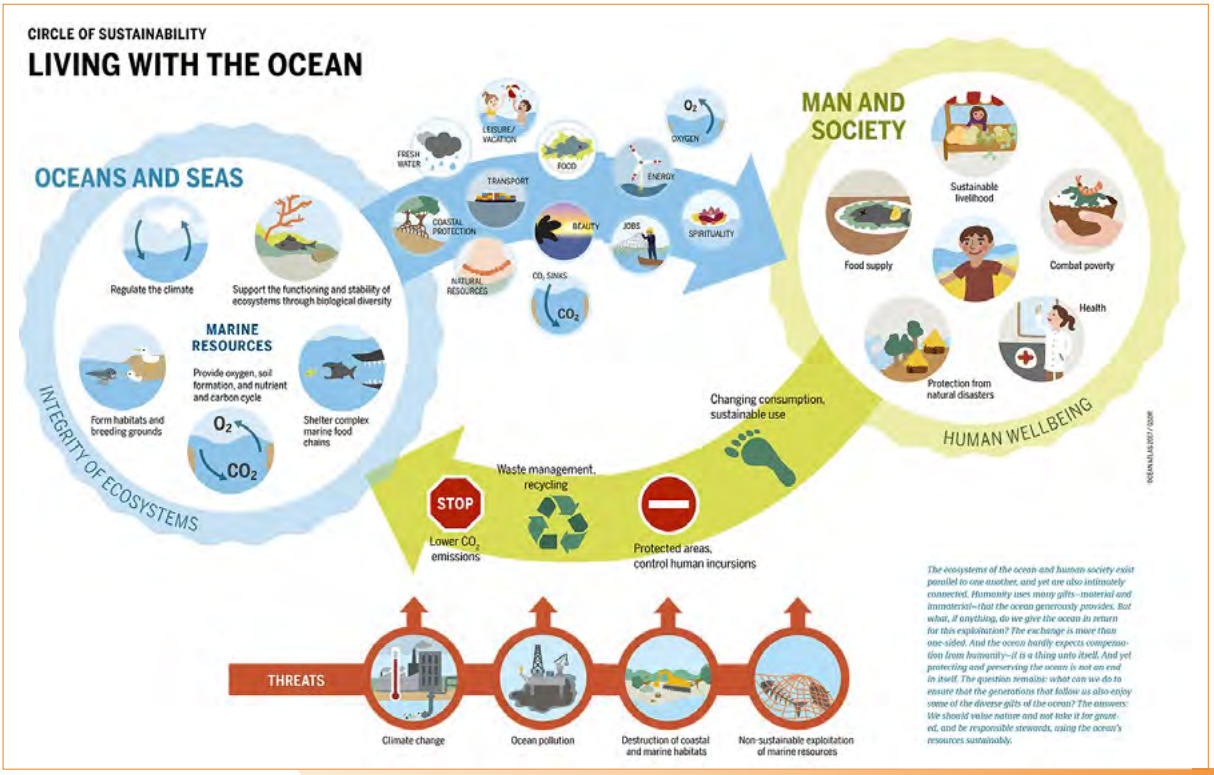


Figure 4: ACIDIFICATION: A CORROSIVE FUTURE



Reality is exceeding predictions. For example, in March 2017 a pH value of 7.6 was measured in the Humboldt Current–83 years sooner than predicted.

Figure 5: CIRCLE OF SUSTAINABILITY



A sample chapter

OCEAN GOVERNANCE

WHO OWNS THE OCEAN?

For thousands of years, people have taken to the sea to fish and trade. For centuries wars have been fought as rival rulers claimed the rights to the sea and its exploitation. Those conflicts have continued to this day.

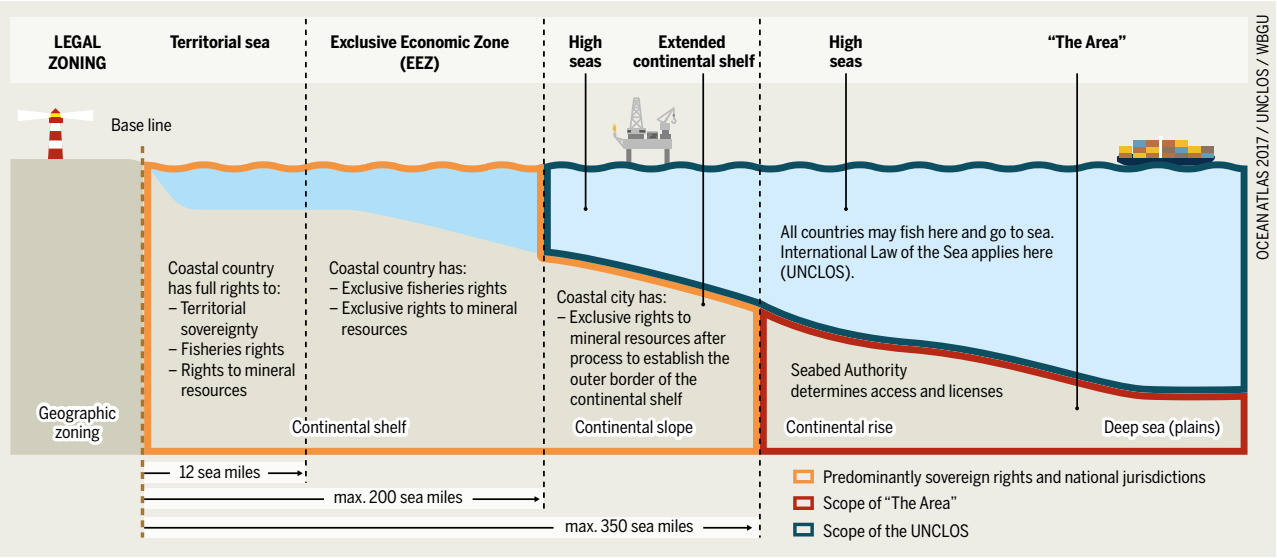
But it is no longer merely a matter of access to shipping lanes. The reason for the current international conflicts actually lies beneath the surface. Disputes revolve around the expansion of territorial seas and economic zones in order to secure exclusive rights to so-called non-living marine resources, like the valuable minerals and fossil fuels buried beneath the sea floor. They are about "territory" in the sea. Absurd? Not if you look at where land begins. And where it allegedly ends.

The foundation is the United Nations Convention on the Law of the Sea (UNCLOS 1982). It says that a country may claim an area extending 12 nautical miles from its coast as its own territorial sea. Additionally, it can exploit 200 nautical miles of the water column beyond its coast as its exclusive economic zone. The same applies to the first 200 nautical miles of the sea floor, the continental shelf. The resources found there can be exploited by that country alone. Furthermore, if the country can scientifically prove that its continental shelf extends even further – that it is continuously geologically connected to the mainland – it also has the sole rights to the resources there as well. This territorial claim includes islands but not rocks or other outcroppings.

This is particularly interesting for some uninhabited islands like Heard Island and the McDonald Islands. They are tiny islands located 1,000 kilometers north of eastern Antarctica. Thanks to them, Australia has secured a geological exploitation area of more than 2.5 million square meters, because these islands stand on the undersea Kerguelen Plateau, a gigantic mountain range that stretches more than 2,000 kilometers. Australia can now claim exclusive exploitation rights to it. The convention does place some limits on this, but the rights may still extend up to 350 nautical miles from the island.

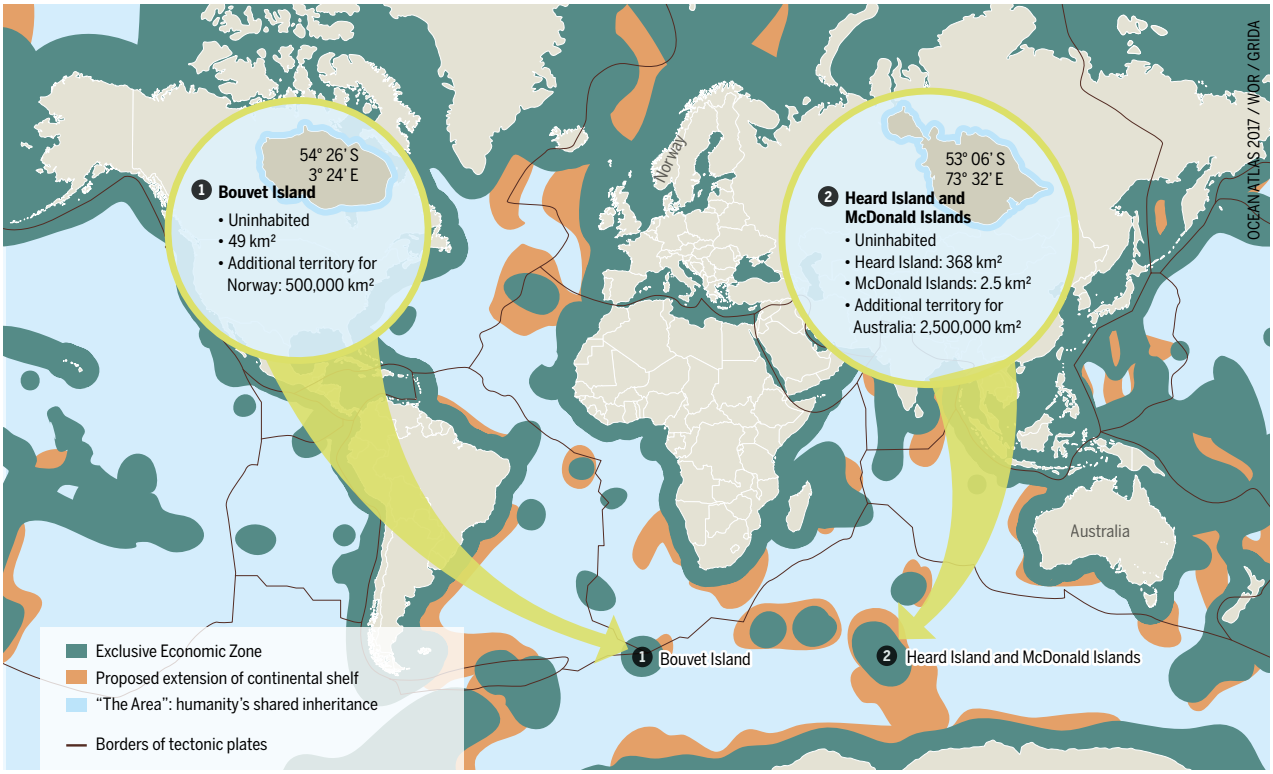
The Convention on the Law of the Sea (UNCLOS 1982), which is considered to be the constitution of the ocean and is intended to peacefully adjudicate the interests of all states, is still relatively young. Its approach to the areas of the ocean floor that lie totally outside national sovereign-

How the Lawyers Think—Maritime Zones and the International Law of the Sea



Today, humanity's inheritance is solely limited to the mineral resources of the parts of the seafloor that lie beyond national jurisdictions ("the Area"), which is administered by the Seabed Authority.
The UN Convention on the Law of the Sea (UNCLOS), together with its existing implementing conventions, defines the framework for ocean governance. The regional fisheries management organizations (RFMO) organize the cultivation of the fish stocks in the high seas as well as the trans-territorial and far-ranging fish stocks in the Exclusive Economic Zones (EEZ).

The International Community Is Losing Ground—As Individual Countries Gain It



The expansion of coastal countries' exclusive economic zones (dark green) into the area of the outer continental shelf (orange) reduces the international area. Any gain for an individual country is a loss for the community of nations. 57 percent of the sea floor is already partitioned. Only 43 percent of humanity's shared inheritance remains.

ty and national exploitation rights – referred to simply as "the area" in the language of the UN – is actually based on the concept of "the shared heritage of humanity." It is intended to guarantee that the environment is protected and that developing nations also have their share of the riches.

These strong words sometimes achieve only weak results. When a country can legally expand its exclusive economic zone, it reduces the shared inheritance. Consider the case of Norway, which has reserved an exclusive economic zone of 500,000 square kilometers thanks to its ownership of Bouvet Island, a small "island" completely covered in ice and lacking fresh water located in the South Atlantic, 2,600 kilometers from the Cape of Good Hope. France has also swelled in size thanks to many far-flung island dependencies – it is still "la grande nation" when it comes to stockpiling the treasures of the ocean floor.

In establishing these claims, the UN Commission on the Limits of the Continental Shelf plays an important role. There, states secure rights to raw material reserves that are sometimes only partly economically ascertainable or that are only suspected to exist – unknown chances of future riches, so to speak. It is not just a matter of fossil fuels, ores, metals, and the power that comes from their control. It is also about the global strategic interests of the states in legally expanding their spheres of influence. The remaining unclaimed "area" shrinks. It has already declined from more than 70 percent of the sea floor to just 43 percent. 57 percent of the ocean floor has already been parceled out. And as the international area shrinks, so does the ability of international influence to ensure that all nations have an opportunity to participate and that resources are fairly distributed.

These regulations are only related to the ocean floor. But the masses of water above, and everything that happens in and on them, are also subject to legal regulations. Within the economic zones, national laws apply to the exploitation of resources and environmental protection. Additionally, the law of the high seas applies – it is part of international law. But it also has loopholes: pirates can be detained by anyone who catches them, but not polluters, illegal fishing fleets, terrorists, weapons dealers, drug smugglers, or human traffickers. They can only be pursued by the countries from which they originate. It is often more than unclear who the responsible international organizations are. Territorially speaking, the high seas belong to no one – and so when it comes to exploitation, they belong to everyone. It is thus difficult to advance the protection of the ocean with reference to global problems. But it is not impossible, as current negotiations to create protected zones in the high seas at the EU level may prove.

Image source: https://www.mtresilience.com/

Mt Resilience

Katerina Stojanovski, Stella Maris College

Mt Resilience is an augmented reality (AR) experience whereby students can witness how a community prepares and responds to bushfires and storms. Mt Resilience was made in conjunction with ABC TV's three-part series, *Big Weather (and how you survive it)* (2019) and it includes stories from the series. Indigenous knowledge, community and innovation are at the forefront of the ways the community at Mt Resilience prepares and responds to the disasters it faces.

Explore Mt Resilience using your device, tablet or desktop computer. However, it works best on your mobile. You scan the QR code to open Mt Resilience on your device here or on your desktop here.

Source: https://www.mtresilience.com/

The app and associated activities are suitable for the study of Bushfire Hazards in Stage 3 and Storms as a Natural Hazard in the Stage 4 topic Water in the World. BTN has developed a worksheet for Year 5.

Geography examining the impact of bushfires or floods on environments and communities, and how people can respond. Additional disaster resilience resources are included and hyperlinked at the end of the BTN worksheet.

Additional Resources

The following resources can be used to support the inclusion of the Mt Resilience App and *Big Weather (and how you survive it)* (2019) in teaching hazards and disasters in Stage 3 and/or Stage 4. The resources can be adapted and modified to be relevant for each Stage.

Mt Resilience Website

https://abc.net.au/mtresilience. 2021. *Explore Mt Resilience in AR.* [online] Available at: https://www.mtresilience.com/ [Accessed 4 February 2021].

BTN – Mt Resilience AR App

App, M., 2021. ***Mt Resilience AR App***. [online] BTN. Available at: https://www.abc.net.au/btn/classroom/mt-resilience-ar-app/12802730 [Accessed 4 February 2021].

DIGITAL RESOURCE: MT RESILIENCE

How can I try Mt Resilience – the ABC's new Augmented Reality experience? (ABC)

ABC Help. 2021. *How can I try Mt Resilience – the ABC's new Augmented Reality experience?* [online] Available at: https://help.abc.net.au/hc/en-us/articles/360002034456-How-can-I-try-Mt-Resilience-the-ABC-s-new-Augmented-Reality-experience- [Accessed 4 February 2021].

Mt Resilience: How one community responds to big weather (ABC)

Splash. 2021. *Education resources for schools teachers and students – ABC Education*. [online] Available at: https://education.abc.net.au/home#!/media/3721309/mt-resilience [Accessed 4 February 2021].

Big Weather Resources

Splash. 2021. *Education resources for schools teachers and students – ABC Education*. [online] Available at: https://education.abc.net.au/home/#!/topic/3710253/big-weather-and-how-to-survive-it [Accessed 4 February 2021].

Source: https://knowledge.aidr.org.au/resources/big-weather/

Source: https://www.abc.net.au/news/redirects/backstory/2020-11-19/the-making-of-mt-resilience-ar-project/12891282

Big Weather and how you survive it – The Australian Institute for Disaster Resilience (AIDR)

Knowledge.aidr.org.au. 2021. *Big Weather | Australian Disaster Resilience Knowledge Hub.* [online] Available at: https://knowledge.aidr.org.au/resources/big-weather/ [Accessed 4 February 2021].

Big Weather Quizzes – The Australian Institute for Disaster Resilience (AIDR)

Knowledge.aidr.org.au. 2021. [online] Available at: https://knowledge.aidr.org.au/media/8083/big-weather-quizzes.pdf [Accessed 4 February 2021].

Big Weather YouTube Playlist

Youtube.com. 2021. [online] Available at: https://www.youtube.com/playlist?list=PLsPVOdZ3LN6fCxid-azSPh_HLwsAxIvsh [Accessed 4 February 2021].

Preparing the fire season with cultural burning

2021. [online] Available at: https://www.youtube.com/watch?v=lXk5idKCfpo&feature=youtu.be [Accessed 4 February 2021].

Extreme Weather – BTN

https://www.abc.net.au/btn/classroom/extreme-weather/10790694

Black Summer Bushfire Special – BTN

https://www.abc.net.au/btn/classroom/20200204-ep1-btn/11911010

The following worksheet from ABC Behind the News (BTN) was developed to support teachers to use the Mt Resilience App in their classrooms.

https://www.abc.net.au/cm/lb/12802478/data/mt-resilience-ar-app-%25E2%2580%2593-teacher-resource-%28pdf%29-data.pdf

Teacher Resource

Episode 30
27th October 2020

Mt Resilience AR App

Focus Questions

1. Discuss the *Mt Resilience AR App* story with another student and record the main points.
2. Australia has always had severe weather. True or false?
3. Finish the following sentence: In more recent decades, Australia is getting longer and more intense…
4. Is Australia experiencing more or fewer floods in recent years?
5. What has the ABC created to look at how we can adapt to a changing climate?
6. Briefly explain what Mt Resilience is.
7. Mt Resilience explains what sorts of things can be done to adapt to a changing climate. Give some examples.
8. What do you think it means to be disaster resilient?
9. What was surprising about this story?
10. What do you understand more clearly since watching the BTN story?

Key Learning

Students will learn more about adapting and responding to extreme weather events.

Curriculum

Geography – Year 5
The impact of bushfires or floods on environments and communities, and how people can respond.

Science – Year 6
Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives.

The growth and survival of living things are affected by physical conditions of their environment.

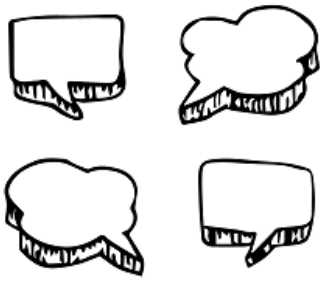
Sudden geological changes and extreme weather events can affect Earth's surface.

Activity

Class Discussion

As a class discuss the BTN *Mt Resilience AR App* story, using the following questions as a guide. Record students' responses.

- What extreme weather does Australia experience? Give examples.
- What impact can extreme weather have on people and the environment?
- What does it mean to be resilient?
- What does it mean to be disaster resilient?
- What did you learn from the BTN *Mt Resilience AR App* story?
- Think of three questions you have about the story.



Activity

Key Words

Students will brainstorm a list of key words that relate to the BTN *Mt Resilience AR App* story. Here are some words to get you started.

Resilience	Natural disaster	Cultural burning
Extreme weather	Predict	Prepare
Fire resilient	Adapt	Climate

Activity

Mt Resilience

Students will visit Mt Resilience – an augmented reality experience that allows students to explore a town that's been designed around climate and disaster preparedness.

The app works on both phones and tablets. Get the app here. Go here to find out more about the technical specifications for the app.

Explore the features of Mt Resilience

Working in pairs, look around Mt Resilience. Practise navigating your way around the town by zooming and rotating. Respond to the following:

- Mt Resilience is a town that's built to adapt to our changing…
- As you look around the town, what do you notice?

Tap each of the four information icons - Community Centre, Communication, Medical Centre and Wildlife.

- **Community Centre** – Why are community centres important when preparing for and recovering from a disaster?
- **Communication** – Why is communication essential during a disaster?
- **Green zone** – Mt Resilience is surrounded by a green zone. Why is a green zone important?
- **Emergency Plans** – Residents of Mt Resilience have their own emergency plan. What do they do to get their plan together?
- **Wildlife –** How do the people of Mt Resilience value and protect wildlife?
- **Government** – How does the council work with local residents in Mt Resilience?

There are two play arrows. They will take to you to the **Fire Resilient House** and **Cultural Burning**

Fire Resilient House

- How do Sam and Ayla prepare their property for bushfires?
- Explain their power set up.
- What is their bushfire evacuation plan?
- Explore the features of Sam and Ayla's house by tapping on the information icons.

Research examples of bushfire resilient buildings (homes and schools) and gardens. Design a bushfire resilient house or garden. What are the features that make it bushfire resilient?

Cultural Burning

- What is cultural burning?
- What do rangers consider when they do a low intensity cultural burn?
- What do practices like cultural burning promote?
- Record what you know about the importance of Country to Aboriginal and Torres Strait Islander people.
- How can we learn from Aboriginal and Torres Strait Islander people about looking after Country?
- Explore each information icon in the cultural burning area.

To learn more about cultural burning, go to the Firesticks website. This Traditional burning video explores bushfire management practices in more detail.

Mt Resilience – Bushfire Scenario

Tap on the fire icon at the bottom of the screen and listen to the bushfire scenario.

- How did the residents of Mt Resilience prepare for the bushfires?
- How did the community respond to the bushfire?
- Why do you think a bushfire recovery plan is important?

Activity

Disaster Resilience Resources

Below is a collection of resources that support both teachers and students learn more about disaster resilience and preparedness.

ABC Education Big Weather resources

Disaster Resilience Teaching Resources

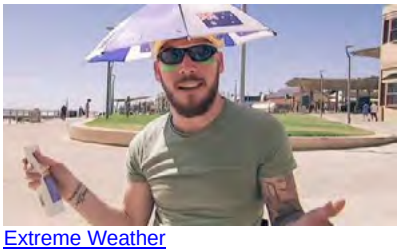
Project Firestorm

Survive and Thrive in a Bushfire

Activity

BTN stories

These BTN stories look at the impact extreme weather and natural disasters have on people and the environment. After watching any one of the BTN videos ask students to respond to the discussion questions (to find the teacher resources go to the related BTN Classroom Episode and download the Episode Package).



Extreme Weather

Fire Preparations

Black Summer Bushfire Special

Heatwaves

Burn off Season

Bushfire Plan

RESOURCE: TIME FOR GEOGRAPHY

Katerina Stojanovski, Stella Maris College

The team at Time for Geography in consultation with expert Geographers have developed a series of short informative educational videos on a variety of geographical topics that closely relate to the Stage 4 and Stage 5 Geography syllabus. The team of Geography experts include educators, researchers and film-makers.

Video topics include coasts, rivers, glaciation, ecosystems, climate change, carbon cycle, plate tectonics, cities, resource management and many more. The link to the video list is https://timeforgeography.co.uk/videos_list/

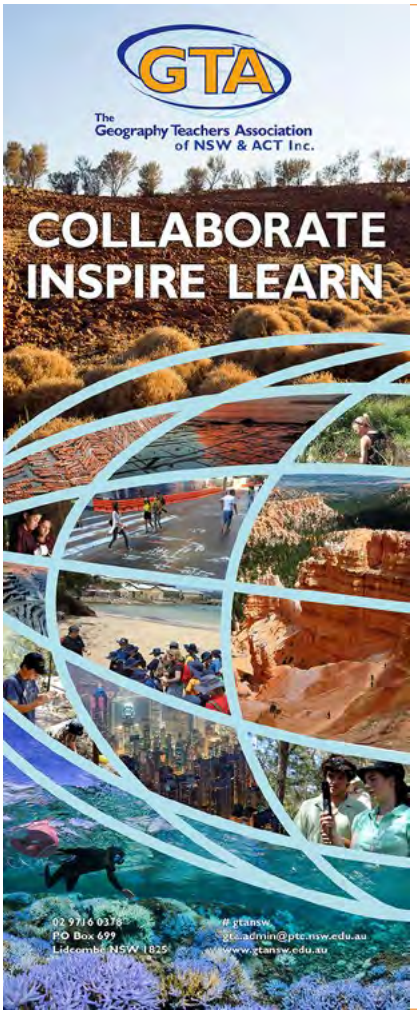
I have included a selection of the videos and links to their respective Stage 4 or Stage 5 Syllabus area. There are more video options to choose from in each section. Coasts and Rivers have a substantial selection of videos. Select the hyperlink for each topic to view additional content videos.

TOPICS	VIDEOS	STAGE 4 / STAGE 5 SYLLABUS LINKS
Coasts	▪ Erosional processes and landforms introduction	▪ Landscapes and Landforms
	▪ Formation of a sea stack	▪ Landscapes and Landforms
	▪ Marine erosion processes	▪ Landscapes and Landforms
	▪ Soft engineering: Sand dune management	▪ Environmental Change and Management
	▪ Soft engineering: Beach management	▪ Environmental Change and Management
	▪ Explain one advantage and one disadvantage of using beach nourishment as a coastal protection strategy	▪ Environmental Change and Management
Rivers	▪ River erosion process	▪ Landscapes and Landforms
	▪ Formation of a waterfall and gorge	▪ Landscapes and Landforms
	▪ Formation of potholes	▪ Landscapes and Landforms
	▪ Hillslope processes: weathering	▪ Landscapes and Landforms

Glaciation	▪ Formation of U-shaped valleys (with kitchen geography) ▪ Glacial landforms: Corries, Cirques, Cwms ▪ Glacial landforms: Arête ▪ Eyjafjallajokull and the impact of Icelandic eruptions ▪ Glacial Lake outburst flood risk, Bolivia	▪ Landscapes and Landforms ▪ Landscapes and Landforms ▪ Landscapes and Landforms ▪ Landscapes and Landforms – Geomorphic Hazards ▪ Landscapes and Landforms – Geomorphic Hazards
Ecosystems	▪ Temperate deciduous woodlands: Biotic and abiotic ▪ Temperate deciduous woodlands: Habitat layers	▪ Environmental Change and Management
Climate Change	▪ Evidence of Climate Change ▪ Natural causes of Quaternary climate change ▪ Human causes of Climate Change ▪ Cause and conditions that favour intense wildfire	▪ Environmental Change and Management ▪ Environmental Change and Management ▪ Environmental Change and Management ▪ Environmental Change and Management
Carbon Cycle	▪ Stores of Carbon on Planet Earth ▪ The Long-Term Carbon Cycle ▪ The Short-Term Carbon Cycle	▪ Environmental Change and Management ▪ Environmental Change and Management ▪ Environmental Change and Management
Plate Tectonics	▪ Living in the shadows of Italy's volcano ▪ Tsunamis Part 1: Causes ▪ Tsunamis Part 2: Evidence of Tsunamis in the UK ▪ Divergent (constructive plate boundaries) ▪ Conservative (transform) plate boundaries	▪ Landscapes and Landforms – Geomorphic Hazards ▪ Landscapes and Landforms – Geomorphic Hazards ▪ Landscapes and Landforms – Geomorphic Hazards ▪ Landscapes and Landforms ▪ Landscapes and Landforms
Cities	▪ Location, importance and sense of place in UK cities ▪ UK urban regeneration ▪ Gentrification: economic, social and political effects	▪ Changing Places ▪ Changing Places ▪ Changing Places
Resource Management	▪ Challenges to achieving water security ▪ UK food surplus and security in low income countries	▪ Water in the World / Human Wellbeing ▪ Water in the World / Human Wellbeing

Teaching Strategies

1. They can be shown at the beginning to introduce the topic as a hook or at the end of the topic to consolidate understanding.
2. Watch the videos prior to teaching and generate inquiry questions. The videos are short so you might need only 2 or 3 questions for each video.
3. Use a visible thinking strategy e.g. See, Think Wonder or Think, Puzzle, Explore.
4. Students can make their own detailed notes. I recommend modelling a structure such as the outline method or cornell notes for more meaningful note-making. Demonstrate this on the board. A good link to explain each method is here: https://medium.goodnotes.com/the-best-note-taking-methods-for-college-students-451f412e264e
5. Write key words and points on the board to assist students with their note making while the video is playing.
6. Give the link of the video to the students to follow along. Have captions on to assist students with understanding and note making. Students can re-watch if necessary to ensure notes are accurate.
7. Ask students to generate one or two questions for further inquiry after they have watched the video.



GTANSW & ACT Support for teachers in 2021

- Annual Conference May 13 and 14, Stadium Australia. See Conference website **HERE**
- Scholarships to attend the Annual Conference Apply **HERE**
- Webinar Program staring Term 2 See page 8
- Online Learning Courses for flexible, affordable professional learning. See pages 48 & 49
- Geography Bulletin 4 Editions plus 1 Special HSC Edition
- Geography Bulletin Guide to assist in finding resources **HERE**
- Classroom Posters and activities via GTA NSW & ACT website **HERE**
- Young Geographer Awards See page 33
- Ask a question via the GTA NSW & ACT website button at the bottom of the homepage **HERE**
- Facebook Page **HERE**
- Facebook Groups –Teachers of HSC Geography in NSW and Primary Teachers
- Scoop.it Ten topic pages for Geography K –12.

Source: https://www.tweedsandbypass.nsw.gov.au/school-students/school-information-package.html

RESOURCE: TWEED SAND BYPASSING SCHOOLS PACKAGE

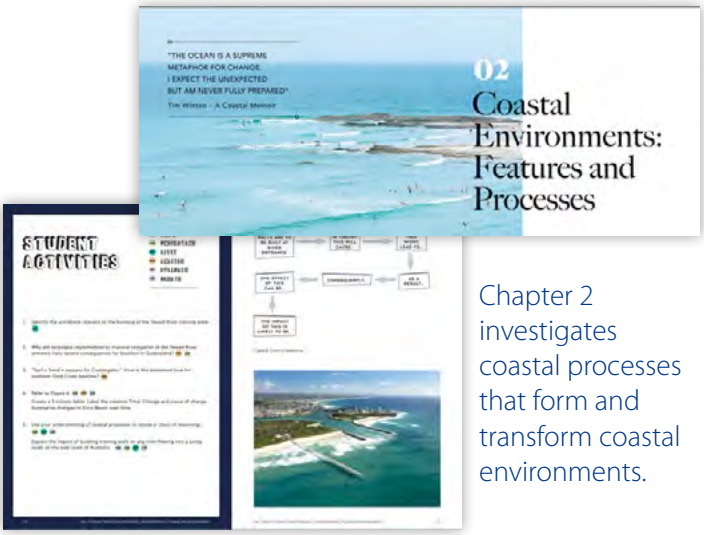
Lorraine Chaffer, Geography Education Consultant

Tweed Sand Bypassing (TSB) is a coastal management case study used in many NSW schools studying coastal environments.

The TSB Schools Information Package was developed during 2019 and 2020 by Tweed Sand Bypassing in collaboration with the Geography Teachers Association of NSW & ACT to provide a complete study for the Stage 5 topic **Environmental Change and Management.** Geographical inquiry and the development of 21st-century skills such as collaboration and creativity are the focus of student activities integrated throughout the package.

Features of the package include:

- **Downloadable chapters** for content areas including coastal environmental processes, environmental change and management, Tweed Sand Bypassing case study, a comparative study from Waikiki Beach in Hawaii as well as other illustrative examples. Key learning is identified for each chapter.
- **Hyperlinks** to videos and other websites such as BOM.
- High quality **stimulus material** such as the change over time images on page 110.
- **Student activities** integrated throughout (coded to levels of thinking)
- **A stimulus booklet** with student activities
- A suggested, transferable **fieldwork activity**, adaptable to other locations
- A suggested **outcomes-based assessment task with marking guidelines**.



Chapter 2 investigates coastal processes that form and transform coastal environments.

Source: https://www.tweedsandbypass.nsw.gov.au/operations/sand-delivery.html

WEB RESOURCE: TWEED SAND BYPASSING

The following tables from the package illustrate coastal management strategies (page 60) used in Australia and globally by coastal managers and coastal monitoring tools (page 128) used by Tweed Sand Bypassing.

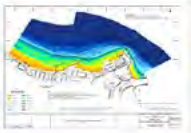
Table 1. *Coastal protection management strategies in NSW and Queensland.*

STRATEGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES
1. TRAINING WALLS  Tweed River Entrance training walls. Source: Tweed Sand Bypassing	Walls located at river mouths/estuaries to prevent natural movement of the entrance. Training walls are often accompanied by periodic dredging (e.g. coastal rivers along the NSW and south-east Queensland coast).	The coastal inlet or river maintains one position along the coastline. A trained river entrance can improve navigation and safety for boats, which enhances the social and economic values of the coast.	Can contribute to beach erosion (downdrift) by interrupting longshore drift. Sand can accumulate on one side of a wall, growing beyond the wall and then forming bars across the river entrance. Dredging is often required to maintain navigational channels. Can cause a change to the tidal prism of the estuary. This can have detrimental effects on coastal processes and the estuary ecology.
2. SAND TRANSFER/SAND BYPASSING  Tweed Sand Bypassing Sand Jetty. Source: Tweed Sand Bypassing	Sand is pumped from one location to another through mechanical means (e.g. Tweed Sand Bypassing, Noosa Beach Sand Shifter, Queensland).	Restores sand. Can be used to bypass training walls and structures that may otherwise impede natural sand movement.	The infrastructure is expensive to build and operate. Requires ongoing monitoring and the ability to adapt to changing conditions such as storm erosion.
3. BEACH NOURISHMENT  Dredge placement at the Gold Coast. Source: City of Gold Coast	Sand is added to a beach though mechanical means. Nourishment can be onshore (e.g. delivery of sand by truck to a beach) or offshore (e.g. dredge placement).	Restores and widens a beach. Enhances amenity. Fast and effective short-term solution to erosion.	Over time its likely that nourished sand will be lost. Usually needs to be repeated after a period of time. It can be expensive to continually replenish eroded sand.
4. GROYNES  Kirra Point Groyne. Source: Tweed Sand Bypassing	Shore perpendicular structure to the coast, aimed at trapping sand that is moving along the beach. Typically constructed using rocks or geotextile containers.	Traps sand and stabilises the beach updrift. Can increase surf amenity (e.g. Kirra beach).	Typically causes erosion on the downdrift side of the structure. Expensive as it requires an engineered solution. Can be visually unattractive. Can decrease surf amenity.
5. SEAWALLS  Sea wall construction at Palm Beach, Queensland. Source: City of Gold Coast	A shore parallel structure used to provide protection to beach and waterfront land from erosion.	Effective in protecting land and property from erosion. Can utilise a number of different designs and materials. Can be attractive and enhance beach amenity and access (e.g. Manly Beach, NSW).	Can cause increased erosion in front and at the ends of the seawall. Expensive as it requires an engineered solution. Maintenance required over the lifetime of the seawall. Can be visually unattractive.
6. BEACH SCRAPING  Beach scraping at Wooli, NSW. Source: NSW Government	Sand is moved from the lower beach onto the upper beach to increase dune sand volumes. Typically used with dune catch fencing to assist in stabilising dunes.	Low-cost solution. Builds beach and dune sand volumes to provide protection from coastal erosion.	Revegetation strategy required following scraping to assist with dune stabilisation. Over time it's likely that scraped sand will be lost. Can produce an artificially high dune which is easily eroded during a storm event.
7. OFFSHORE BREAKWATER OR ARTIFICIAL REEF  Narrowneck artificial reef, offshore of Surfers Paradise. Source: City of Gold Coast	A rock or geotextile bag structure built parallel to the shore.	Reduces erosion by making waves break further offshore and reducing wave energy at the shore. May increase surf amenity. Low maintenance. Supports marine ecosystems.	Expensive to create. Not always effective.
8. MANAGED RETREAT  Clarkes Beach Caravan Park managed retreat, Byron Bay, NSW. Source: NSW Government	Development relocated from vulnerable coastal zones. No new development.	Long-term solution. Reduces future threats to property. Restores natural processes.	Expensive. Community resentment.
9. BUYBACK  Collaroy Beach, NSW. Buyback at this coastal erosion hot spot would be very expensive. Source: UNSW WRL	Governments purchase vulnerable properties, remove structures and ban further development.	Minimises property losses in vulnerable areas.	Very expensive. Community resentment.

Table 1: Geographical tools and TSB monitoring

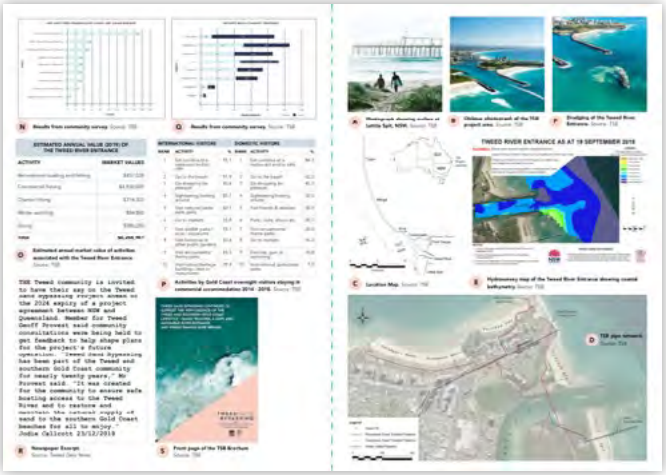
PRIMARY DATA SOURCES	GATHERING PRIMARY DATA: FIELDWORK	PURPOSE
	1. Vertical aerial photographs of the project area (Fingal–Currumbin) are taken from an aeroplane at a fixed height. This has historically occurred in autumn and spring.	Aerial photographs are georeferenced and used in GIS to carry out spatial analysis Changes to beaches, offshore sand banks and reef exposure can be measured and analysed
	2. Oblique photographs taken from helicopters every 3 months.	Series of photographs are used to: › make visual comparisons of change over time › identify and annotate potential causes of change such as storms and seasonal wave conditions.
	3. Ground-level beach photographs taken › from 5 locations at the main project area beaches every few months. or › by community members at the Gold Coast CoastSnap station at Kirra Hill (City of Gold Coast)	
	4. ARGUS camera network – a series of cameras on tall buildings in Coolangatta take photos every minute of Kirra, Coolangatta, Greenmount and Rainbow Bay.	Images are merged using computer programs and the location of the shoreline for each beach is determined. The images are used to make time-lapse videos which are used to examine and communicate beach change over time.
	5. Wave monitoring using a wave rider buoy in the ocean off Fingal to record wave height, period and direction.	Computer models use wave data to predict how much sand is moving along Letitia Spit by longshore drift. Wave data is also used to: › interpret changes shown on hydrographic surveys and photographs › create wave roses.

Table 1: Geographical tools and TSB monitoring

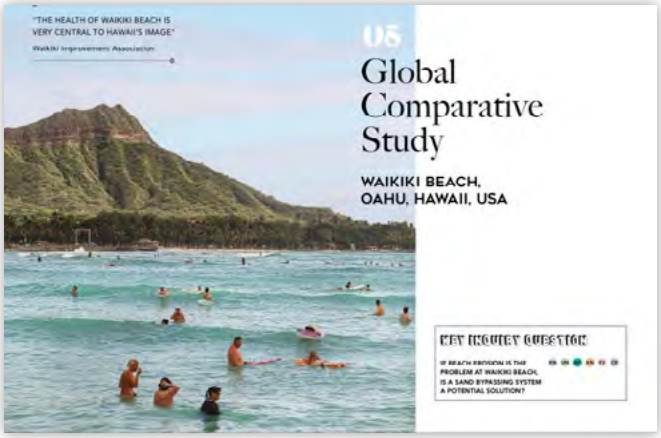
PRIMARY DATA SOURCES	GATHERING PRIMARY DATA: FIELDWORK	PURPOSE
	6. Hydrographic surveys collect bathymetry – the depth of the ocean floor – using sonar from a boat or jet-ski.	Computer programs analyse the data to determine the change, over different time scales – by comparing surveys and calculating differences. Maps and diagrams are also produced to visualise changes in the sea floor.
	7. Boat crossing data is collected by Marine Rescue at Point Danger.	The crossing data is graphed over different time scales to determine patterns and trends.
	8. Dredge logs are used to record exactly where TSB sand is being collected and placed.	The data is collated into tables and graphed.
	9. Surf quality – visual records. Qualitative data from observations, surfing photos and videos obtained by or from: › the TSB Project team › sites such as Coastal Watch › the TSB Advisory Committee › the surfing community.	Wave peel analysis is used to determine surf quality at Duranbah Beach.
	10. Community consultation is the primary mechanism of gaining opinion and sentiment about Tweed Sand Bypassing. It includes: › quantitative data collected through online survey › qualitative data collected through questionnaires, interviews and ongoing discussions (particularly with the Advisory Committee).	Feedback from community consultation is used to: › incorporate local coastal processes knowledge when planning for sand delivery › figure out what the information needs of the community are › understand how the community feels about Tweed Sand Bypassing and what improvements can be made (adaptive management).

WEB RESOURCE: TWEED SAND BYPASSING

The downloadable **stimulus booklet** contains a variety of geographical tools including maps, graphs, tables and statistics, diagrams and photographs. All of the stimulus material relates to the Tweed Sand Bypassing Case Study. A thorough set of **student activities** require students to demonstrate their knowledge, understanding and geographical skills.

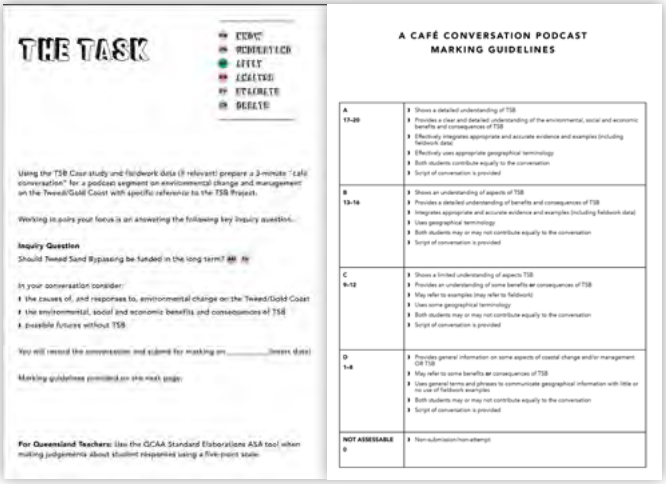


Waikiki Beach is an interesting **Comparative Study** for Environmental change and management challenging students to decide whether a sand bypassing system would work as a coastal management strategy in Hawaii.

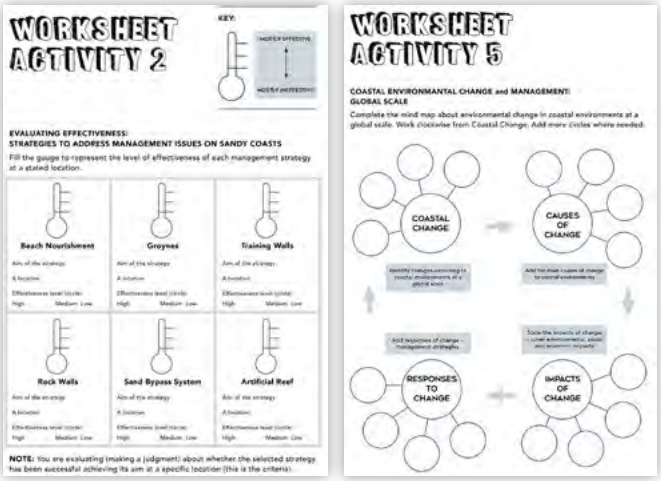


Suggested fieldwork activities and a **summative assessment** are based on the Tweed Sand Bypassing Case Study.

WEBSITE RESOURCE: TWEED SAND BYPASSING



Student activity worksheets can be used to guide geographical inquiry or test knowledge and understanding at the completion of the topic.



All images from Tweed Sand Bypassing Schools Package: https://www.tweedsandbypass.nsw.gov.au/school-students/school-information-package.html

BONUS VIDEO ACCESS FOR GTA BULLETIN USERS

The following link will take you to a presentation from the 2020 Digital Professional Learning Package made available to schools during Term 4. Lorraine Chaffer and Catherine Kerr discuss development of the package and most of the key features. https://vimeo.com/469682666/b8897b0a44

Password: **2021specialBULLETINaccess**

EXPERIENTIAL LEARNING: EVENT

Catherine Donnelly, Curriculum Advisor
NSW Department of Education

TEACHING AND LEARNING ACTIVITIES

Schools host a lunch based on the model of the OXFAM Hunger Banquet. Students are placed in groups according to their allocated country (representing high, middle and low-income) and given food rations accordingly. The inequalities of the food system become glaringly obvious as students discover for themselves some of the issues associated with hunger and poverty. Duration: 2–3 lessons

Specific instructions are easily adapted from the booklet linked below.
https://www.oxfam.org.au/education-resources/files/2018/10/Oxfam-Hunger-Banquets-Student-how-to-guide-V1c.pdf

SYLLABUS LINKS

Year 10 Geography: Human Wellbeing

Context

During this activity, students will be developing their conceptual knowledge and understanding about the following content:

- Students investigate causes, issues and consequences of spatial variations in human wellbeing

Key Inquiry Questions

- How can the spatial variations in human wellbeing and development be measured and explained?
- What are the economic, social and environmental impacts of variations in development and human wellbeing?

Stage 5 outcomes

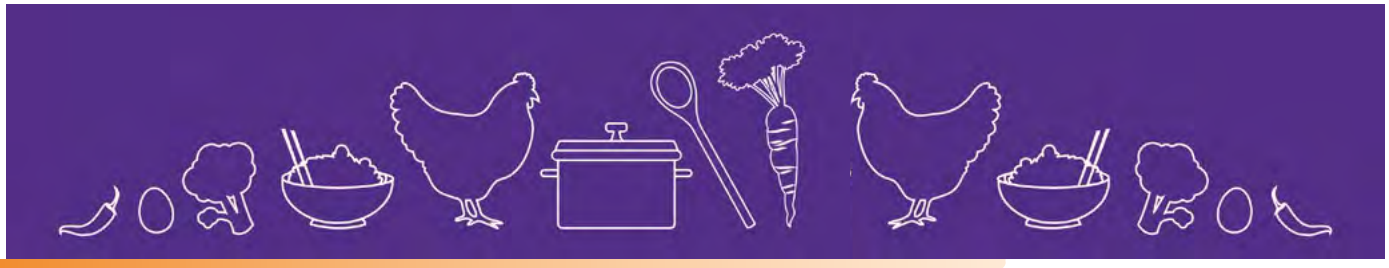
A student:

GE5-6 analyses differences in human wellbeing and ways to improve human wellbeing

GE5-8 communicates geographical information to a range of audiences using a variety of strategies

Geographical skills

apply geographical concepts to synthesise information from various sources and draw conclusions based on the analysis of data and information, taking into account alternative perspectives (ACHGS068, ACHGS077)



EXPERIENTIAL LEARNING: OXFAM HUNGER BANQUET

Learning across the curriculum
Critical and creative thinking
Ethical understanding
Intercultural understanding
Literacy
Civics and citizenship

ASSESSMENT

Criteria for assessing learning

Students will be assessed on their ability to:

- prepare a written response about their experiences of the OHB
- reflect on their own learning and inquiry processes.

Written response describing what was learned during the lunch (can use the reflection questions on pg. 23 of the Oxfam book linked below) as a guide. Student choice as to format of the written response genre (i.e., report, poem, song lyrics, recount, or narrative).

Feedback

- Formative feedback –
  students may receive ongoing teacher feedback in relation to the criteria for assessment. Students reflect on their own learning during the activity and on completion of the activity
- Summative feedback –
  based on written assessment task. This may take the form of comments/annotations, or a grade/mark for the completed task.

archived-content-/archive--news-items-/2016/12/oxfam-2016.html

ABOVE: Irrawang High School. Source: https://irrawang-h.schools.nsw.gov.au/archived-content-/archive--news-items-/2015/12/oxfam-hunger-banquet.html

The experience at Irrawang High School.

Year 10 Geography students gained first -hand experience of the global inequalities in our food system recently by participating in the Oxfam Hunger Banquet organised the HSIE faculty. Students were divided into groups representing high. middle and low-income countries of the globe; Italy. Tonga and Burundi to have a lunch experience they will never forget. There was also a group of refugees outside the fences sheltered by cardboard boxes with no food or water.

Those fortunate enough to represent the high income Italy experienced a beautiful and delicious chicken salad lunch whilst seated at a white linen covered table with placemats and cutlery in the school's fruit orchard.

Students who represented the middle income country of Tonga, found themselves eating sandwiches and drinking cordial. and sitting on chairs.

And then there was poor Burundi, a landlocked country in East Africa .... their residents sitting on the ground or under their cardboard shelter eating their meal of rice off a banana leaf and drinking water (explained to students it would normally highly likely be unclean).

The inequalities of the food system became glaringly obvious as students from Burundi (and the refugees) cast envious looks to those in Italy and Tonga; whilst initially the Italian residents enjoyed their meals enormously only to later feel guilty enough to share their bounty with the other poorer countries including the refugees.

A thought provoking social experiment to give our students a greater understanding of the problems of hunger and poverty.

USING GEOGRAPHICAL FIELDWORK TO TACKLE PRECONCEPTIONS ABOUT PLACE

David Latimer, MLC School

Over the last two years my school has trialed a fieldtrip to the Auburn community to explore the effects of international immigration on Sydney as a part of the Changing Places unit. In part, this fieldwork unit was planned as an opportunity to expose our students to a fascinatingly diverse part of Sydney for which they rarely encounter. We had hopes that the concept of place could be examined when students recognised that the reality of suburbs like Auburn may be quite different from their preconceived ideas.

When the fieldtrip was planned, Australia was regularly exhibiting disturbing examples of islamophobia in the media and an apparently growing rejection of Australia's successful experiment with multiculturalism. We felt this excursion could be used as tool to promote the benefits of immigration and the valuable contribution suburbs like Auburn make in accommodating international migrants. The excursion also provides students with an opportunity to experiment with a variety of fieldwork tool, such as questionnaires, interviews and transects.

Practically the excursion was designed for a whole cohort group of 130 students. The group was broken in three smaller groups for the day with each group participating three separate activities. The activities can easily be planned so that buses can drop students at Auburn Train station and make minimal trips throughout the day. Including the small fee for the mosque and transport the excursion cost $30 per student.

Figure 1. Migration alters development, sustainability and cultural influences in urban

Table 1. Activity planning

	GROUP 1	GROUP 2	GROUP 3
Activity 1	Gallipoli Mosque Visit	Lecture from Cumberland City Council	Retail transect and interviews on Auburn Road
Activity 2	Retail transect and interviews on Auburn Road	Gallipoli Mosque Visit	Lecture from Cumberland City Council
Activity 3	Lecture from Cumberland City Council	Retail transect and interviews on Auburn Road	Gallipoli Mosque Visit

The first activity was a visit to the Gallipoli Mosque to build an understanding about the importance of Islam in the Cumberland City Council. In this Local Government Area 21.9% of residents are Islamic (ABS, 2016) compared with 2.6% in Australia as a whole. The community liaison from Gallipoli Mosque provided an excellent tour through the mosque and discussion about how the mosque serves the local community. Students are required to bring modest dress which covers the legs and (for women) can be worn over the hair for this part of the excursion.

Gallipoli Mosque. Wikimedia Commons – https://commons.wikimedia.org/wiki/File:Auburn_NSW_2144,_Australia_-_panoramio.jpg

During the next activity students received a seminar from the urban planning team at Cumberland City Council. The council planners discussed how local government managed some of the key challenges of the community, including sustainable transport, climate change and multicultural harmony. The talk lasted approximately 45 minutes and was presented within a theatre in the Civic Centre.

The last activity involved more hands-on Geography, with students completing an urban transect of retail activity on Auburn. During this activity students were allowed to move between Auburn Train Station and the Auburn Civic Centre at 78 Auburn Road independently.

Figure 2. The mosque has expectations of modest dress

Table 2. Selected student feedback

- "I liked asking questions to people in the public and also the mosque tour as I learned a lot. Also, the council's existing and future plans were really interesting to hear."
- "The mosque was interesting. Getting to know about city planning (behind-the-scenes stuff) and how social & technological changes occur in a city/town was very interesting as well."
- "I liked having the independence and walking around Auburn asking people about the questions we wanted them to answer."

Over the two years the excursion has been used, it has been quite successful with 70% of the cohort rating the experience as both an enjoyable and valuable learning experience. Most students also identified the community interviews and the mosque as the most high-impact learning experiences. I would also like to extend my thanks to both the Cumberland City Council team and the Gallipoli Mosque, both of whom have been extremely helpful and accommodating while planning this execution.

ANNOUNCING

The 2021 GTA NSW & ACT Young Geographer Awards

The Young Geographer Awards invites students in NSW and the ACT to demonstrate engagement with Geography, the discipline and with the tools and skills of Geography through the creation and conduct of an inquiry-based research project. Although it is not essential, teachers are encouraged to incorporate the research and construction of the project into their teaching programs to help support students.

Unslash image by Bill Oxford @bill_oxford

Prizes for the winning entries in the Young Geographer Award prizes, in any category are:

- **First Prize $500**
- **Second Prize $250**
- **Third Prize $100**

FOR MORE DETAILS CLICK HERE

STEPPING OUT INTO GEOGRAPHY – REFLECTION AND DIRECTION

Kathy Jones, Fieldwork Connections

Over the past four years and during my university studies in Geography education I have spent a lot of time identifying and developing My Geography and what this means in the context of Australian schools. I have found myself on a path which leads towards inquiry and outdoor learning and I have found that this naturally leads to fieldwork.

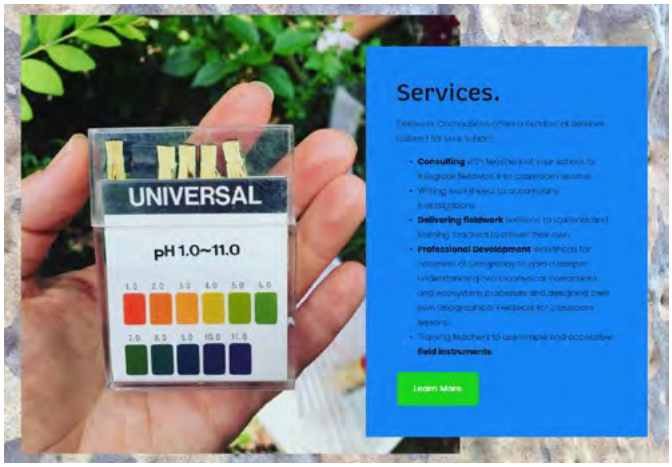
I spend a lot of time in the natural world and have always loved observing how natural processes occur. From my background in Environmental Science, my observations of biophysical processes allow me to understand links between human impacts and management of environments. However, I have also learnt that a lot of people see the word through a more human-centric lens and the natural world is mostly kept at arms-length. The danger is that it can be hard to truly comprehend how humans impact our world if we don't first understand the natural processes at play.

Fieldwork in Geography takes us outside the classroom and allows us to immerses ourselves in the natural world. It sparks wonder which leads to inquiry questioning and light-bulb moments when we realise the simplicities and complexities of how the world works, but equally importantly, how we fit into this delicate balance.

From reading the last edition of the Geography Bulletin (v52, 4, 2020), there are some inspiring geography teachers who have embraced and incorporated fieldwork into their schools and lessons, however, I also know that for a lot of teachers, the thought of taking students outside the classroom is quite a daunting idea and they have no idea where to begin. There are many excellent external opportunities for schools to complete the fieldwork component of the Geography curriculum (NESA, 2015) immersed in an ecosystem, but I feel that fieldwork also needs to become more streamlined into lessons with tools and skills for deeper understanding.

I found myself asking 'Why don't geography teachers enjoy fieldwork?'. I came to the realisation that it was because of the high number (40%) of out-of-field teachers who find themselves teaching Geography (National Committee for Geographical Sciences, 2018). Some aspects of Geography can have close links to other HSIE subjects and teachers may attempt undertaking suburb liveability surveys, however, fieldwork is more than human demographics and urban processes.

I believe that to truly understand Geography you first need to understand the biophysical environment. It is only then that we can begin to understand human impacts and change which leads to management. I believe that if out-of-field Geography teachers, or 'teachers-of-Geography', can build a firm understanding of biophysical processes through simple fieldwork investigations, they will gain a deeper understanding and grow in confidence and passion for what they are teaching and this will flow through to their students own engagement, enjoyment and understanding. Ultimately the goal is to increase the number of students in senior geography and onto future careers made for informed, responsible and active citizens.



If teachers of Geography are to understand the Syllabus and make Geography lessons Geographical (Caldis, 2019) by integrating content and concepts with tools and skills, inquiry, language and communication, then this can also be directly applied to Geographical Fieldwork. Geographical fieldwork incorporates all these elements as well as being relevant, having meaning and most importantly being accessible to all 'teachers-of-Geography' and their students.

But how does this work in practice? How can we keep it simple? Fieldwork does not need to be a full day program. It can be a simple idea or process, gently sequenced into lessons, on school grounds, with minimal cost and disruption. These ideas were also developed by Caldis (2020) in 'Fieldwork in 50'. Knowledge and skills to use geographical tools can first be discovered in the classroom, followed by observations and data collection in the school grounds. Most importantly, to bring meaning, discussions or directed questions to guide students to an understanding of what they have just participated in and observed and how this fits into the bigger picture, not only from the syllabus but also to the local community and their own lives.

Through my work in industry and now having completed my education degree I hope to fill a small niche to bring about slow but impactful change. I believe that my vision of simple Geographical Fieldwork for all teachers of Geography can bring them to a deeper understanding of not only biophysical processes and human interactions in the context of Geography but also how fieldwork is nothing to be feared as it can be made simple, accessible and achievable in a Geography lesson.

Kathy Jones, Fieldwork Connections

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What is Profile.id?

Karen Bowden, HSIE Teacher
NSW Department of Education

Profile.id is a digital resource that Geographers can use to investigate features of Australia's and New Zealand's population and economy. Data analysts have created a range of interactive resources about places, cities, Local Government Areas and suburbs across Australia and New Zealand.

Link: https://profile.id.com.au/

What are the features of this resource?

- Data is sourced from ABS and Stats NZ data.
- Data is analysed and presented on the site in a variety of formats such as GIS, choropleth mapping, population pyramids, statistics, and graphs.
- Current trends can be examined and compared to past trends.
- Students and teachers can freely access Profile. id data.
- It is a useful investigative tool for the following units of study:

STAGE 4:	**Place and Liveability**	– Community
	Interconnections	– Personal connections
STAGE 5:	**Changing Places**	– Internal migration
	Human Wellbeing	– Spatial variations in human wellbeing

How can this site be used in the classroom?

Example 1: Stage 4 | Place and Liveability | Community

Task: To examine the age/sex distribution of the population residing in the Sydney suburb of Green Square.

STEP 1: select the Local Government Area of the Sydney suburb of Green Square.

STEP 2: choose the community profile from the following options:

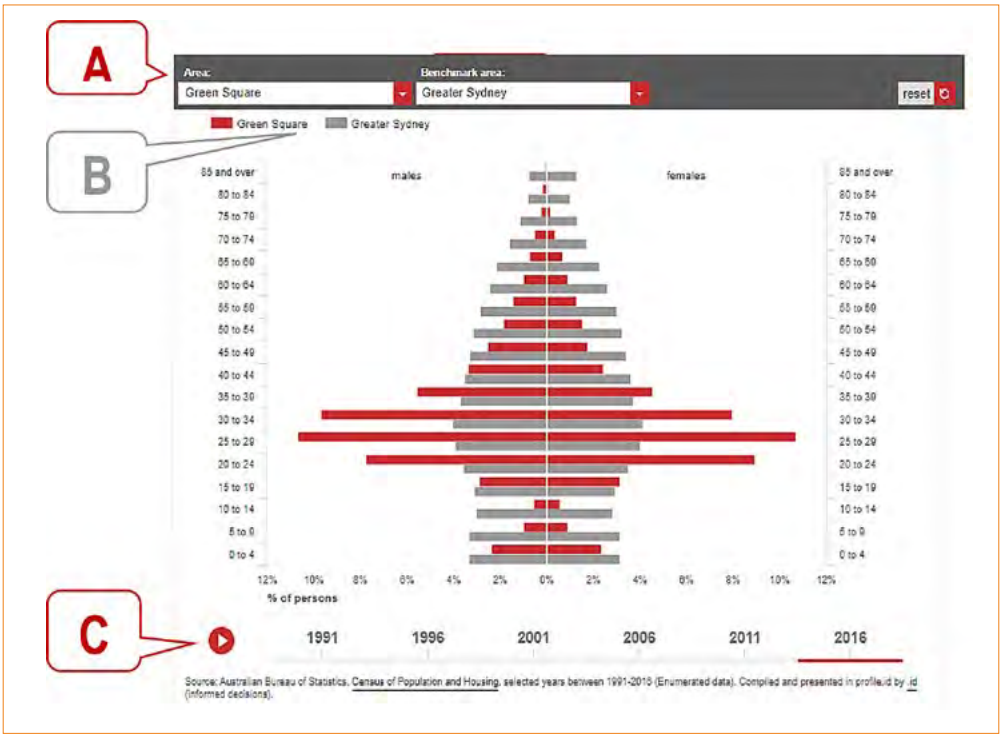
STEP 3: select the specific interest topic – How old are we?

STEP 4: select Age-sex pyramid to create a population pyramid of your selected area.

A – Green Square is selected as the Area. In this example it is being compared with the 'benchmark area' of Greater Sydney.

B – To deselect data e.g. Greater Sydney – click on the data name shown in the key and a simplified version of the population pyramid is created.

C – Click the arrow at the base of the population pyramid and Green Square's population structure can be presented over time. The following population pyramid shows the population structure of Green Square in 1991



ACTIVITY: Refer to Figure 1: Green Square population structure 2016 [below] to answer the following questions.

1. What age group is largest for the Green Square population?
2. What is the total percentage of people found in this age group?
3. What do your answers to Q1 and Q2 tell us about the Green Square community?

Figure 1: Green Square population structure 2016 [ABS census data]

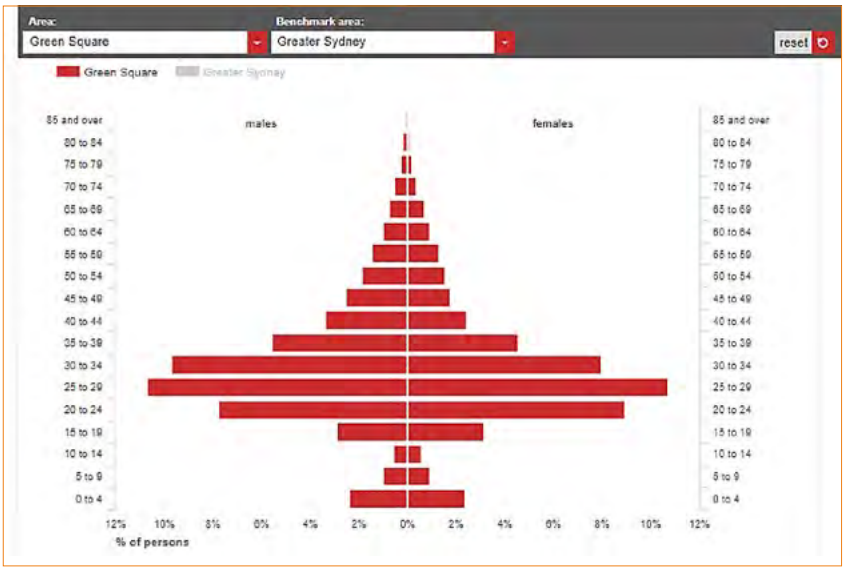
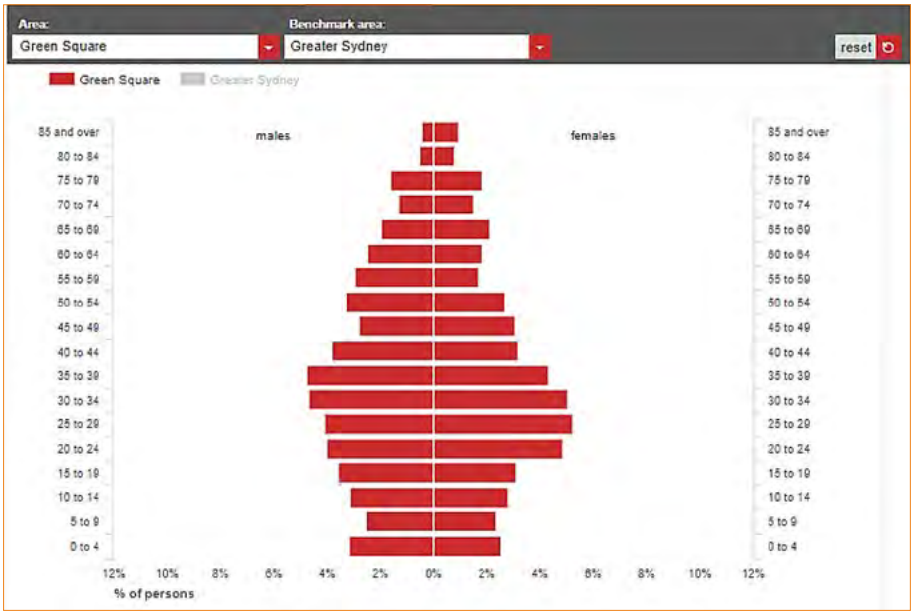


Figure 2: Green Square's population structure 1991 [ABS census data}



ACTIVITY: Refer to Figure 2:
Green Square's population structure 1991 [above] to answer the following questions.

4. What differences can you see between Figure 1 and Figure 2.
5. What do Figures 1 and 2 tell us about the Green Square community?
6. Suggest a reason for the changes you have observed between 1991 and 2016.

Example 2: Stage 5 | Changing Places | Internal migration

ACTIVITY: Think / Pair / Share to explore reasons for relocating within Australia.

1. Why would people want to live in each of the following locations?

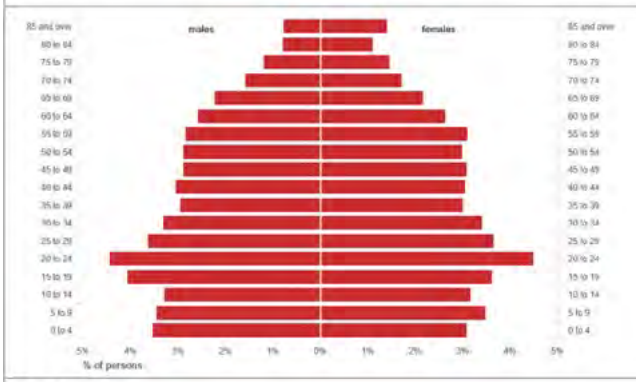
Northern Beaches	A regional NSW town	Gold Coast	An inner-city suburb of Sydney

2. Why might people want to move away from each of the following locations?

Northern Beaches	A regional NSW town	Gold Coast	An inner-city suburb of Sydney

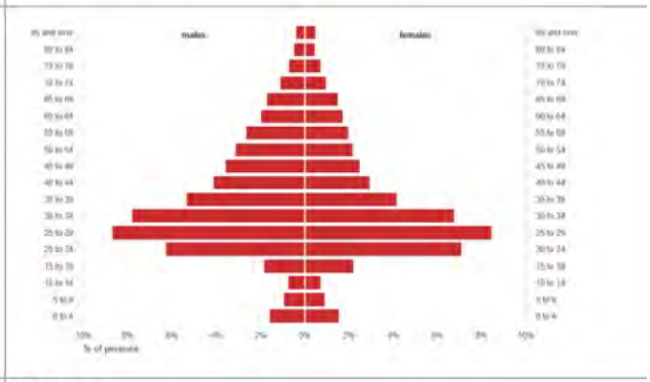
3. a. Match the population pyramids with each of the locations given above in the space provided.
   b. Suggest a reason for your choice.

Place A = ...



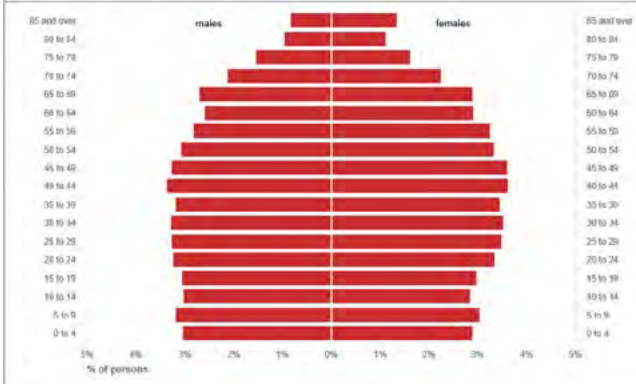
Reason:
.....

Place B = ...



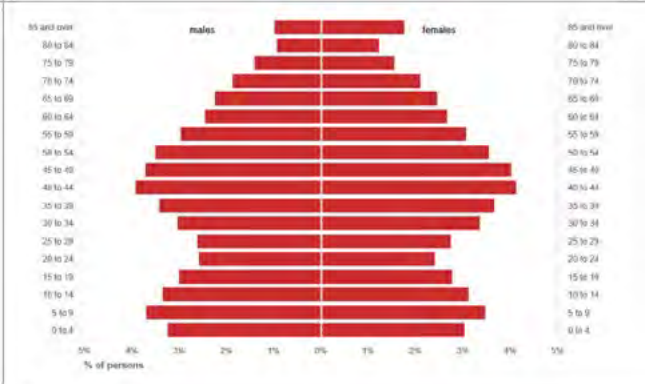
Reason:
.....

Place C = ...



Reason:
.....

Place D = ...



Reason:
.....

GTA NSW & ACT Annual Conference

Ivan Motley, founder and director at .id is presenting a Keynote and workshop at the GTA NSW & ACT Annual Conference on Friday 14 May.

Learn how to find and use the .id tools to tell stories about communities and influence future change in the workshop titled 'Using tools of the trade for Geographers'

ANSWERS

Example 1:

Refer to Figure 1: Green Square population structure 2016 [below] to answer the following questions.

1. What age group is largest for the Green Square population? 25–29 years
2. What is the total percentage of people found in this age group? 21.5 % [10.5% + 11%]
3. What do your answers to Q1 and Q2 tell us about the Green Square community?
   Green Square's young adult population in 2016 was the most common age group. 21.5% of the total population was aged 25–29 years.

Refer to Figure 2: Green Square's population structure 1991 [above] to answer the following questions.

4. What differences can you see between Figure 1 and Figure 2?
   There is a lower percentage of people aged under 15 years and over 50 years in 2016 compared to 1991. The 2016 population structure shows a more balanced percentage of males and females at each age group. In 1996 there were more females at older age groups, in 2016 were more males in this age group.
5. What do Figures 1 and 2 tell us about the Green Square community?
   There has been change within the Green Square community between 1991 and 2016. There has been a decline in the percentage of younger people and older people in the community over time. Most of the population is young adult with a balanced male / female representation.
6. Suggest a reason for the changes you have observed between 1991 and 2016.
   Green Square has been transformed into a high-density suburb with fewer jobs linked to the industrial sector. One reason for the lower proportion of young children is the preference of families for a lower density residential suburb with age-appropriate school and recreation facilities. Older residents of Green Square may have been forced out of the area by the high-density housing projects and increased housing prices.

Extension:

What other information would help you to become more informed about the Green Square community? [Ethnicity, car ownership, family size] Use Profile.id to find this information.

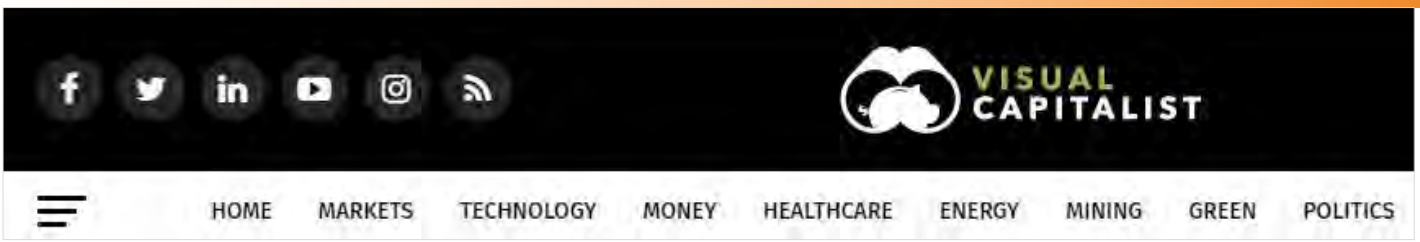
Example 2:

Questions 1 and 2 – class discussion:
Using the following images or your own places, discuss the reasons why people may want to MOVE to each place and reasons why people may want to LEAVE each place.

Question 3.

Place A = Regional NSW Place B = Inner city suburb

Place C = Gold Coast Place D = Northern Beaches



RESOURCE: VISUAL CAPITALIST

Lorraine Chaffer, Geography Education Consultant

Visual Capitalist is an online publisher creating data-driven visuals. Many of these are highly relevant to Geography topics. VC also publish animated maps and graphs covering topics such as population change over time and trade flows.

Data sources

The majority of Visual Capitalist graphics use quality public sources of data that are publicly available, verifiable, accessible, and transparent. Examples of sources include government entities, intergovernmental organisations e.g., IMF, World Bank or established thought leaders in different sectors (non-profits, corporations).

Using Visual Capitalist Infographics

It is free to use any original .jpg and .png visualisations from the website however users cannot change anything on the visualisation. Users should:

- attribute to Visual Capitalist
- link back to Visual Capitalist

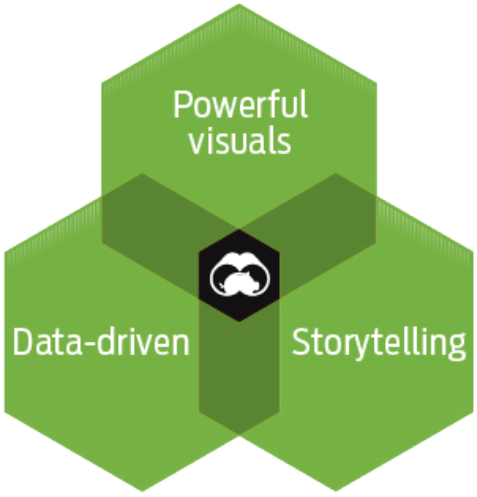
Infographics can be downloaded directly from the VC website; however, most are optimised for online viewing rather than printing.

Licensing provides additional options and permissions such as access to high-resolution source files (.ai, .pdf, .eps) for enhanced printing and permission to modify – depending on the license acquired.

Educational use

VC infographics are of great value in classroom settings, Teachers can use the infographics in an educational capacity with appropriate credit provided, however, to edit the infographics, licensing is required.

NOTE: GTA NSW & ACT has licensed several infographics to print quality classroom posters such as those in the examples on the following pages. Throughout 2021, more posters will be printed and packaged for sale through the GTA NSW & ACT website



Examples of animated maps:

- The comparative might of continents (size, population, GDP) https://www.visualcapitalist.com/animated-map-the-comparative-might-of-continents/
- The world's rapid rise in life expectancy in 13 seconds https://www.visualcapitalist.com/rapid-rise-in-life-expectancy/

Examples of infographics and related articles on the following pages:

- Example 1. Visualizing Countries by Share of Earth's Surface
- Example 2: Visualizing the Biggest Threats to Earth's Biodiversity
- Example 3: How to Spot Fake News

Source: https://www.visualcapitalist.com/countries-by-share-of-earths-surface/

Visualizing Countries by Share of Earth's Surface

Published January 23, 2021
by Nicholas LePan

There are over 510 million square kilometres of area on the surface of Earth, but less than 30% of this is covered by land. The rest is *water*, in the form of vast oceans.

Today's visualisation uses data primarily from the United Nations Statistics Division (UNSD) to rank the world's countries by their share of Earth's surface.

Breakdown of Countries Share of Earth's Surface

The largest countries by surface area are Russia (3.35%), Canada (1.96%), and China (1.88%).

Together they occupy roughly 7.2% of Earth's surface. Russia is so big that even if we divided the country between its Asian and European sections, those new regions would still be the largest in their respective continents.

Country / Dependency	Total in km² (mi²)	Percentage of Earth's Surface
Russia	17,098,246 (6,601,670)	3.352%
Antarctica	14,000,000 (5,400,000)	2.745%
Canada	9,984,670 (3,855,100)	1.958%
China	9,596,961 (3,705,407)	1.881%
United States	9,525,067 (3,677,649)	1.867%
Brazil	8,515,767 (3,287,956)	1.670%
Australia	7,692,024 (2,969,907)	1.508%
India	3,287,263 (1,269,219)	0.644%
Argentina	2,780,400 (1,073,500)	0.545%
Kazakhstan	2,724,900 (1,052,100)	0.534%

Antarctica, although not a country, covers the second largest amount of land overall at 2.75%. Meanwhile, the other nations that surpass the 1% mark for surface area include the United States (1.87%), Brazil (1.67%), and Australia (1.51%).

The remaining 195 countries and regions below 1%, combined, account for the other half of Earth's land surface. Among the world's smallest countries are the island nations of the Caribbean and the South Pacific Ocean. However, the tiniest of the tiny are Vatican City and Monaco, which combine for a total area of just 2.51 km^2.

The remaining 70% of Earth's surface is water: 27% territorial waters and 43% international waters or areas beyond national jurisdiction.

Areas Beyond National Jurisdiction

In the past, nations adhered to the freedom-of-the-seas doctrine, a 17th century principle that limited jurisdiction over the oceans to a narrow area along a nation's coastline. The rest of the seas did not belong to any nation and were free for countries to travel and exploit.

This situation lasted into the 20th century, but by mid-century there was an effort to extend national claims as competition for offshore resources became increasingly fierce and ocean pollution became an issue.

In 1982, the United Nations adopted the Law of the Sea Convention which extended international law over the extra-territorial waters. The convention established freedom-of-navigation rights and set territorial sea boundaries 12 miles (19 km) offshore with exclusive economic zones up to 200 miles (322 km) offshore, extending a country's influence over maritime resources.

Does Size Matter?

The size of countries is the outcome of politics, economics, history, and geography. Put simply, borders can change over time.

In 1946, there were 76 independent countries in the world, and today there are 195. There are forces that push together or pull apart landscapes over time. While physical geography plays a role in the identity of nations, Sheikh Zayed bin Sultan Al Nahyan, the former ruler of UAE, a tiny Gulf nation, put it best:

"A country is not measured by the size of its area on the map. A country is truly measured by its heritage and culture."

SUGGESTED ACTIVITIES

Relevant to physical geography topics including Landscapes and Landforms, Water in the World, Sustainable Biomes and Environmental Change and Management.

Countries by Share of Earth's Surface poster

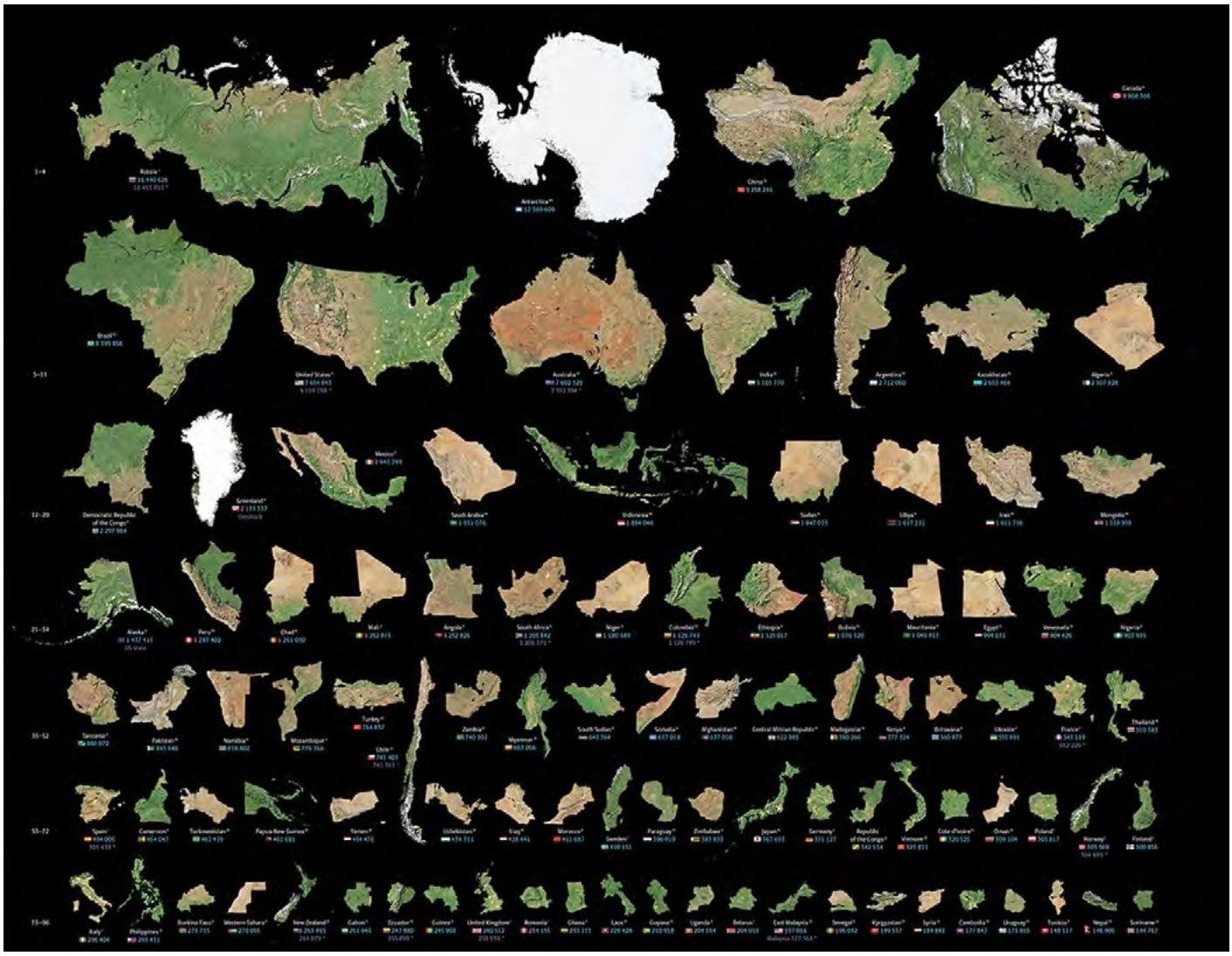
1. Begin with some thinking questions such as:
   - Will the proportion of Earth covered by oceans increase or decrease with climate change?
   - What might Australia's proportion of earth's surface be as a result of a global 1 metre rise in sea level?
   - Why is Antarctica and not the Arctic shown on the graphic as a portion of Earth's surface?

   Discuss and explain correct answers
2. A. Predict how the graphic depicted would change with a 1 metre rise in sea level.

   B. Predict how the graphic depicted would be different by 2100 as a result of the impact of climate change on weather and climate.
   - Create a hand drawn simplified infographic to illustrate your predictions.
   - Conduct an inquiry to determine the accuracy of your predictions.
3. Research two sources that will validate the data used in the infographic.
4. Calculate the % of Earth's surface occupied by China PLUS India
5. Explain the difference between Territorial Waters and International Waters.

   What message is the following quote giving?
   "A country is not measured by the size of its area on the map. A country is truly measured by its heritage and culture."

Visualising the True Size of Land Masses from Largest to Smallest (detail)



Source: https://www.visualcapitalist.com/visualizing-the-true-size-of-land-masses-from-largest-to-smallest/

Source: https://www.visualcapitalist.com/biggest-threats-to-earths-biodiversity/

Visualizing the Biggest Threats to Earth's Biodiversity

Published November 11, 2020

By Carmen Ang

The Biggest Threats to Earth's Biodiversity

Biodiversity benefits humanity in many ways.

It helps make the global economy more resilient, it functions as an integral part of our culture and identity, and research has shown it's even linked to our physical health.

However, despite its importance, Earth's biodiversity has decreased significantly over the last few decades. In fact, between 1970 and 2016, the population of vertebrate species fell by **68%** on average worldwide. What's causing this global decline?

Today's graphic uses data from WWF's Living Planet Report 2020 to illustrate the biggest threats to Earth's biodiversity, and the impact each threat has had globally.

Measuring the Loss of Biodiversity

Before looking at biodiversity's biggest threats, first thing's first—how exactly has biodiversity changed over the years?

WWF uses the Living Planet Index (LPI) to measure biodiversity worldwide. Using data from over 4,000 different species, LPI tracks the abundance of mammals, birds, fish, reptiles, and amphibians across the globe.

Here's a look at each region's average decline between 1970 and 2016:

Rank	Region	Average decline (between 1970 and 2016)
1	Latin America & Caribbean	94%
2	Africa	65%
3	Asia Pacific	45%
4	North America	33%
5	Europe and Central Asia	24%

Latin America & Caribbean has seen the biggest drop in biodiversity at **94%**. This region's drastic decline has been mainly driven by declining reptile, amphibian, and fish populations.

Despite varying rates of loss between regions, it's clear that overall, biodiversity is on the decline. What main factors are driving this loss, and how do these threats differ from region to region?

Biggest Threats to Biodiversity, Overall

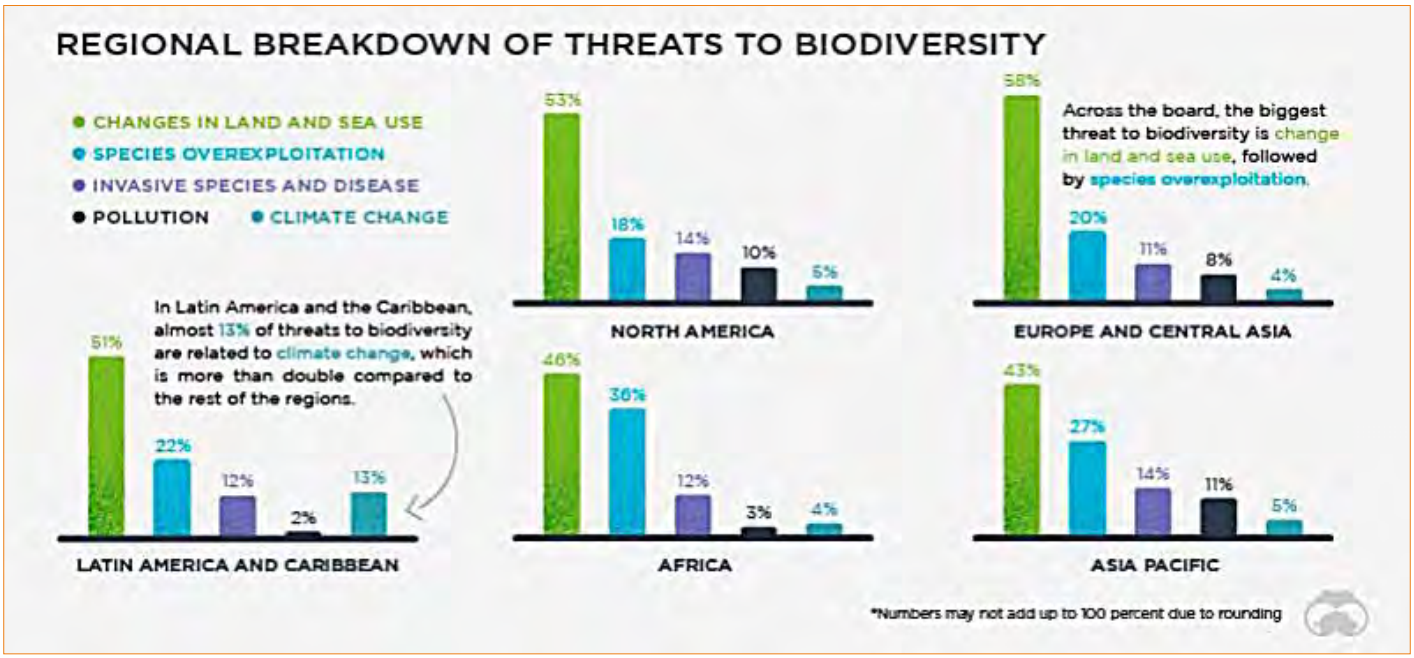
While it's challenging to create an exhaustive list, WWF has identified **five major threats** and shown each threats' proportional impact, averaged across all regions:

Threat	Proportion of threat (average across all regions)
Changes in land and sea use	50%
Species overexploitation	24%
Invasive species and disease	13%
Pollution	7%
Climate Change	6%

Across the board, changes in land and sea use account for the largest portion of loss, making up 50% of recorded threats to biodiversity on average. This makes sense, considering that approximately one acre of the Earth's rainforests is disappearing every two seconds.

Species overexploitation is the second biggest threat at 24% on average, while invasive species takes the third spot at 13%.

Source: https://upload.wikimedia.org/wikipedia/commons/1/1c/ISS029-E-008032_Fires_along_the_Rio_Xingu_-_Brazil.jpg



Source: https://www.visualcapitalist.com/biggest-threats-to-earths-biodiversity/

Biggest Threats to Biodiversity, By Region

When looking at the regional breakdown, the order of threats in terms of biodiversity impact is relatively consistent across all regions—however, there are a few discrepancies.

In Latin America and Caribbean, climate change has been a bigger biodiversity threat than in other regions, and this is possibly linked to an increase in natural disasters. Between 2000 and 2013, the region experienced 613 extreme climate and hydro-meteorological events, from typhoons and hurricanes to flash floods and droughts.

Another notable variation from the mean is species over-exploitation in Africa, which makes up **35%** of the region's threats. This is higher than in other regions, which sit around 18–27%.

While the regional breakdowns differ slightly from place to place, one thing remains constant across the board—all species, no matter how small, play an important role in the maintenance of Earth's ecosystems.

Will we continue to see a steady decline in Earth's biodiversity, or will things level out in the near future?

SUGGESTED ACTIVITIES

Topic: Environmental Change and Management (An introduction)

Working in small groups

1. Students visit the infographic poster during a lesson.
   a. They study the infographic for 3 minutes and develop TWO inquiry questions based on the poster. Write these on a POST-IT note.
   b. At the end of the lesson collate suggestions from the whole class by placing Post-it notes on a wall or using Padlet (digital).
   c. Class votes to investigate selected questions - chosen through consensus.
2. Students propose strategies to address ONE threats to biodiversity on the poster.
3. Teacher introduces the Environment students will study in this topic e.g., riverine
   a. Students identify threats to that environment using the categories on the poster.
   b. Students list what they know about one of the threats to that environment using geographical concepts and specific examples.

GTA NSW & ACT Annual Conference

The infographics On the Brink, Fake News and Earth's Surface have been licensed and printed as posters by GTANSW & ACT for the 2021 Annual Conference.

Source: https://www.visualcapitalist.com/how-to-spot-fake-news/

How To Spot Fake News

Published February 10, 2021
By Omri Wallach

"Fake news" used to be a relatively uncommon problem, but over the last decade, and especially during the COVID-19 pandemic, increasing consumption of news and articles has caused misinformation to run wild.

Far from a new concept, misinformation and cherry-picked stories have been used throughout history as a form of propaganda or information warfare. However, the rise of social media as a hub for sharing articles has spread "fake news"— false or misleading information presented as legitimate news—all over the internet.

Fueled further by increasing polarization, as well as the use of the term by former U.S. President Donald Trump to also refer to negative coverage (whether legitimate or misinformed), it seems more difficult than ever to separate trustworthy from misleading sources.

With this in mind, we combined guidance from non-profit journalism project First Draft News and the International Federation of Library Associations and Institutions (IFLA) to create this guide for understanding "fake news" and how to spot it.

The Different Types of "Fake News"

In order to spot fake news, you have to know the many forms misinformation can take.

Not all fake news is created equal, or even with the intent to deceive. Some start as opinions or jokes that become misunderstood, twisted over time, and eventually turn into misinformation. Others begin with the sole purpose of deception.

Online Misinformation: From Least Intentional to Most

- **Satire/Parody**
  Articles or videos created to mock or laugh at an issue. If created without being an obvious parody, these types of articles can still fool readers and be shared as "real."
- **False Connection**
  Stories with headlines, visuals, and captions that don't support the content. Sometimes the cause is an honest mistake or poor journalism, but other times the false connections are deliberate to draw more attention.
- **Misleading Content**
  Misleading use of information to frame an issue or individual, especially one not involved in the story. This can be caused by poor journalism or political influence, but is also caused by opinions being shared as news and the increasingly blurring line between the two.
- **False Context**
  Genuine content that is shared with false contextual information, such as an incorrect date or a misattributed quote. This type of misinformation can still appear on news sites with poor fact-checking or opinion-based reporting but is clearly driven by an agenda with an attempt to influence.
- **Imposter Content**
  When genuine sources are impersonated in order to deceive the audience. Though this type of misinformation is used in parody, it is also used for profit and propaganda purposes, such as by sites disguised to look like news organizations or using fake credentials.
- **Manipulated Content**
  The deliberate manipulation of information, such as digitally altering an image or making up quotes. This type of misinformation is easily proven fake with some research but can spread too far before it is fact-checked.
- **Fabricated Content**
  Newly created false content designed to deceive and do harm. These include deepfake videos and sites posing as legitimate news organisations.

WEB & INFOGRAPHIC RESOURCE: VISUAL CAPITALIST

Despite many types of misinformation appearing to be obvious at a glance, it's harder to discern when browsing online. In a 2019 global survey on social media by Ipsos, **44% of people** admitted to being duped by fake news at least once, while others may have been duped unwittingly.

How To Tell If An Article is "Fake News"

With many types of misinformation to contend with, and trust in media organisations falling in the U.S. and around the world, it might seem like you're surrounded by "fake news," but there are a few things you can check to be sure.

- **The Source**
  Investigate the site to make sure it's legitimate and check its mission and its contact info to understand if it's news, satire, or opinion.
- **The URL**
  Be wary of unusual top-level domain names, like ".com.co" that are designed to appear legitimate, such as ABCnews.com.co.
- **The Text**
  Does the article have spelling errors or dramatic punctuation? This can be an easy find for simple fabricated content, as most reputable sources have high proofreading and grammatical standards.
- **The Information**
  Read past click-baity headlines, note who is (or isn't) quoted, and verify the information on other sites. This is also a good way to separate opinion pieces from news.
- **The Author**
  Check the author's bio and do a quick search on them. Are they credible to write about their story? Are they real?
- **Supporting Sources**
  Click on the supporting links and perform reverse searches on images. Do they actually support the story, or are they irrelevant (or worse, manipulated)?
- **The Date**
  Sometimes older news stories are shared again and gain traction because of current events, but that doesn't mean they're relevant or accurate.
- **Your Bias**
  Especially with the rise of opinionated journalism and websites profiting from polarization, consider the intended audience for this story and if your own beliefs could affect your judgement.
- **The Experts**
  If a story feels flimsy, or doesn't seem to be properly cited, consider asking an expert in the field or consulting a fact-checking site.

More than anything, consider that outrageous misinformation has an easier time spreading on the internet than boring real news. An MIT study found that false stories on Twitter were **70% more likely** to get retweeted than accurate news.

But armed with knowledge about what "fake news" looks like, and with increased pressure on news organizations, the tide can be turned back in the favour of accurate news.

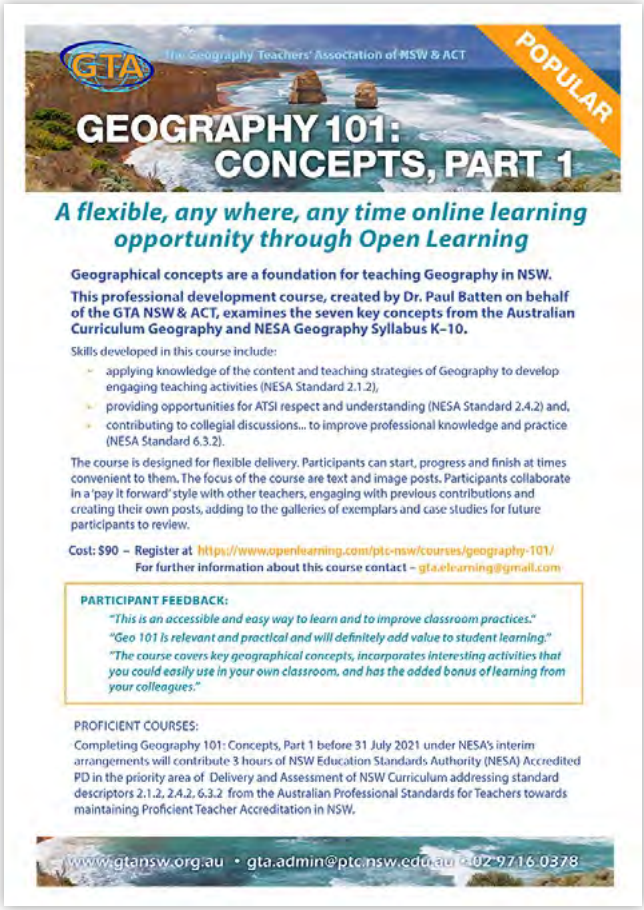
SUGGESTED ACTIVITIES

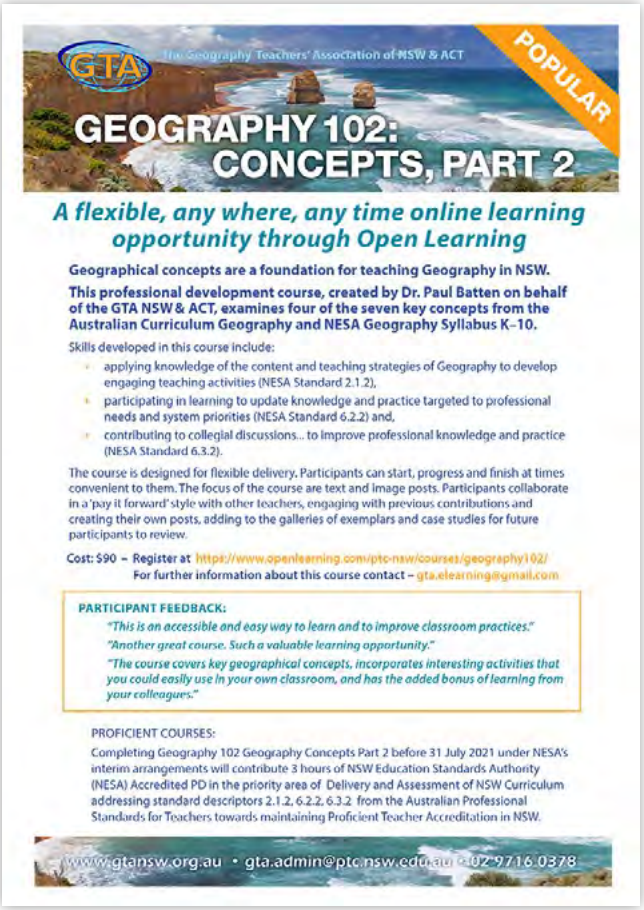
Relevant to all topics and students undertaking Geographical Inquiry.

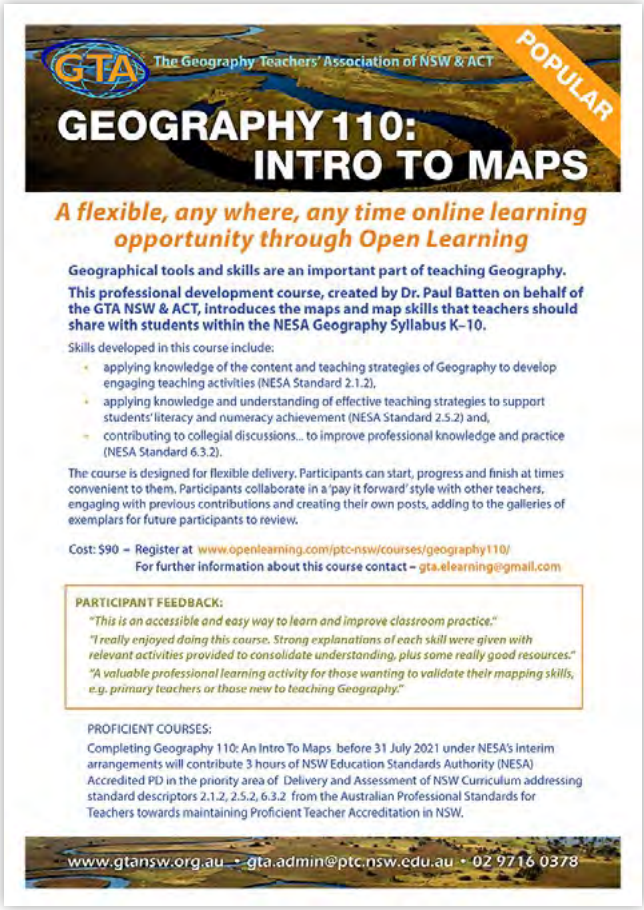
1. Students work in groups to develop a 'Fake News in Geography Checklist' they can apply to sources they use when undertaking Geographical inquiry.
2. Groups contribute to a class discussion to develop a list that students at all levels can use. The final checklist should have the following features:
   - Be a 1-page table
   - Be easy to read
   - Not too text heavy
   - Limited to eight features they should check in a source
   - Have a tick box column
3. Students use the checklist to create an annotated example of a Geography Source to demonstrate either an Example of Fake News OR Example of Real News.
4. Print copies and place on classroom walls.

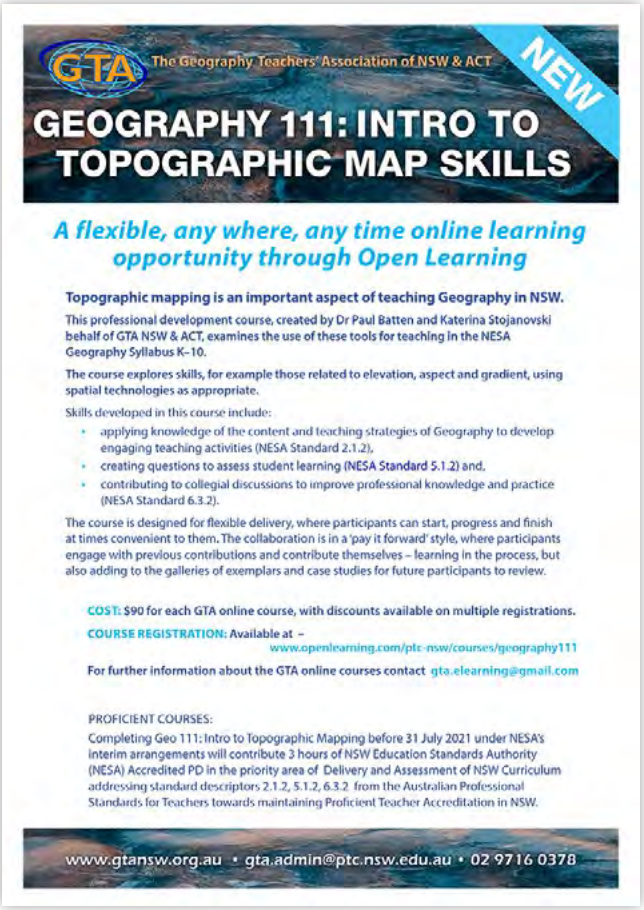
PROFESSIONAL LEARNING ONLINE

GTA NSW & ACT is continuing to offer its acclaimed online learning opportunities through the Open Learning platform.









These flexible, anywhere, anytime courses are NESA accredited for 3–5 hours.

The last year has seen an exciting expansion of course offerings to support new and experienced Geography teachers:

- Geography 101: Concepts, Part 1 (5hr)
- Geography 102: Concepts, Part 2 (5 hr)
- Geography 110: Intro to Maps (3hr)
- Geography 111: Intro to Topographic Map Skills (3hr)
- Geography 141: Teaching Place and Liveability – for teachers new to the unit (3hr)
- Geography 241: Teaching Place and Liveability – for experienced teachers (3hr)
- Geography 142: Teaching Landscapes and Landforms (3hr)

These courses, written and facilitated by Dr Paul Batten and Katerina Stojanovski, have been rated very positively by participants. Here is a sample of their comments:

"An awesome module. One of the best I have completed. Clear instructions provided and very practical."

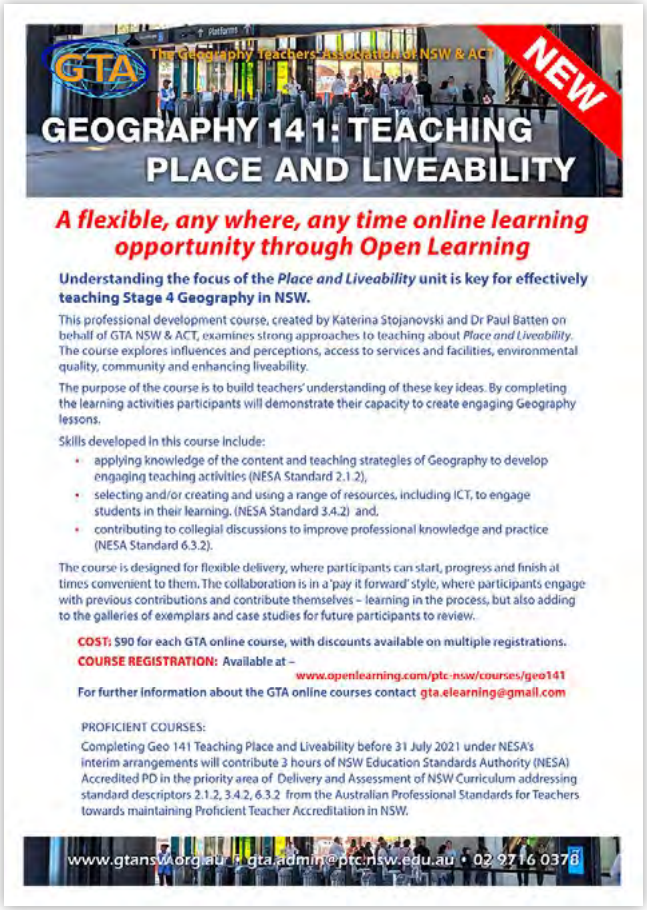
"Such a great course. Thank you so much. It's really nice to engage with other Geo teachers too."

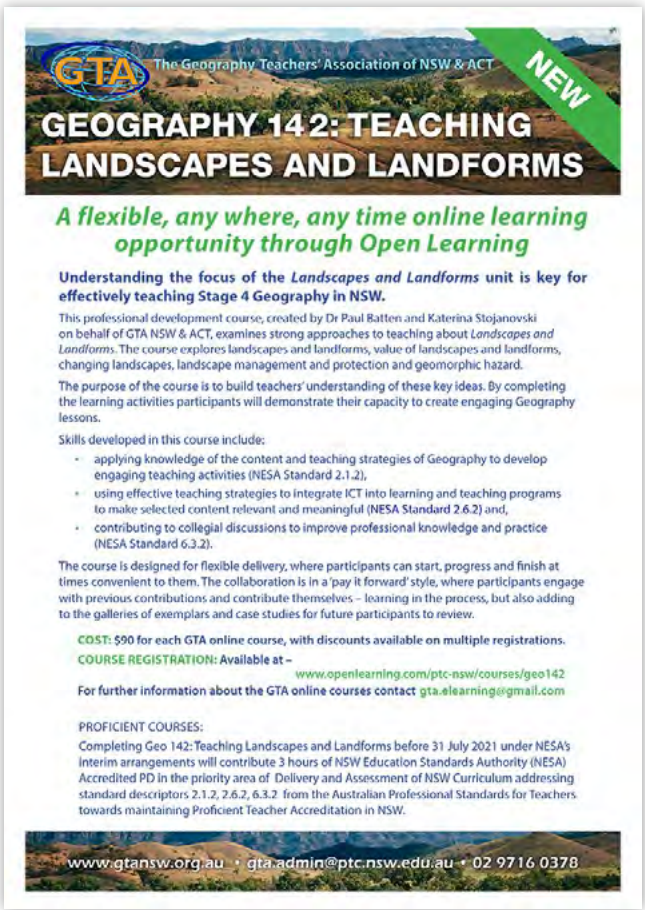
"This online course was really handy! It meant that I could do some bits and then come back and complete the rest. It was also engaging."

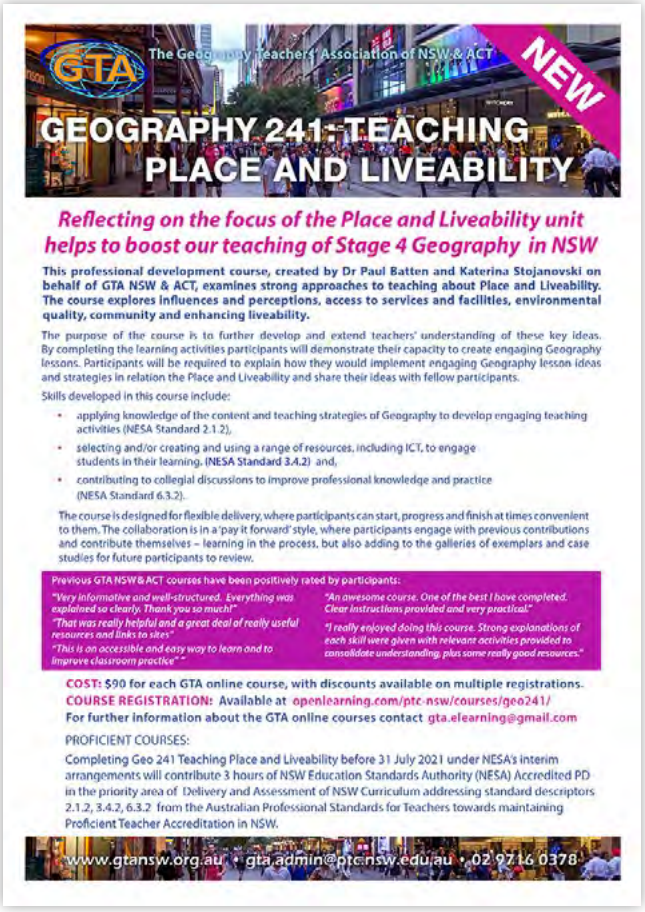
"Excellent PD. Specific to our subject and able to be applied into our teaching immediately. Thanks GTA."

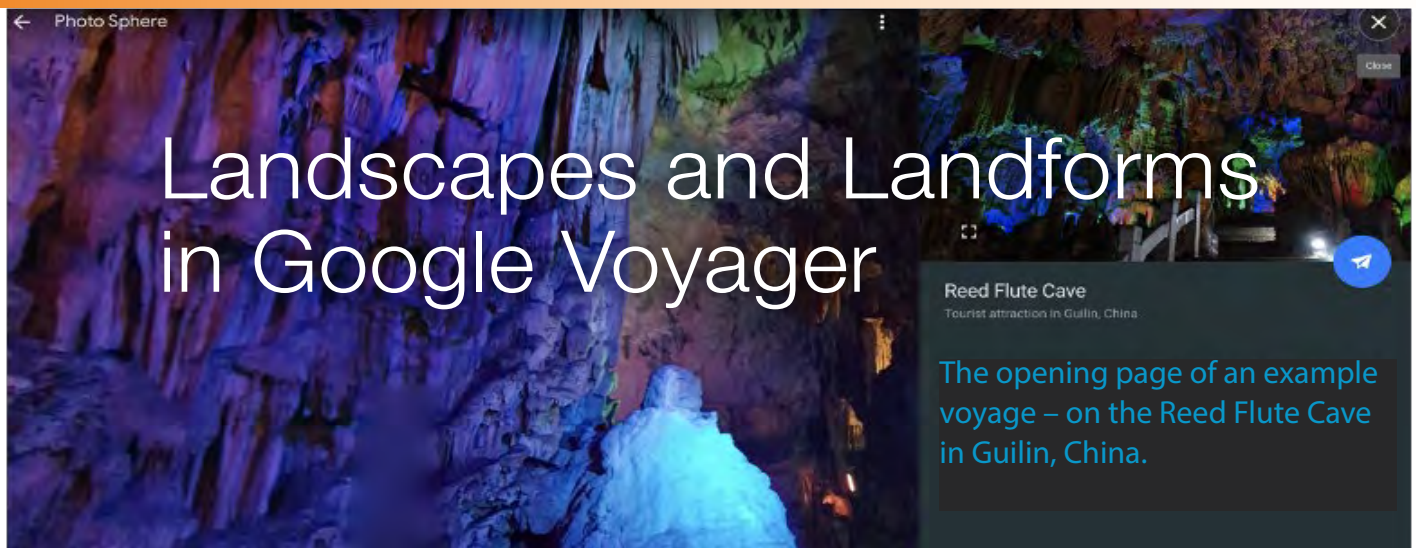
For more information about our online learning courses, please contact the GTANSW & ACT Online Learning Coordinator at gta.elearning@gmail.com

Dr Paul Batten, Vice President, GTANSW & ACT & Katerina Stojanovski, Minutes Secretary and Councillor GTANSW & ACT









Landscapes and Landforms in Google Voyager

The opening page of an example voyage – on the Reed Flute Cave in Guilin, China.

A teaching resource adapted from a GTA online course

Katerina Stojanovski and Dr Paul Batten

There are awesome capabilities to explore the world without leaving the classroom with *Google Voyager*. *Google Voyager* is a resource for showing landscapes and landforms (Stage 4), environments (Stage 5) and ecosystems (Stage 6) from around the world. The voyages are as beautiful and informative as a National Geographic magazine, but with free online access and a range of technologies, including spatial tech.

Google Earth Education has done the hard work for you - you basically just need to find the projects that they've already created. At https://earth.google.com/web/data=CgQSAggB they have a whole bunch of voyages presented – when you find one you like, you click into it. A couple of example tiles are shown below.

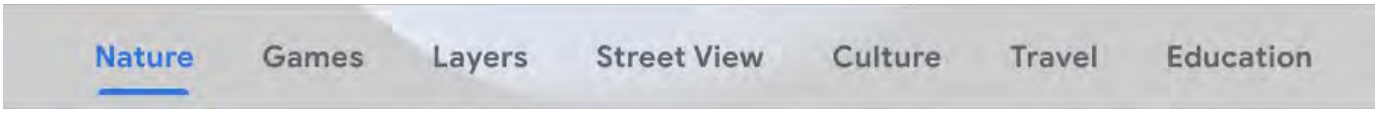
Google Earth Education have created an abundance of materials, guides, classroom resources and tutorials within the voyages, any or all of which you could use with your students. There is a combination of maps, images, text and interactive features that allow the user to explore and analyse the associated geographical issues. The quality is exceptional.

Getting on to *Google Voyager*

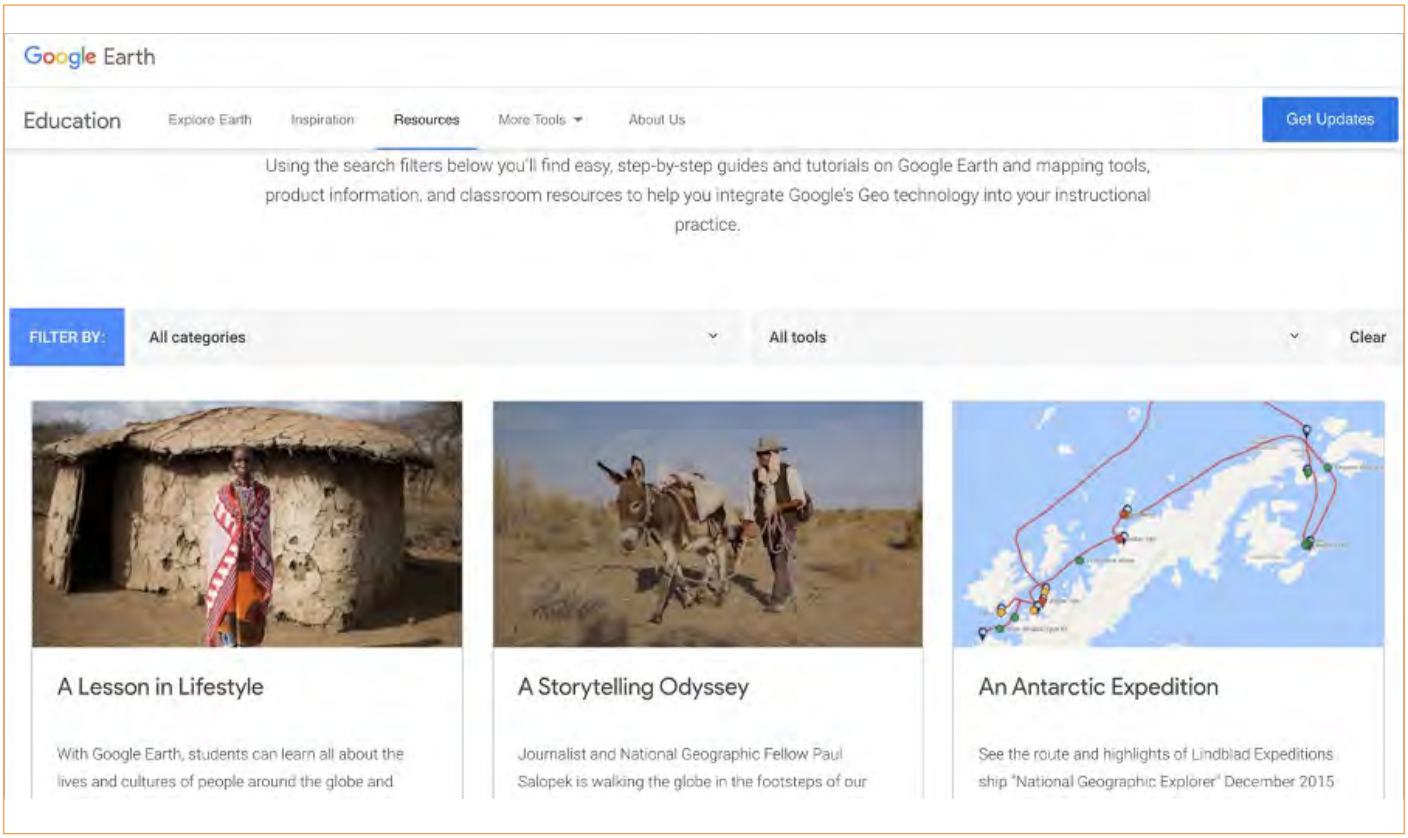
You need to sign into your Google account so that you can access, view and save your work. If you don't have one, it is easy to create one at www.google.com.

Once you've done that, here are the instructions:

1. Go to https://www.google.com/earth/
2. Select 'Launch Earth'.
3. Choose a voyage by selecting the ship's steering wheel which is located on the left menu panel just below the search icon.
4. You can choose a category to explore e.g. Nature, Games, Education etc.
   Let's start with *Nature.*



5. Within these categories, you can hunt for a voyage that relates to what you want to teach in the classroom, be it landscapes or landforms, managing environments, or investigating ecosystems.
   Unfortunately there doesn't appear to be a search button.
   Once you select a link, click 'start exploring'.
6. Each voyage has a combination of photos, videos, information, plus quizzes, games, stories and education which you can find by navigating through the various options.
7. The other tabs (Explore Earth, Inspiration, More Tools) have a lot of useful information as well. The image below has the **resources** tab highlighted in the very top menu you can see.



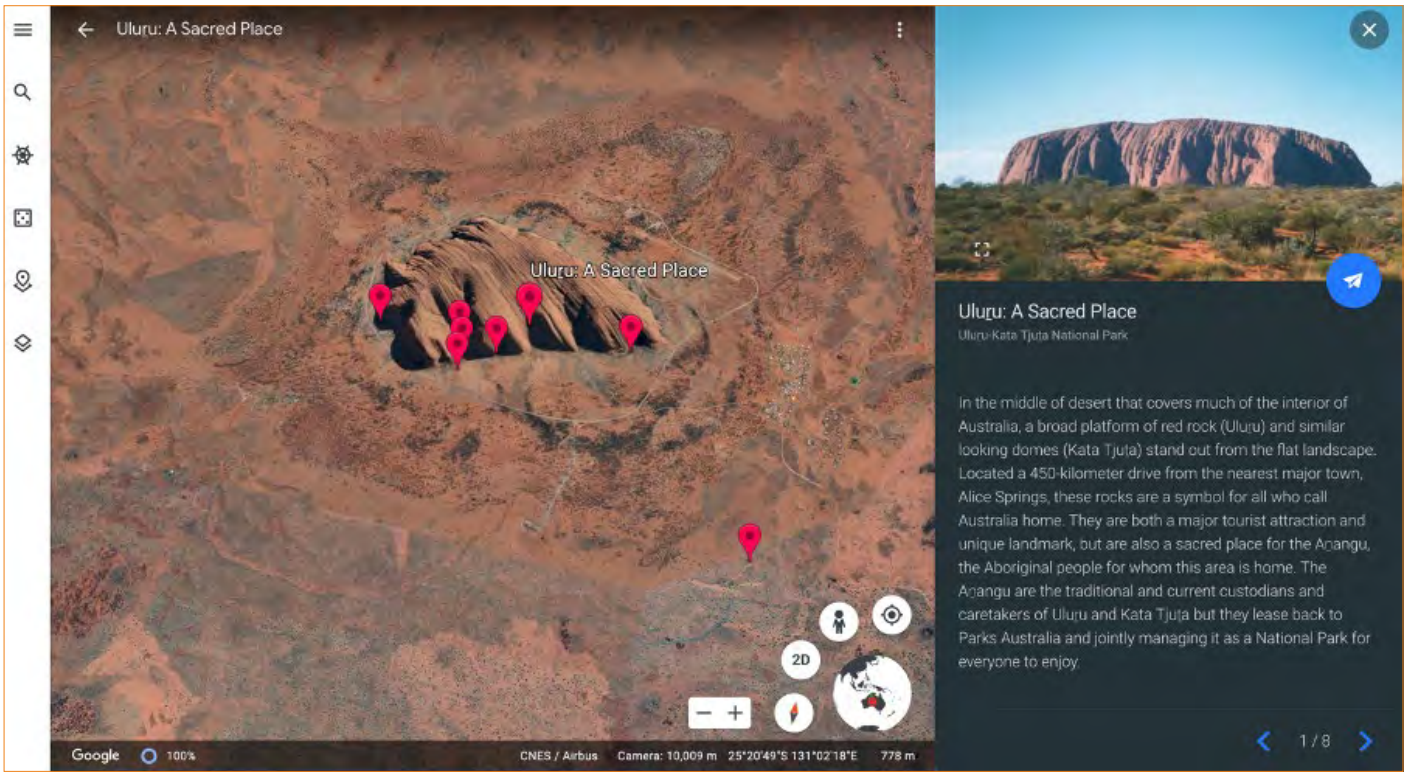
Do you need a lesson starter? Choose one of the many quizzes to commence your lesson. Here's an example on **Natural Wonders**:

A couple of extra tips when using Google Voyager:

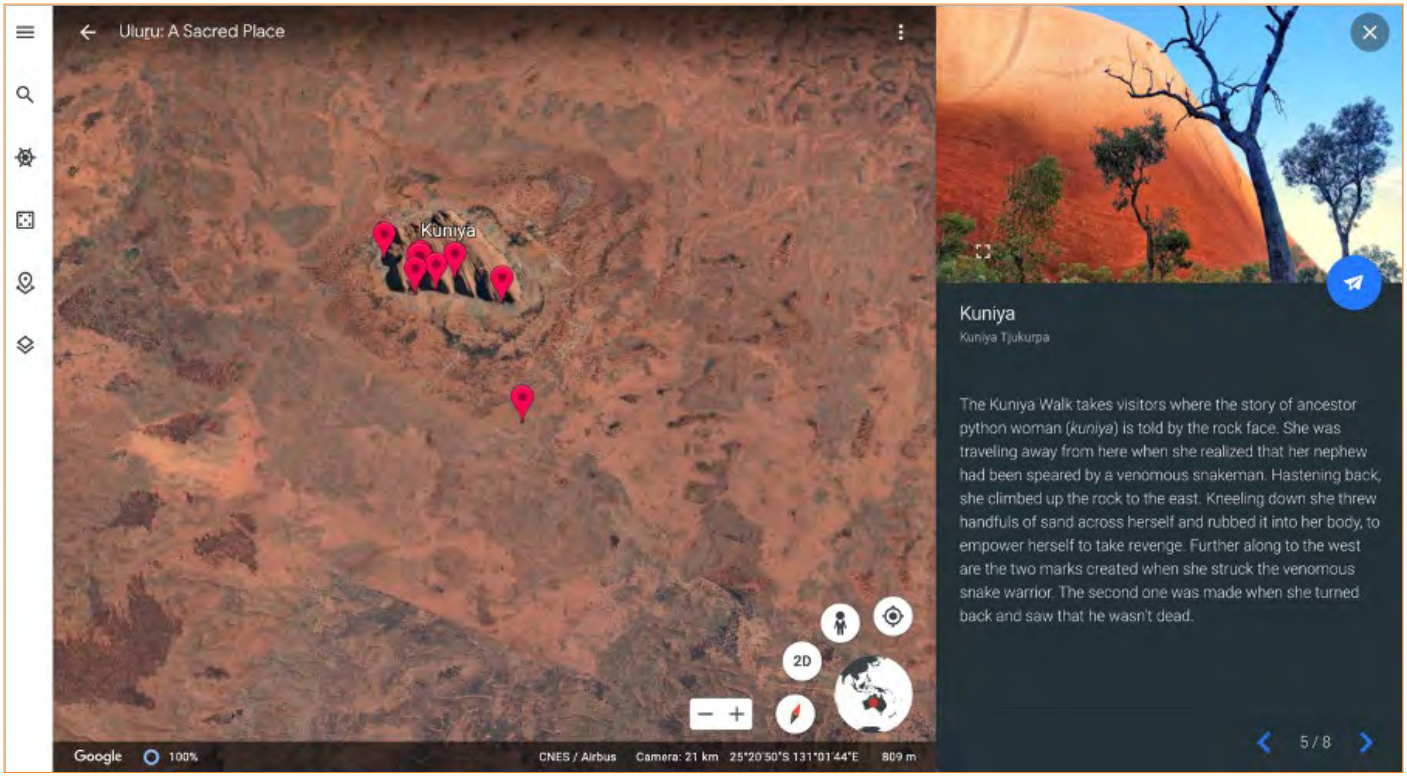
- Click on the compass  (bottom right, near the globe) and it will align things to North.
- Select map style  to customise your map e.g. add / remove borders, labels, latitude and longitude etc.

An example voyage – *Uluru: A Sacred Place*

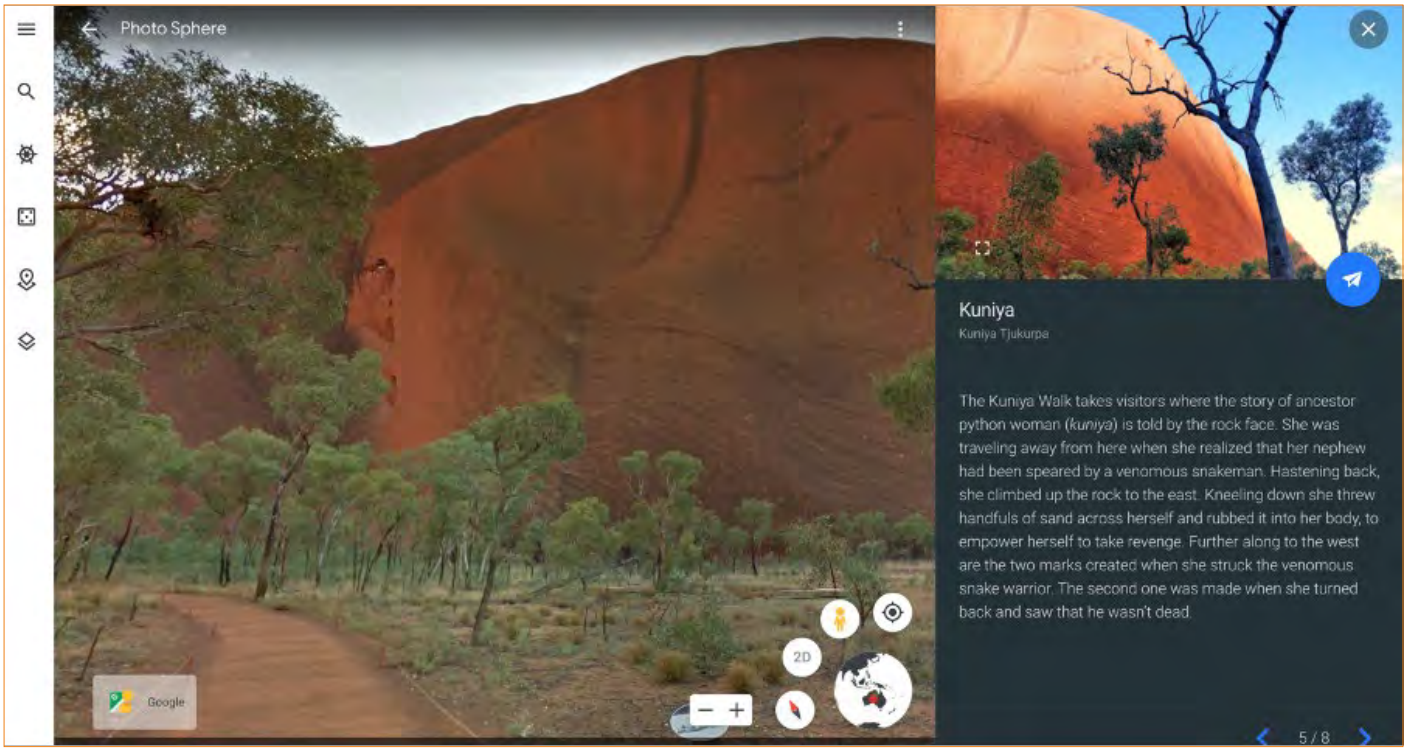
The ***Uluru: A Sacred Place*** voyage is interactive and makes for a valuable classroom resource where students can visit Uluru without having to leave their classroom. Each page is linked to a red marker . 



Users can select a marker and it links directly to the corresponding page e.g. Page 5 – Kuniya the creation story of ancestor python woman. Each page has a photo in the upper right, and information on the lower right and on the left you can explore Uluru using *Google Earth* with 3D view, street view etc.



Selecting the white arrow in the blue circle between the writing and the photo makes the map fly to the place, in this example Kuniya Walk.

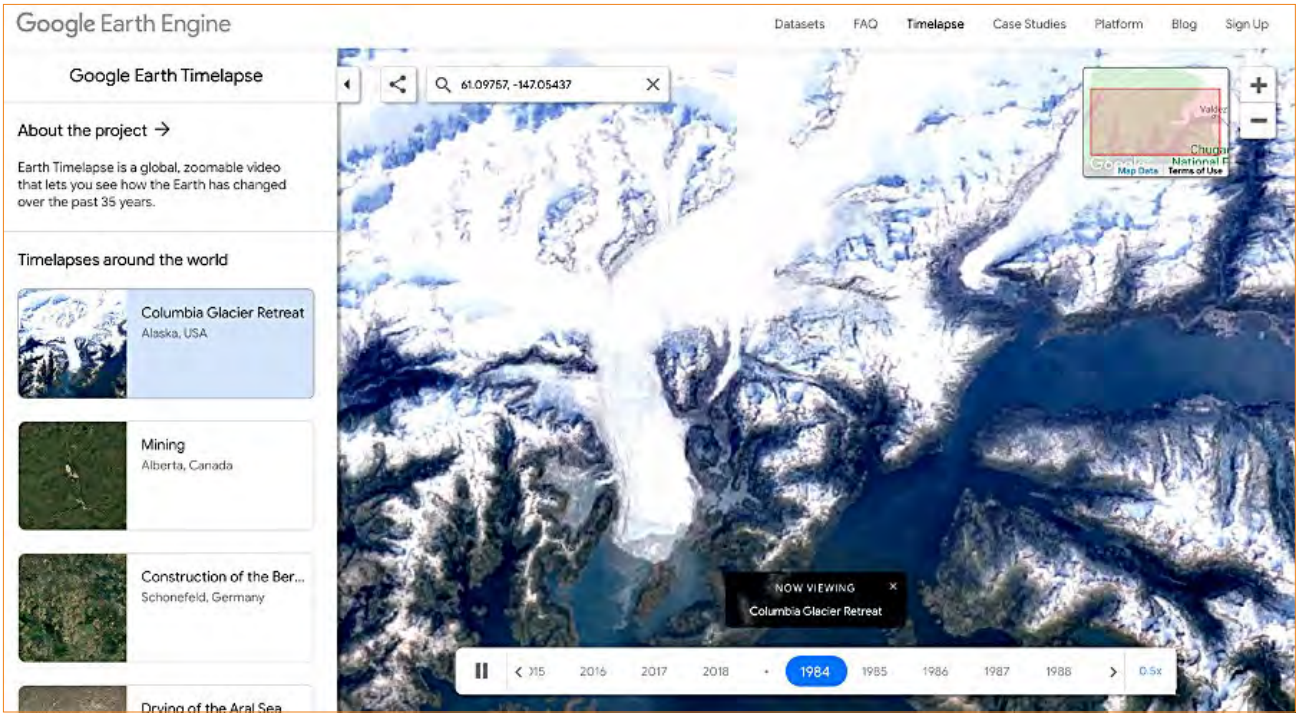


It is possible to enlarge the upper right photo by clicking this button: 


The dips in the rock show where the Python Woman knelt down. Photo credit: Markus Oberer

Timelapse Resource

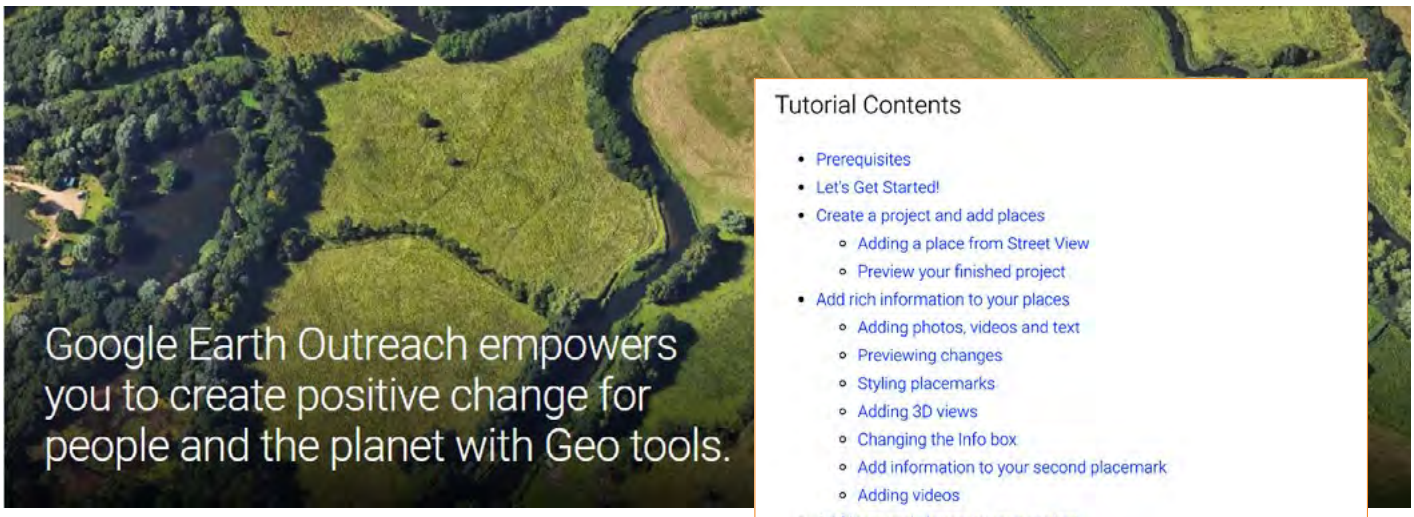
Visualise Earth is an example of a classroom activity you can use to explore surfaces of the earth using **timelapse.** These classroom resources can be found at www.google.com/earth/education/resources/. *Google Earth Engine* has produced ready-made Google Earth timelapse resources that allow you to go back in time 35 years to see changes in the Earth's surface. The one below shows the Columbia Glacier retreat.



Guides and Tutorials

Guides can also be found at https://www.google.com/earth/education/resources/ The example below demonstrates how to use *Google Earth* to create stories. The **getting started** guide is easy to follow with five easy steps to allow students to create, share and collaborate using Google Earth. Example stories are provided and can be viewed by students as a source of inspiration.

Google Earth Outreach provides a range of tutorials to assist with the creation of stories and voyages. A comprehensive list of tutorials can be found at https://www.google.com/earth/outreach/



Tutorial Contents

- Prerequisites
- Let's Get Started!
- Create a project and add places
  - Adding a place from Street View
  - Preview your finished project
- Add rich information to your places
  - Adding photos, videos and text
  - Previewing changes
  - Styling placemarks
  - Adding 3D views
  - Changing the Info box
  - Add information to your second placemark
  - Adding videos
- Add lines and shapes to your project
  - Draw a line
  - Draw a shape
- Add slides to your project
- Share your project
  - To share a link to the project
  - To share the project with specific people for viewing or collaboration
- More with Earth creation tools
  - Viewing your projects on web and mobile

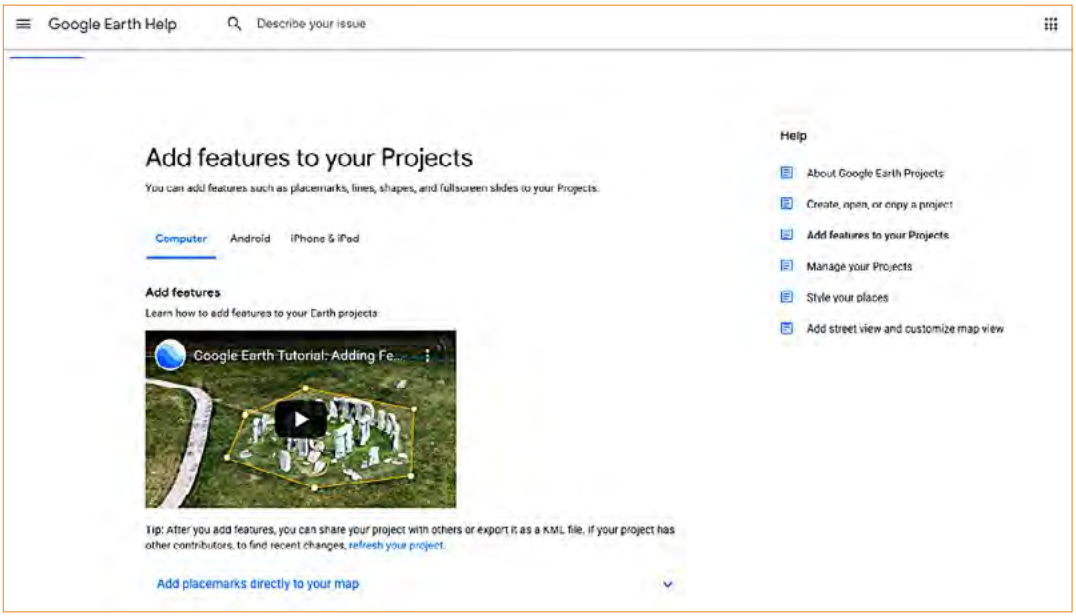
Tutorials are hyperlinked. If you select 'Changing the Info box', it takes you straight to the image below.

Changing the Info box

You can change the style of the Info box that displays your content (text, photos, videos, etc).

1. In the Property Editor panel click the drop down arrow on the right-side of the Info box and change the Info box from Small info box to Large info box.
2. Click the *Preview presentation* button to see the changes. Decide which style you like best!

An extensive range of video tutorials is available on *Google Earth Help*. This image shows a screenshot of the video tutorial on "Adding features to your projects." They are relatively easy to follow even for a novice user of *Google Earth*.



A quick teaching activity – reading the ABC'S from space

The ***Google Voyager*** project Reading the ABCs from space is a fun one to do with students of all ages.

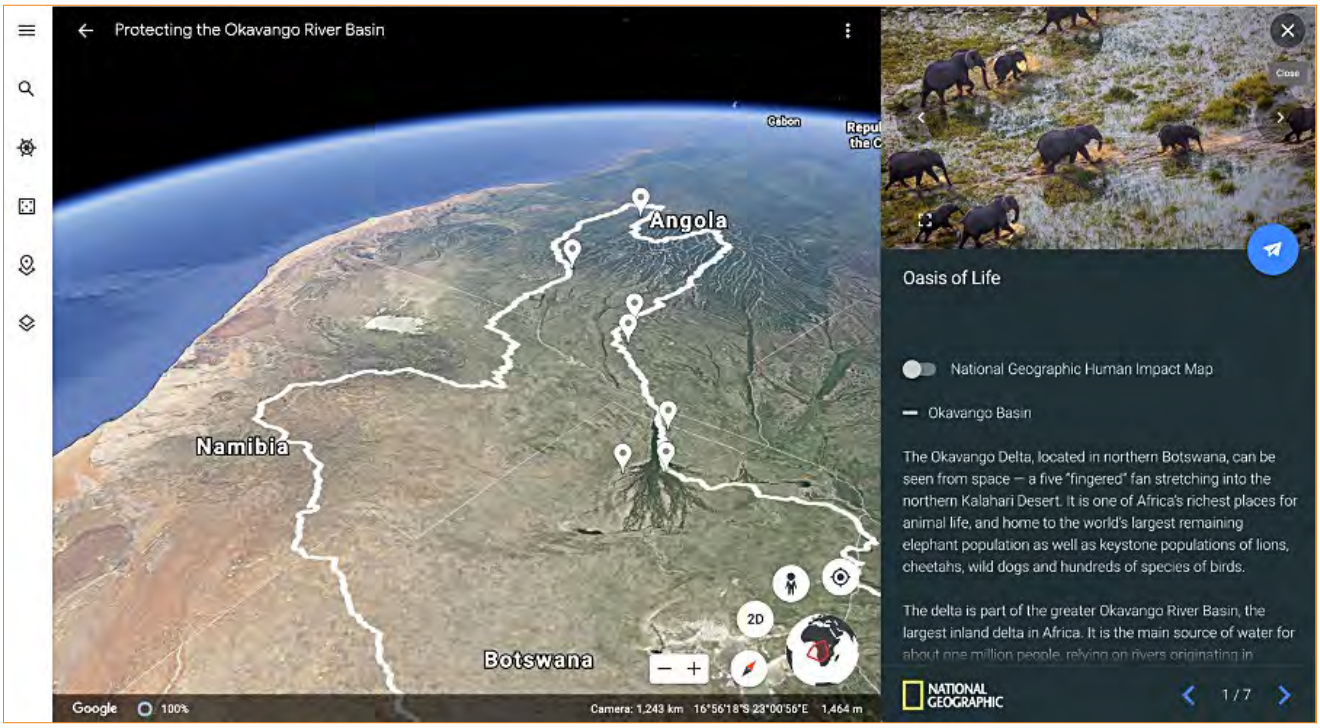
1. Get your students to search for the "Reading the ABCs from space" voyage.
2. They should then find their first name using the letters.
3. They can take screenshots of each letter and upload to a shared Google Slides or PowerPoint presentation.

The example below shows the name 'Sophia'.

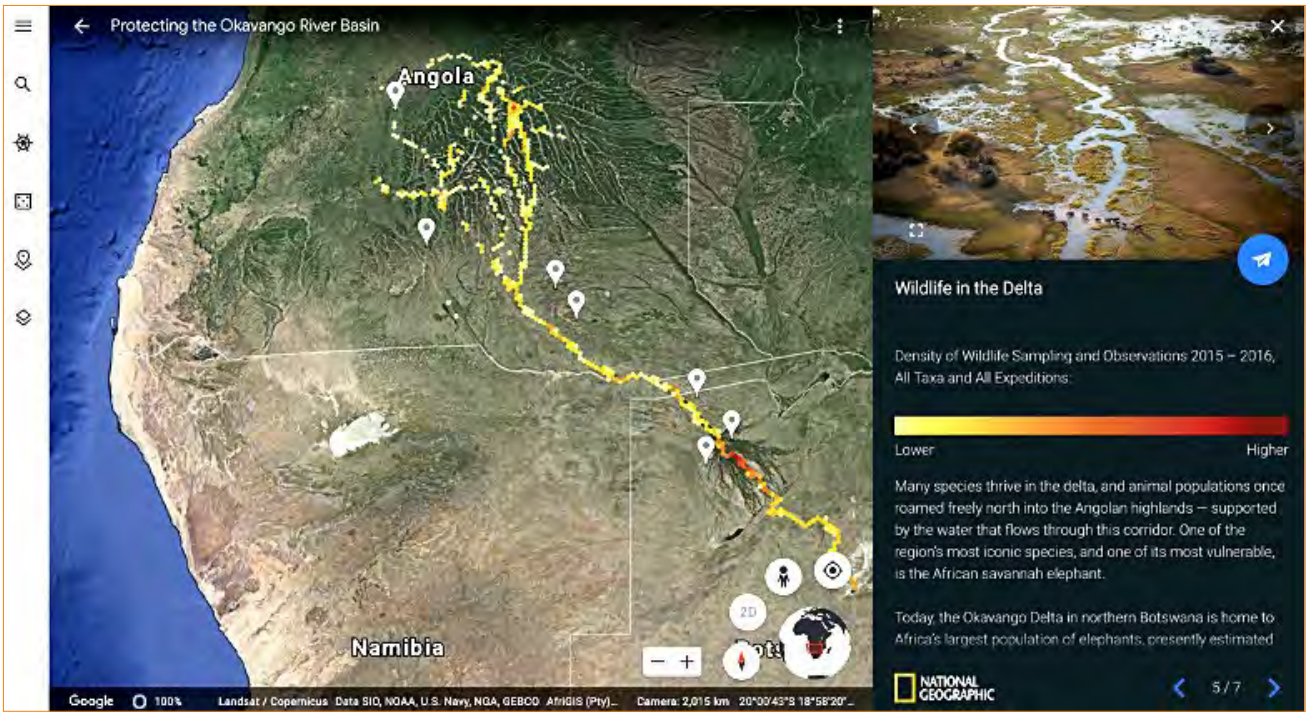
A longer teaching activity – for Environmental Change and Management (Stage 5)

Get your students to think about the human impacts within the Okavango River Basin. You will use the information on protecting the Okavango River Basin, written by National Geographic.

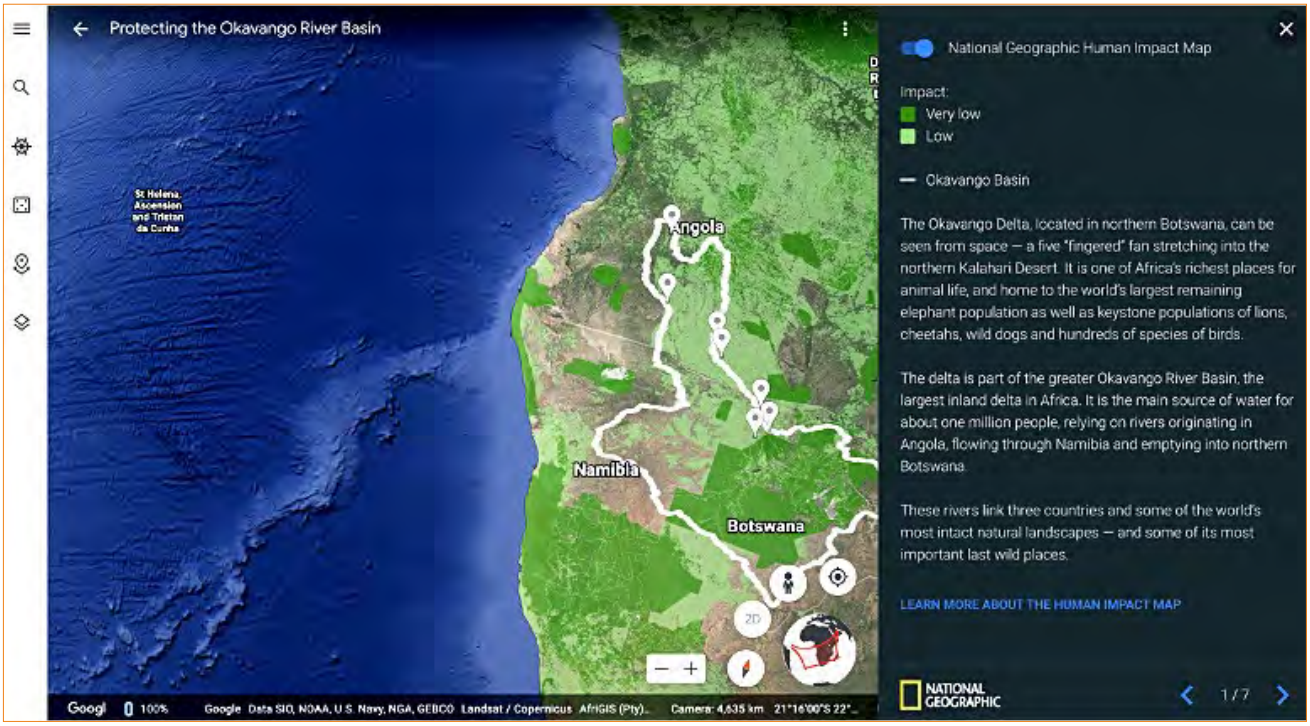
1. Allow students 5 minutes to view the information within the first page in the voyage to assist them in forming their suggestions. They can move around the page, use the 3D function, zoom in and out of the map, scroll down and read more text etc. Give students five minutes to write down their suggestions and then share their initial responses with the class.



2. They may move through the rest of the project to deepen their understanding. For example, page 5 has information on wildlife density within the Okavango River Basin. Give students five more minutes to write down further suggestions and then again share their thoughts with the class.



3. So that they can see what the actual human impacts have been, get the students to toggle the button to switch on the *National Geographic Human Impact Map* and to select "**Learn more about the human impact map**".



Online Learning

These activities are two examples of hundreds of learning ideas presented in the GTA's online learning courses. You can do these courses, which range from 3 hours to 5 hours long, at anytime and anywhere you have access to the Internet. See the advertisements in this Bulletin or go the GTA's website to link to the courses.

All images source: Google Earth Education Resources and Google Voyager

STEM EDUCATION BLOG

Introduction by Lorraine Chaffer

SheMaps is one of Australia's leading providers of training and resources for Geospatial Education. They provide online and in-school drone and geospatial science programs and training for students and teachers with a strong mission to increase the engagement of girls with STEM subjects, skills and careers.

SheMaps recognises the place of Geography in STEM and is passionate about assisting teachers to see the place of Geography in projects and tasks labelled as STEM. Several blog entries relate to the recognition of Geography in STEM and the practical use of drones and GIS in real world situations and careers.

"At SheMaps, we're also passionate about the value of real-world applications to enhance student experience! This is why all of our activities are centred around real-world challenges for students to find creative and interdisciplinary solutions for. Have you seen our newest challenge, 'Healthcare in the Himalayas – Drones to the Rescue'? In this activity, students use design thinking and both manual and coded drone flight to address a humanitarian challenge in Nepal".

Source: https://shemaps.com/blog/what-can-students-learn-from-drones/?r_done=1

The Blog provides updates about SheMaps school programs such as the Healthcare in the Himalayas Program as well as insights into the world of spatial technologies, including links to careers.

Reading SheMaps blogs can be used to satisfy NESA Elective Professional Development requirements.

Two examples of blog posts with a clear link to Geography are included here.

- Helping students succeed through GIS
  (A great read for teacher professional learning)
- The role of surveying in restoring native title
  (A great resource for use with students)

Did you catch Brett Dascombe's talk at EduDrone this year? He shared some of the fantastic work he's doing integrating GIS and spatial technology into his Geography classroom. Each month in the lead up to EduDrone 2021, we'll be releasing one of our favourite talks from EduDrone 2020! Tune in each month to get your fix of STEM-spiration. We hope this will keep the ideas flowing all the way through until EduDrone 2021!

What is GIS? What can it do?

The 18th of November is International GIS Day – where we celebrate Geographic Information System (GIS) technology! For those of you who aren't familiar with GIS, it's a tool for gathering, managing, and analysing data that's rooted in the science of geography, and the output is often in the form of maps! Hundreds of thousands of organisations in virtually every field are using GIS to make maps that communicate, perform analysis, share information, and solve complex problems around the world. This is changing the way the world works.

Brett Dascombe is a Geography teacher at Wavell State High School. He's been working with ArcGIS (a major software for GIS) since 2001, where he used Version 2.3 (for reference we're now up to Version 10.8!). He even spent two years working for the software company behind ArcGIS, called Esri (the Environmental Systems Research Institute). During EduDrone he shared some of the impressive work his students were doing using GIS, and plenty of inspiring project ideas!

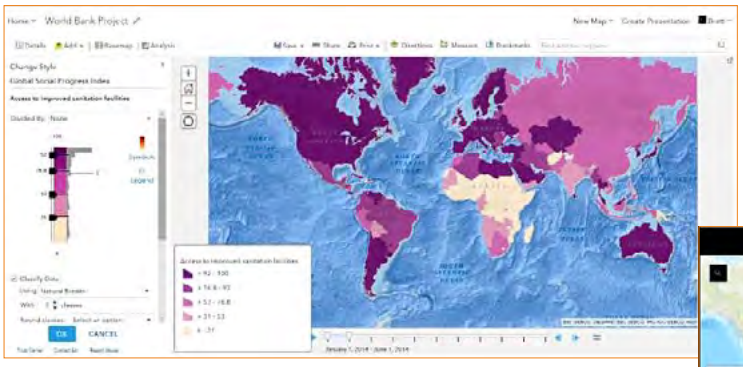
Using Storymaps in Esri

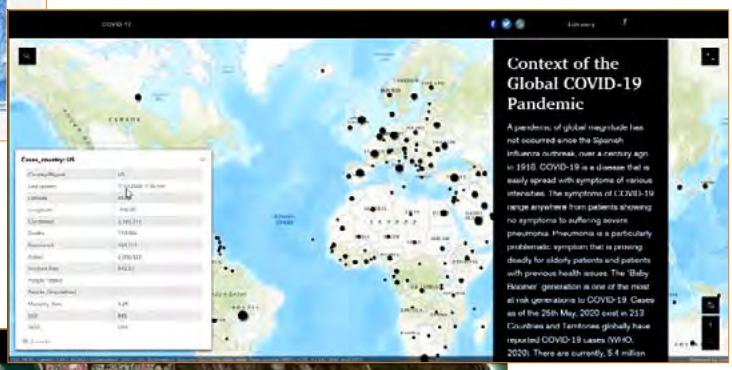
One of the coolest new tools that Esri have released are ArcGIS Storymaps! If you've never heard of these before, check out this video demonstrating a Storymap of a **National Geographic expedition to Mt Everest**. https://www.youtube.com/watch?v=8wY14zHDmEs

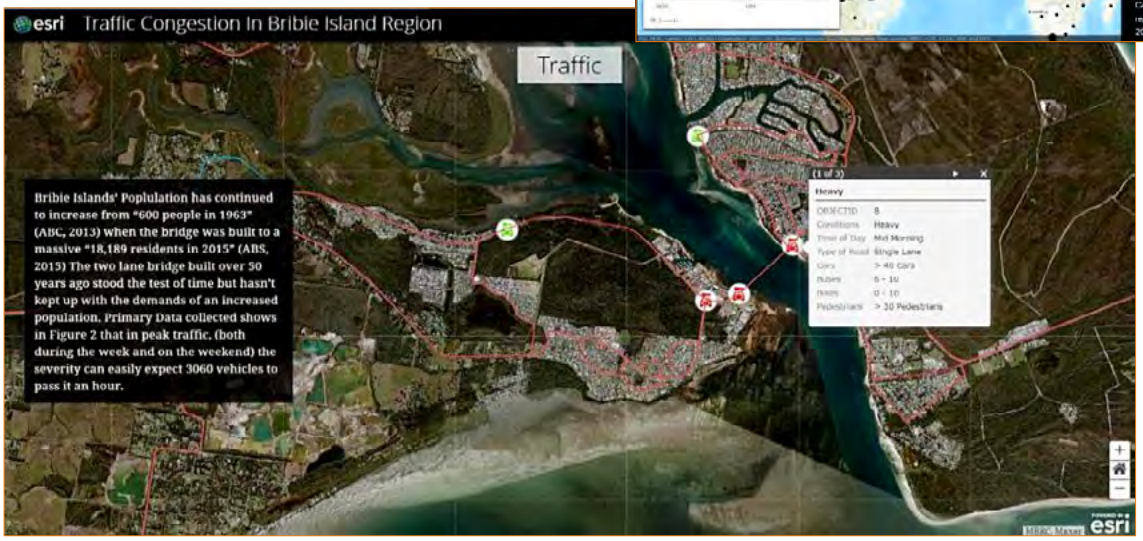
Brett's students have been using Storymaps to present their assignments with some fantastic results! Take a look at these examples done by Brett's Grade 10 students that use Storymaps to explore a local traffic congestion issue, as well as global scale dynamics of the COVID-19 pandemic.

Here are some other great project ideas which Brett has used for learning with spatial technology:

- **Human wellbeing** e.g., sanitation, food security, disease outbreaks.
- **Environmental change and management** (can possibly be incorporated with a field trip!) e.g., microplastics, erosion, bushfires, weed invasion.
- **Urban Planning** (another field trip opportunity!)
- **Global population change** e.g., birth rates and megacities







Thinking Outside the Box to Benefit Students

I think you'll agree that the work that Brett's students have produced is truly impressive for any age level, let alone Grade 10! During his EduDrone 2020 presentation, Brett shared some of the inventive ways that he's been able to encourage students to consistently improve and succeed.

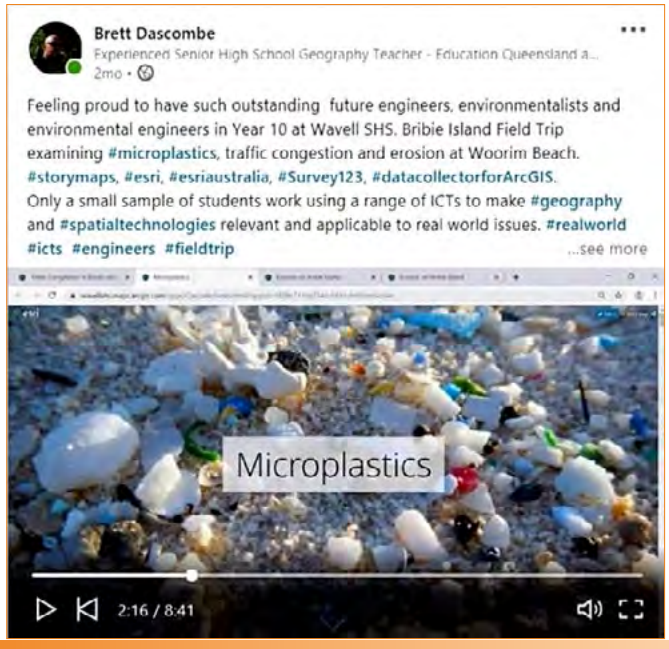
- **Entering in competitions**

  Anything involving a cash prize is pretty sure to get students attention! Brett has encouraged his students to enter their work into both national and international competitions. Winning isn't important, but it gives the students something to strive for other than just an assignment grade. Here are some of the competitions Brett is using to motivate his students:

  - Asia-Pacific Spatial Excellence Awards
  - Australian Planning Excellence Awards
  - ArcGIS Storymaps Competition for Sustainable Development Goals
  - SheMaps: Map My School Competition
  - ESRI User Conference, San Diego, California – Map Gallery

- **Promoting Students in Professional Networks**

  Not all teachers out there are using social media, but if you are, share your students work! Brett has been posting snippets of his student's Geospatial assignments on his LinkedIn account, where it is seen by teachers, university professors, and industry professionals. One of his posts about an erosion project on Bribie Island received 1900 views – from people all over the world from Canberra to Dallas, Texas.



Transitioning to Online Learning

2020 has seen many teachers and students transition to online learning. This has been challenging for many. Brett found a unique way to support his students during the COVID lockdown, by creating a YouTube channel to help assist students with the transition to online learning.

Spatial Tech is Good for Students

Just like at SheMaps, Brett is passionate about the power of spatial tech and geography to make positive changes in the world! He is always seeking to improve his own GIS skills and to come up with new and inventive project ideas for his students. With hundreds of thousands of organisations across every field you could think of using GIS, it truly is a tool for the future!

If you're looking for project ideas or further inspiration for your Geography or STEM classroom, there are often local social media networks you can join. You can also reach out to us at She Maps! **Let's get geospatial in the hands of the next generation!**
https://shemaps.com/blog/helping-students-succeed-through-gis/?r_done=1

Brett Dascombe will share his classroom use of GIS, social media and industry links at the 2021 GTA NSW & ACT Annual Conference.

Many of us see surveyors working with their tripods by the roadside but have a limited understanding of what it is they do or just how different and exciting their jobs can be. We're on a mission to showcase surveying! We're teaming up with a number of young surveyors across the world to bring you their favourite projects and what they love the most about working as a surveyor.

So what is Surveying?

Surveying is the measurement and mapping of our surroundings using mathematics, specialised technology and equipment. Surveyors measure just about anything, from buildings and structures, to the land, the sky or the ocean bed. They even measure polar ice-caps!

What are the fundamental skills of surveyors?

Whilst surveyors use maths skills and technology to do their jobs, there is also a strong link to Geography. Surveyors use geographical inquiry skills on a daily basis to observe, question, and plan how to solve problems. They collect, record, and represent information and data from a variety of sources. Once they have this information, then they make interpretations and conclusions, then communicate these results and findings to a wide variety of audiences.

This series showcasing surveyors, is designed to show students and teachers how the curriculum content can be bought alive in real-world examples.

Meet a Surveyor: Marie Janina Navarro Ferrer

Janina is a Geodetic Surveyor who works for the Department of Resources within the Queensland Government. She has a Bachelor of Science in Geodetic Engineering and her favourite subjects in high school were Maths, English, and Programming. Her favourite project that she has worked on as a surveyor was assessing land parcels on Mulgumpin (Moreton Island) as part of a native title determination.

Janina conducting surveys on Mulgumpin.

Mulgumpin and Quandamooka Native Title

The Quandamooka People are First Nations custodians of lands and waters within parts of Moreton Bay, and have more than 20,000 years' association with their Country. The Quandamooka People include three clans of Aboriginal people: the Ngugi people of Mulgumpin (Moreton Island) and the Noonuccal and Gorenpul people of Minjerribah (North Stradbroke Island). Similar to Minjerribah, Mulgumpin boasts a rich and significant cultural history and the Quandamooka People have a strong spiritual connection to the island. Numerous cultural sites have been recorded over the island and include shell and bone scatters, large shell middens and a stone quarry.

Southern part of Mulgumpin

Native Title is the recognition that Aboriginal and Torres Strait Islander people have rights and interests to land and waters according to their traditional law and customs as set out in Australian Law. It is governed by the Native Title Act 1993. In 2019, the Federal Court recognised the Native Title claim made by the Quandamooka People, acknowledging that Moreton Bay's islands were always Quandamooka land. Here is a great resource to explain more about Native Title.

Using Surveying in Native Title Determination

As part of the negotiations for the proposed state land actions, Janina's job was to accurately reinstate and mark out the boundaries for individual land parcels on Mulgumpin which formed part of the tenure package. To do this, Janina used geodetic data, which is the data obtained from GPS or GNSS (Global Navigation Satellite Systems), as well as cadastral surveying. Cadastral surveying is the process of accurately defining property boundaries and understanding the laws of land ownership. This may include the identification of residential or rural boundaries, re-establishing boundaries that have been previously surveyed or creating new boundaries as part of the land subdivision process.

Survey site on Mulgumpin

Janina used her skills and knowledge to interpret and advise on the location of the land parcel boundaries on Mulgumpin. Given that parts of the island were largely unsurveyed, she undertook survey work on areas of land that were State-owned to ensure there was an accurate land description registered in the Titles Office. The information and measurements taken during the cadastral surveys were used to produce a survey plan. This survey plan included a reinstatement report, outlining how the reinstatement of land boundaries was carried out, what the considerations were, and what decisions were made, as well as water boundary report, as some of the land parcels were bounded by tidal and non-tidal water.

Surveying a water boundary

What does the Native Title Determination mean for Quandamooka People's?

The Federal Court made a Native Title consent determination for Mulgumpin (Moreton Island) on 27th November 2019. Their native title determination recognises the Quandamooka People's rights that include to live and be present on the determination areas, conduct traditional ceremonies, take, use, share and exchange traditional natural resources for traditional practices, conduct burial rites, teach about the physical and spiritual attributes of the area, and maintain places of importance and areas of significance.

Joint management arrangements are being progressed for Mulgumpin's National Park and Recreation Area between the Quandamooka People and the Queensland Parks and Wildlife Service, building on the successful joint management currently in place on Minjerribah (North Stradbroke Island). This will include additional Quandamooka Rangers and new opportunities for eco-tourism on Mulgumpin. The Quandamooka Native Title also recognises some small parcels of sacred land for exclusive use.

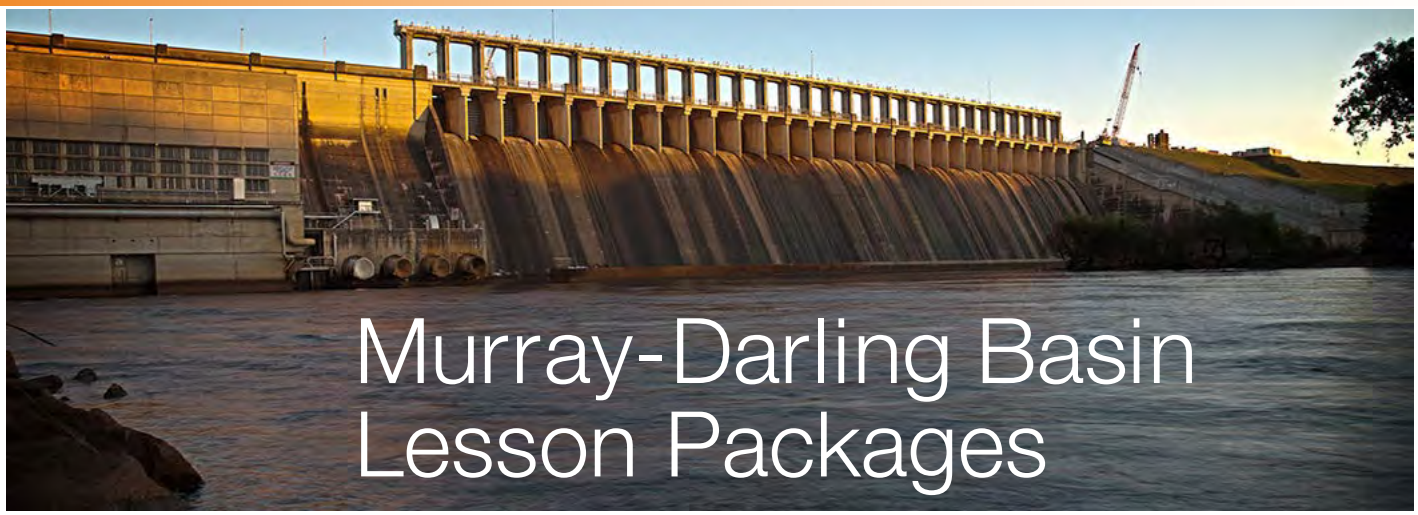
Surveying – a constant adventure!

What Janina likes most about surveying is that no one day is like another, it is a constant adventure! She says that she never stops learning, which keeps her engaged and excited in the work. During the Mulgumpin surveying project, Janina learnt a great deal about historical and cadastral surveying, Native Title, and state land actions. Surveying has been different to what she first expected in that there are so many broad and varied work opportunities. Inspired by Janina's story? Download the poster to display in your classroom.

GTA NSW & ACT Annual Conference

The NSW Surveyor General, Narelle Underwood, will present ' Surveying offers Geography students a new horizon' at the GTA NSW & ACT Annual Conference, Thursday 13 May.

WEB RESOURCE



Murray-Darling Basin Lesson Packages

https://www.mdba.gov.au/education/lesson-packages

Sharon McLean, St Ignatius College, Riverview

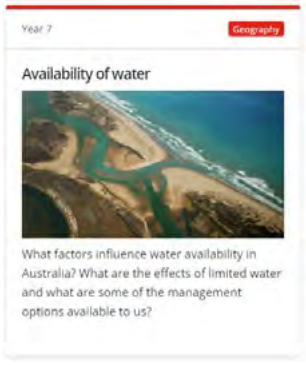
The Murray-Darling Basin Commission has produced a highly engaging and informative series of lesson packages suitable for Stages 4 and 5 Geography. The units provide opportunities for student centred learning, discovery and application of learning in the world using a variety of pedagogical practices.

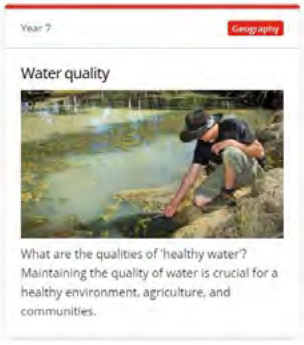
The units cover geographical concepts: Place, Space, Environment, Interconnection, Scale, Sustainability, Change and the cross-curriculum priorities of Aboriginal and Torres Strait Islander histories and cultures and sustainability. Students will also engage in using technology, critical and creative thinking and complete literacy and numeracy activities.

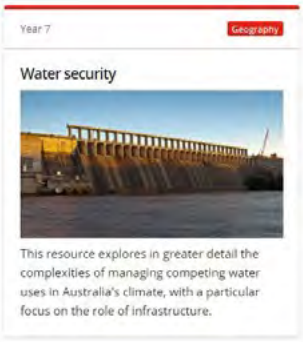
Topics available are: **Water as a Resource, Environmental Change and Management, Life and Environment**. Each package is clearly structured with outcomes, Australian Curriculum focus, preparation information, and activities to engage students in the topic, opportunities to explore, elaborate on their learning and draw conclusions. The packages include teachers notes on how to use the resource and downloadable activities and case studies.

Features of the Packages

Water as a Resource (suitable for Stage 4: Water in the World)







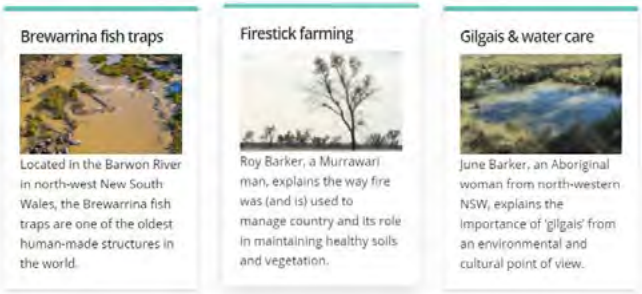
Caring for River Country (suitable for Stage 5: Environmental Change and Management)

"Aboriginal and Torres Strait Islander students should be warned that the videos and publications used in this resource contain images of deceased persons which may cause sadness or distress."

1. Our river country

2. A traditional management strategy

Traditional Management Case Studies examples



3 Merging tradition and science

Worksheet question 5: Think: how might it be challenging to create a water management plan that accounts for traditional cultural/ceremonial water uses?

4. Follow-up activity ideas

Discover local knowledge

Who are the Traditional Owners in your area? Invite an Elder to speak to the class about some of the ways they have traditionally used and managed the environment.

What season is it?

The Aboriginal groups throughout the Basin used different seasons to Europeans. Examine an Aboriginal seasonal calendar near your area and discuss: what season are you in now? What actions are associated with this time? Here's an example.

Hear a Dreaming story

Dreaming stories play a significant role in Aboriginal life and spirituality. Some of the most celebrated Dreaming stories are those describing how the River Murray came to be, including the Bangarang story and the story of Ponde, the River Creator.

WEB RESOURCE: MURRAY-DARLING BASIN

Life and the Environment – Wetlands (suitable for Stage 4: Landscapes and Landforms and Water in the World)

1. What is a wetland

2. What lives in a wetland?

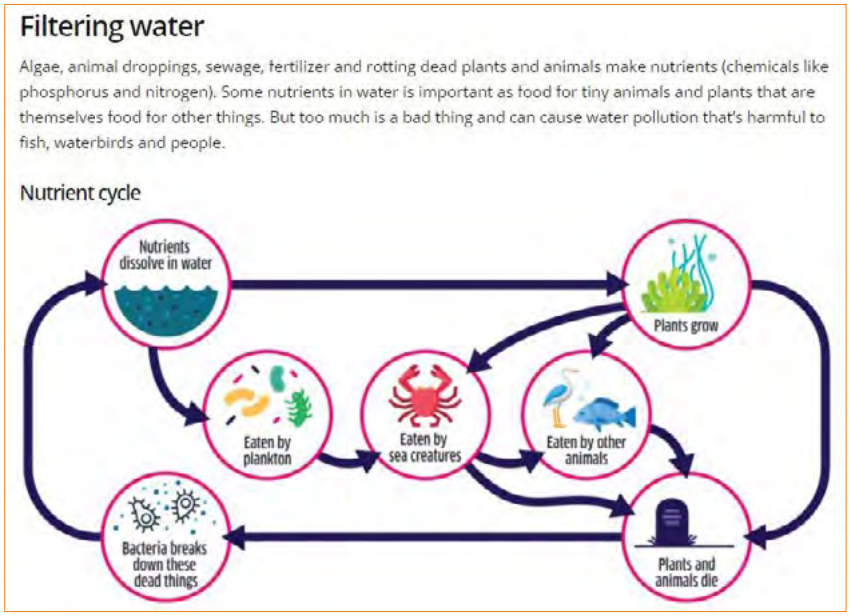
Activity 1: What is naturally found in a wetland? Worksheets 1 and 2; wetlands and food webs worksheet.

3. Food webs

4. Case Study – Macquarie Marshes

Source: https://upload.wikimedia.org/wikipedia/commons/f/f9/Macquarie_Marshes_healthy_July_2008.jpg

5. Importance of wetlands



6. Experiments

INTERCONNECTIONS & THE COTTON INDUSTRY

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Photo by Jordan Whitfield on Unsplash

INTRODUCTION

Stage 4 Geography comprises the topics Landscapes and Landforms, Place and Liveability, Water in the World and Interconnections. This brief paper will investigate one aspect of Interconnections in the context of the fourth sub point Production and Consumption with a focus on cotton production and consumption. Through this investigation resources will be suggested to help shape the teaching and learning of the syllabus sub-point of this unit of work.

The cotton industry has varied influence on the economies and communities of the developed and developing world. The impact of the industry can be both positive and negative, which at time contributes to different viewpoints of the various stakeholders in the industry. This provides a useful framework for looking at Interconnections as required in Stage 4 of the NSW Geography Syllabus

Interconnections can be drawn out through an investigation of levels of involvement in the cotton industry. These include:

- the *advocates* of the cotton industry and their effort to sustain an industry while engaging in sustainable agricultural practices,
- the *groups and individuals* expressing concerns about high levels of water consumption and the impact on regional drainage catchments like the Murray Darling Basin,
- the *governments* formulating research and policy directions enabling growing farming communities and
- *special interest groups* advocating fast fashion,
- *research think tanks* developing new technologies with the use of drones, AI fashion
- the *people in regional areas* reliant on the industry for their livelihoods.

All these stakeholders are interconnected at many levels.

Cotton plays a significant role in regional areas of Australia particularly NSW in terms of income generation, employment and social cohesion community building. There are some in the wider community who point to the negative, social, economic and environmental impacts of cotton production and consumption while others make the case for the positive social, economic and environmental impacts. It is in this tension where the interconnections are best illustrated.

The following guide will look into resources aligned to the three syllabus sub points of the production and consumption of cotton in Australia and overseas.

- Examination of environmental, social and economic impacts of production and consumption of consumer goods.
- Assessment of the effect of the production and consumption of goods in ONE place or environment.
- Explanation of the responses of governments, groups and individuals to minimise the effects of production in and consumption.

I have kept the number of resources provided per section to six, chosen to reflect a variety of locations, scale, perspectives and detail. The following guide does not endeavour to suggest a pedagogical focus, except to say, it lends itself to individual or group research with the potential for student presentation. I will provide some scaffolds to enable students to research different aspects with a consistent framework.

GENERAL OVERVIEW

Cotton Australia Industry Overview

https://cottonaustralia.com.au/industry-overview

This breaks-down the number of cotton farms in Australia, the characteristics of the average farm, the irrigation requirements, water efficiency and monitoring and much water is used to make a bale of lint.

This site also unpacks the facts and figures of community contribution to the cotton industry including the number of people employed, the percentage cotton makes out of total production, levels of production in good and drought seasons and the main countries to which cotton is exported.

Cotton Consumption

Cotton Consumption on the rise in QLD – https://www.queenslandcountrylife.com.au/story/5152173/global-cotton-consumption-to-increase-in-2018/

An article describing the cyclical nature of cotton consumption.

Retail Cotton Consumption –

https://www.intracen.org/Retail-cotton-consumption/

The International Trade Centre provides an overview of the world cotton market.

World Cotton Consumption –

https://www.researchgate.net/publication/303484879_World_Cotton_Consumption_Transition_and_Competition

This academic article from Research Gate links the pattern of cotton consumption to the global economic recession.

Cotton Production

The World Counts – https://www.theworldcounts.com/challenges/consumption/clothing/world-cotton-production-statistics/story

Cotton is described as a dirty industry, while the clock adds up the cotton being produced while you read the information.

Top cotton producing countries in the world

https://www.worldatlas.com/articles/top-cotton-producing-countries-in-the-world.html

This world atlas indicates the production figures of the top cotton producing countries India, USA and China and then and then works through the other countries.

2020 Australian Cotton Production Manual –

https://www.cottoninfo.com.au/publications/australian-cotton-production-manual

This is a report provides an understanding of the cotton physiology, considerations of productivity, profitability, latest research and improvements in best practice.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
General Overview				
Resource 1				
Cotton Consumption				
Resource 1				
Resource 2				
Resource 3				
Cotton Production				
Resource 1				
Resource 2				
Resource 3				

Examination of environmental, social and economic impacts of production and consumption of consumer goods

Environmental impacts of cotton

World Life Foundation–
https://www.worldwildlife.org/industries/cotton

This website outlines the world contribution of cotton to production and employment and then outlines impacts in relation to water scarcity, erosion and degradation, pollution.

The world counts –
https://www.theworldcounts.com/challenges/consumption/clothing/cotton-farming-water-consumption/story

This website uses a counter showing the tons of water used in cotton production based on 2021, month, week and current day. It outlines how much water is used to produce 10 000 litres of water, compares water loss to a sea, examines the impact of cotton dust, outlines how much virtual water is consumed through cotton clothing and explores the potential of organic cotton.

Fabrics and fast fashion –
https://www.independent.co.uk/life-style/fashion/fabrics-environment-fast-fashion-eco-friendly-pollution-waste-polyester-cotton-fur-recycle-a8963921.html

This article outlines the real cost of clothes and the fabrics with the best and worst environmental impact.

Scientific Direct –
https://www.sciencedirect.com/science/article/abs/pii/S0921344916302828

This is an academic article which you will be required to access through your library or subscription. It takes a detailed look at the environmental impact of 'recover' cotton in the textile industry.

Cotton Today –
https://cottontoday.cottoninc.com/cotton-production/

This is an article suggesting strategies to reduce the environmental impacts of US cotton production.

Managing the environmental impacts of cotton growing – an Australian perspective
http://www.insidecotton.com/jspui/bitstream/1/3818/2/AAW5%20Presentation%20Paper.pdf

This is an academic article by the Executive Officer of the Austrian Cotton Growers Research Association. It talks about successful programs partnerships (Interconnections) and provided a bibliography for further research.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Environmental impacts of cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				
Resource 6				

Social Impacts of Cotton

Social Impacts of Cotton production –
https://ergonassociates.net/publication/social-impacts-of-cotton-production/

This article is by Ergon Associates discussing the social impacts of cotton production for several countries of the world. It outlines how cotton provides employment and is a vital income source for individuals and economies. It also looks into the quality not just the quantity of labour involved in cotton production.

Fashion revolution –
https://www.fashionrevolution.org/the-role-of-cotton-in-social-and-economic-development/

This is an article examining the role of cotton in social and economic development. The cotton farmers are an important link in the fashion supply chain. It demonstrates how most cotton farmers live below the poverty line and how a price increase to them might work to improve their lives without increasing the retail cotton price.

How to grow a pair of jeans? –
https://cottonaustralia.com.au/grow-a-pair-of-jeans

This shows the step-by-step process of how cotton can end up as jeans with two PDF documents to download. This indicates another layer in which cotton impacts of social trends via clothes people wear.

Social Impact of Australian Cotton –
https://australiancotton.com.au/environment-people/social-impact

The social impacts of cotton in Australia are discussed in terms of supporting family businesses, providing jobs for the bush, building profitability of farmers and facilitating community contributions.

International Case Study –
https://www.worldbank.org/en/country/uzbekistan/publication/social-impact-of-cotton-harvest-mechanization-in-uzbekistan

An investigation of the social impacts of cotton harvest mechanisation in Uzbekistan highlights issues such as cotton under a state-ordered system, the number of people who benefit, implications on districts and key recommendations.

Organic Cotton –
http://aboutorganiccotton.org/social-economic-benefits/

The perspective of farmers from the world are presented on the social benefits of organic cotton on them and their cotton community.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Social impacts of cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				
Resource 6				

ECONOMIC BENEFITS OF COTTON

Partnerships

Dawson Cotton Growers learning from each other – https://cottonaustralia.com.au/news/dawson-valley-cotton-growers-learning-from-each-other

This article investigates cotton growers in Queensland's Dawson Valley

Connecting cotton stakeholders in the cotton industries leadership initiative – https://cottonaustralia.com.au/news/australian-future-cotton-leaders-program-participants-announced

This is a cotton leadership initiative connecting those working in the cotton industry.

Cotton and Fair Trade – https://www.fairtrade.net/product/cotton

Some very important basic facts are provided, highlighting the economic impacts on cotton farmers in developing countries who make up 90% of cotton farmers.

Cotton Aid – http://cottonanalytics.com/category/cotton-and-economic-development/

This article by Cotton Analytics examines the role of cotton in locations such as India and sub-Saharan regions, the required aid and the benefits.

Cotton, Biotechnology and Economic Development – https://www.researchgate.net/publication/228275765_Cotton_Biotechnology_and_Economic_Development

This academic article shows how biotechnology improvements have increased production in India and china while in Africa, whose cotton industry has not adopted biotechnology, has had a decline in production.

The economics of cotton – https://courses.lumenlearning.com/suny-ushistory1os2xmaster/chapter/the-economics-of-cotton/

This addresses the important historical background of cotton from the US perspective.

Global Cotton Production hit by slowing economic growth – https://www.just-style.com/news/global-cotton-consumption-hit-by-slowing-economic-growth_id137639.aspx

A statistical grab indicates the changing nature of cotton consumption

The contribution of cotton to the economy and food security in developing countries – http://staging.icac.org/Meetings/cgtn_conf/documents/11_fortucci.pdf

This is an academic article which examines revenue contributions, employment contributions, food security contributions, all supported by detailed statistical analysis.

Automatic Sprinkler irrigation system watering in the cotton farm. Maharashtra, India. Source: Shutterstock

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Economic impacts of cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				
Resource 6				

Assessment of the effect of the production and consumption of goods in ONE place or environment.

Although the syllabus requests ONE case study there is no prerequisite that each student has to do the same ONE case study and as a such a selection of potential case studies are provided both in and beyond Australia. Alternatively, you can pick one of the following for further investigation as a case-study.

There is a selection of resources linked to fluvial environments aka the hydrosphere and following this are some place- based case studies mainly at a regional level. From this introduction at the regional level a specific place can be identified and a mined in more depth.

Case Study: Fluvial environments (hydrosphere) and cotton

Cotton Info –
https://www.cottoninfo.com.au/publication-type/case-studies

These case-studies include benchmarking water productivity, managed aquifer recharge, evaporation mitigation and other non-hydrosphere related case-studies.

Bankless channels –
https://cottoninfo.com.au/publications/case-study-bankless-channels

This is a case-study of the Cook family of 'Turkey Lagoon' near Boggabilla.

Textile effluent treatment: a case-study in home textile zone –
https://www.fibre2fashion.com/industry-article/2473/textile-effluent-treatment-a-case-study-in-home-textile-zone

This is an article based on a case-study of the treatment of textile effluent prior to being released back into the hydrosphere.

The water imprint of Cotton Production –
https://waterfootprint.org/media/downloads/Report18.pdf

Although this is a 2005 UNESCO report it provides a useful framework for additional student research linking cotton to the environmental aspects of the hydrosphere.

Freshwater and Field Case Studies –
http://infras.info/downloadpdf.php?filename=b-1215e.pdf

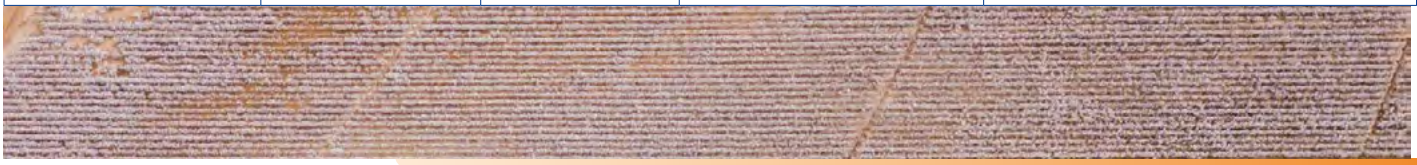
After a few chapters of synthesis there are a large number of detailed academic case-studies which might need to be scaffolded for the following countries cotton and water – Maikaal, India and Mavideniz and Rapunzel, Western Turkey.

Water Smart cotton and grains in NSW –
http://npsi.gov.au/projects/3290

This is a government case study in Australia about the work of irrigators managing the hydrosphere and. Cotton.

Student Activity template

	Title, Author & Address	Key facts	Perspective of author	How does resource demonstrate interconnections in the industry?
Fluvial environments – water and cotton				
Resource 1				
Resource 1				
Resource 2				
Resource 3				
Resource 4				
Resource 5				



Case Study: Place with a regional focus

Southern Cotton in NSW – https://www.business.nsw.gov.au/__data/assets/pdf_file/0014/241340/Southern-Cotton-case-study.pdf

This is a case-study of a place. The focus is on a new cotton gin in southern NSW about the introduction of new technology.

Cotton in the Murray Darling Basin – https://www.agriculture.gov.au/sites/default/files/documents/mja-cotton-mdb.pdf

This Australian Government Department of Agriculture Report was published in March 2020 and comprehensively provides background information, seasonal production, water availability, yield and productivity, enterprise mix, on farm upgrades, employment, the value chain, ginning operations, exports and internal and external factors.

India Case Study – https://www.researchgate.net/publication/268031125_India%27s_experience_with_Bt_Cotton_Case_studies_from_Gujarat_and_Maharashtra

This is an academic report by Research Gate on. Gujarat and Maharashtra in India. If of use it will need to be accessed by your library.

Cotton Production in NSW – https://www.svcga.com.au/wp-content/uploads/Cotton-factsheet-2016.pdf

This is a one page fact sheet about cotton in Southern NSW which can be built upon by focussing on a place within southern NSW .

Cotton Production in West Africa – https://www.oecd.org/swac/publications/38409410.pdf

This OECD Report examines cotton in West Africa in the international market context, provides a continental overview, demonstrating regional integration with detailed and accessible statistics for a case study.

Cotton Belt USA – https://agronomag.com/famous-agricultural-areas-world-cotton-belt-usa/

This case-study focuses on the cotton belt of southern USA examining the future of the region, the history of the cotton belt, factors favouring cotton, and the development of the new cotton belt.

A case-study in Peru – http://www.nzdl.org/gsdlmod?e=d-00000-00---off-0hdl--00-0----0-10-0---0---0direct-10---4-------0-1l--11-en-50---20-about---00-0-1-00-0--4----0-0-11-10-0utfZz-8-10&cl=CL2.14.3&d=HASH01c11ddac0d07ee765719caa.2.4&gt=1

This article discusses organic cotton cultivation and eco-textiles

Organic Cotton in Peru – https://blog.biz.colostate.edu/2018/07/24/exploring-organic-cotton-in-peru/

This is a case-study which explores organic cotton Peru. It provides good context which can be built upon if further research is of interest.

Explanation of the responses of governments, groups and individuals to minimise the effects of production in and consumption.

The suggested articles and resources provided above represent a reasonable sample of the governments, groups and individuals involved in the cotton industry.

An ***explanation*** of the responses involves providing insights into the ***perspectives*** of the governments, groups and individuals. This is the framework which could be used to assist students to understand these perspectives and as such be able to offer an explanation.

The perspective shapes the explanation

For example, Cotton Australia is an organisation who can come to a school to provide the perspective of the individual farmers, building awareness about cotton from the farm to the market and the provision educational resources- see below.

The explanation of the response of Cotton Australia starts with their perspective as an organisation and advocate for cotton and the key stakeholders.

In doing so Cotton Australia strives to address issues, with a balanced perspective It strives to achieve this by demonstrating initiatives to manage negative environmental, social and economic impacts of the cotton industry while highlighting the positive economic, social and environmental impacts of the cotton industry. This is supported by making available case – studies to build awareness, knowledge and understanding of the cotton industry in Australia.

A second example is the Organic Cotton Organisation, whose responses revolve around: advocating for organic cotton and specifically aligning its initiatives to reducing the environmental imprint of cotton production, the promotion of safe work and better livelihoods, providing a model for the future, identifying the impacts on our food system, making the case for a fair price for sustainability and indicating individuals can make a difference.

Thirdly, explaining the Southern Valleys Cottons Growers Association's responses involve understanding their perspective of the region they represent. This centres around the notion that a collective voice counts, their ability to connect cotton growers, the provision of events, and updates in research such as the use of drones in agriculture, pesticide management, sustainable water initiatives and field days

Fourthly, the World Wildlife Organisation acknowledges cotton provides income for more than 250 million people and employs almost 7% of all labour in developing countries. However, any explanation of this perspective necessarily involves an understanding that their perspective is based on the premise that production methods are unsustainable and perhaps undermining the industry's ability to maintain future production. Some of the above articles suggest organic cotton is the only way forward from a sustainable perspective.

Additional resources from Cotton Australia

Cotton and Sustainability Posters – https://cottonaustralia.com.au/posters

These posters show the sustainable aspects of cotton farming, the story of the field to fashion and a map of the growing areas for both primary and secondary schools.

Cotton Educational Videos – https://cottonaustralia.com.au/education-videos

There are videos on "from seed to sock", cotton products and uses, meet the grower, know the facts on water allocation, know the facts why is cotton grown in Australia, biotechnology: transgenic versus conventional cotton, solid your undies experiment, cotton harvesting in Australia, the ginning process, the John Deere Round Cotton balers, how does our cotton grow, the beginning with the Cotton Seed Distributors (CSD), breeding a sustainable future, growing the territory – modern cotton, cotton research at the CSIRO

Cotton irrigation, St George, Qld. Source: https://upload.wikimedia.org/wikipedia/commons/f/f9/StGeorgeCottonIrrig.jpg

Education Kit – https://cottonaustralia.com.au/education-kit

A comprehensive education kit is available set out in 10 chapters which can be downloaded in the following topics. The resource dos have curriculum links and investigates the Australian Cotton industry, sustainable cotton industry, history of cotton, the cotton plant, how cotton is grown, the business of cotton farming, processing from gin to fabric, cotton as a competitive commodity, cotton as a consumer able product and cotton careers.

In addition, there cotton activities for lessons in primary and secondary schools – https://cottonaustralia.com.au/lessons-and-units

Australian cotton water story – https://www.cottonaustralia.com.au/assets/general/Publications/Industry-overview-brochures/The-Australian-Cotton-Water-Story.pdf

A PDF packed with information logically developing the story

Public Galleries – https://cottonaustralia.smugmug.com/Public-Galleries

As the peak grower body showcasing the modern Australian cotton industry, the farms, practices and the technology to are it happen.

Source: https://cottonaustralia.com.au/assets/general/Education-resources/Posters/Field-to-Fashion_Senior-poster-Online.pdf

CONCLUSION

This provision of resources concerning cotton is not exhaustive and only represents my selection of resources as I tried to align them to the syllabus points for the unit off work Interconnections. In particular the focus was the fourth sub point production and consumption.

This was further broken down into the three sub points examine it social, economic and environmental impacts, explanations of responses of governments, groups and individuals by focusing on their perspectives and suggested examples of case- studies for the fluvial environments connected to the cotton industry; and a selection of regional case studies from which specific places could be chosen for further research.

Many industries of production and consumption are closely interconnected with a range of close and extended stakeholders. The cotton industry is no exception.

Although no specific pedagogical approaches have been suggested the focus here is to provided resources with scaffolds to build a depth of knowledge leading understanding, consistent with the recent NESA Curriculum Review.

Individual geography teachers are empowered to use their professional judgement as to how access to resources, identify individual student learning needs, facilitate individual or group collaboration and presentations and take into account their environmental and cultural context of their school community.

This poster shows the perspective of the cotton Industry on the sustainability of Cotton Farming. Source: https://cottonaustralia.com.au/assets/general/Education-resources/Posters/Sustainable-Cotton-Farm-A1-Poster-Primary-Online.pdf

'WILD AUSTRALIA – AFTER THE FIRES'

Grace Larobina, The Hills Grammar School

Source: Shutterstock

The documentary on ABC iView *Wild Australia – After the Fires* is an excellent teaching resource that can be used across Stages 5 – 6 reflecting the NSW Geography Syllabus. In Year 12 Geography, the documentary has a place in the Syllabus topic Ecosystems at Risk exploring many themes including resilience, dynamic equilibrium, and breaking points in the functioning of ecosystems. Including a variety of ecosystems management strategies. Food chains and food webs are also a feature where the impacts of the bushfires are demonstrated and the co-dependency of flora and fauna.

Used as an introduction to Environmental Change and Management in Stage 5 the documentary shows the above. There is also a great story of hope and it is magnificent to see how the natural environment has shown resilience. The wildlife has been in recovery and the great lengths that expert scientists in ecology and nature have gone to ensure some of the species are accounted for and rescued.

Students can be active and informed citizens and realise the impacts of humanity on our natural environments and consider their own future actions. The important work of local volunteers is commended in the documentary and demonstrate the collective need to protect. The CC was an added feature as it gave the students a visual and can be used as a literacy tool. The documentary comes with a ***warning*** as some of the images can be distressing of injured and dead wildlife hence its PG Rating, so this will need to have teacher discretion and some schools may need parental / guardian permission to use. The narration is very clear and at a great learning pace for students, the language is technical but very accessible for students across a range of literacy abilities.

For further information about the following activities used in the Year 10 Unit of Inquiry, Environmental Change and Management, refer to Making Thinking Visible Ron Ritchhart et al

Wild Australia – After the Fires

'Charting the recovery of wildlife in the aftermath of Australia's catastrophic bushfires through stories of hope and resilience. Narrated by Hugo Weaving, the film provides an urgent message to safeguard our environment.'

Documentary ABC iView (58 Minutes)
Published January 2021 Available until 31st March 2021.

YEAR 10 GEOGRAPHY
ENVIRONMENTAL CHANGE & MANAGEMENT

BEFORE VIEWING

What do you **SEE - THINK - WONDER** about when you see the following image from the ABC iView documentary?

Source: ABC iView Wild Australia - After the Fires 2021

SEE	THINK	WONDER

AFTER VIEWING

PART 1. THE ENVIRONMENT

A. Explain what ecosystems need to function.

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B. Describe **ONE** way that ecosystems can provide protection from fires.

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C. What ***natural services*** do ecosystems provide? e.g., Think of the Lyre Bird in the documentary.

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PART 2. ENVIRONMENTAL CHANGE

A. Describe how natural environments changed during the Australian Black Summer Bushfires 2019-2020.

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B. THINK- PAIR- SHARE

THINK	PAIR	SHARE
Describe how the natural environment has shown ***resilience*** to the catastrophic change caused by the Australian Black Summer Bushfires.		

PART 3. ENVIRONMENTAL MANAGEMENT

Describe **TWO** environmental management strategies that you observed in the documentary that assisted in the management and protection of the natural environment after the catastrophic fires.

Consider the scale of the management strategy; Local, State, National or Global

STRATEGY	CONNECT What do you know about the management strategy?	EXTEND What have you found out after your research about the management strategy?	CHALLENGE What challenges do you see with the management strategy?
1.			
2.			

The Geography Teachers' Association of NSW & ACT Inc
ABN: 59 246 850 128

November 2019 – December 2020 Annual Report

Presented by Susan Caldis (President)

I am delighted to present the 2019 - 2020 Annual Report for the Geography Teachers Association of NSW and ACT (GTA NSW&ACT). In a year full of extraordinary and challenging circumstances, I am proud to say the Council have been agile, adaptive and responsive to unexpected change.

Let me start by Acknowledging Country. In our work as geographers and geography educators it is crucial to understand our connections to place and people across time – and to share such understanding with our students and colleagues. I would like to respectfully acknowledge all of the Aboriginal Countries that we are residing and working on today. For me, I would like to acknowledge Darug Country and Eora nation, the lands and their waterways to which I am connected through work, study and residence. I would like to pay my respect to the traditional custodians of Darug Country and Eora Nation, the Wattamattagal clan and the Cammeraygal People respectively. I would also like to pay my respect to all Elders and knowledge-holders who have and continue to pass on their knowledges and wisdom for the sustainability of our environments, our education and our communities. I would like to extend my respect to all Aboriginal and Torres Strait Islander Peoples present today.

At the time of reporting, membership of the Association was 647 and fees remained the same as for 2018 – 2019 and 2019 – 2020. Membership categories are identified in Table 1.

Table 1: ***Membership categories for GTA NSW & ACT***

Category	Fee	Number of members in the category
Concessional	$40	35
Personal	$90	119
School	$200	356 Each school can have up to six teacher emails to ensure wide distribution of correspondence
Primary School or teacher	No charge	21
Teacher Education Student	No charge when sign-up occurs with a university email	110
Life members	No charge	6

Before I do present the activities of the Association enacted by Council between November 2019 – December 2020, I would like to thank Council for their endless support together with their tireless work and enthusiasm for what it is we stand for as an Association leading geography education in NSW and ACT. Whilst there are honorariums available for selected projects and activities, we are a volunteer Council. All projects we design, deliver, evaluate and refine occur beyond the demands of our 'day-job'. The year of 2020 continued to present

circumstances that forced an adjustment to familiar practice. Leadership in turbulent times is particularly tricky, however, with clear vision and care for each other, what seems daunting and perhaps impossible becomes achievable and actioned. I would also like to thank colleagues from the Professional Teachers Council of NSW who provide continued and wonderful support with our administrative workload.

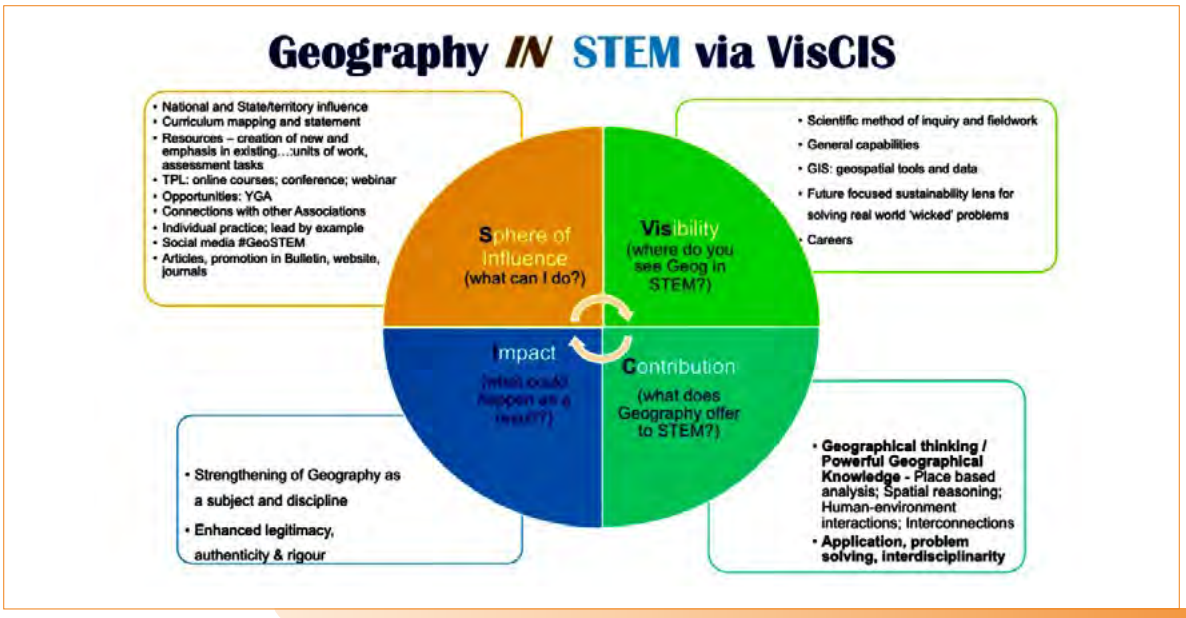
GTA NSW & ACT are successful at both state and national scales for meeting our four key enduring goals:

- advocacy for, and recommendations about, issues and policies affecting education for Geography;
- connecting the work of the Association to an evidence base and current developments in education for Geography;
- designing and delivering evidence-informed, timely, accredited professional learning events and materials; and
- maintaining a close relationship with organisations such as the Professional Teachers' Council of NSW (PTC NSW), the New South Wales Education Standards Authority (NESA) and the Geographical Society of NSW (GSNSW).

As President it was particularly important to me to ensure GTA NSW & ACT made significant progress during 2020 to ensure the Association strategy and action were grounded in key evidence-based recommendations from the Decadal Plan for the discipline, Geography: Shaping Australia's Future (National Committee for Geographical Sciences, 2018) https://www.science.org.au/files/userfiles/support/reports-and-plans/2018/geography-decadal-plan.pdf The recommendations were from Chapter 13, Geography in Australian Schools and the focus was on two recommendations:

- **Geography being recognised as a partial STEM subject in policy and practice.** In 2020, the President was appointed on merit by Science & Technology Australia as a STEM Ambassador for geography education. The GTA NSW & ACT Council collaboratively developed a Geography IN STEM strategy for 2020-2021 (see Figure 1). Six GTA NSW & ACT representatives attended a national symposium about Geography and STEM to advocate for the strategy.
- **Increase collaboration between school and university** geographers continued with TAFE and universities; professional associations; fieldwork providers e.g. Environmental Education Centres; resource developers e.g. Urban Growth and the Rural Fire Service. Universities operated trade tables at the 2019 Conference to promote careers links with Geography. TAFE teachers presented a full day drone course at the 2019 Annual Conference. Invitations to events e.g. 2018 COLAB (Urban Growth/Landcom) reflected and broadened our public exposure.

Figure 1: ***Geography IN STEM via VISCIS***



Now to present the activities of the Association for 2020.

In January, Australia faced devastating bushfires. Much of the fire activity and destruction occurred in NSW and ACT; consequently, members of Council felt compelled to develop, endorse and release a public ***Statement of Support for Geography Teachers in Fire Affected Communities*** https://drive.google.com/file/d/1GZs_Cmqy49xs_dand_4URnbx5fqjZALC/view to:

- offer support to NSW and ACT Geography teachers working in fire-affected schools and communities; and
- outline the importance of Geography as a school subject in helping students to develop an understanding and make decisions about the big issues affecting the quality of their lives and environments, such as climate change, coping with fires, floods and droughts, and engaging with our neighbours in the Asia-Pacific region and beyond.

The statement was available on the GTANSW&ACT website, and a similar statement was drafted by colleagues in Western Australia directed at their membership and communities.

In February, the GTA NSW&ACT Executive confirmed the professional learning plan for 2020 based on discussions from the planning day at the end of 2019. In February there was also the Award Ceremony hosted by the Professional Teachers Council of NSW PTCNSW) to celebrate the work of Associations during 2019. It was delightful to see two awards be presented to those on GTA NSW&ACT Council:

- Vice President, Alexandria Warnock who received an award for Outstanding Professional Service to the Association for her services to GTA NSW&ACT.
- Immediate Past President, Lorraine Chaffer who received the PTCNSW Award for Exceptional Service to the Profession for her services to geography education.

By the time the first Council meeting was due to occur the COVID-10 pandemic had arrived and lockdown had commenced. Meetings which had operated in blended form from the PTCNSW Offices and via zoom were now moved to a zoom-only format. During 2020, confidentiality of meeting documents was retained through file storage in Google Drive with access restricted link. During 2020, for each General Meeting, all agenda items had an accompanying report where possible and were made available in the relevant Google Drive folder before the General Meeting. This process will continue in 2021. Since 2017, General Council meetings have been conducted in the blended form: zoom and face to face. This allows for flexibility in attendance as some Council members travel from the Central Coast and Hunter region, the Illawarra region, and across the Sydney metropolitan region. During 2020, in response to the pandemic, all meetings occurred via zoom and for a shorter period with a more targeted focus or theme than in previous years. The Executive took the lead in decision-making and development of events to recognize the competing timelines and responsibilities during lockdown and zoom fatigue of many Councillors. Periods of lockdown and the continuation of COVID-safe restrictions meant our professional learning program needed to be adjusted.

GTANSW&ACT is a highly regarded provider of timely, quality, evidence-informed professional learning initiatives suitable for uptake within and beyond the NSW context; and Council seamlessly reimagined and adapted our 'planned for' professional learning program in response to constraints of the COVID-19 era. The clearest way to demonstrate such adjustment is in a table. Please see Table 2.

Table 2: ***Planned for and Actioned in 2020 as a result of COVID-19***

Planned for 2020	Actioned in 2020
NESA Accredited Annual Conference and the ceremony for the recipient of the Arthur Phillip Award and 2019 HSC High Achievers (two-day event, April 2020)	2020 Conference program rolled over to 2021 (13–14 May 2021) Certificates for recipients of the Arthur Phillip Award and 2019 HSC High Achievers were distributed via mail (April 2020) Keynote speakers and targeted presentations curated as an online TPL package (October 2020)
NESA Accredited Study Tour to China (April school holidays 2020)	Postponed until further notice and for review as a TPL offering at the planning day
Senior Geography Conference (one-day event, April 2020)	Postponed until October 2020 pending COVID-19 restrictions and release of the new stage 6 Geography syllabus. Postponed until 2021 upon non-release of the new Stage 6 Geography syllabus
NESA Accredited Webinars (two per Term 1 – 3)	Webinars (two per Term 1 – 3)
	Café Conversations online networking opportunities (during lockdown and re-entry into schools Terms 1, 2)
NESA Accredited Regional Conferences (two x one-day events; May, June 2020)	Postponed until 2021
HSC Student Lectures (three x one-day event; June 2020)	Curated into a fully resourced online package suitable for teacher professional learning and student learning (August 2020)
NESA Accredited Online learning courses via Open Learning for Geography Concepts; Intro to Topographic Mapping Skills (during 2020)	Geography Concepts; Intro to Mapping; Intro to Topographic Mapping Skills; Place and Liveability; Landscapes and Landforms (throughout 2020 until current time)
Geography Bulletin (one per Term plus one special editions for Senior Geography)	Geography Bulletin (one per Term plus special editions for Senior Geography)
Reworking the Arthur Phillip Award to become the Young Geographer Award (to be launched during Term 4 2020)	On schedule (Term 4 2020)

During the year there are opportunities for celebrate the contribution our Council and membership. Awards have a peer review and merit selection process. For 2020, the following Awards were:

- Brock Rowe Award, for excellence in the teaching of Geography in schools: Samantha Coburn, Maitland Grossmann High School
- Geoff Connolly Award for outstanding contribution to the Geography Bulletin, journal of the Association: Fleur Farah and Sharon McLean
- Outstanding Professional Service to the Association, for services to GTANSW&ACT: Dr Paul Batten
- Life membership to the Association: John Lewis

For 2019 – 2020, the governance of Council is identified in Table 3

Table 3: ***Governance of GTANSW&ACT Council for 2019 – 2020***

Name	Position
Susan Caldis	President
Lorraine Chaffer	Vice President (Immediate Past); Editor
Dr Grant Kleeman	Honorary Treasurer; Vice President and Public Officer (from July 2020)
Sharon McLean	Vice President
Louise Swanson	Vice President (until June 2019); Public Officer (until June 2019)
Alexandria Warnock	Vice President
Katerina Stojanovski	Minutes Secretary (from March 2019)
Dr Paul Batten	Councillor
Karen Bowden	Councillor
Drew Collins	Councillor
Michael Da Roza	ACT representative; Councillor
Catherine Donnelly	Councillor
Adrian Harrison	Councillor
Keith Hopkins	Councillor
David Latimer	Councillor
John Lewis	Councillor
Alexandra Pentz	Councillor
Martin Pluss	Councillor
David Proctor	Councillor
Paul Alger	Co-opted
Grace Larobina	Co-opted
John Petts	Co-opted

In closing I would like to thank again each member of Council for their contribution to the Association and their enthusiasm for geography education. I would also like to extend particular thanks and appreciation to the Executive group of 2019 – 2020 for their wise counsel, support, and good humour: Lorraine Chaffer, Dr Grant Kleeman, Sharon McLean, Katerina Stojanovski, Louise Swanson, and Alexandria Warnock.

As a collective, and through dedicating our own time to the work of the Association for its members, we achieved the milestones planned for 2020 despite the extraordinary times.

As a Council, we actively demonstrate care and support for each other as much as we actively demonstrate care for our subject, Geography, and the work of the Association. We are a collaborative, hard-working, innovative Council who generously donate our time and willingly share our expertise for the greater good of Geography education in NSW and ACT.

Throughout 2020, the GTA NSW&ACT Council drew on their attributes of agility, care and responsiveness to effectively adapt our 'planned for' program during the COVID-19 era and maintain a close relationship with organisations of importance.

I end by commending to you the Annual Report for 2019 – 2020, and I look forward to what lies ahead for 2021.

Susan Caldis,

President GTA NSW&ACT

GEOGRAPHY TEACHERS ASSOCIATION OF NSW SOUTH WALES INC
A.B.N. 59 246 850 128

INCOME AND EXPENDITURE STATEMENT
FOR THE YEAR ENDED 30 JUNE 2020

	Note	2020	2019
		$	$
Revenue			
Conference		-	123,227
Copyright		4,389	4,407
Regional conference		2,091	25,559
Event		41,653	60,165
Grant		500	500
Interest income		319	324
Membership		82,181	75,583
Sponsorship		(1,974)	9,875
Development of new resource income		13,500	-
Other		2,291	4,123
Sales		22,254	17,828
Total income		167,204	321,591
Administration Expenses			
Audit fee		2,000	1,708
Bank fee		984	932
Bookkeeper		7,460	8,428
Capitation		2,928	-
Conference		-	94,761
Conference - AGTA		15,272	3,842
Courier		-	452
Depreciation		932	251
Filing fee		300	194
Gifts		505	-
Graphic design		19,467	24,878
Insurance		320	571
Membership		-	5,856
Postage		3,313	3,313
Printing & stationery		2,055	1,271
Rent		15,913	15,634
Secretariat		25,241	28,884
Subscription		4,534	5,819
Stock		27,312	29,760
Travel		3,329	3,955
Website		9,119	10,093
Workshop		20,484	66,592
Total administration expenses		161,468	307,194
Profit (Loss) from ordinary activities before income tax		5,736	14,397
Income tax benefit (expense)		-	-
Profit (Loss) from ordinary activities after income tax		5,736	14,397

The accompanying notes form part of this financial report.

Page 6

GEOGRAPHY TEACHERS ASSOCIATION OF NSW SOUTH WALES INC
A.B.N. 59 246 850 128

BALANCE SHEET
AS AT 30 JUNE 2020

	Note	2020	2019
		$	$
CURRENT ASSETS			
Cash	2	320,735	340,754
Receivables	3	11,241	6,723
Prepayments		16,794	5,863
TOTAL CURRENT ASSETS		348,770	353,340
NON-CURRENT ASSETS			
Plant	4	2,795	-
TOTAL NON-CURRENT ASSETS		2,795	-
TOTAL ASSETS		351,565	353,340
CURRENT LIABILITIES			
Creditors & Accruals	5	7,693	26,505
Income received in advance		11,301	
TOTAL CURRENT LIABILITIES		18,994	26,505
NET ASSETS		332,571	326,835
MEMBERS' FUNDS			
Retained profits	6	332,571	326,835
TOTAL MEMBERS' FUNDS		332,571	326,835

The accompanying notes form part of this financial report.

ADVICE TO CONTRIBUTORS

Geography Bulletin guidelines

1. *Objective:* The Geography Bulletin is the quarterly journal of The Geography Teachers' Association of NSW & ACT Inc. The role of the Geography Bulletin is to disseminate up-to-date geographical information and to widen access to new geographic teaching ideas, methods and content. Articles of interest to teachers and students of geography in both secondary and tertiary institutions are invited, and contributions of factually correct, informed analyses, and case studies suitable for use in secondary schools are particularly welcomed.

2. *Content:* Articles, not normally exceeding 5000 words, should be submitted to the GTA NSW & ACT Office by email gta.admin@ptc.nsw.edu.au

   Submissions can also be sent directly to the editors: Lorraine Chaffer (lchaffer@tpg.com.au)

   Articles are welcomed from tertiary and secondary teachers, students, business and government representatives. Articles may also be solicited from time to time. Articles submitted will be evaluated according to their ability to meet the objectives outlined above.

3. *Format:* Digital submission in Word format.

- Tables should be on separate pages, one per page, and figures should be clearly drawn, one per page, in black on opaque coloured background, suitable for reproduction.
- Photographs should be in high resolution digital format. An indication should be given in the text of approximate location of tables, figures and photographs.
- Every illustration needs a caption.
- Photographs, tables and illustrations sourced from the internet must acknowledge the source and have a URL link to the original context.

Note: Please try to limit the number of images per page to facilitate ease of reproduction by teachers.

Diagrams created using templates should be saved as an image for ease of incorporation into the bulletin.

All assessment or skills tasks should have an introduction explaining links to syllabus content and outcomes. A Marking Guideline for this type of article is encouraged.

4. *Title:* The title should be short, yet clear and descriptive. The author's name should appear in full, together with a full title of position held and location of employment.

5. *Covering Letter:* As email with submitted articles. If the manuscript has been submitted to another journal, this should be stated clearly.

6. *Photo of Contributor:* Contributors may enclose a passport-type photograph and a brief biographical statement as part of their article.

7. *References:* References should follow the conventional author-date format:

   Abbott, B. K. (1980) *The Historical and Geographical Development of Muswellbrook* Newcastle: Hunter Valley Press.

   Harrison, T. L. (1973a) *Railway to Jugiong* Adelaide: The Rosebud Press. ***(2nd Ed.)***

Refereeing

All suitable manuscripts submitted to the Geography Bulletin are subject to the process of review. The authors and contributors alone are responsible for the opinions expressed in their articles and while reasonable checks are made to ensure the accuracy of all statements, neither the editor nor the Geography Teachers' Association of NSW & ACT Inc accepts responsibility for statements or opinions expressed herein.

Books for review should be sent to:

The GTA NSW & ACT Council
PO Box 699
Lidcombe NSW 1825

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