

Spatial Technologies

Workshop 3

Tamworth Regional Conference

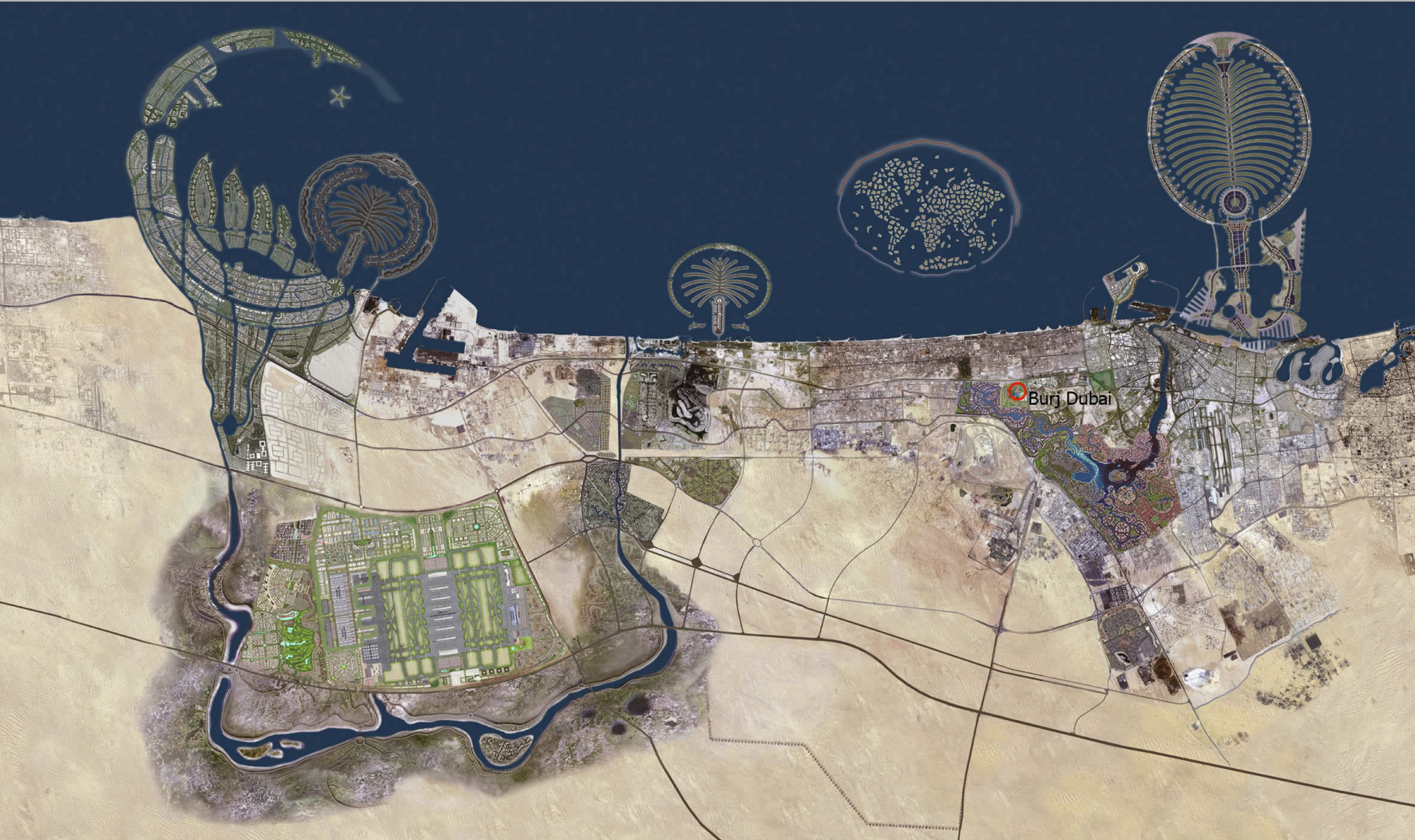
Lorraine Chaffer
GTA NSW President 2017



<http://www.bellsfire.co.za/.cm4all/mediadb/ire-earth-globe-wallpaper.png>



Geography is **visual**



VISUAL TOOLS

Photos

Video clips / animations

Maps

Graphs

Diagrams / 2D & 3D

Illustrations / Picture books

Models

Interactive websites / Apps

Spatial technologies

Augmented reality/ Virtual reality

Games eg Apps / Minecraft

Fieldwork

Websites / textbooks

The
Geography
advantage

Tools continuum

K-10 GEOGRAPHICAL TOOLS CONTINUUM

	Maps M	Fieldwork F	Graphs and Statistics GS	Spatial Technologies ST	Visual Representations VR
Stage	Examples may include:				
ES1	<ul style="list-style-type: none"> pictorial maps 	<ul style="list-style-type: none"> observing and recording data 	<ul style="list-style-type: none"> tally charts pictographs 	<ul style="list-style-type: none"> virtual maps 	<ul style="list-style-type: none"> photographs illustrations story books multimedia
1	<ul style="list-style-type: none"> pictorial maps, large-scale maps, world map, globe 	<ul style="list-style-type: none"> observing, collecting and recording data, conducting surveys 	<ul style="list-style-type: none"> tally charts pictographs data tables column graphs weather data 	<ul style="list-style-type: none"> virtual maps satellite images 	<ul style="list-style-type: none"> photographs illustrations diagrams story books multimedia web tools
2	<ul style="list-style-type: none"> large-scale maps, world map, globe, sketch maps maps to identify location, direction, distance, map references, spatial distributions and patterns 	<ul style="list-style-type: none"> observing, measuring, collecting and recording data, conducting surveys or interviews fieldwork instruments such as measuring devices, maps, photographs 	<ul style="list-style-type: none"> tally charts pictographs data tables column graphs simple statistics 	<ul style="list-style-type: none"> virtual maps satellite images global positioning systems (GPS) 	<ul style="list-style-type: none"> photographs illustrations diagrams story books multimedia web tools
3	<ul style="list-style-type: none"> large-scale maps, small-scale maps, sketch maps, political maps, topographic maps, flowline maps maps to identify location, latitude, direction, distance, map references, spatial distributions and patterns 	<ul style="list-style-type: none"> observing, measuring, collecting and recording data, conducting surveys and interviews fieldwork instruments such as measuring devices, maps, photographs, compasses, GPS 	<ul style="list-style-type: none"> pictographs data tables column graphs line graphs climate graphs multiple graphs on a geographical theme statistics to find patterns 	<ul style="list-style-type: none"> virtual maps satellite images global positioning systems (GPS) 	<ul style="list-style-type: none"> photographs aerial photographs illustrations flow diagrams annotated diagrams multimedia web tools

	Maps M	Fieldwork F	Graphs and Statistics GS	Spatial Technologies ST	Visual Representations VR
Stage	Examples may include:				
4	<ul style="list-style-type: none"> sketch maps, relief maps, political maps, topographic maps, flowline maps, choropleth maps, isoline maps, précis maps, cartograms, synoptic charts maps to identify direction, scale and distance, area and grid references, latitude and longitude, altitude, area, contour lines, gradient, local relief 	<ul style="list-style-type: none"> observing, measuring, collecting and recording data, developing and conducting surveys and interviews fieldwork instruments such as weather instruments, vegetation identification charts, compasses, GPS, GIS 	<ul style="list-style-type: none"> data tables pie graphs column graphs compound column graphs line graphs climate graphs population profiles multiple tables and graphs presented on a geographical theme statistics to find patterns and trends 	<ul style="list-style-type: none"> virtual maps satellite images global positioning systems (GPS) geographic information systems (GIS) 	<ul style="list-style-type: none"> photographs aerial photographs illustrations flow charts annotated diagrams multimedia field sketches cartoons web tools
5	<ul style="list-style-type: none"> relief maps, political maps, topographic maps, choropleth maps, flowline maps, cadastral maps, thematic maps, isoline maps, land use maps, précis maps, special-purpose maps, cartograms, synoptic charts maps to identify direction, scale and distance, area and grid references, degrees and minutes of latitude and longitude, bearings, aspect, altitude, area, density, contour lines, gradient, local relief 	<ul style="list-style-type: none"> observing, measuring, collecting and recording data, developing and conducting surveys and interviews fieldwork instruments such as weather instruments, vegetation identification charts, compasses, clinometers, GPS, GIS or remote sensing 	<ul style="list-style-type: none"> data tables pie graphs column graphs compound column graphs line graphs scatter graphs climate graphs population profiles multiple tables and graphs presented on a geographical theme statistics to find patterns and trends; and to account for change 	<ul style="list-style-type: none"> virtual maps satellite images global positioning systems (GPS) geographic information systems (GIS) remote sensing data augmented reality 	<ul style="list-style-type: none"> photographs aerial photographs illustrations flow charts annotated diagrams multimedia field and photo sketches cartoons mind maps web tools

Syllabus p 34 (K-6 & 7-10 documents)

Spatial technologies

Spatial technologies are geographical **tools**, to be used by students along with maps; graphs and statistics, fieldwork and visual representations such as diagrams to **acquire, process and communicate geographical information** (undertake geographical inquiry) .

SYLLABUS : SPATIAL TECHNOLOGIES – ST

Spatial technologies include any software or hardware that interacts with real world locations.

Examples include, but are not limited to, virtual maps, satellite images, global positioning systems (GPS), geographic information systems (GIS), remote sensing and augmented reality.

Spatial technologies are used to visualise, manipulate, analyse, display and record spatial data.

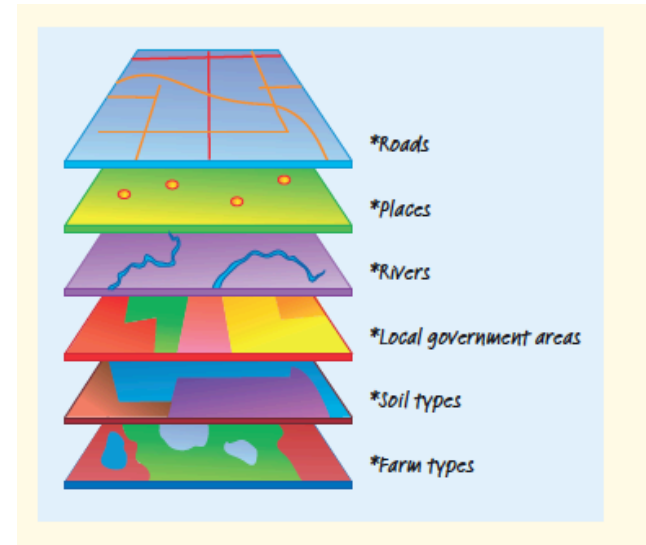
GIS and GPS



GPS

A GPS device locates places via satellite

The device can also collect data about a place e.g. latitude, longitude, altitude e.g. Garmin Sports App, phone camera



GIS: Geographic information systems

The digital plotting of spatial data to create visual images is a GIS e.g. Google Earth

Syllabus glossary

GPS: Navigation systems that provide location and time information anywhere there is a line of sight to GPS satellites.

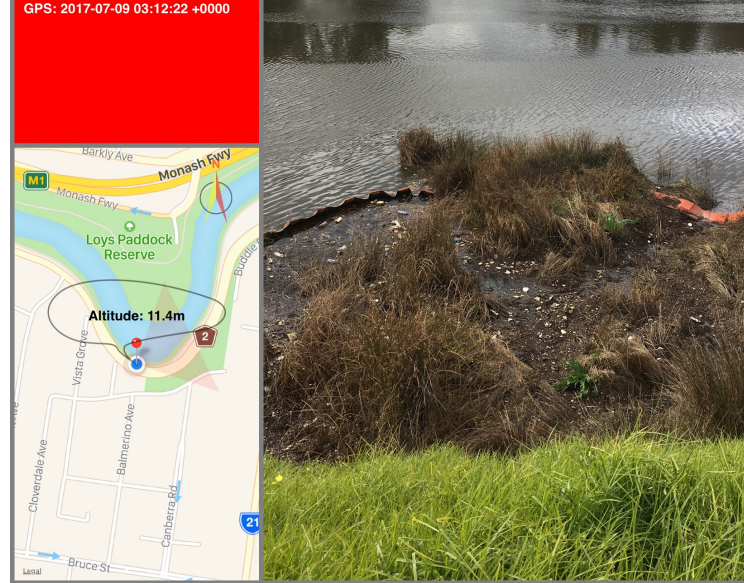
GIS: Systems for storing, managing, analysing and portraying spatial data.

Tablet / phone camera apps & GPS

Altitude: 1901.4m
Longitude: -109.856712° E
Latitude: 38.310139° N
Location: Grandview Point Overlook
City: Monticello
Province: UT
Time: 2017-05-13 16:05:55
GPS: 2017-05-13 22:05:56 +0000



Altitude: 11.4m
Longitude: 145.009216° E
Latitude: -37.833912° N
Location: Como Park North
City: Toorak
Province: VIC
Time: 2017-07-09 13:12:21
GPS: 2017-07-09 03:12:22 +0000



Inquiry continuum

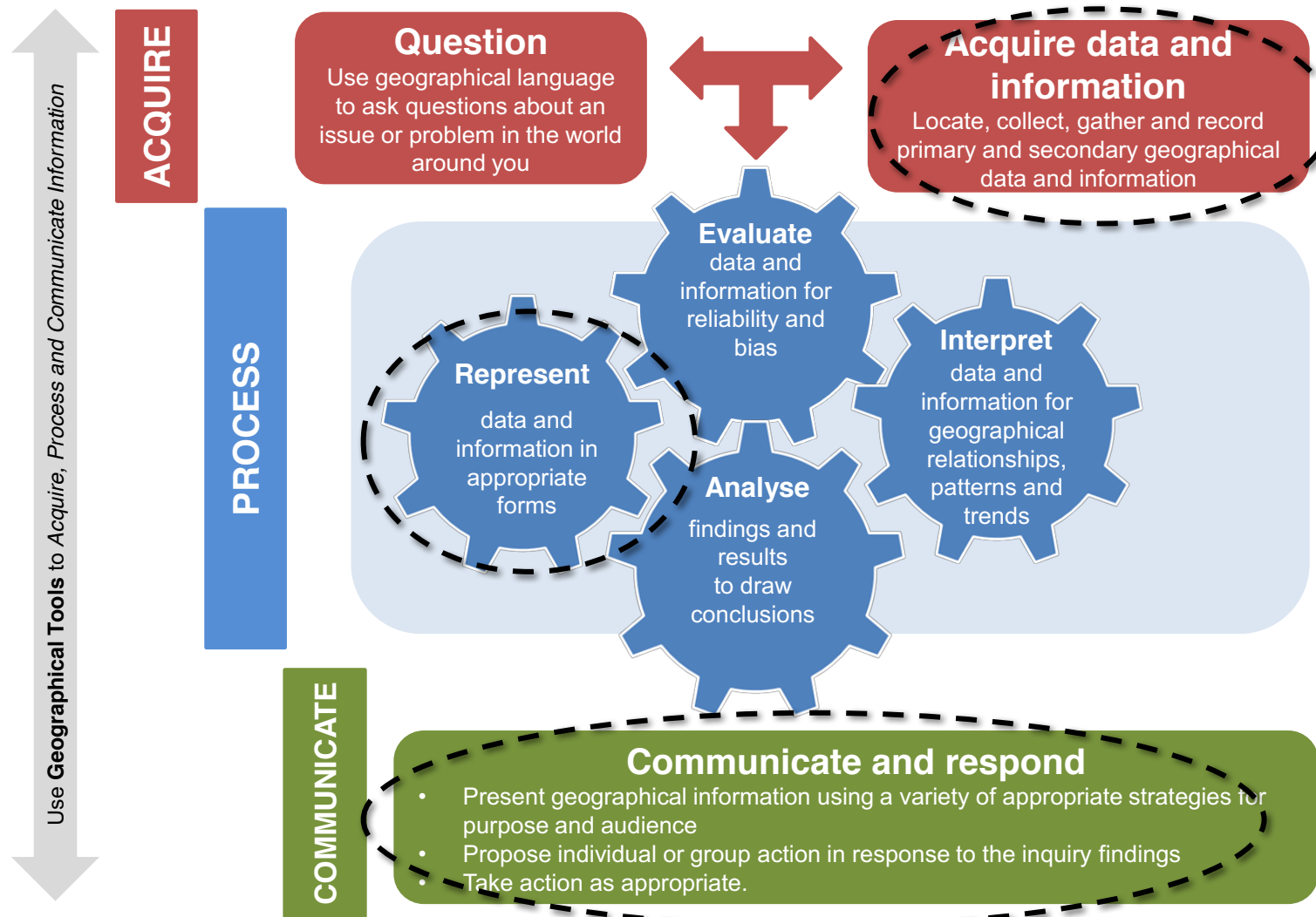


K-10 GEOGRAPHICAL INQUIRY SKILLS CONTINUUM

	Acquiring geographical information	Processing geographical information	Communicating geographical information
Stage	Students:		
ES1	<ul style="list-style-type: none"> pose questions and make observations (ACHGS001) record geographical data and information (ACHGS002) 	<ul style="list-style-type: none"> represent data using charts or graphs (ACHGS003) draw conclusions based on discussions of observations (ACHGS004) 	<ul style="list-style-type: none"> present information (ACHGS005) reflect on their learning (ACHGS006)
1	<ul style="list-style-type: none"> pose geographical questions (ACHGS007, ACHGS013) collect and record geographical data and information, for example, by observing, by interviewing, or using visual representations (ACHGS008, ACHGS014) 	<ul style="list-style-type: none"> represent data by constructing tables, graphs or maps (ACHGS009, ACHGS015) draw conclusions based on the interpretation of geographical information sorted into categories (ACHGS010, ACHGS016) 	<ul style="list-style-type: none"> present findings in a range of communication forms (ACHGS011, ACHGS017) reflect on their learning and suggest responses to their findings (ACHGS012, ACHGS018)
2	<ul style="list-style-type: none"> develop geographical questions to investigate (ACHGS019, ACHGS026) collect and record relevant geographical data and information, for example, by observing, by interviewing, conducting surveys, or using maps, visual representations, the media or the internet (ACHGS020, ACHGS027) 	<ul style="list-style-type: none"> represent data by constructing tables, graphs and maps (ACHGS021, ACHGS028) represent information by constructing large-scale maps that conform to cartographic conventions, using spatial technologies as appropriate (ACHGS022, ACHGS029) interpret geographical data to identify distributions and patterns and draw conclusions (ACHGS023, ACHGS030) 	<ul style="list-style-type: none"> present findings in a range of communication forms (ACHGS024, ACHGS031) reflect on their learning to propose individual action in response to a contemporary geographical challenge and identify the expected effects of the proposal (ACHGS025, ACHGS032)
3	<ul style="list-style-type: none"> develop geographical questions to investigate and plan an inquiry (ACHGS033, ACHGS040) collect and record relevant geographical data and information, using ethical protocols, from primary data and secondary information sources, for example, by observing, by interviewing, conducting surveys, or using maps, visual representations, statistical sources and reports, the media or the internet (ACHGS034, ACHGS041) 	<ul style="list-style-type: none"> evaluate sources for their usefulness (ACHGS035, ACHGS042) represent data in different forms, for example, plans, graphs, tables, sketches and diagrams (ACHGS035, ACHGS042) represent different types of geographical information by constructing maps that conform to cartographic conventions using spatial technologies as appropriate (ACHGS036, ACHGS043) interpret geographical data and information, using digital and spatial technologies as appropriate, and identify spatial distributions, patterns and trends, and infer relationships to draw conclusions (ACHGS037, ACHGS044) 	<ul style="list-style-type: none"> present findings and ideas in a range of communication forms as appropriate (ACHGS038, ACHGS045) reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge and describe the expected effects of their proposal on different groups of people (ACHGS039, ACHGS046)

	Acquiring geographical information	Processing geographical information	Communicating geographical information
Stage	Students:		
4	<ul style="list-style-type: none"> develop geographically significant questions and plan an inquiry, using appropriate geographical methodologies and concepts (ACHGS047, ACHGS055) collect, select and record relevant geographical data and information, using ethical protocols, from appropriate primary data and secondary information sources (ACHGS048, ACHGS056) 	<ul style="list-style-type: none"> evaluate information sources for their reliability and usefulness (ACHGS049, ACHGS057) represent data in a range of appropriate forms, with and without the use of digital and spatial technologies (ACHGS049, ACHGS057) represent the spatial distribution of different types of geographical phenomena by constructing maps at different scales that conform to cartographic conventions, using spatial technologies as appropriate (ACHGS050, ACHGS058) analyse geographical data and other information using qualitative and quantitative methods, and digital and spatial technologies as appropriate, to identify and propose explanations for spatial distributions, patterns and trends and infer relationships (ACHGS051, ACHGS059) apply geographical concepts to draw conclusions based on the analysis of the data and information collected (ACHGS052, ACHGS060) 	<ul style="list-style-type: none"> present findings, arguments and ideas in a range of communication forms selected to suit a particular audience and purpose, using geographical terminology and digital technologies as appropriate (ACHGS053, ACHGS061) reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations, and predict the expected outcomes of their proposal (ACHGS054, ACHGS062)
5	<ul style="list-style-type: none"> develop geographically significant questions and plan an inquiry that identifies and applies appropriate geographical methodologies and concepts (ACHGS063, ACHGS072) collect, select, record and organise relevant data and geographical information, using ethical protocols, from a variety of appropriate primary data and secondary information sources (ACHGS064, ACHGS073) 	<ul style="list-style-type: none"> evaluate information sources for their reliability, bias and usefulness (ACHGS065, ACHGS074) represent multi-variable data in a range of appropriate forms, with and without the use of digital and spatial technologies (ACHGS065, ACHGS074) represent the spatial distribution of geographical phenomena on maps that conform to cartographic conventions, using spatial technologies as appropriate (ACHGS066, ACHGS075) evaluate multi-variable data and other geographical information using qualitative and quantitative methods and digital and spatial technologies as appropriate to make generalisations and inferences, propose explanations for patterns, trends, relationships and anomalies, and predict outcomes (ACHGS067, ACHGS076) 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) identify how geographical information systems (GIS) might be used to analyse geographical data and make predictions (ACHGS069, ACHGS078) 	<ul style="list-style-type: none"> present findings, arguments and explanations in a range of appropriate communication forms selected for their effectiveness and to suit audience and purpose, using relevant geographical terminology and digital technologies as appropriate (ACHGS070, ACHGS079) reflect on and evaluate the findings of an inquiry to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations, and explain the predicted outcomes and consequences of their proposal (ACHGS071, ACHGS080)

A process for geographical inquiry



Simple Spatial Technologies

SPATIAL TECHNOLOGY APPLICATIONS

HANDOUT WITH LINKS



<http://www.gispeople.com.au/what-is-gis/>

1. National Geographic mapmaker



Created by L Chaffer

1. Select a base map
2. Select the map scale eg World, Australia
3. Select layers to create a map - human or natural features

Screen capture

<http://mapmaker.nationalgeographic.org>

Exploring spatial patterns / answer simple inquiry questions

HOT

Analysing relationships / synthesise interconnections / answer complex inquiry questions

NATIONAL GEOGRAPHIC | MapMaker Interactive

Save Bookmarks Share Print Reset map Give Feedback Help


Search

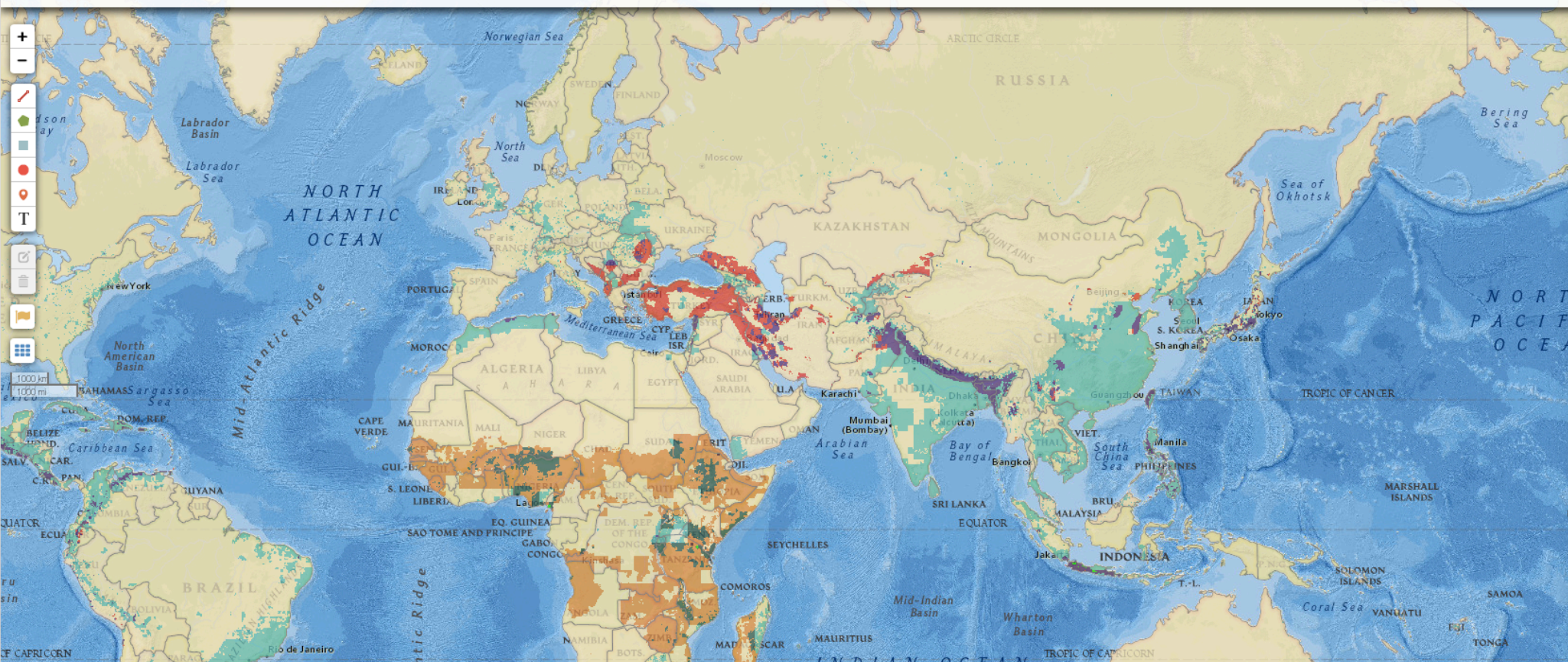
Enter Location...

Legend Layers Base Maps Data

Add Layer

Below are the layers currently displayed on the map. Drag and drop the layers below to reorder them on the map.

 **Natural Disaster Hot Spots** X
Transparency



The map displays a world map with a color-coded overlay representing natural disaster hot spots. The colors range from green (low risk) to red (high risk). High-risk areas (red) are concentrated in the Mediterranean region, the Middle East, and parts of East Asia. Moderate risk areas (orange and yellow) are seen in South America, Africa, and Southeast Asia. The map includes labels for major oceans, seas, and continents, as well as various geographical features like the Mid-Atlantic Ridge and the Tropic of Cancer.

Screen capture

<http://mapmaker.nationalgeographic.org>

NATIONAL GEOGRAPHIC | MapMaker Interactive

Save Bookmarks Share Print Reset map Give Feedback Help

Search

Enter Location...

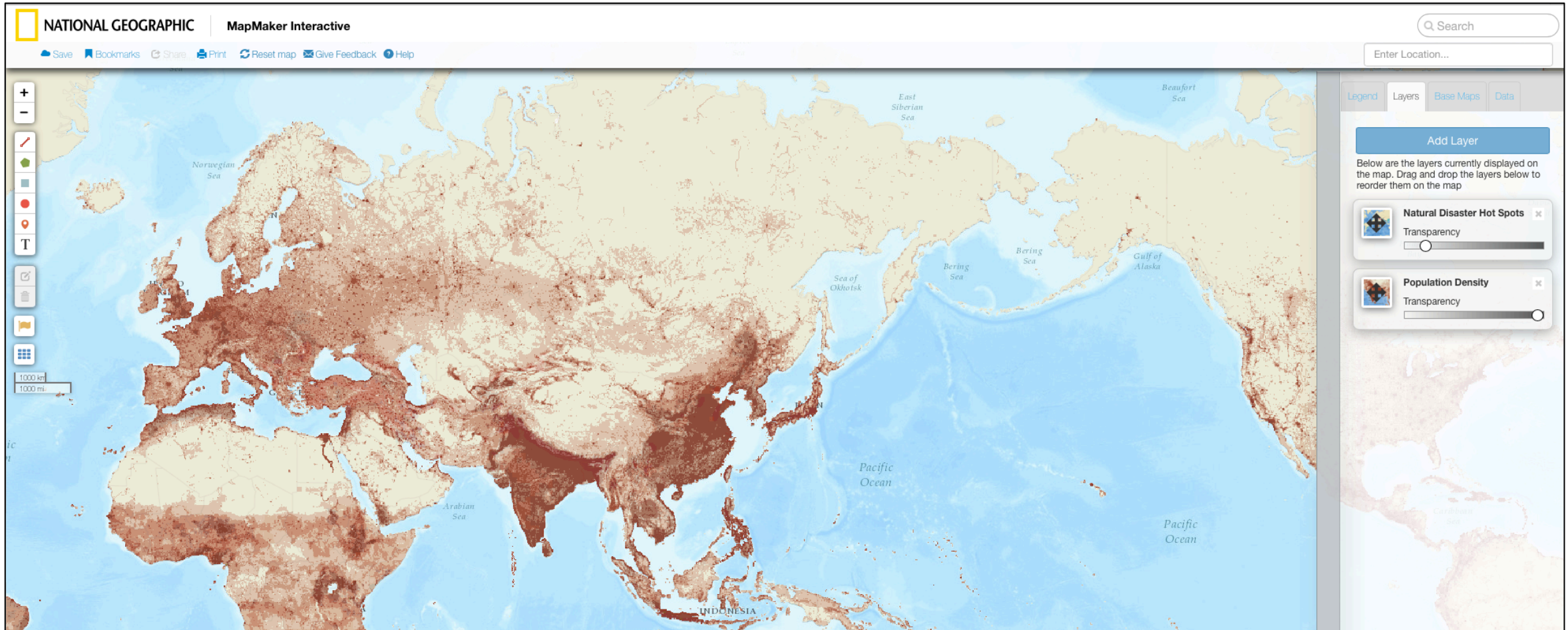
Legend Layers Base Maps Data

Add Layer

Below are the layers currently displayed on the map. Drag and drop the layers below to reorder them on the map.

Natural Disaster Hot Spots
Transparency

Population Density
Transparency

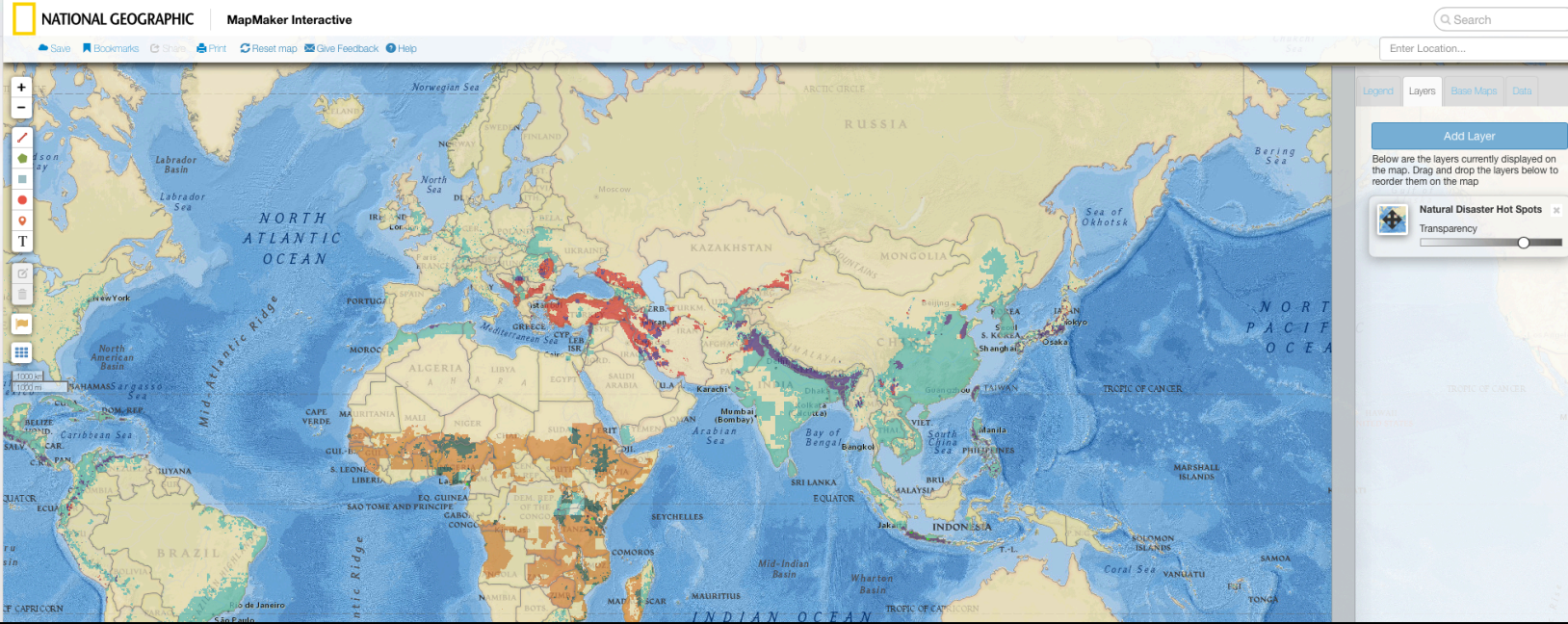


Screen capture

<http://mapmaker.nationalgeographic.org>

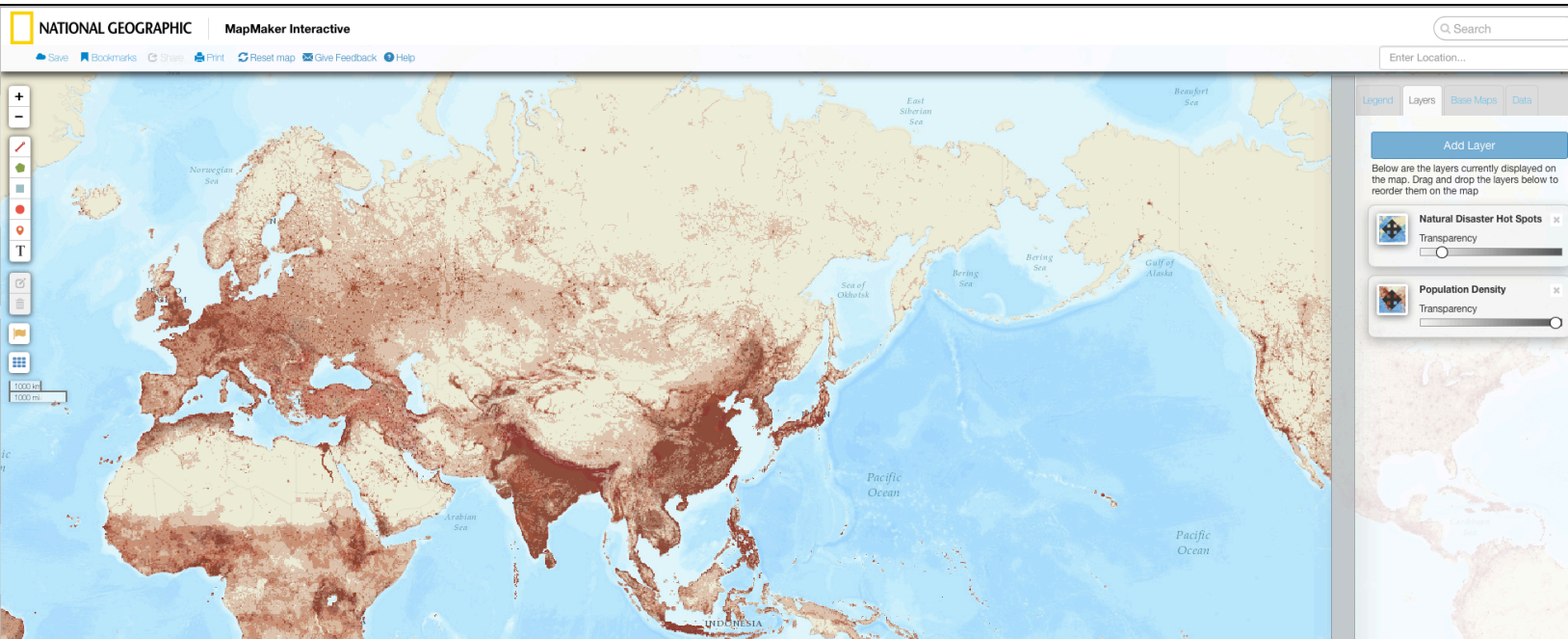
Inquiry question

Acquire - Where are the areas of greatest population concentration in the world?



Inquiry

Synthesise - Where are the greatest numbers of people vulnerable to natural hazards and disasters?

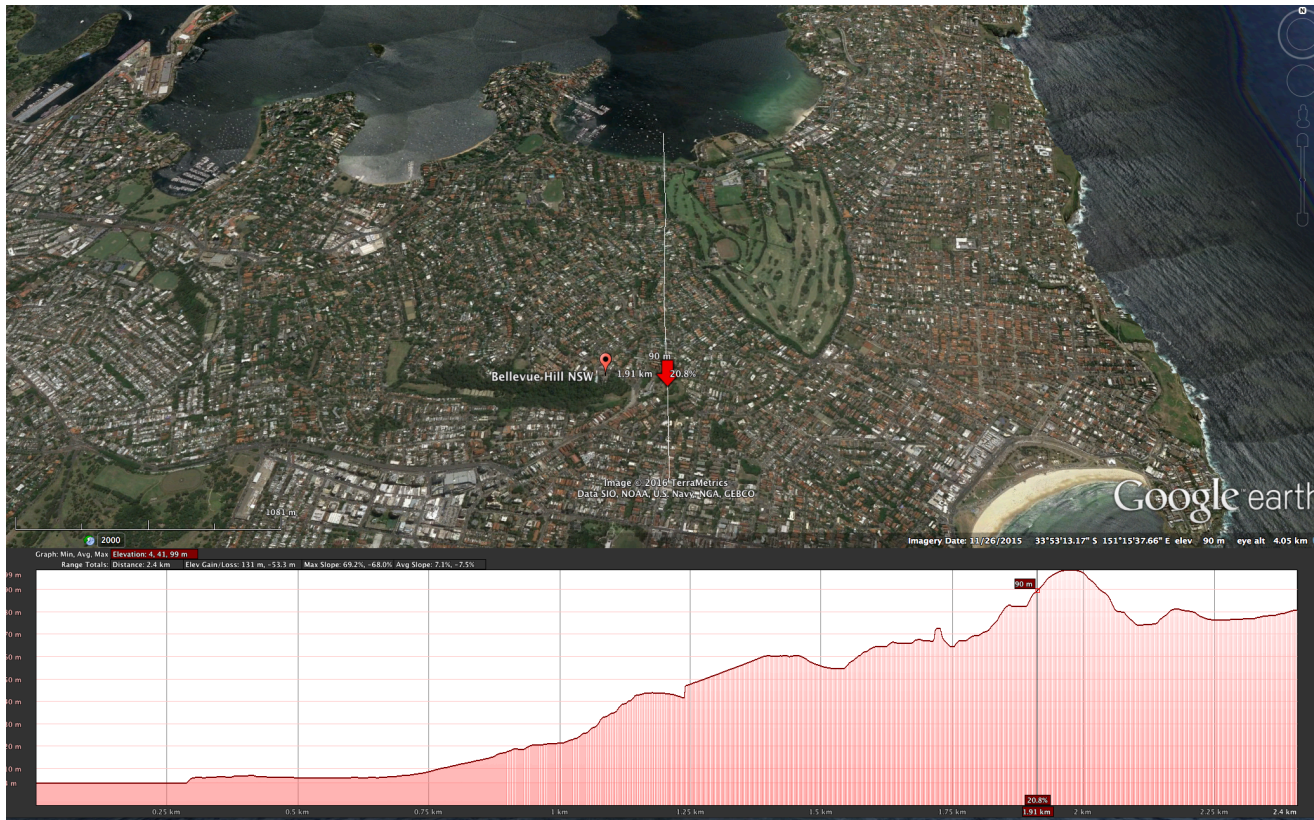


Analyse - Which natural disasters have the potential to impact on the greatest number of people?

Screen capture

<http://mapmaker.nationalgeographic.org>

2. ICT: Elevation profiles – Google Earth



Screen capture

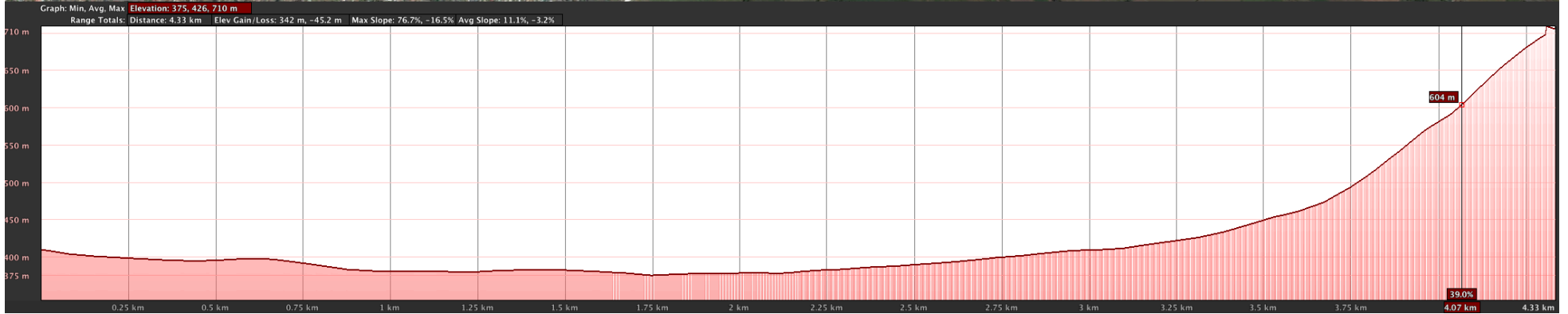
Created using Google Earth

Similar activities using
Google MyMaps

ESRI Elevation profile

Topo-profiler (iPhone / iPad)

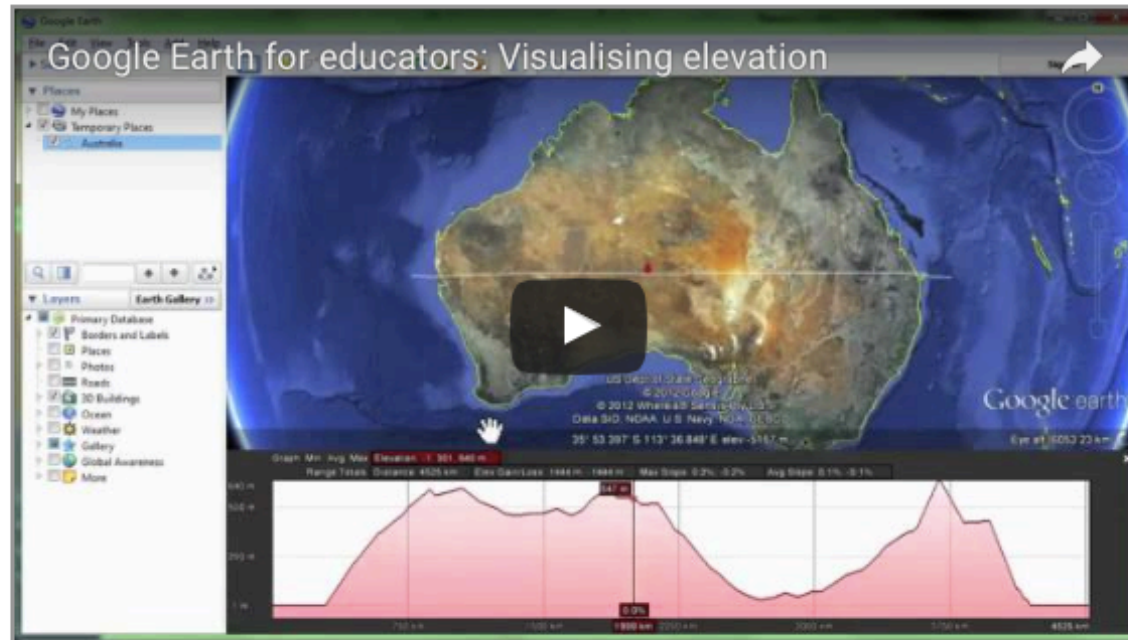
Where could this
be used?



Created by L Chaffer using Google Earth

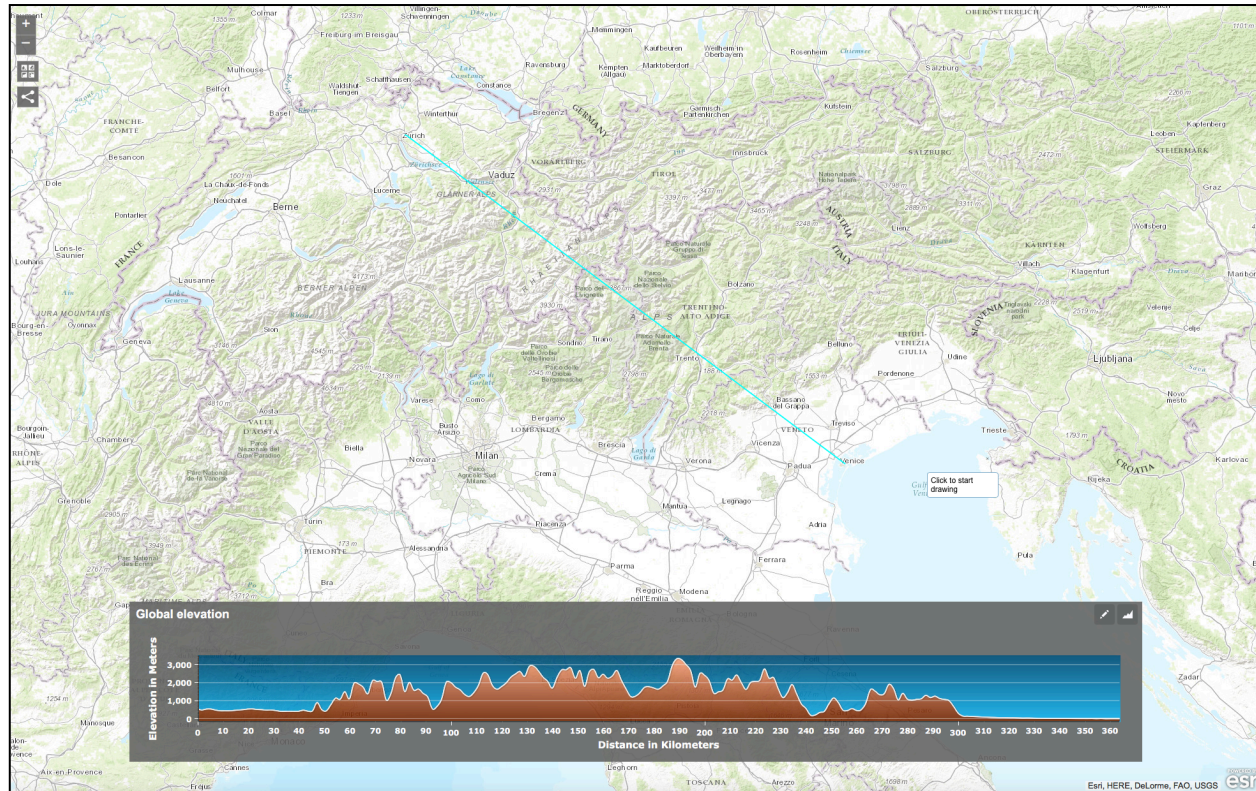
Google Earth tutorial

Watch the video below to see how to create an elevation profile in Google Earth



<http://www.contoureducation.com/resources>

Arcgis: Global elevation



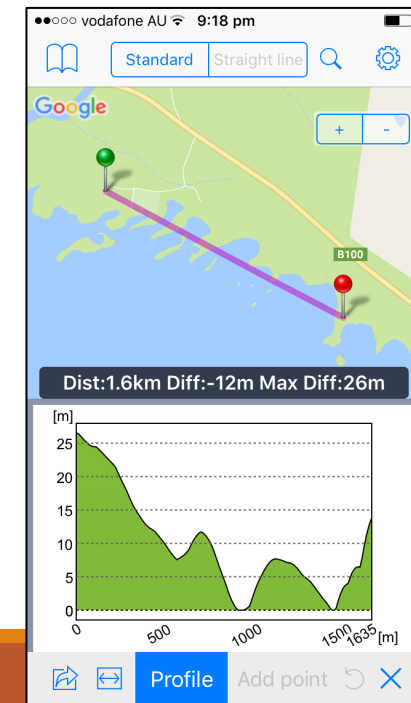
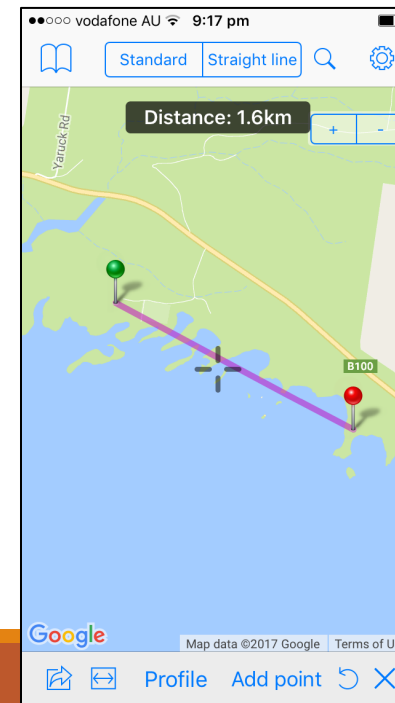
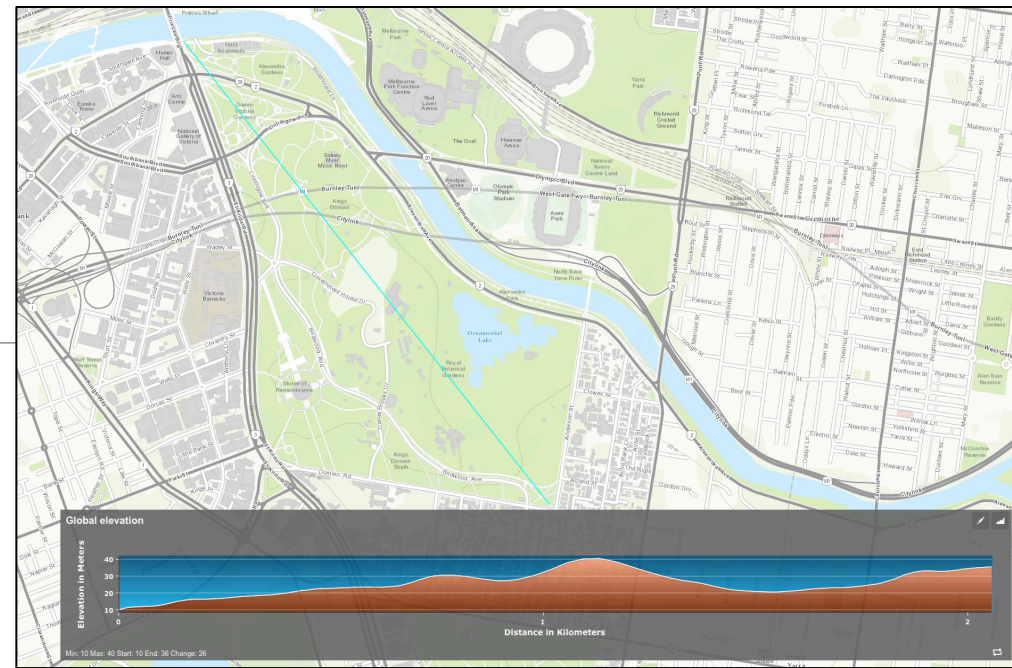
Global elevation

Screen capture

<http://esriukeducation.maps.arcgis.com/apps/Profile/index.html?appid=f0a2a2a3e1964129b22c715e31282f6c>

Topo Profiler

... and there is
an iPhone / iPad
App!

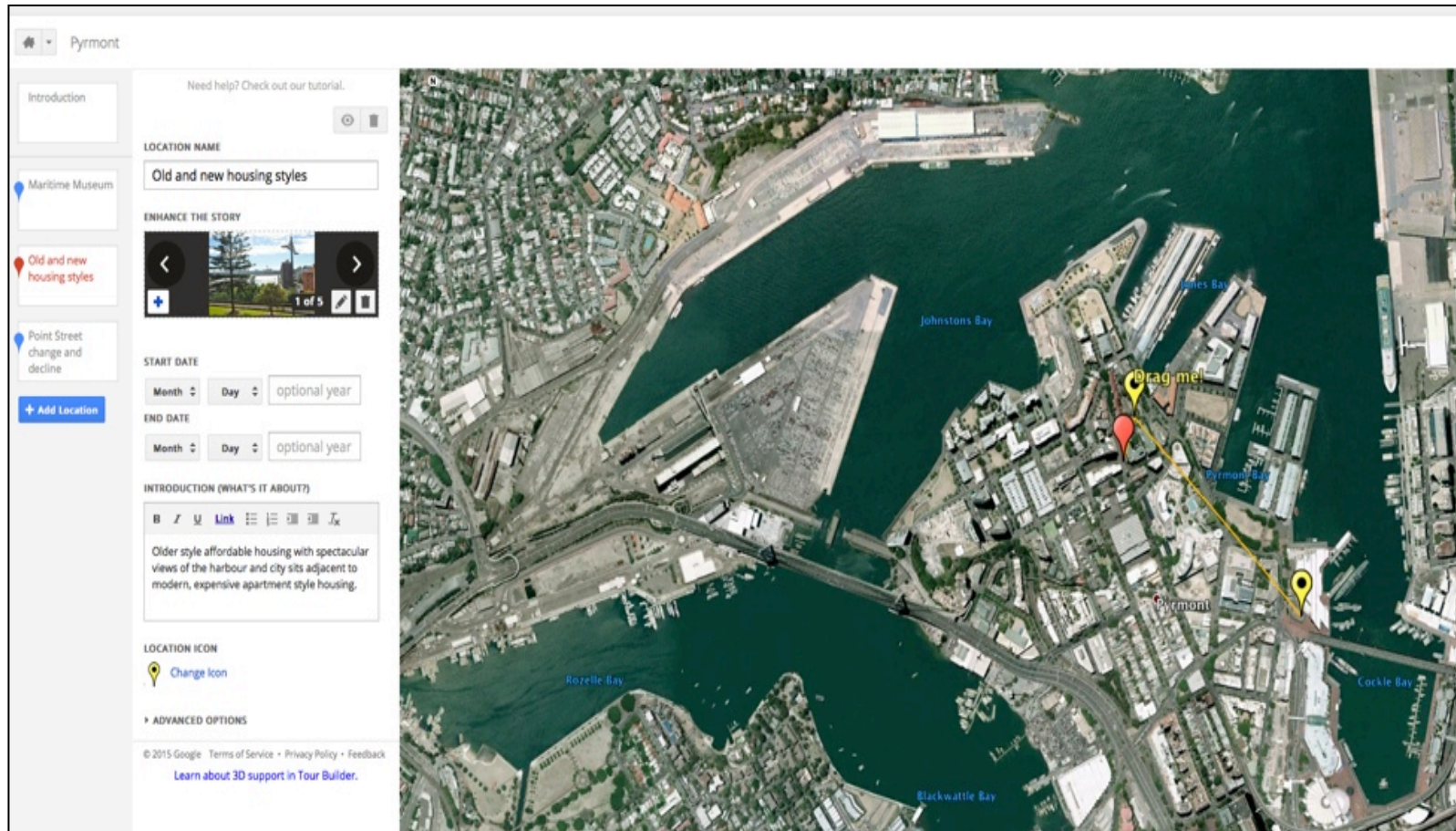


Topo Profiler – elevation graph viewer

<https://itunes.apple.com/us/app/topo-profiler-elevation-graph-viewer/id478596308?mt=8>

<http://esriukeducation.maps.arcgis.com/apps/Profile/index.html?appid=f0a2a2a3e1964129b22c715e31282f6c>

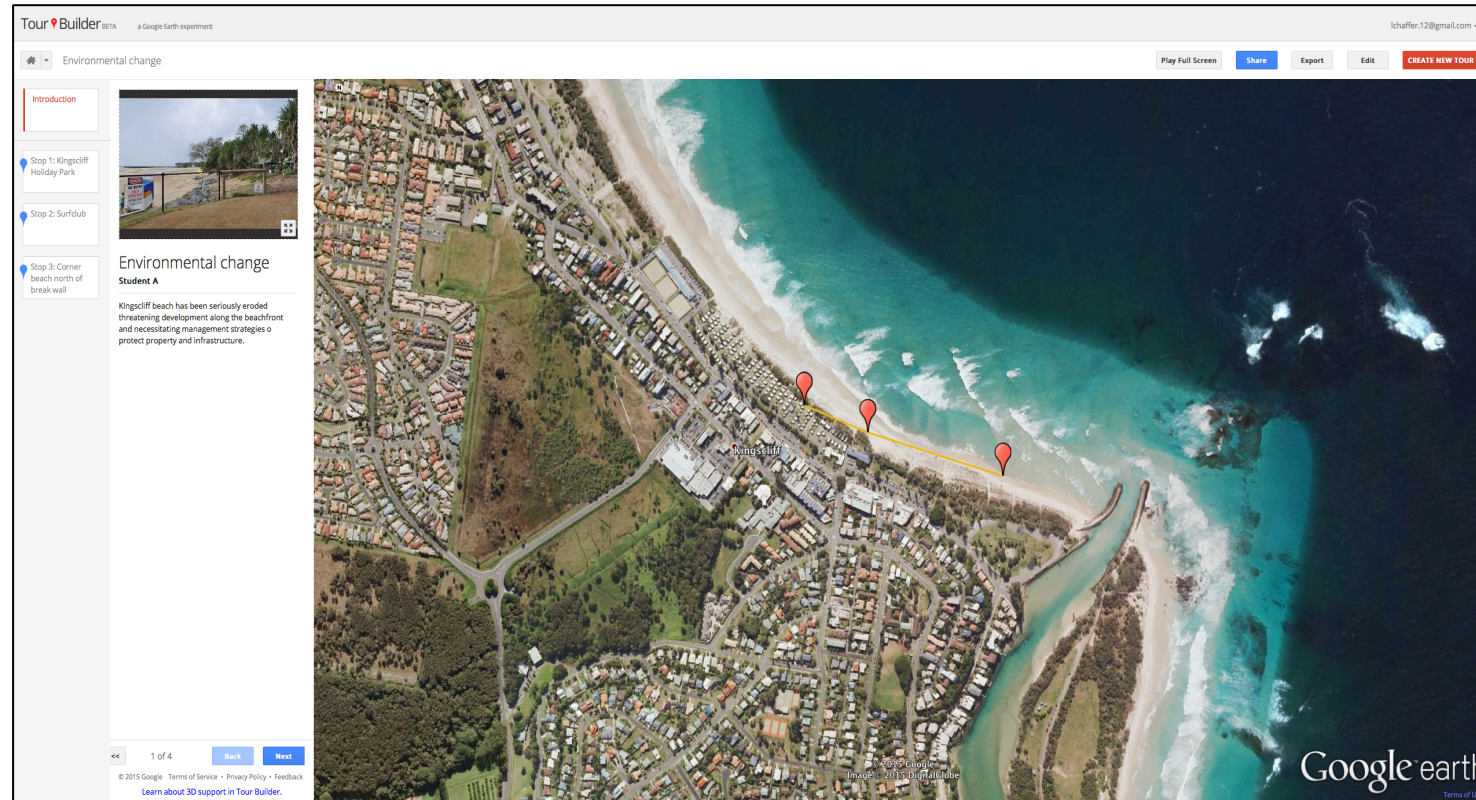
3. Google tour builder



How / where could this be used?

Map created by L Chaffer using Google Tour Builder
<http://www.google.com.au/earth/outreach/tutorials/tourbuilder.html>

Communicating fieldwork findings



High tech - ICT

Map created by L Chaffer using Google Tour Builder

<http://www.google.com.au/earth/outreach/tutorials/tourbuilder.html>

Screen captures L Chaffer

POST FIELDWORK / Communicate inquiry findings


Tour builder tutorial

Tour Builder BETA a Google Earth experiment [Sign in](#)

[Gallery](#) [About](#)


Tour Builder
Put your story on the map.

[VIEW A TOUR](#) [CREATE A TOUR](#)



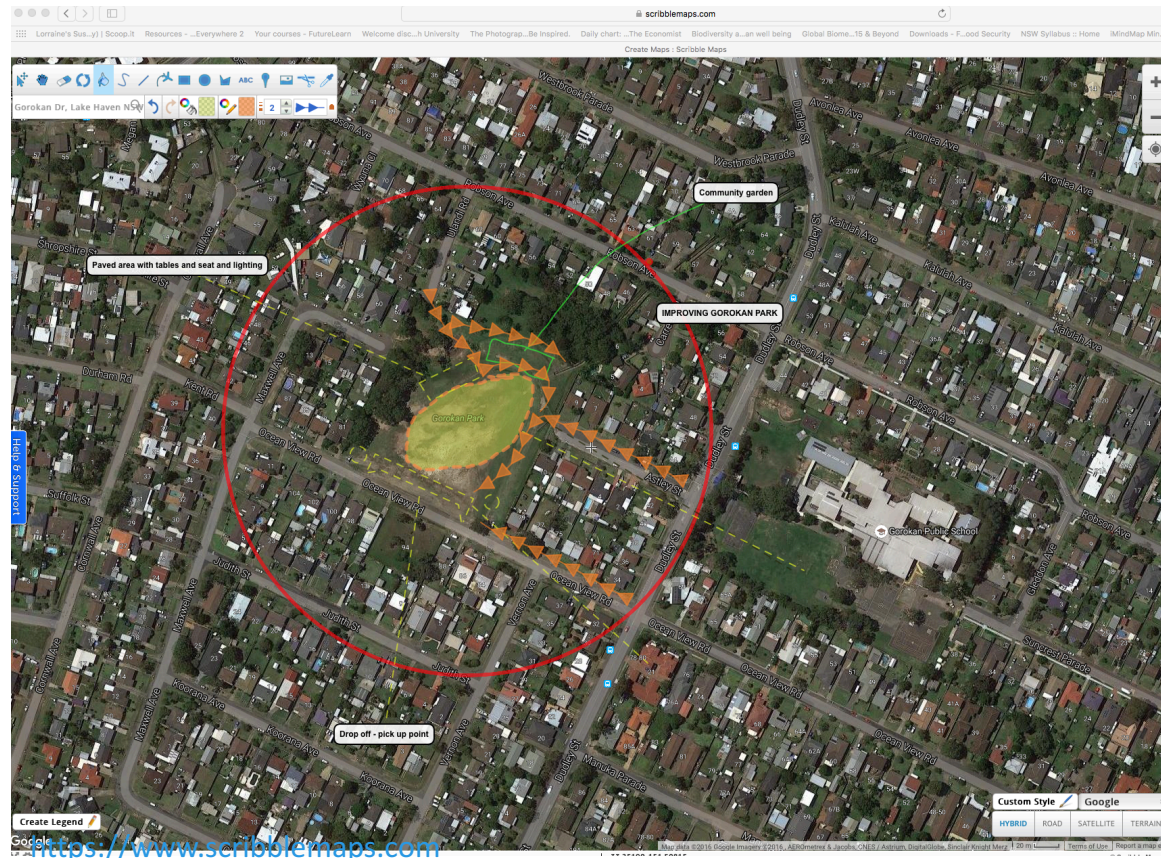
See how people are using Tour Builder

From a nonprofit documenting its global missions, to a teacher transforming American history - check out the inspiring stories that people are creating using Tour Builder.



<https://tourbuilder.withgoogle.com>

4. Scribble maps



Liveability
Landscape /
environmental
management
and protection

Screen captures L Chaffer

Authentic task – A proposal to improve the liveability of a local place



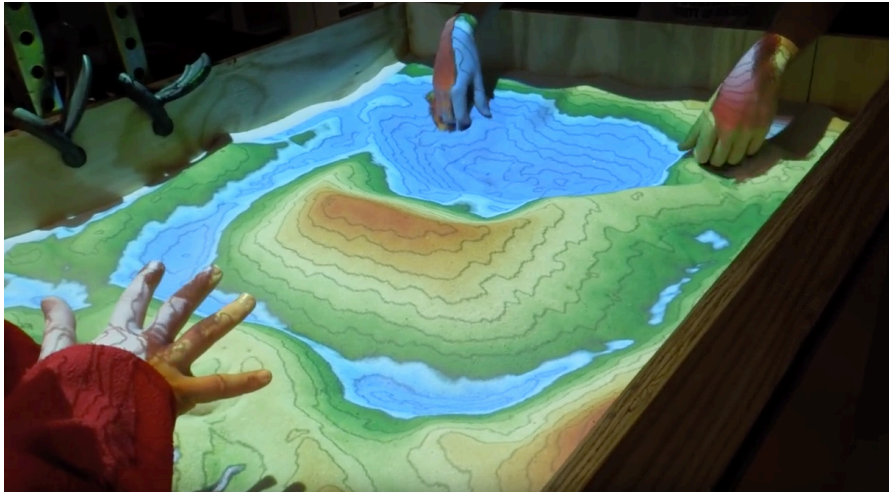
<https://www.scribblemaps.com>

Enhance the liveability of a place

Design a protected area

Screen captures L Chaffer

5. Augmented Reality & virtual reality



Screen capture

<https://www.youtube.com/watch?v=Ki8UXSJmrJE>



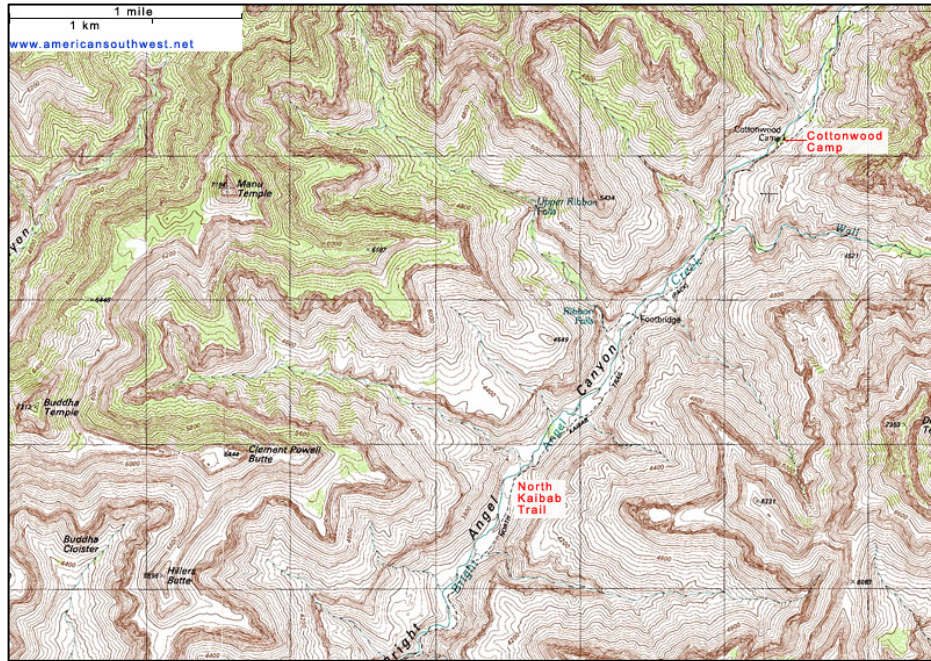
Example: Google expeditions

<https://www.theguardian.com/technology/2016/jun/13/best-virtual-reality-apps-smartphone-iphone-android-vr>
<https://edtech4beginners.com/2016/11/14/a-fantastic-virtual-reality-app-fulldive/>



Screen capture

6. Flyover & streetview: visualising place & space



Google Earth flyover
Google Earth 3D layer

<http://www.americansouthwest.net/topo-maps/north-kaibab-trail2.jpg>

7. 360 degree photographs / drone footage



<http://www.airpano.com>

<https://www.airpano.com/files/the-twelve-apostles-australia/2-2>

Screen capture

Google Map • 360° Aerial Panoramas



AIRPANO



<https://www.airpano.com/files/the-twelve-apostles-australia/2-2>

Screen capture <http://www.airpano.com>

8: Interactive games / Apps

(must have a spatial component)

Run the River (MDBA / Water / Environmental management)

Run that Town (Urban / Liveability) (ABS)

ABS Spotlight (Liveability / urban)

Stop disasters (Landforms / water)

Catchment detox (Water)

Ayiti Cost of a Life (Wellbeing)

Stop disasters (Landforms /Water)



www.stopdisastersgame.org

www.mdba.gov.au

www.runthattown.abs.gov.au

www.abc.net.au/science/catchmentdetox/files/home.htm

<https://ayiti.globalkids.org/game/>

<http://spotlight.abs.gov.au>

<http://www.stopdisastersgame.org/en/home.html>

Planning student activities

When planning the integration of spatial technologies link to the syllabus –outcomes, inquiry questions, inquiry focus, content area

Template : Planning scaffold



Template on USB created by L Chaffer

TEMPLATE 3 CREATING STUDENT ACTIVITIES USING SPATIAL TECHNOLOGIES

TOPIC: _____

Area of content:

Identified outcomes

ICT application(s) / website(s)

Key inquiry question(s)

Geographical inquiry focus of the student activities

- Acquiring geographical information
- Processing geographical information
- Communicating geographical information

ACTIVITY (ies): Step by step instructions

TEMPLATE 2: Spatial technologies planning document

Units	National Geographic Mapmaker	Google Earth Elevation OR Global Elevation ESRI	Google Tour Builder	Scribble Maps	Other eg VR
Stage 4					
Water in the world					
Place and liveability					
Landscapes and landforms					
Interconnections					

Template : Mapping grid



Map where you could
different spatial
technologies in the
content areas of the
syllabus

Suggested activities



Year Prep: People live in places	
Key inquiry questions	
<ul style="list-style-type: none"> • What are places like? • What makes a place special? • How can we look after places we live in? 	
Year Prep toolkit	
What are places like?	
Learning experiences and teaching strategies	Spatial resources
Use an online virtual 3D globe, satellite image viewer or map to view places that are familiar to students such as their house, the school, local shops, parks or main roads in the area.	Online map services ^{vi} Google Earth ^{vi}
What makes a place special?	
Learning experiences and teaching strategies	Spatial resources
Collect data on a field trip to a special place close to the school. Record location, take photographs and field sketch at each site. Collate all of this material into a virtual field trip.	Google Tour Builder ^{vii} MapStory ^x
How can we look after places we live in?	
Learning experiences and teaching strategies	Spatial resources
Ask students to create a map either on a computer, tablet or interactive whiteboard the highlights places in the local area that need management, looking after or special care. Use appropriate symbols to represent features.	Scribble Maps ^x Umapper ^{xi} Mapbox ^{xii}

TEMPLATE 1: Integrating tools and inquiry skills to create learning activities								
STAGE	GEOGRAPHICAL TOOLS					GEOGRAPHICAL INQUIRY SKILLS		
	Maps	Fieldwork	Graphs & Statistics	Spatial Technologies	Visual Representations	Acquiring	Processing / Representing	Communicating
4	Types of maps Sketch maps, Relief maps, Political maps Topographic maps ✓ Flowline maps, Choropleth maps, Isoline maps, Précis maps, Cartograms, Synoptic charts Maps to identify direction, scales and distance, area and grid references, latitude and longitude, altitude, area, contour lines, gradient, local relief	Activities Observing measuring, collecting and recording data ✓ Developing and conducting surveys and interviews Fieldwork instruments Weather instruments, vegetation identification charts, compasses, GPS, GIS	Data tables Types of graphs Pie Graphs Column graphs Compound column graphs Line graphs Climate graphs Population profiles ✓ Multiple tables and graphs on a geographical theme Statistics to find patterns and trends	Virtual maps Satellite images ✓ GPS GIS	Photographs Aerial photographs Illustrations Flow charts Annotated diagrams ✓ Multimedia sources Field sketches Cartoons Web tools	Landscapes and landforms <i>Example: Use topographic maps and satellite images to identify distinctive landform features in a place</i> <i>Example: Use VR headsets and programs to investigate the features of a landscape eg Himalayas using National Geographic Horizons</i>	<i>Example Use National Geographic Mapmaker to analyse maps showing population density and hazard hotspots. Answer the inquiry question – which areas of the world are most vulnerable to Geomorphic hazards.</i>	<i>Example Present a short talk to the class justifying the classification of one World Heritage protected landscape. Your talk will include a Google flyover of the selected location pointing out significant features and the importance of protection and good management.</i>
					Place and liveability <i>Example: Use a liveability criteria checklist developed by students in class to assess the liveability of several streets in a place using Google Street View.</i>	<i>Example: Create a digital field sketch of a place visited during fieldwork to show differences in liveability between at least three locations. Use an App such as Sketch.</i>	<i>Example: Students show suggested proposals to enhance the liveability of a local public places using Scribble Maps, annotated Satellite images or Minecraft.</i>	

QLD SPATIAL EDUCATORS TOOLKITS
Foundation (K) – 6 and 7-10

<https://www.dnrm.qld.gov.au/qsic/spatial-education/queensland-spatial-educators-toolkit>

PLANNING TEMPLATE Lorraine Chaffer

Further reading



AGTA ANNOUNCES AN ESSENTIAL NEW GEOGRAPHY RESOURCE
Geography Skills Unlocked is an exciting new skills book for Australian secondary schools

Geography Skills Unlocked is published by the Australian Geography Teachers Association and written by a team of experienced Geography teachers.

KEY FEATURES:

- Contents aligned to the inquiry and skills-based requirements of Australian Curriculum: Geography
- An engaging, easy to navigate design
- A student friendly approach with step-by-step explanations, descriptions and worked examples
- A focus on emerging technologies used to gather, analyse and present geographical data
- Geoskills and Geoinquiry activities that scaffold student learning
- A wealth of stimulus material including a diverse range of maps, graphs, aerial photographs, satellite images, diagrams and photographs
- Examples drawn from each Australian state and territory with additional international material
- Key terms explained in embedded glossary boxes

Geography Skills Unlocked will be published mid 2016 and will be available for purchase via the AGTA website: www.agta.asn.au/Products

Geography Skills Unlocked
 Chapter 5 : Geospatial technologies pp 67-73
 Chapter 11: Spatial technologies : pp 143-149

GEOGRAPHY BULLETIN

The Geography classroom: Inside and out

Volume 47 No 2 2015

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- DETROIT - A large city of the developed world
- NEW ZEALAND - The Decline of Detroit in Five Maps
- DRONES, ICT in action
- Geography in the Real World
- Yosemite: The Ultimate Guide

PROJECTS • REPORTS • RESOURCES • ARTICLES • REVIEWS

GTA NSW Geography Bulletin (copy on USB)
 Vol 47 No 2 2015
 Integrating spatial technologies into the Geography Classroom

Integrating spatial technologies into the Geography Classroom

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 Geography Education Consultant

Spatial technologies are specifically referred to in the Australian Curriculum: Geography and NSW Geography Syllabus K-10 (2015). They are geographical tools, to be used by students along with maps, graphs and statistics, fieldwork and visual representations such as diagrams to acquire, process and communicate geographical information.

What are spatial technologies?
 Spatial technologies include any software or hardware that interacts with real world locations. Examples include, but are not limited to, virtual maps, satellite images, global positioning systems (GPS), geographic information systems (GIS), remote sensing and augmented reality. Spatial technologies are used to visualise, manipulate, analyse, display and record spatial data.

http://syllabus.bos.nsw.edu.au/html/geography_k10/geographical_tools/

The NSW K-10 Geography Syllabus 'Continuum of Tools' gives examples of spatial technologies that could be used at each stage of geographical study. It is intended that students will become familiar with a range of tools at each stage, progressing from their use for acquiring geographical information in early stages of learning to representing, analysing and communicating geographical data and their findings from geographical inquiry in later years.

Continuum of Tools NSW K-10 Geography 2015

Stage	Spatial Technologies
1	Virtual maps Satellite images
2 & 3	Virtual maps Satellite images Global positioning systems (GPS)
4	Virtual maps Satellite images Global positioning systems (GPS) Geographic information systems (GIS)
5	Virtual maps Satellite images Global positioning systems (GPS) Geographic information systems (GIS) Remote sensing data Augmented reality

http://syllabus.bos.nsw.edu.au/html/geography_k10/continuum_of_tools/

Challenges for teachers
 The challenge for many teachers is overcoming a lack of confidence with spatial technologies, a shortage of time to learn and a fear of failure.

I have found that most spatial technologies applicable for use in schools can be mastered given time and perseverance. Teachers can build skills and confidence slowly by

1. Choosing one tool at a time eg. Google Maps, NSW Globe, Google Earth, National Geographic, Mapmaker Interactive
2. Using one selected tool wherever possible until confident in the ability to integrate its use into topics currently being taught.
3. Using online tutorials
4. Limiting activities to one aspect of the selected tool at a time
5. Implementing for the first time into classes with students quick to learn and willing to help each other and their teacher.
6. Ensuring computers have the required software and the school system supports its operation
7. Always having a PLAN B in case of issues with ICT (Making this a practical activity eg. a simple fieldwork activity in the school grounds using prepared worksheets and toolkits will limit student disappointment)

"The introduction of spatial technology into the curriculum is more than just about the introduction and use of a new technology but really is concerned with engaging students in meaningful spatial learning."

"By now most teachers have heard, if not participated in spatial technology activities. However for many the steps towards introducing spatial technology and related concepts into their classroom are daunting, if not insurmountable. There is a range of impediments to the introduction of spatial technology in the classroom. They included factors such as software

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BE WHO YOU WANT TO BE



DISCOVER SPATIAL

MEET PEOPLE

EXPLORE STUDY OPTIONS

CHECK OUT PROJECTS

GRAB OPPORTUNITIES

For Students



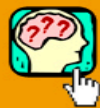
For Parents



For Teachers



For Upskillers



Spatial Science Career Pathways



DISCOVERING SPATIAL SCIENCE



What is Spatial Science?

Know Google Earth ?

Then YOU already know Spatial Science

Scroll down or check the links at right for more information

Spatial Science is typically concerned with the measurement, management, analysis and presentation of spatial or location based information describing the Earth, its physical features on both land and water, and our man-made environment.

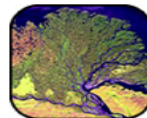
Spatial Science is a collection of academic subjects or disciplines including —



Surveying



GIS



Satellite Imagery



Visualisation



Maps and Charts

SPATIAL IN ACTION

What's it all about?

How we got here

Why do we need it?

What is GIS?

The power of GIS

GIS Zone introduction

A Life Without Limits - Surveying

About Spatial Science

Geography & Social Science

Layers of our World

How we get there

Cutting edge science

What is Remote Sensing?

Aerial Photography

Terrains : the musical

Geomatic Technologies

The future of GIS

G-I-S State of Mind

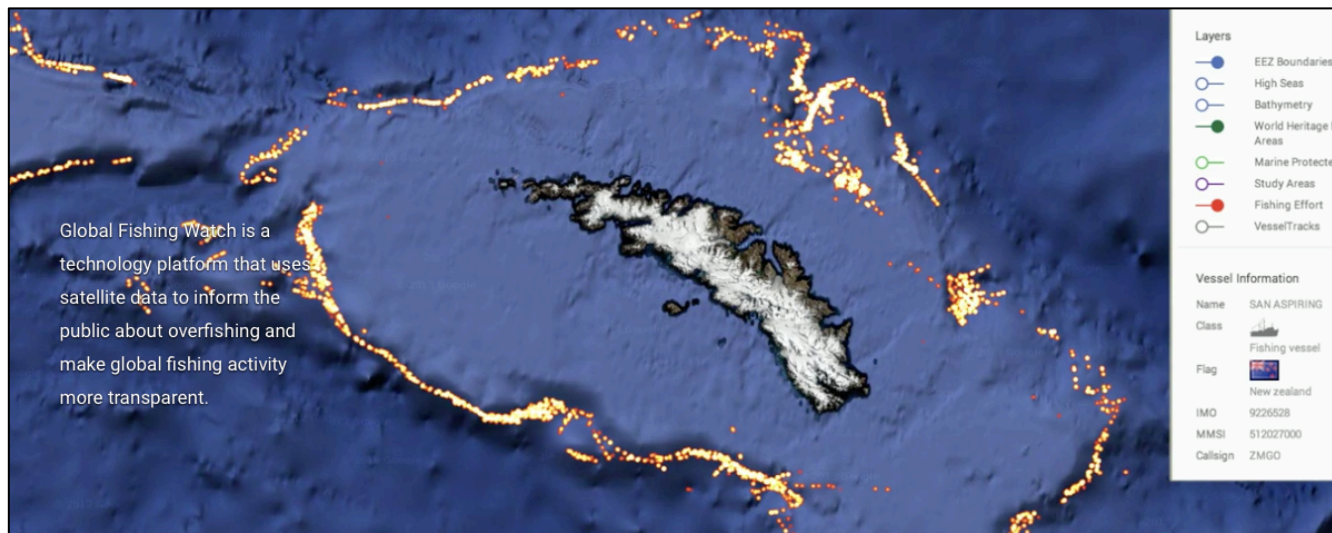
Spatial technology careers

Management and protection
Law Enforcement
Planning

Spatial technology: real world links

Citizen Science / open source mapping

Environmental monitoring : Global fishing watch



<http://globalfishingwatch.org>

Others include: Ship finder, plane finder, forest watch

ENGAGING CITIZENS IN ENVIRONMENTAL MONITORING

Geo-Wiki

- » Home
- » News
- » Publications
- » Downloads
- » Sources

Games

- » Picture Pile
- » Picture Paint
- » FAQ

Land-Cover Geo-Wiki

Since large differences occur between existing global land cover maps, current ecosystem and land-use science lacks crucial accurate data (e.g. to determine the potential of additional agricultural land available to grow crops in Africa). **Volunteers** are asked to review hotspot maps of global land cover disagreement and determine, based on what they actually see in Google Earth and their local knowledge, if the land cover maps are correct or incorrect. Their input is recorded in a database, along with uploaded photos, to be used for the **creation of a new and improved global land cover map.**

Land-Cover

Landcover: [input field]

Legend:

- Corrected disagreement
- High level disagreement
- Low level disagreement
- Land cover disagreement
- Land cover disagreement
- Low level and high level disagreement
- High level and low level disagreement
- High level and low level disagreement

Login

Email: [input field]

Password: [input field]

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Try as guest

Administration

- » Smartphone Legends

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Final comments / questions
