

# Spatial Technologies

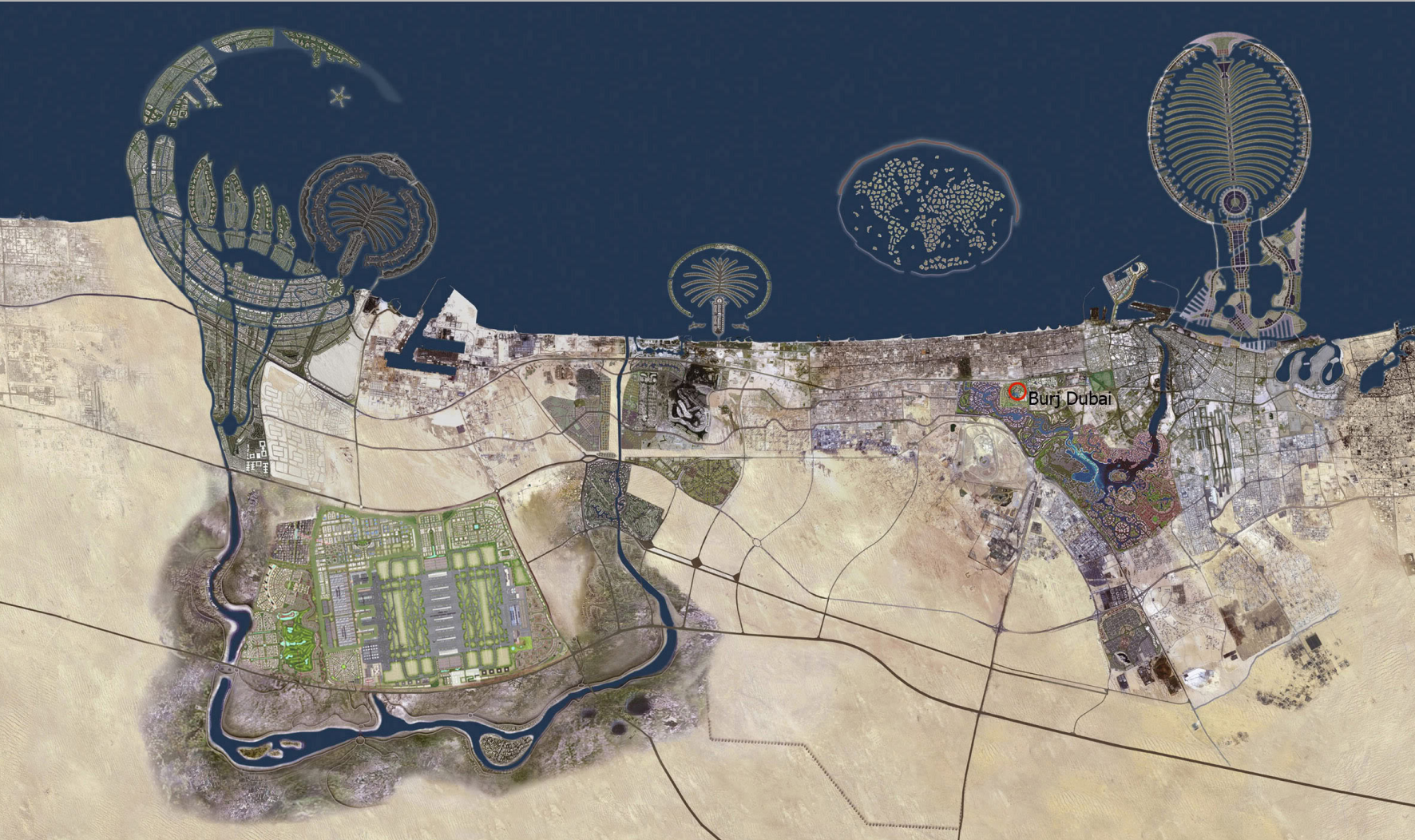
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Lorraine Chaffer  
GTA NSW President 2017



<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**
- Fieldwork
- Websites / textbooks

The  
Geography  
advantage

# Spatial technologies

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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.

# Tools continuum

## K-10 GEOGRAPHICAL TOOLS CONTINUUM

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

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

# GIS and GPS

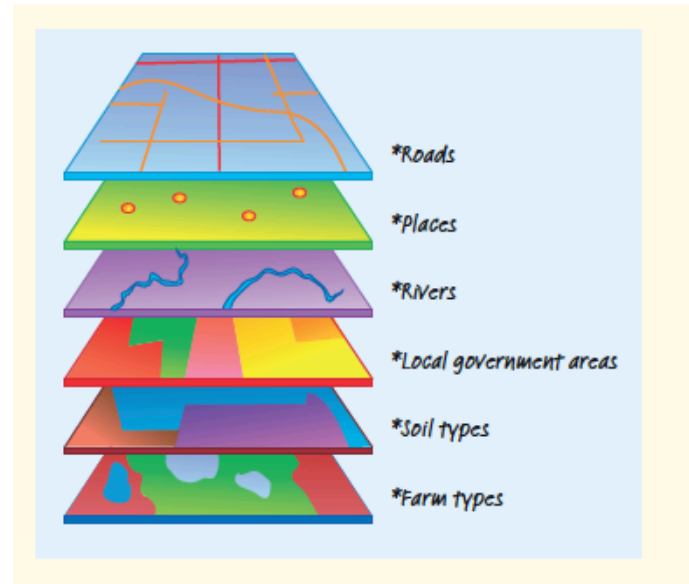
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## GPS

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 system

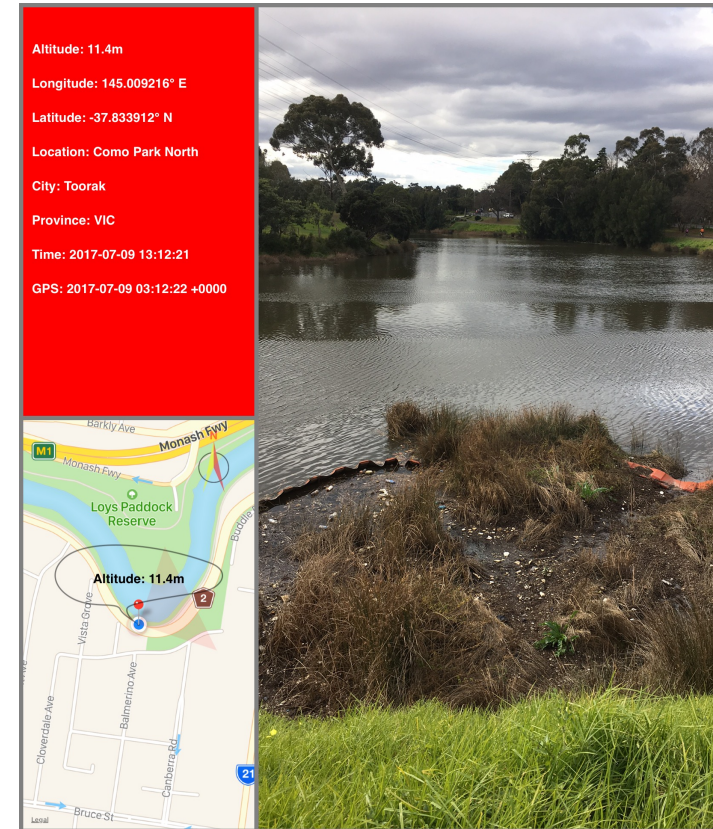
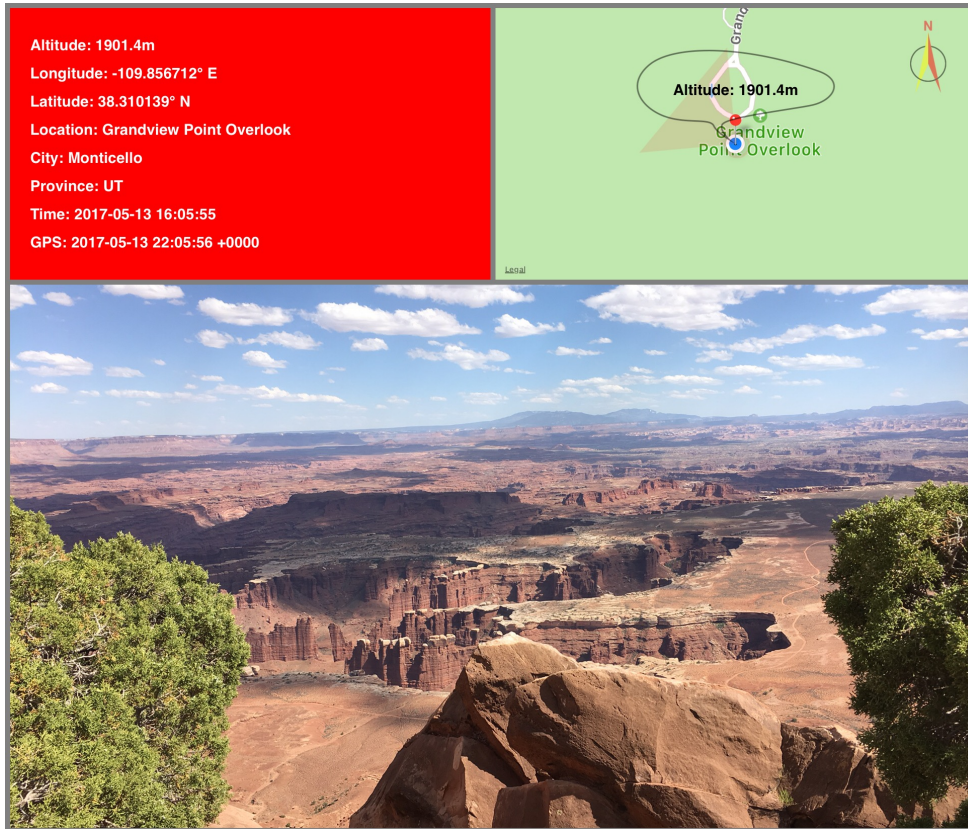
The **digital plotting of spatial data** to create visual images is a GIS e.g. Google Earth

Syllabus glossary

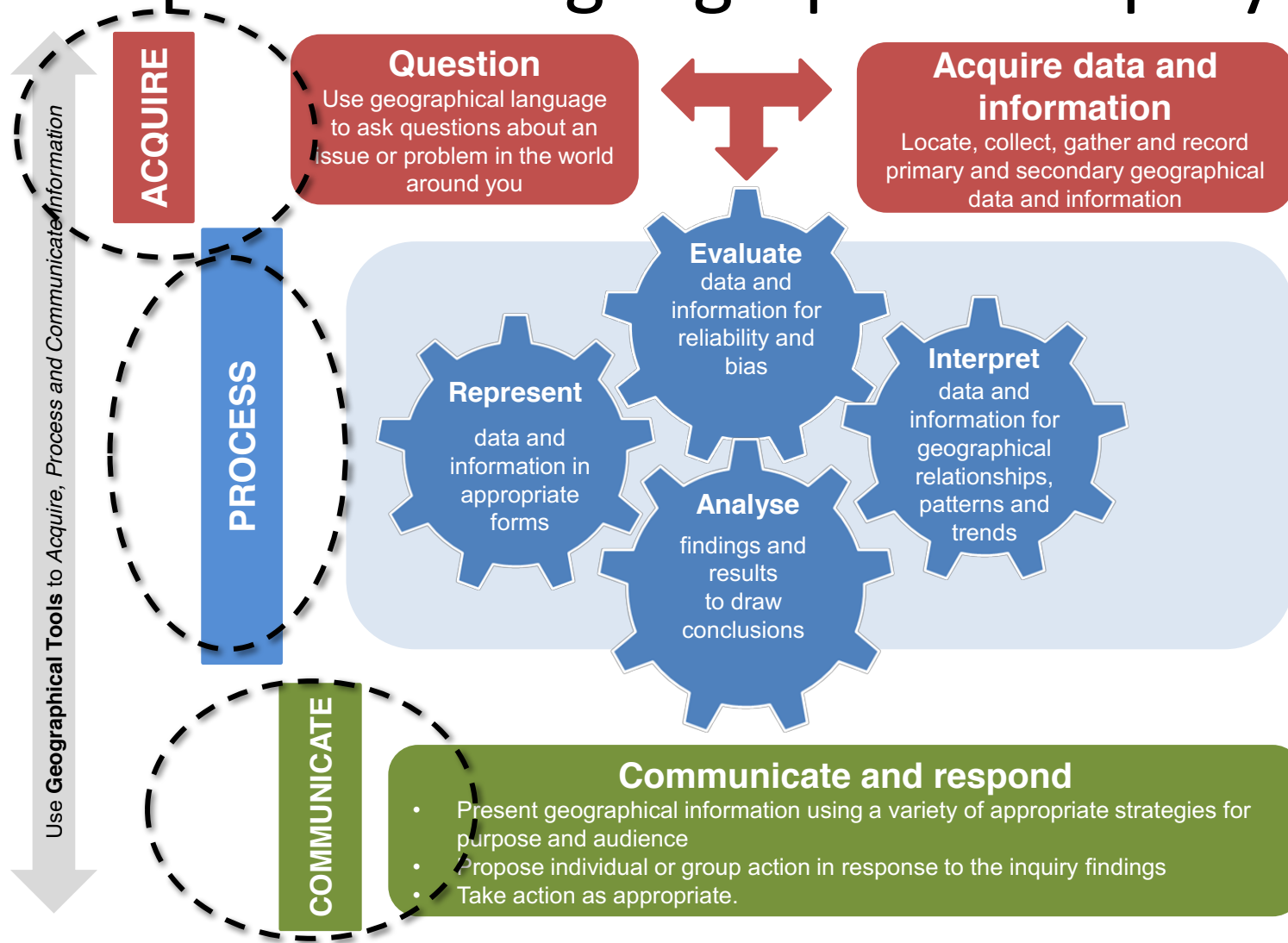
GPS: Navigation systems that provide location and time information anywhere there is a line of sight to GPS satellites.

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

# Tablet / phone camera apps & GPS



# A process for geographical inquiry



Spatial technologies are tools for inquiry

Image : [www.hsiensw.com](http://www.hsiensw.com)

# Planning

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



# Mapping

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

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

Template : Mapping grid

# Simple Spatial Technologies

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SPATIAL TECHNOLOGY APPLICATIONS

SEE DOCUMENT WITH LINKS



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

# Acquiring, interpreting & analysing

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National geographic mapmaker  
& similar

Biome viewer app

Real world / real time GIS

# 1. National Geographic mapmaker



Created by L Chaffer

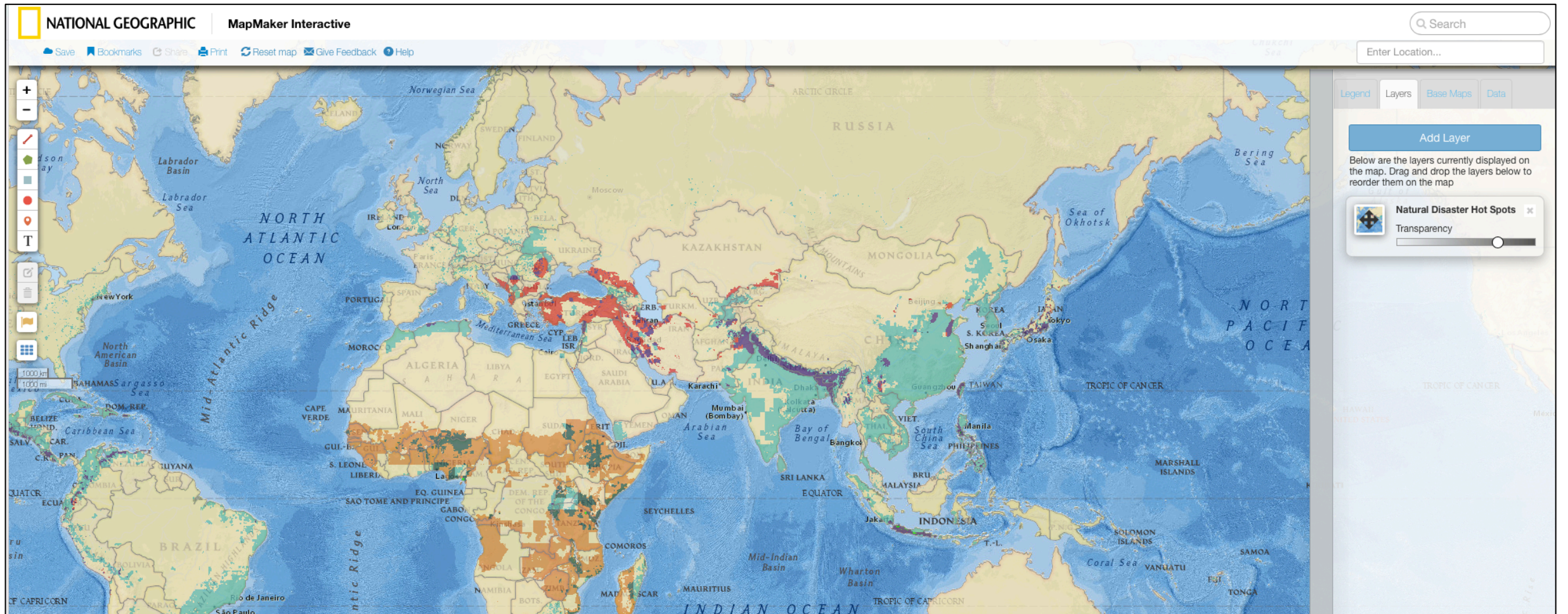
1. Select a base map
2. Select the map scale eg World, Australia
3. Select layers to create a map - human or natural features

<http://mapmaker.nationalgeographic.org>

Exploring spatial patterns / answer simple inquiry questions / acquiring information

HOT

Analysing relationships / synthesise interconnections / answer complex inquiry questions



## Inquiry question

Where are the global hotspots for geomorphic hazards ? (Acquiring information)

NATIONAL GEOGRAPHIC | MapMaker Interactive

Save | Bookmarks | Share | Print | Reset map | Give Feedback | Help

Enter Location...

Legend | Layers | Base Maps | Data

Add Layer

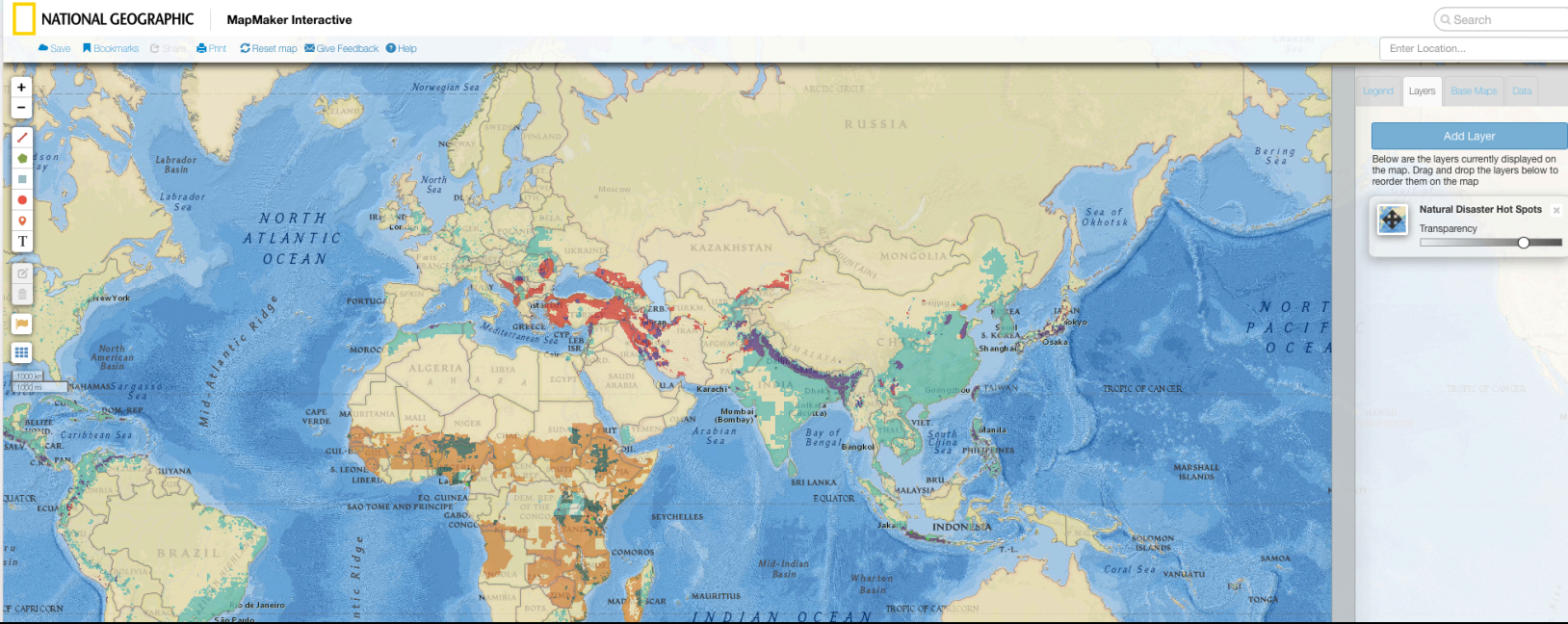
Below are the layers currently displayed on the map. Drag and drop the layers below to reorder them on the map

- Natural Disaster Hot Spots  
Transparency
- Population Density  
Transparency

How is the base map different?  
Is this important?

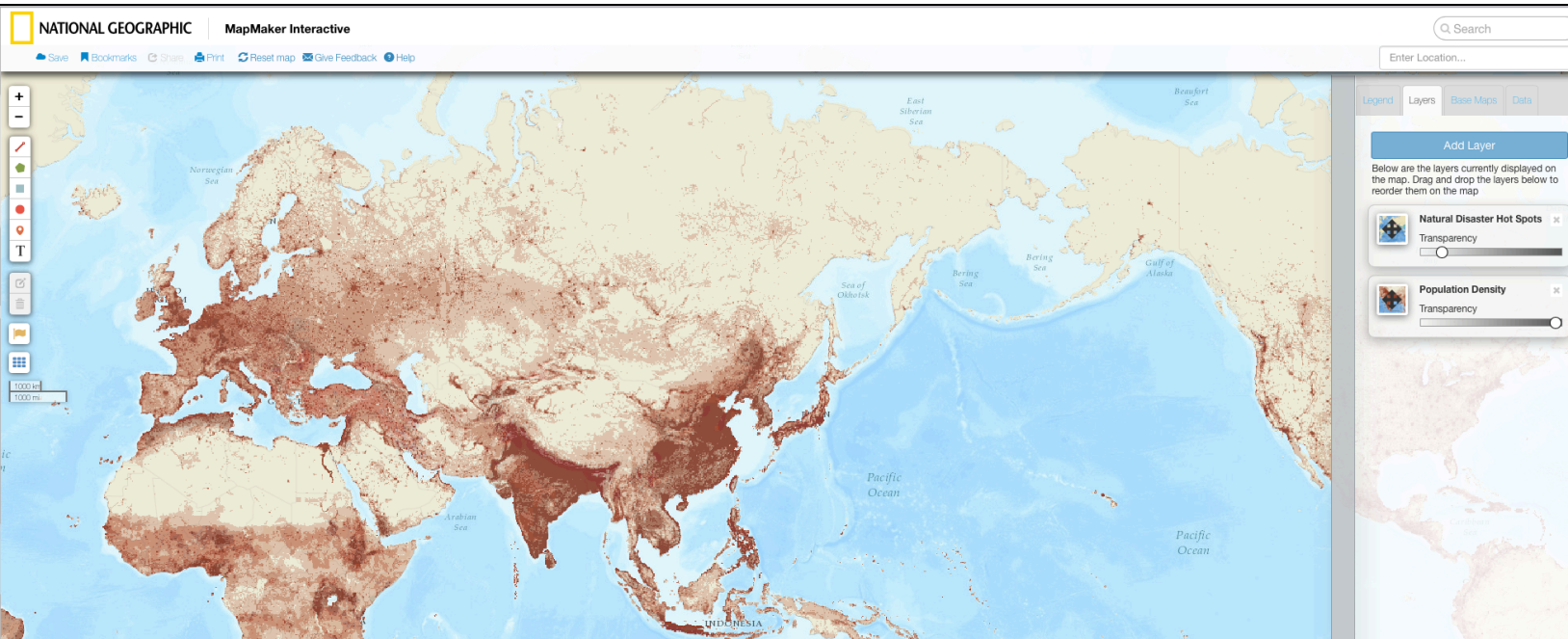
## Inquiry question

Where are the areas of greatest population concentration in the world? (Acquiring information)



## 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>

# Learn the tool

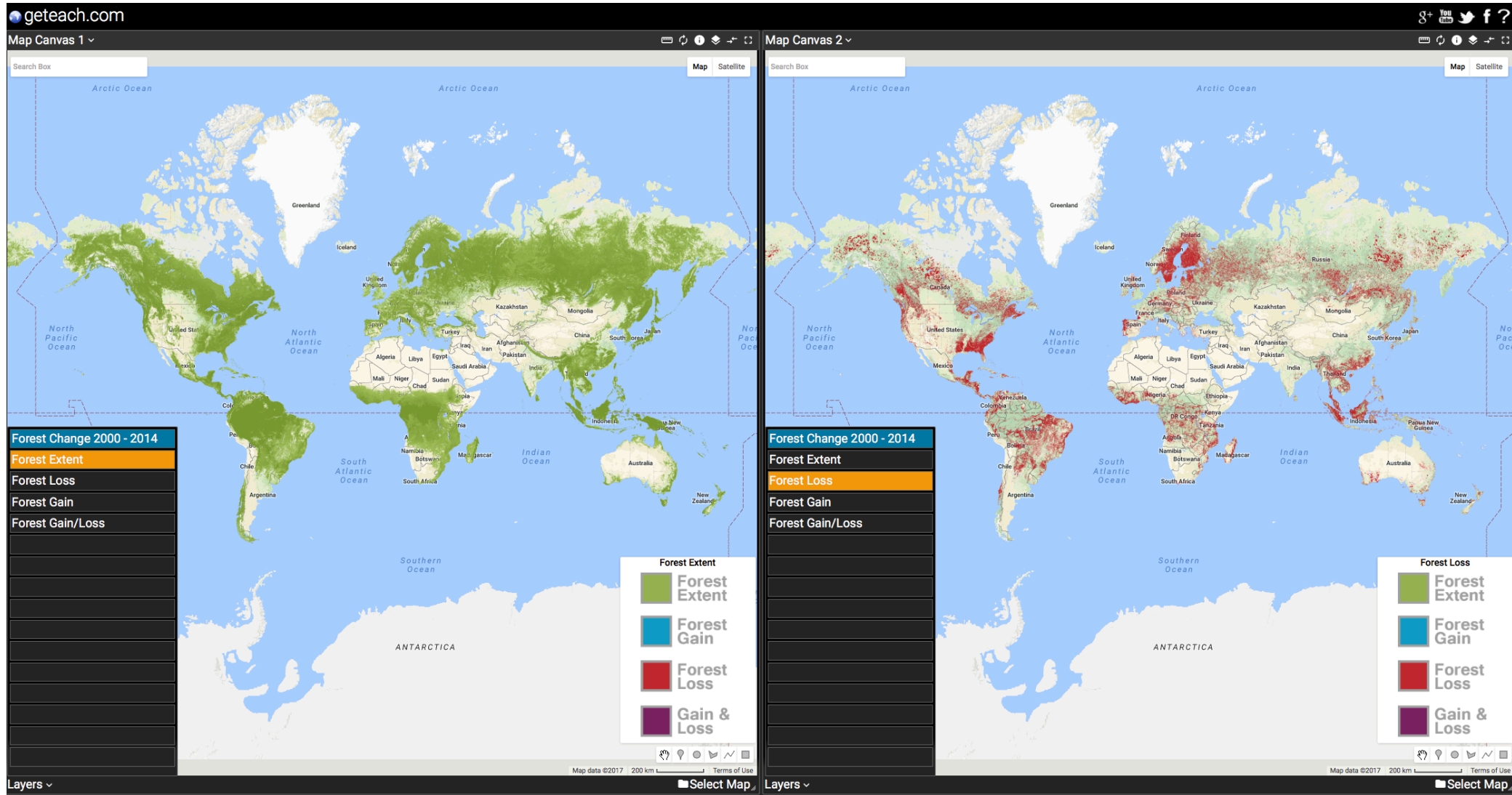
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- Find layers you could use for different content areas
- Find layers that can be used to analyse relationships
- Develop inquiry questions
- Differentiate - challenge talented students



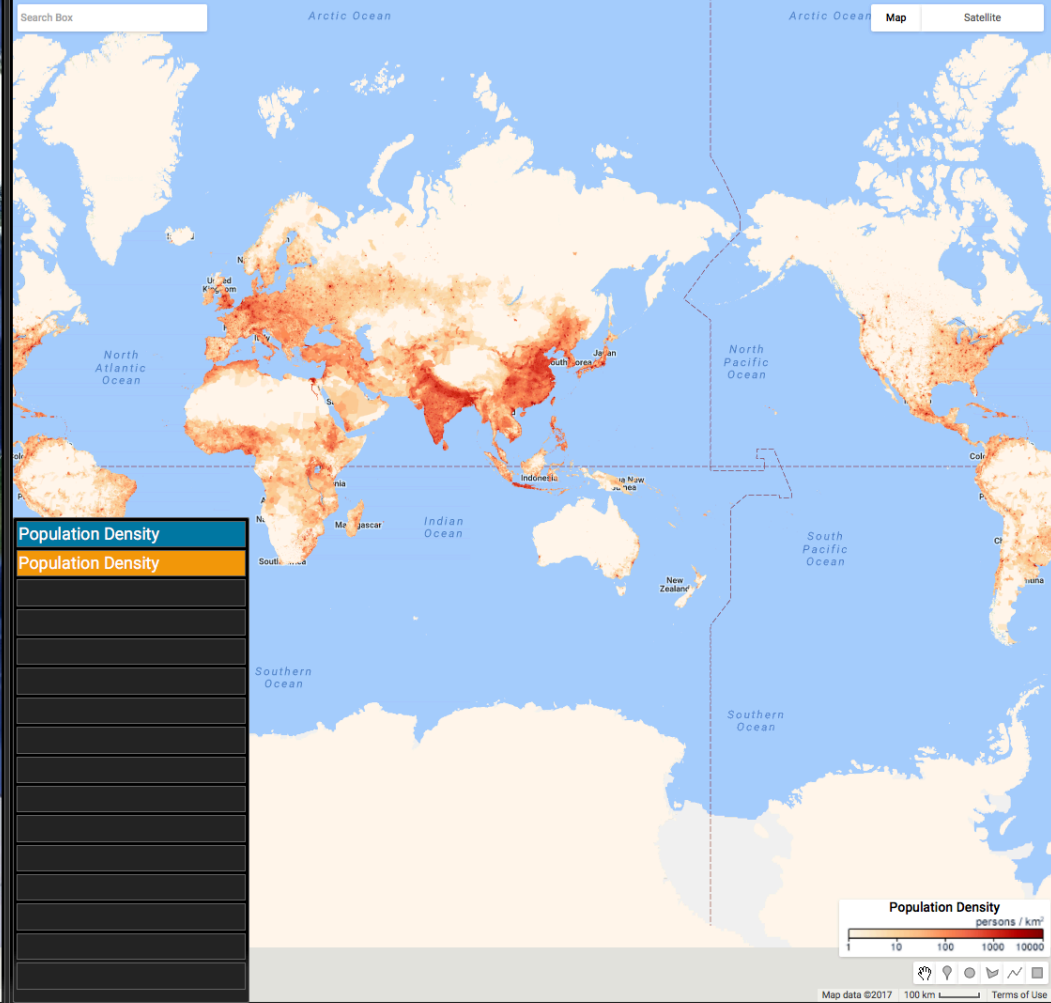
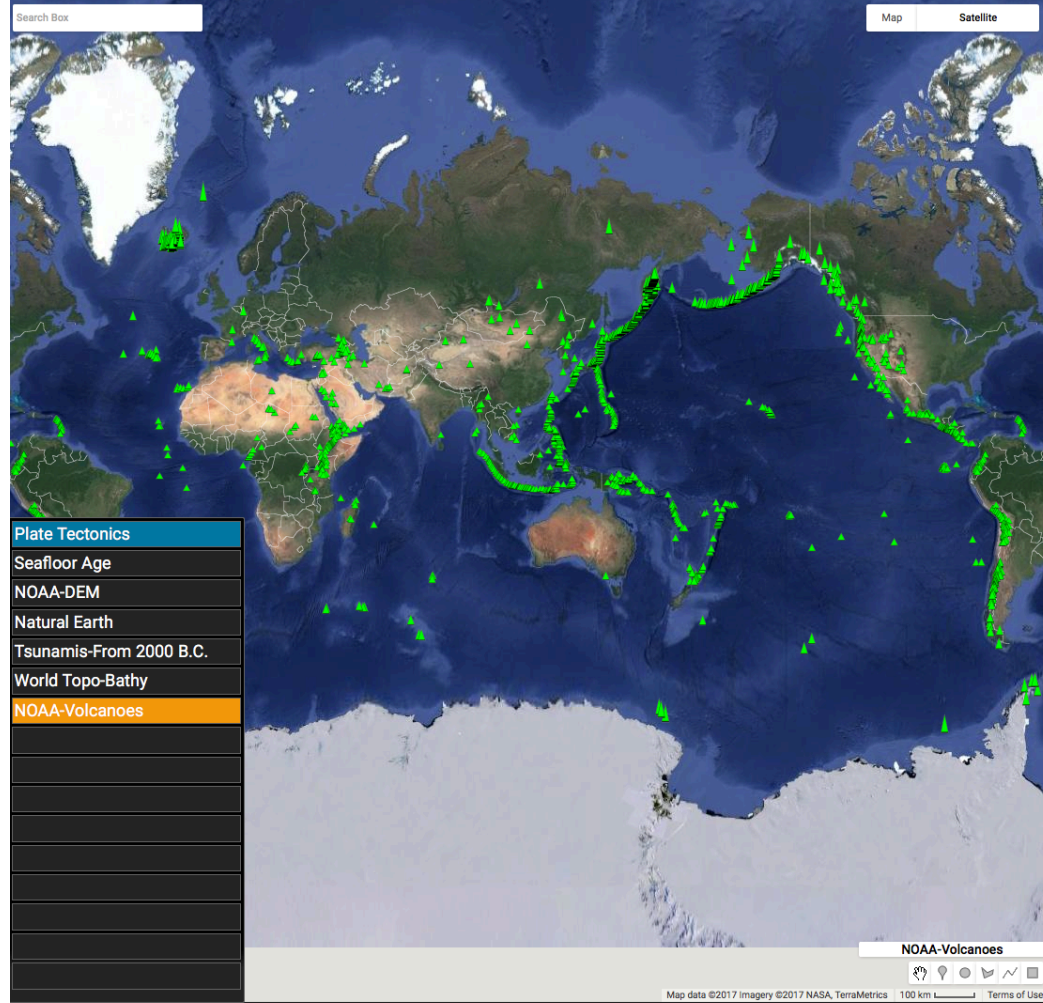
# SOMETHING SIMILAR

<https://www.geteach.com>



Map Canvas 1

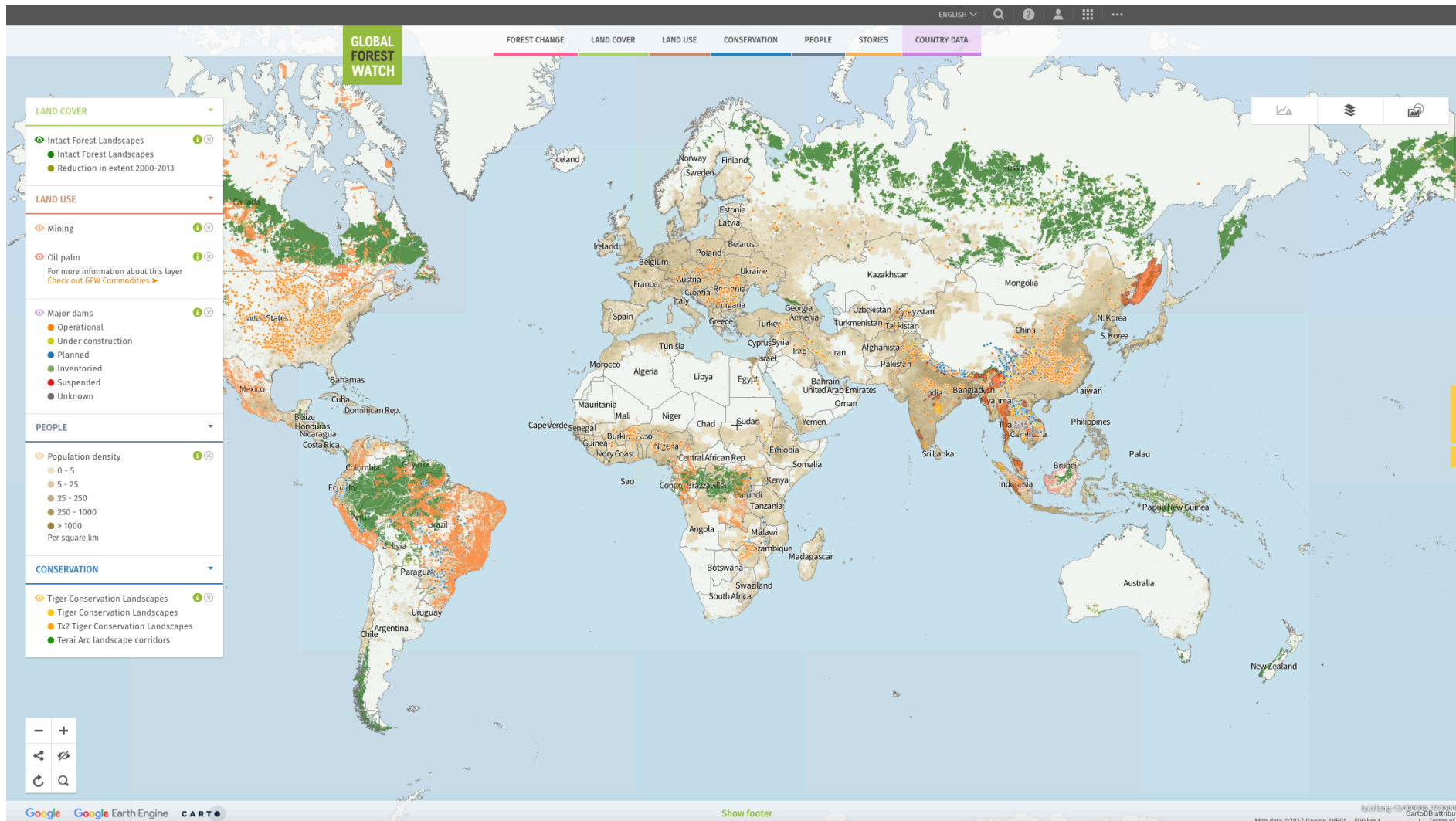
Map Canvas 2



Layers

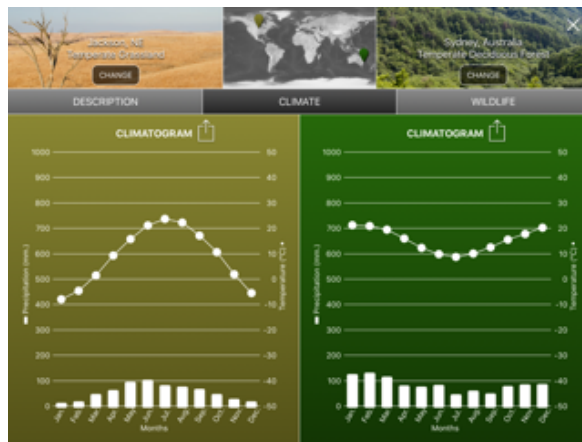
Layers

# SOMETHING SIMILAR



<http://www.globalforestwatch.org>

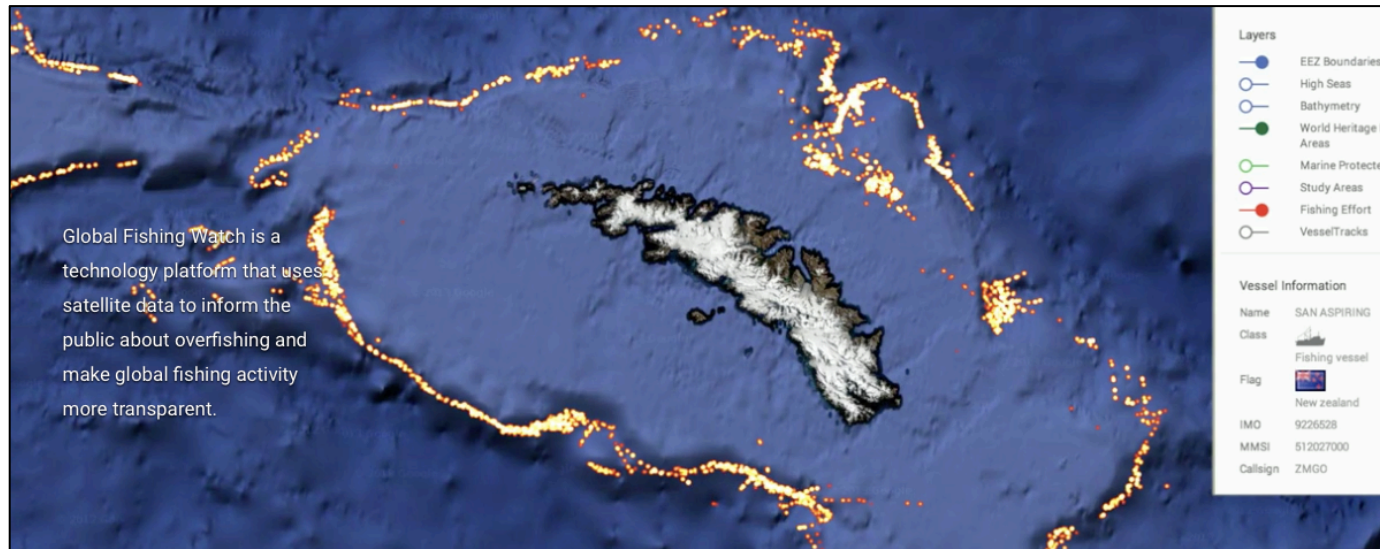
# App - Biome viewer (iPad)



Saves time  
Deeper analysis

# Real world/ real time GIS

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Contemporary issues

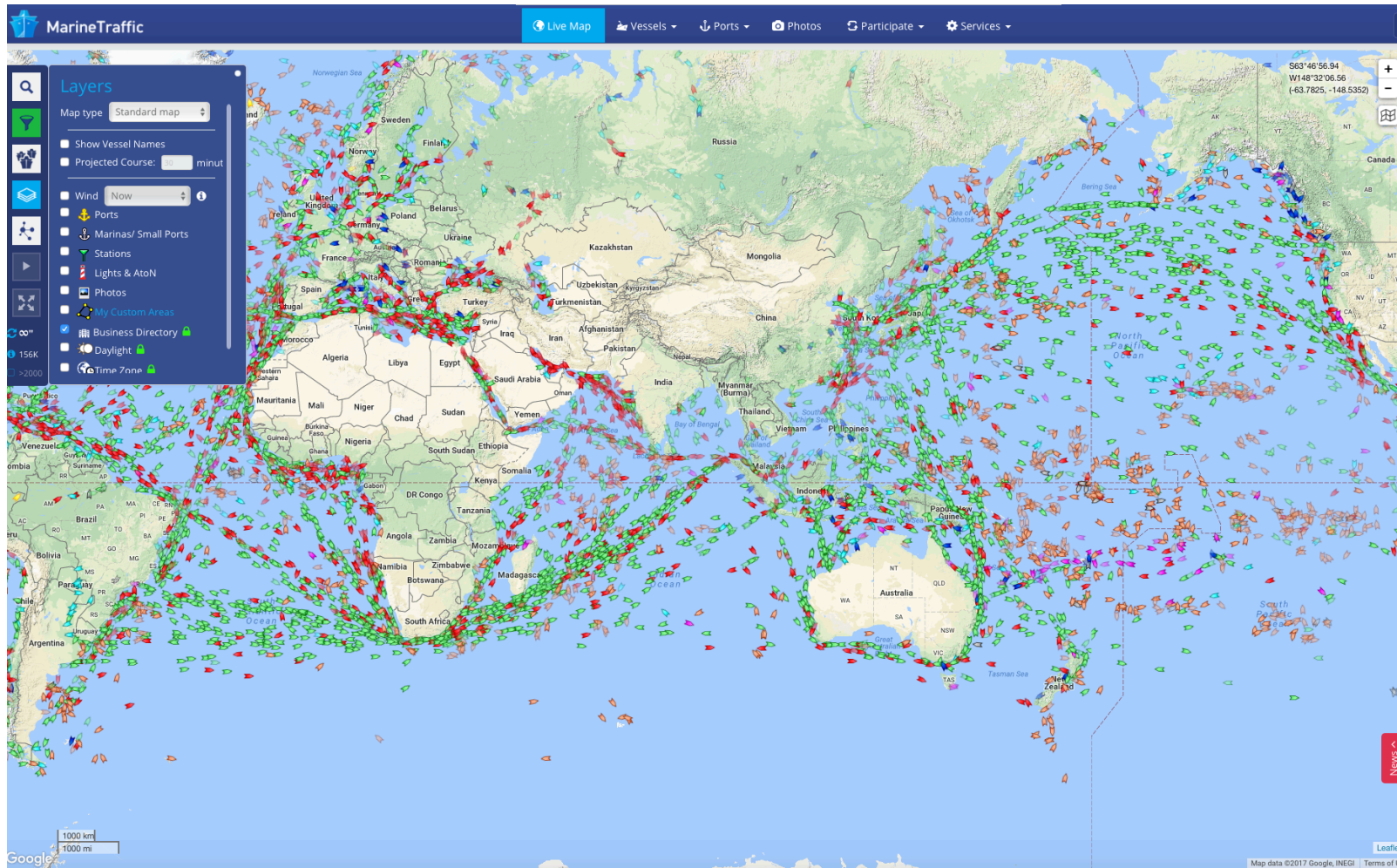
Environmental monitoring : Global fishing watch

<http://globalfishingwatch.org>

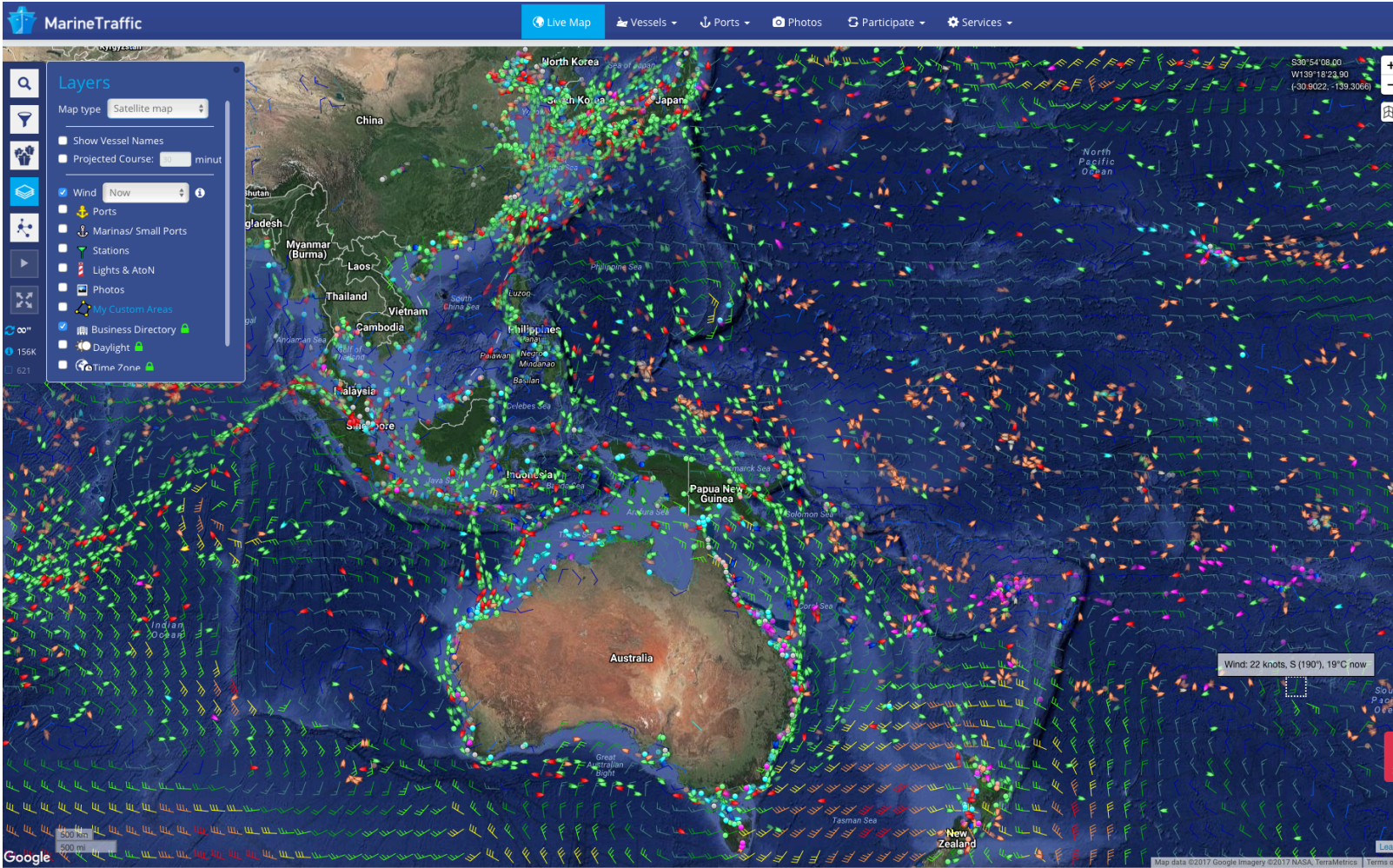
The screenshot displays the Flightradar24 website interface. At the top, there is a navigation bar with the Flightradar24 logo and various menu items like 'Apps', 'Add coverage', 'Data / History', 'Social', 'Press', 'About', and 'Business services'. A search bar is located in the top right corner. The main content area is a map of North America, densely populated with yellow aircraft icons representing live air traffic. The map includes labels for various states and countries, such as New Mexico, Texas, Oklahoma, Florida, Mexico, and the Caribbean Sea. On the left side, there is a sidebar with several sections: 'AIRPORT DELAYS' with a table of airport information, 'TWEETS' with recent tweets, and 'BLOG POSTS' with article titles. At the bottom right, there is a promotional banner for removing ads and links to download the app from the App Store and Google Play.

AIRPORT	ARR	DEP
Nice (NCE)	5.0	4.8
Tunis (TUN)	3.9	5.0
Barcelona (BCN)	2.9	3.5
San Juan (SJU)	3.6	1.7
Zhengzhou (CGO)	0.4	4.8

Flights <https://www.flightradar24.com/multiview/30.25,266.14/7>



Marine Traffic <https://www.marinetraffic.com/>

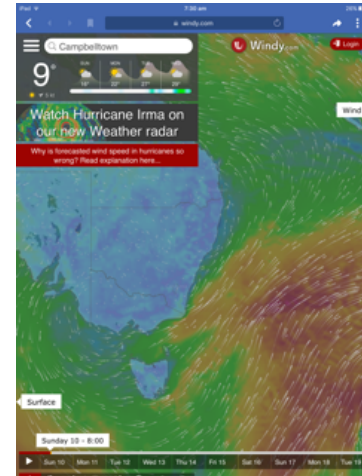




# Wind, weather and ocean systems

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- Earth – <https://earth.nullschool.net>
- NOAA Weather Radar (App)
- Weatherzone - weather radar  
[www.weatherzone.com.au](http://www.weatherzone.com.au)
- WOW – ABM web service – information sharing [www.bom.gov.au/support/](http://www.bom.gov.au/support/)
- Google earth radar – weather layers tab in GE sidebar + animations + forecasts



# Representing, analysing and communicating

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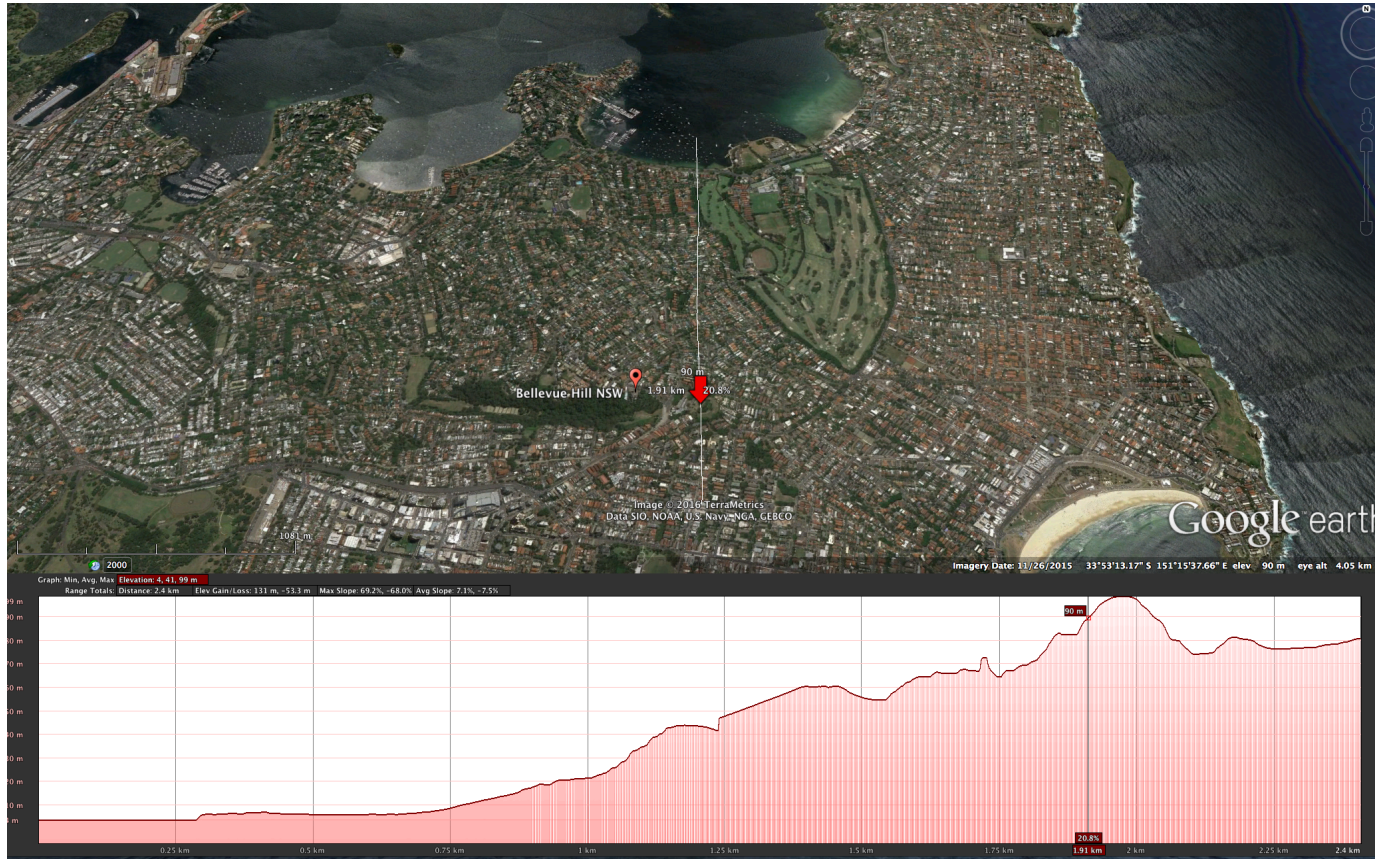
Creating elevation profiles

Google tour builder

Scribble maps

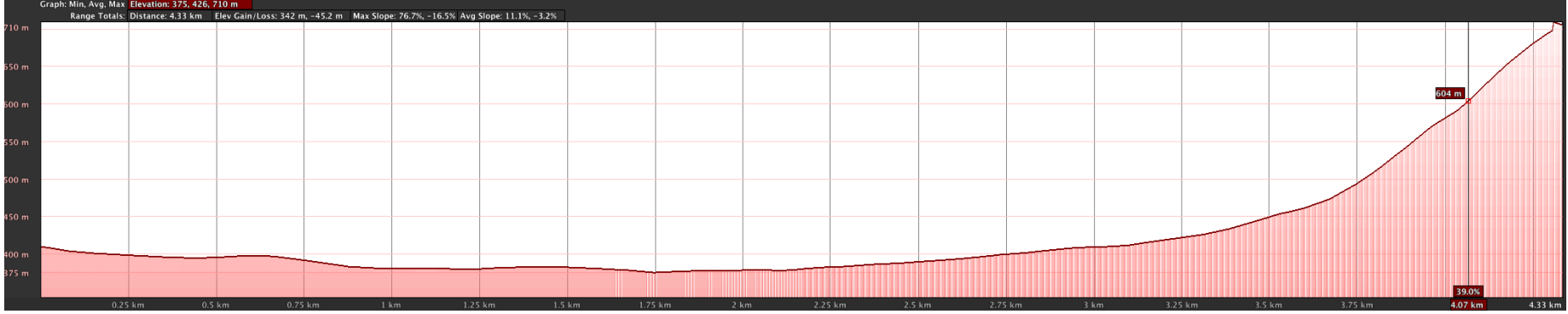
Citizen science

## 2. Elevation profiles – Google Earth



Where could this be used?

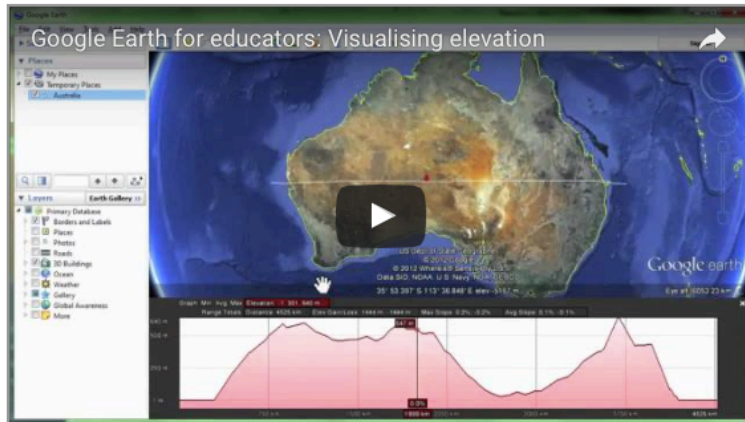
What Geographical inquiry skills are being used?



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>

Spatial Technologies webinar Lorraine Chaffer for GTA NSW

## SPATIAL TECHNOLOGY APPLICATIONS

### 1. NATIONAL GEOGRAPHIC MAPMAKER INTERACTIVE (NGMI)

<http://mapmaker.nationalgeographic.org>

- *Demonstration*
- *Geographical inquiry applications*
- *Links to syllabus content*

#### Tutorials

<https://blog.education.nationalgeographic.com/2014/04/21/mapping-monday-mapmaker-interactive-tutorials/>  
<https://www.youtube.com/watch?v=MpoJaoZ4es>

#### \*\* SIMILAR:

- GETEACH  
<https://www.geteach.com>
- GLOBAL FORST WATCH  
<http://www.globalforestwatch.org>

#### BIOME Viewer App

##### Real world Real time GIS

- Global fishing watch  
<http://globalfishingwatch.org>
- Flights / Flightradar  
<https://www.flightradar24.com/multiview/30.25,266.14/7>
- Marine Traffic  
<https://www.marinetraffic.com/>

### 2. GOOGLE EARTH ELEVATION PROFILE

USE: Google Earth Pro

- *Demonstration* – how to create a digital cross section
- *Geographical inquiry*
- *Links to syllabus content*

#### Tutorial

Spatial Technologies webinar Lorraine Chaffer for GTA NSW

#### Creating an elevation profile in Google Earth

<https://www.youtube.com/watch?v=TZZ-dKOp8NY>

*Blog: Google Earth Elevation Profile*

<https://www.gearthblog.com/blog/archives/2015/04/google-earth-elevation-profiles.html>

#### \*\* SIMILAR:

ESRI GLOBAL ELEVATION (ArcGIS)

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

- *Demonstration*
- *Geographical inquiry*
- *Links to syllabus content*

### 3. GOOGLE TOUR BUILDER

<https://tourbuilder.withgoogle.com>

- *Demonstration*
- *Fieldwork and inquiry applications* - Acquiring, processing and communicating geographical information

#### Tutorials

<https://www.youtube.com/watch?v=M207eNweBI>

<https://www.youtube.com/watch?v=EAvuOSMKU4Y>

<http://googleearthdesign.blogspot.com.au/2014/01/google-earth-tour-builder-howto.html>

*Interesting Blog - refers to Google Classroom and Google Maps as well.*

<http://www.edgaged.net/2016/01/tour-builder-with-google.html>

### 4. SCRIBBLE MAPS

<https://www.scribblemaps.com>

- *Demonstration*
- *Geographical inquiry*
- *Links to syllabus content*

#### Tutorials

An introduction to Scribble maps

<https://www.youtube.com/watch?v=tNvmcQ-6n60>

Using scribble maps and Google Earth for your projects

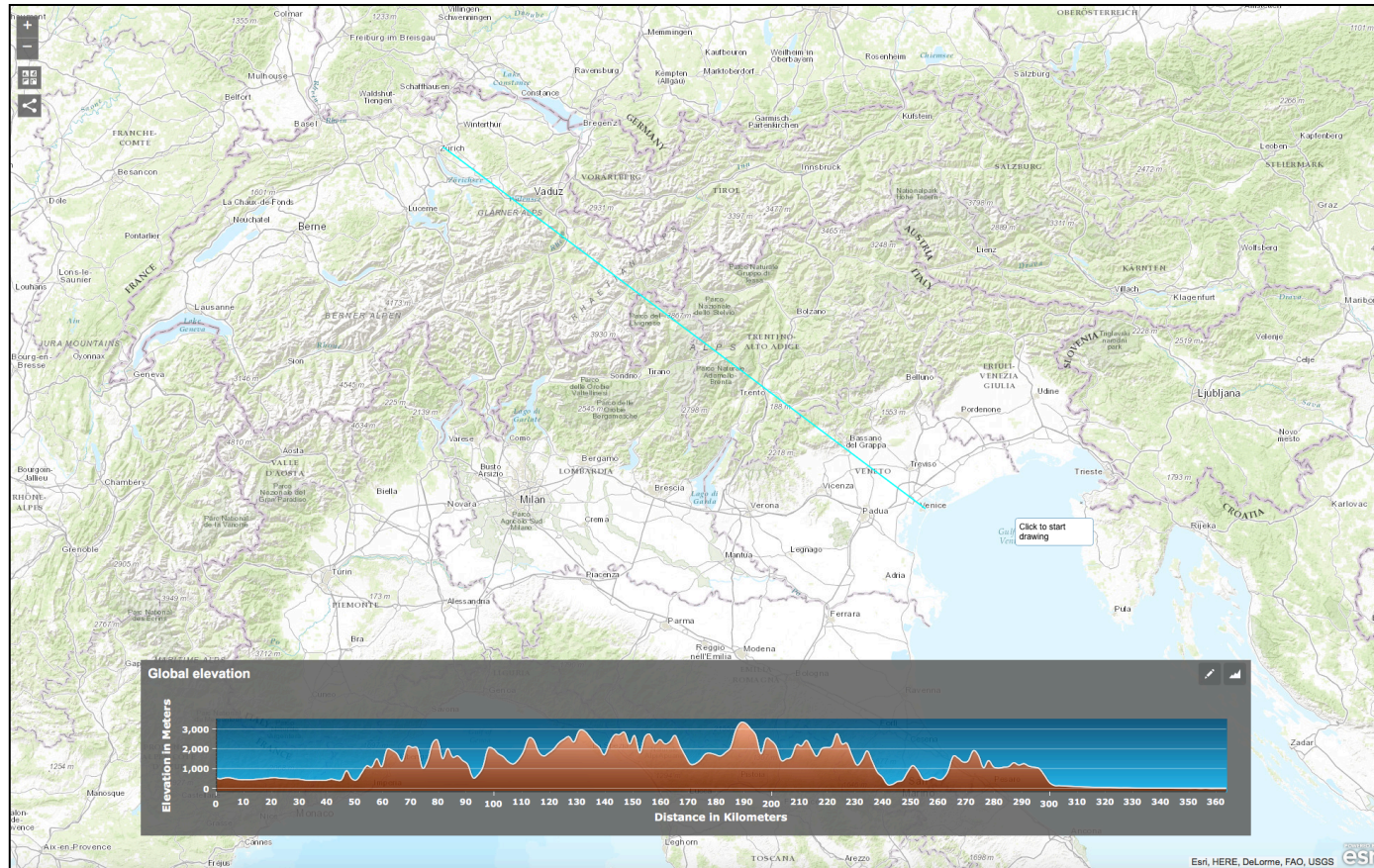
# Relevance

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- Suggest relevant content areas
- What is being represented ?
- Look for relationships eg. landforms & land use
- Interpret /analyse eg. Vulnerability to hazards
- Use inquiry questions

SOMETHING SIMILAR

# ESRI arcgis: Global elevation



Small subset of the GIS for schools program free to Australian schools

Global elevation

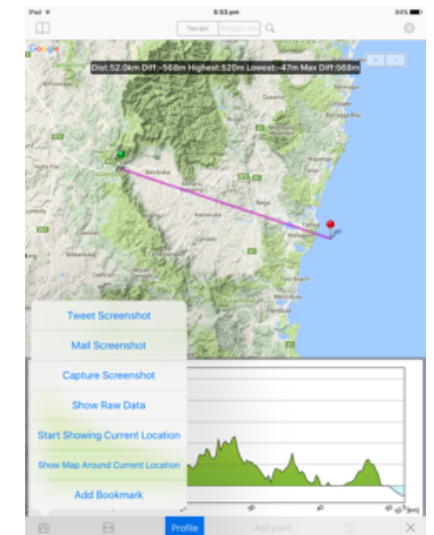
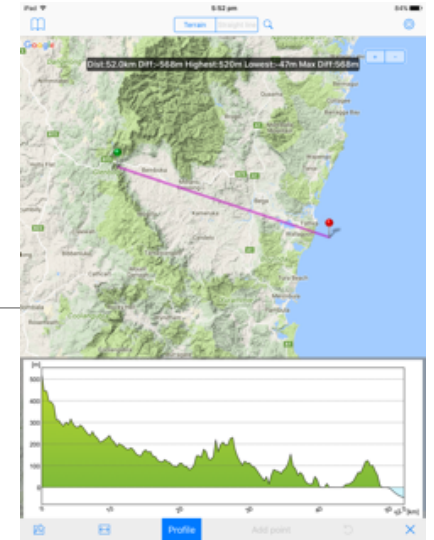
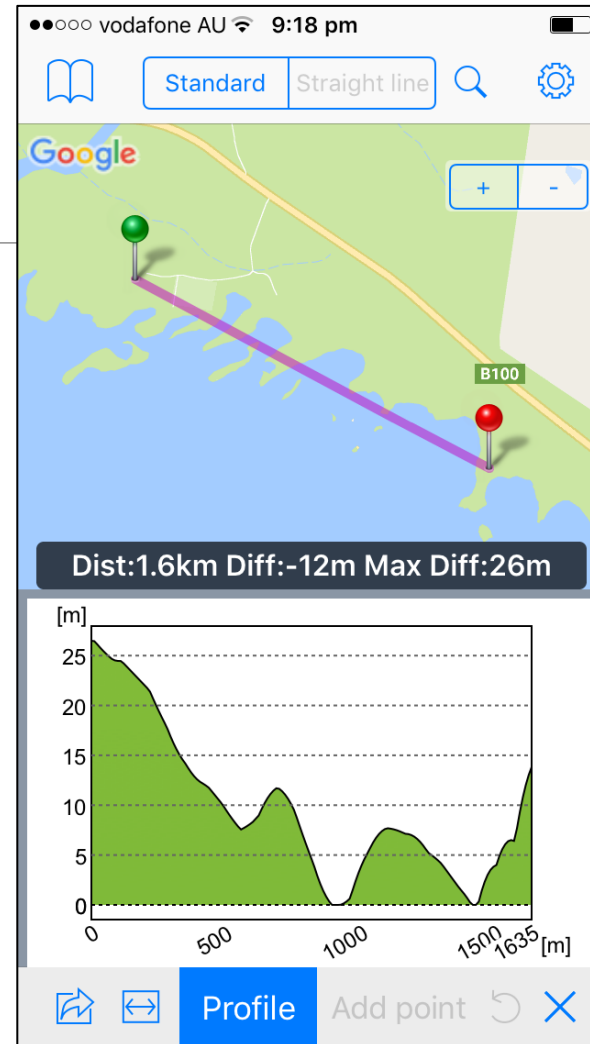
<http://esriukeducation.maps.arcgis.com/apps/Profile/index.html?appid=f0a2a2a3e1964129b22c715e31282f6c>

# Topo Profiler

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

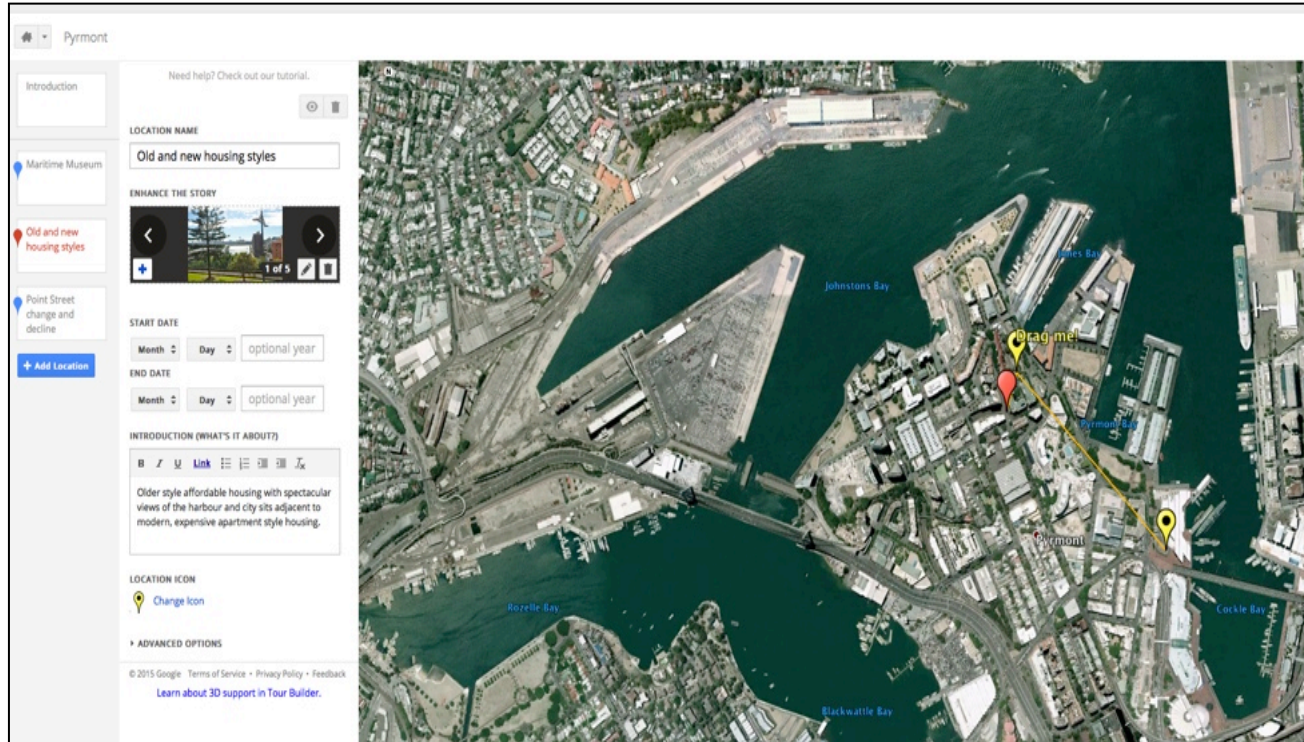
Topo Profiler – elevation graph viewer

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





# 3. Google tour builder



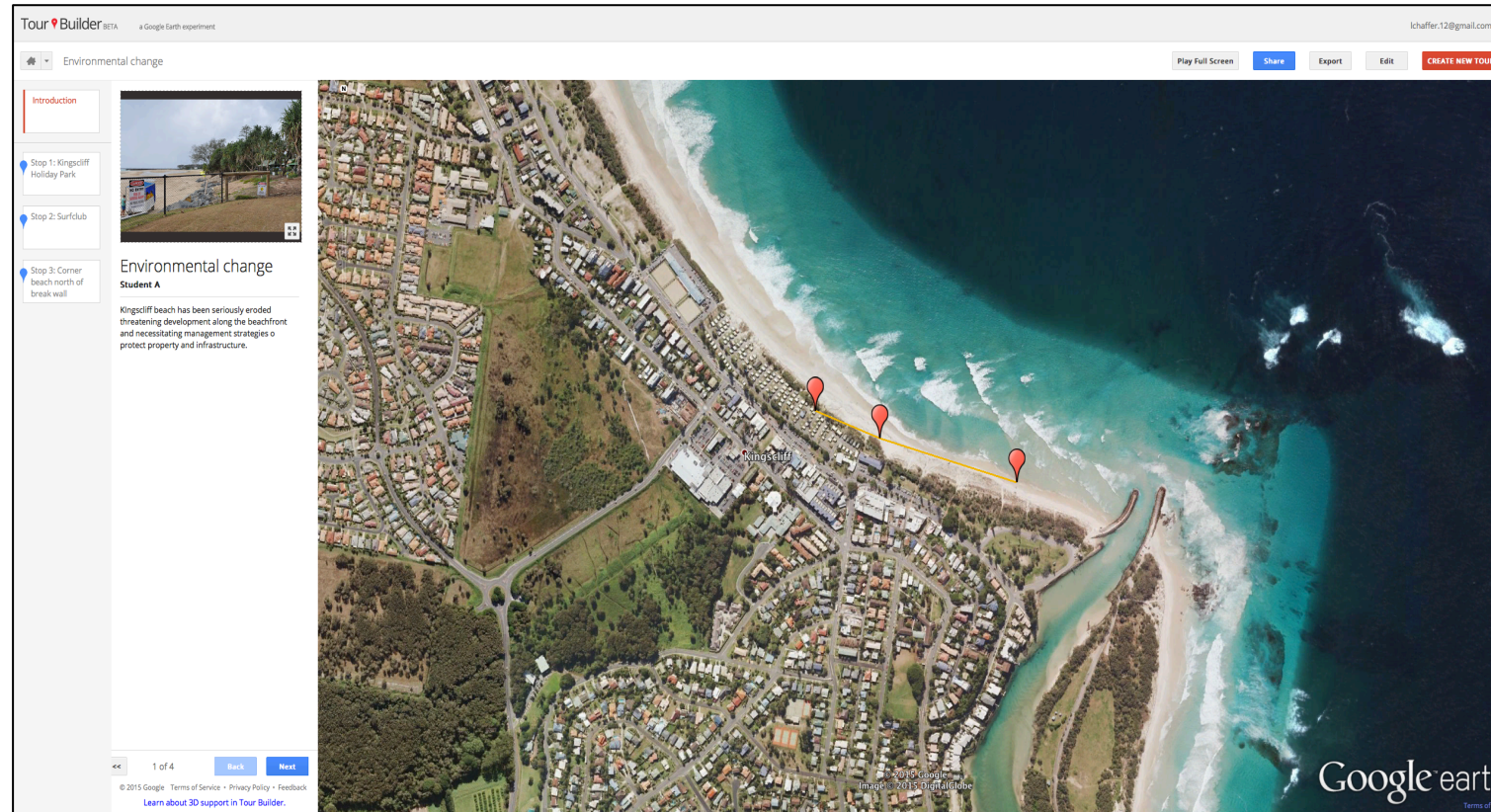
How / where  
could this be  
used?

Communicate  
inquiry findings

Inquiry &  
concepts

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

# Communicating fieldwork findings



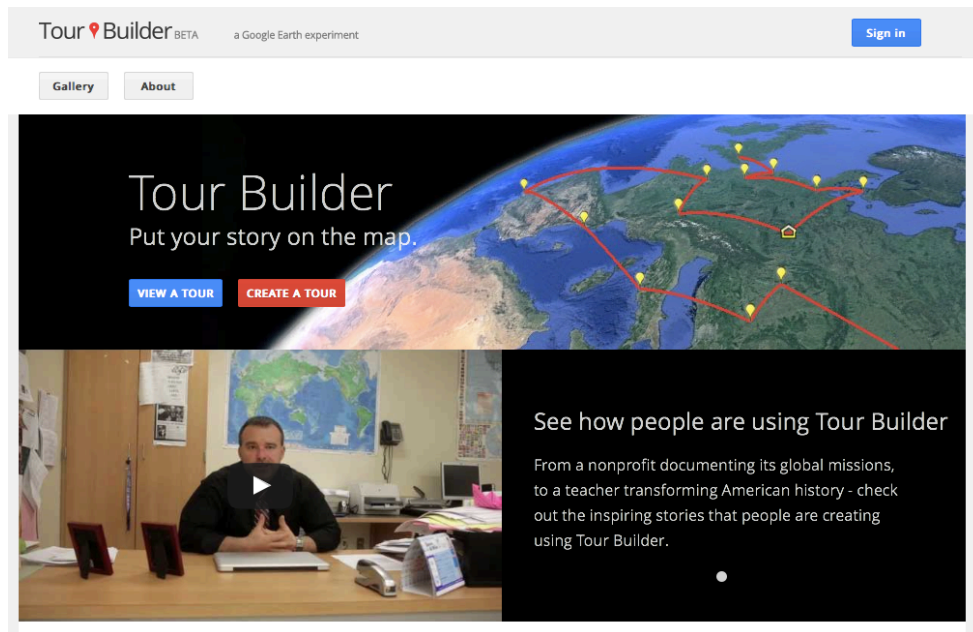
Be geographical

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

POST FIELDWORK / Communicate inquiry findings

# Tour builder tutorial

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The screenshot shows the Tour Builder website interface. At the top, it says "Tour Builder BETA a Google Earth experiment" with a "Sign in" button. Below that are "Gallery" and "About" buttons. The main content area features a large image of a globe with a red path and yellow markers. Text on the left reads "Tour Builder Put your story on the map." with "VIEW A TOUR" and "CREATE A TOUR" buttons. Below this is a video player showing a man at a desk with a play button icon. To the right of the video, the text says "See how people are using Tour Builder" followed by a paragraph: "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."

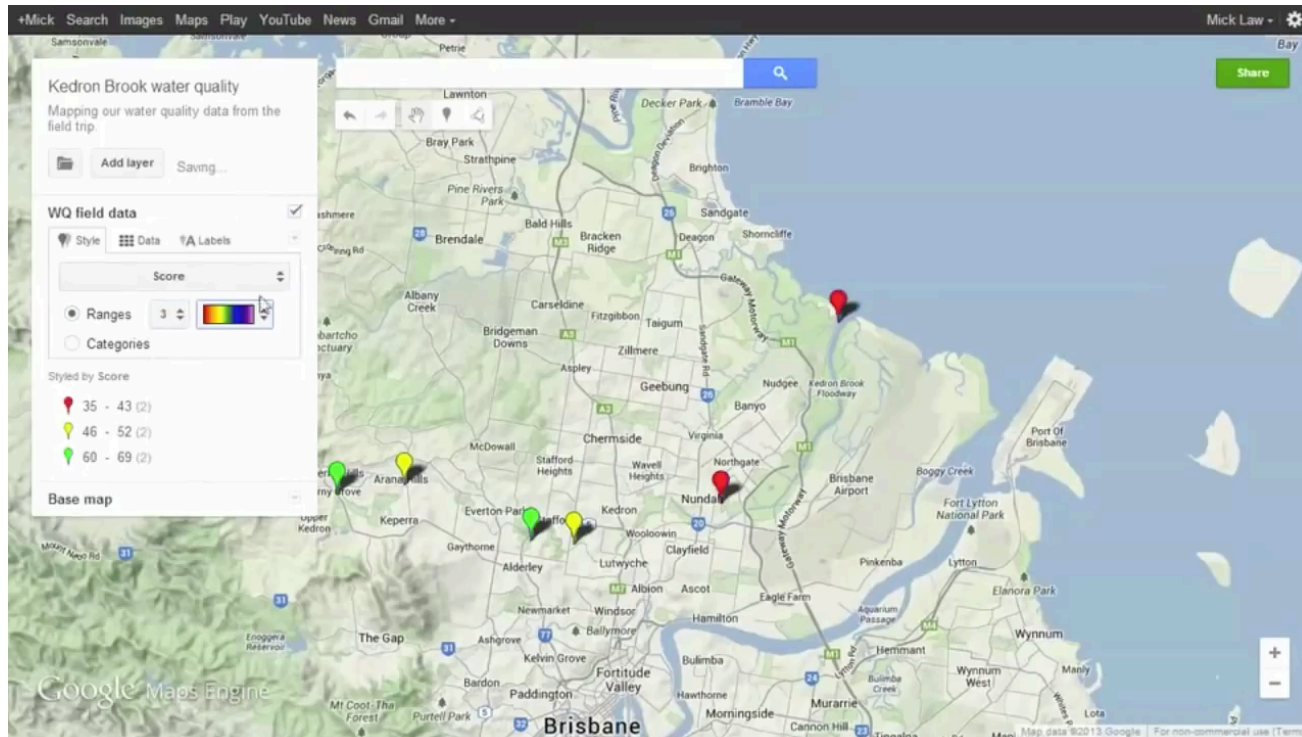
<https://tourbuilder.withgoogle.com>

Be geographical

Inquiry focus?

## SOMETHING SIMILAR

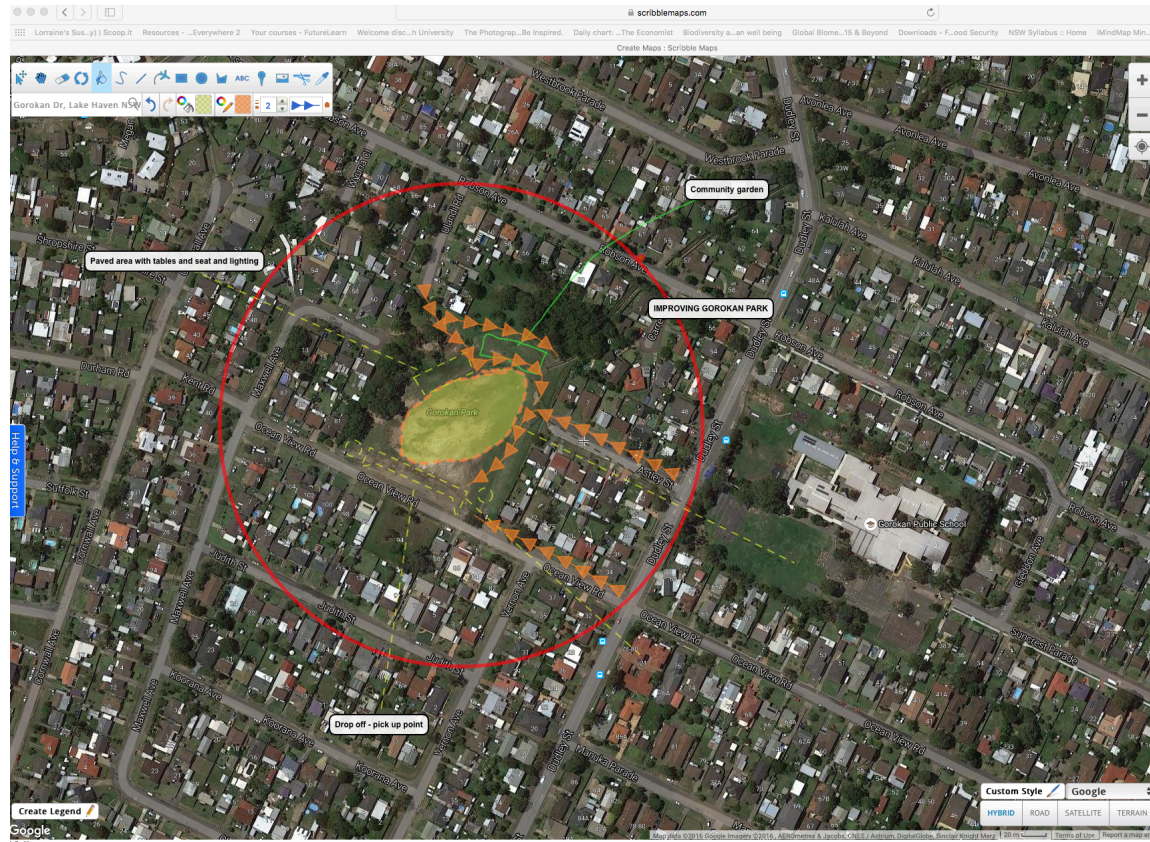
# Google Maps



Tutorial

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

# 4. Scribble maps



<https://www.scribblemaps.com>



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

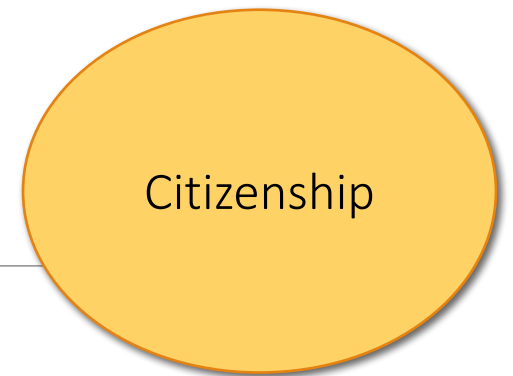
Screen captures L Chaffer

# Google Street view / Fieldwork photos



Sketch

# Open maps / real world



Citizenship

**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**

**Administration**

- » Smartphone Legends

**Tweets by @Geo\_Wiki**

**IASA Geo-Wiki** @Geo\_Wiki  
Want to join the @growobservatory online community? Learn from and share with lots of other GROWers growobservatory.org/get-involved/@IASAVienna

Jul 12, 2017

**IASA Geo-Wiki** @Geo\_Wiki  
Want to join the @growobservatory

Embed View on Twitter

Like 524 Share

Citizen science

**Royal National Park Environmental Education Centre**  
September 8 at 5:02pm · 🌐

The Aussie Backyard Bird Count is a great way to get students involved in studying biodiversity on school grounds. Check out resources now to be ready for late October.

## Aussie Backyard BIRD COUNT

**Aussie Backyard Bird Count**

Celebrate National Bird Week 2017 by taking part in the biggest citizen science project to hit Aussie shores. From 23-29 October, thousands of people from across the country are heading out into...

AUSSIEBIRDCOUNT.ORG.AU

**IASA Geo-Wiki** @Geo\_Wiki  
Want to join the @growobservatory online community? Learn from and share with lots of other GROWers growobservatory.org/get-involved/@IASAVienna

Jul 12, 2017

**IASA Geo-Wiki** @Geo\_Wiki  
Want to join the @growobservatory

Royal National Park Education Centre / Aussie Backyard Bird Count

Magpie attack

Map Kibera



# ArcGIS in Schools FREE

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Many different  
tools in one  
software  
package

GIS for schools ESRI Australia <http://esriaustralia.com.au/gis-for-schools>

Existing layers to investigate and analyse

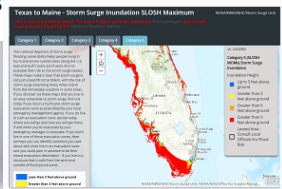
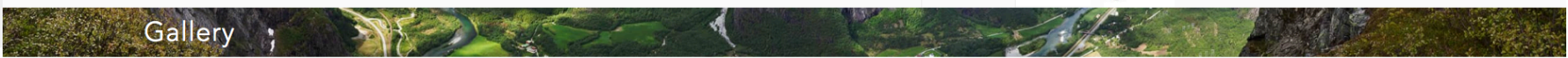
Import data to create maps

Story maps

Fieldwork



**STAY TUNED : GTA NSW / ESRI DAY WORKSHOPS ... Term 4 and 2018**



**NOAA Storm Surge Inundation Model**  
By NOAA National Weather Service



**Hurricane Irma Resource Catalog – Ready-to-Use Applications**  
By Esri Disaster Response team



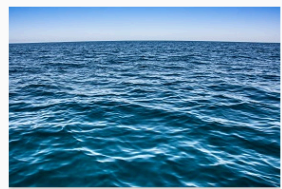
**Hurricane Irma Photo Story Map**  
By National Alliance for Public Safety GIS F



**Tracking the 2017 Hurricane Season**  
By NOAA Satellite and Information Service



**Wish You Were Here**  
By EntertainMaps.com



**What is under the Ocean's Hood?**  
By Witold Fraczek, Esri



**End of the Line: Public Transit in Washington**  
By Esri Story Maps team



**Amanda Huber - Portfolio of GIS Work**  
By Amanda Huber



**Are You Ready Tampa Bay?**  
By City of Tampa, FL



**#Fridaysonthefarm: Ashland Forest Restoration**  
By USDA Natural Resources Conservation Service



**City of Poway, CA 2015/2016 Capital Improvement Program**  
By City of Poway, CA



**Capital Improvement Projects**  
By Town of Bluffton, SC



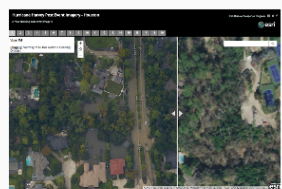
**Capital Improvement Projects for Chesterfield County, VA**  
By Chesterfield County, VA



**Business Forward...**  
By City of Brooklyn Park, MN



**CYCLE snApp**  
By Halifax Cycling Coalition, Nova Scotia



**Hurricane Harvey Post Event Imagery Swap**  
By Esri Disaster Response team



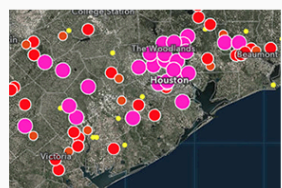
**Protecting America's Ocean and Great Lakes**  
By National Marine Sanctuary Foundation



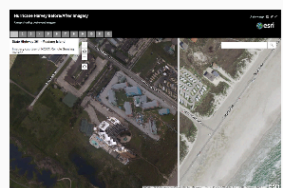
**Mortgage Magnitude**  
By John Nelson, Esri



**Gauging U.S. Population Change 2000 to 2010**  
By Jennifer Reil, Esri



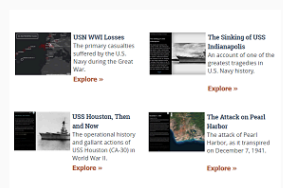
**Tropical Storm Harvey: Current Conditions**  
By Esri Story Maps team



**Hurricane Harvey Before/After Imagery - F**  
By Esri Disaster Response team



**Hurricane Harvey Photo Story Map**  
By National Alliance for Public Safety GIS F



**Naval History Story Maps**  
By US Naval History and Heritage Command



**Fire, Forests & the Future of Rural Communities**  
By Sierra Institute for Community and Environment

Acquire, process, create





<https://gctrust.maps.arcgis.com/apps/Cascade/index.html?appid=55584ca0e7f94a9b9473cc28dd6272cf>



<http://storymaps.esri.com/stories/2015/river-reborn/>

[Return to overview](#)



## South Sudan in Crisis

# 7.5

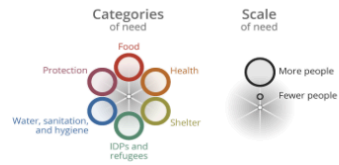
million people in need.

In July 2011, South Sudan declared independence from Sudan, after a long and bloody civil war that left over two million civilians dead and twice as many displaced. Although the country's leaders expressed optimism for a fresh start, South Sudan relapsed into civil war in 2013, after just two years of independence.

The heaviest fighting has occurred in the Greater Upper Nile region, where most of the country's sorghum is produced. Consequently, food production has declined precipitously, and in February 2017, the United Nations declared a famine in several embattled districts. The fighting has displaced over 3.6 million people, and left an estimated 7.5 million people in need of humanitarian assistance, out of an overall population of just 12 million.

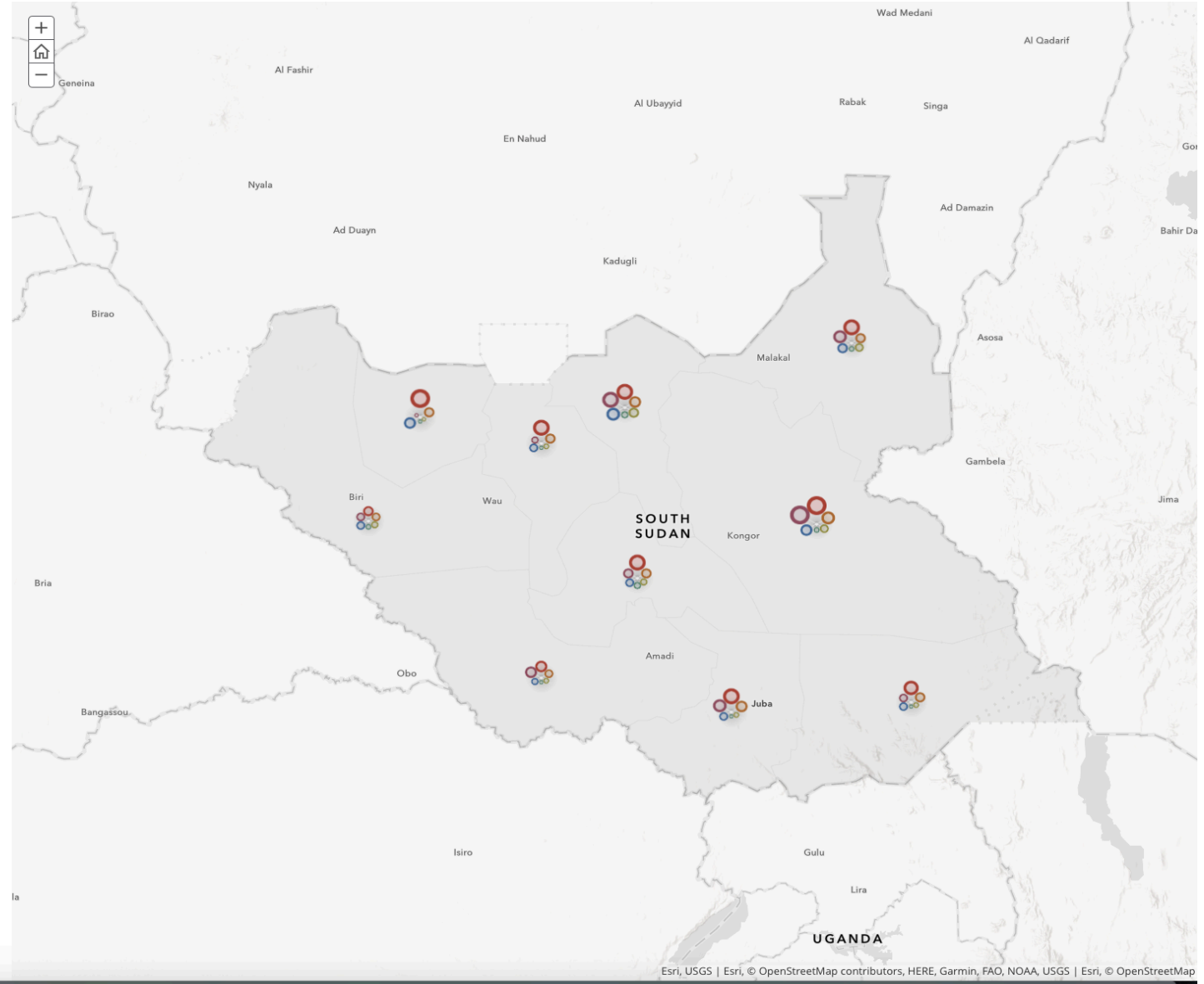


### Map: people in need by sector



### The Conflict

# 7.3



<http://storymaps.esri.com/stories/2017/dashboard-south-sudan/>

# Why spatial technologies / GIS

Employment /  
career links

DESTINATION SPATIAL - HOME

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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

Management and  
protection  
Law Enforcement  
Planning

# 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.

**Contents**

**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](http://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**

**GTA**  
 The Australian Geography Teachers Association

Volume 47 No 2 2015

In this issue:

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- NEW REPORT - The Decline of Interest in the West 27
- DRONES ICT in action 35
- Geography in the Real World 44
- Tourism: The Ultimate Guide 48

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**

Lorraine Chaffer  
 Vice President GTA NSW  
 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 acquire, manipulate, analyse, display and record spatial data"

<http://syllabus.bon.nsw.edu.au/html/geography410/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.bon.nsw.edu.au/html/geography410/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 pre-prepared worksheets and tools 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

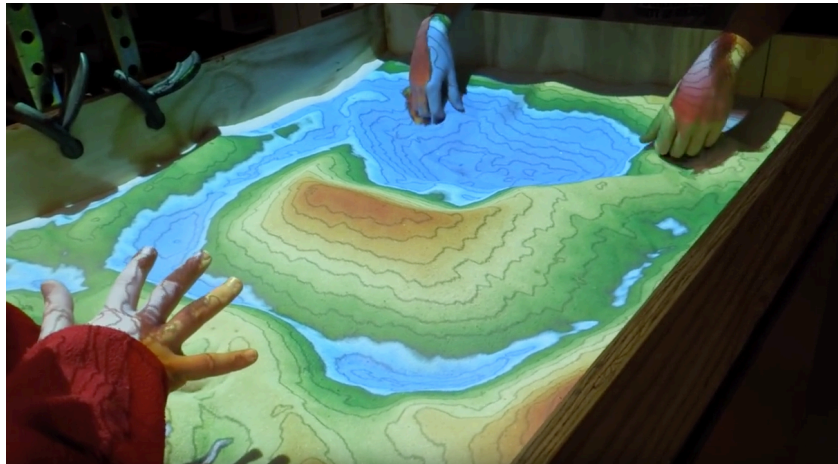
Geography Bulletin Vol 47, No2 2015 7

# Thank you: Questions

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# Augmented Reality & virtual reality

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



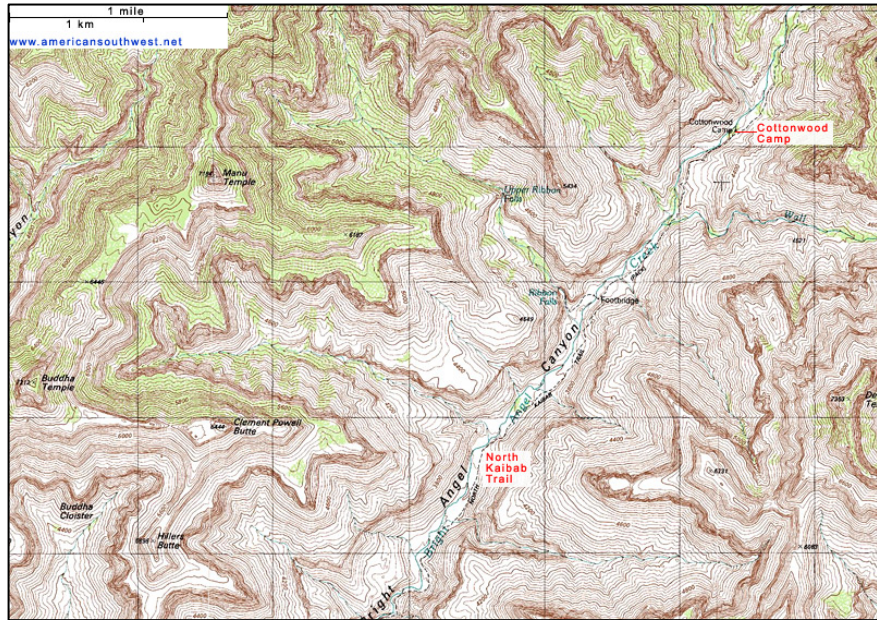
Example: Google expeditions



<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/>



# Flyover & streetview: visualising place & space



Google Earth flyover  
Google Earth 3D layer

[https://www.youtube.com/watch?v=eTzj7yyha\\_M](https://www.youtube.com/watch?v=eTzj7yyha_M)

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

# 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>

# Interactive games / Apps

(Must have a spatial component / link to real world places )

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)

[www.stopdisastersgame.org](http://www.stopdisastersgame.org)

[www.mdba.gov.au](http://www.mdba.gov.au)

[www.runthattown.abs.gov.au](http://www.runthattown.abs.gov.au)

[www.abc.net.au/science/catchmentdetox/files/home.htm](http://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>

