

# Overcoming the Lisnagunogue Effect

Using GIS to turn space to place

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## Royal Geographical Society

with IBG

Advancing geography  
and geographical learning

## TEACHMEET

3 November 2020

19:00 to 20:30

'Every time I see a river' – **Brendan Conway**, Notre Dame School

Visualisers - the possibilities are endless - **Laura Free**, Tudor Grange Academy Worcester

Using visuals to develop independence, **Chris Hoare**, Kings' School Al Barsha, Dubai, UAE

Hopeful Education: understanding progress, believing in humanity, and creating a better world, **David Alcock**, Bradford Grammar

The power of multiple choice questions, **Matthew Williams**, Old Swinford Hospital School

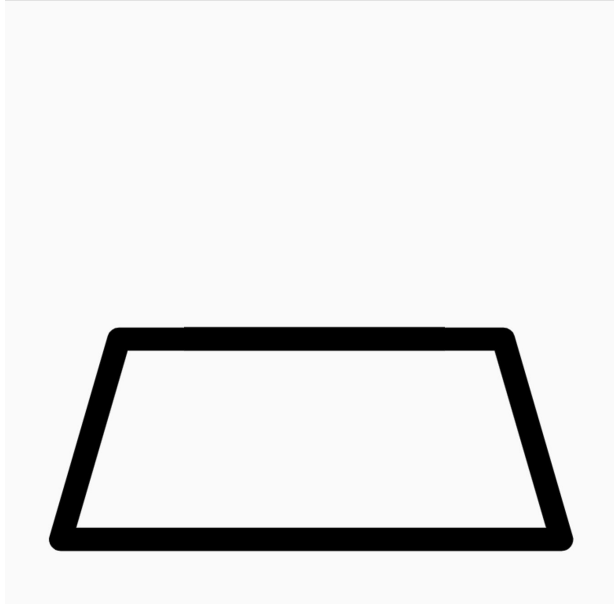
Changing the subject: emerging post-Covid-19 geographies, **Alan Parkinson**, King's Ely Junior School

Teaching geography for the Anthropocene, **Paul Turner**, Freelance geography resource writer

Making case studies stick, **Fiona Old**, Kingsthorpe College

Overcoming the Lisnagunogue Effect: using GIS to turn space into place, **Alistair Hamill**, Lurgan College

Curriculum design 4 Geography: Your role as a 'curriculum maker', **Sophie Wilson**, St Mary's University



Space



Place

Let's play a game of 'place word association'...

New York

Belfast

Lisnagunogue

# Lisnagunogue



# Lisnagunogue or Haiyan

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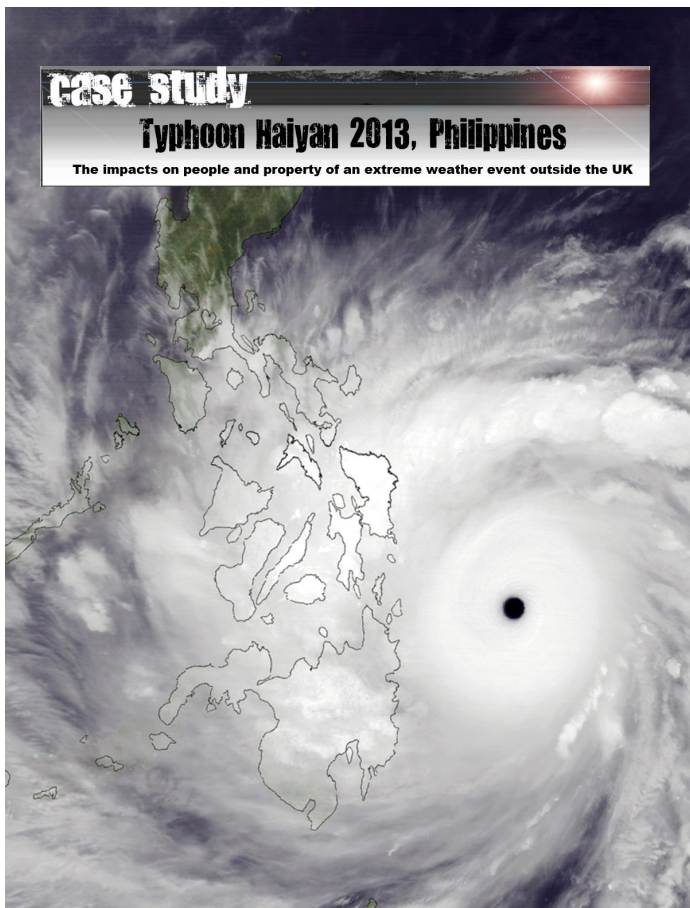
How do we ensure our pupils don't have a similar reaction of 'Eh?!' when we talk to them about "strange sounding" places like Haiyan? How can GIS help turn space into place?



# Lisnagunogue or Haiyan

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How do we ensure our pupils don't have a similar reaction of 'Eh?!' when we talk to them about "strange sounding" places like Haiyan? How can GIS help turn space into place?



## Impacts on people

- Most of the deaths occurred as a result of the unprecedented **6m storm surge** that swept across the coastal plain up to **1 km inland**. Most of Tacloban's populated area is less than 5 metres above sea level, and there were no coastal defences to stop the surge from inundating the city. As the eye of the storm passed over, the wind direction changed and funnelled the sea up the bay to Tacloban, bringing the storm surge on shore. It caught most people by surprise and caused most of the deaths from this typhoon. Over **6,200 people were killed** and over **1,750 were reported missing**. The city of **Tacloban** had more loss of life than any other area in the Philippines. In the city of 220,000 people, **5,800 died**.
- As the typhoon approached, **371,000 people were moved to evacuation camps**; but these camps could not withstand the **strong winds** and many of them were also destroyed. The storm surge was also devastating. The typhoon shelter centre at the Tacloban City Convention Centre, to which thousands of coastal inhabitants had been evacuated, became a death zone as the storm surge washed through it.
- In the longer term, there was severe damage to crops. Although the harvest season had just finished, the supply of seeds for the next year was damaged, resulting in **food shortages for 2.5 million people**.

## Impacts on buildings

Initially, the sustained **winds** of over **145 mph** damaged many buildings, especially their upper floors, as roofs were torn off and windows smashed. However, later on in the storm, it was the **storm surge** that caused significant damage to the property as well. As the winds shifted to southerly once the eye had moved passed Tacloban, this pushed the storm surge waters up the bay, **inundating** the city.

The winds and storm surge devastated many buildings.

- **90%** of all structures were wiped out across a **500 miles** radius from the eye of the typhoon. This left **5 million people** whose homes were destroyed or severely damaged.
- 10,390 schools were destroyed.
- Even newer buildings were damaged. The new town hall in **Bogo** had its roof torn off, windows broken and some of its walls collapsed.
- A Convention Centre in **Tacloban** where people were sheltering was flooded.
- The airport in **Tacloban** was severely damaged. The terminal building was destroyed by the 6 m storm surge which reached up to the height of the second storey. Runways were submerged and could not be used.

StretchCheck

How many people were killed and missing? What caused most of the deaths and where did they occur?

What happened to the people in the evacuation camps?

What happened to food supplies after the event?

What % of buildings were destroyed & how many left homeless?

How many schools destroyed?

What happened in Bogo & the Convention Centre?

What happened to the airport?

Exam friendly notes. But pretty poor geography. Where is the sense of place?

# Where does the GIS task sit in the sequence of lessons?

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We teach the students the background knowledge they need to know about the three main hazards associated with tropical storms. Then the GIS task is designed to allow them to apply their prior knowledge. They are given a Google Slides 'worksheet' to follow through, guiding them through the task step by step.

# The impacts of typhoons

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Rainfall flooding



Storm surge



Strong winds

# You can access the map, the Slides worksheet and VAR (Video Assistant Resource!) here.



1

### Click to open the GIS map

2

### A couple of tips to start on using ArcGIS

- General info to navigate the GIS Map:
  - Select Content to turn layers on and off
  - Select Legend to see the key for the layers
- For each stage, screen grab the map (**Window/Shift+S** for PC - **Command/Shift+W** for Mac) and paste it in here.
- The writing in black contains instructions to follow. The writing in red contains questions for you to answer.

3

### A couple of tips to start on using ArcGIS

- Answer the questions as you go through the Slides.
- There is a [video to go along with this task](#) which gives you clues and tips to help with each part. Let's call it VAR (Video Assistance Reference!).
- It would be best if you had a go thinking about the tasks here **before** watching the video.
- Use the video either
  - to help you **if you get stuck** and really don't know what to do
  - or **check your thinking** before you type your answers

4

### World overview

1. The map will open with an overview of the track of Typhoon Haiyan in the global context.

- A very simple question to get you started. Name the ocean that Haiyan occurred in.

Your answer:

5

### Overview of the storm: bookmark 2

2. Select **bookmark 2** to give you an overview of the track of the storm.

- Using the Legend (key) and clicking on the dots on the map, what was the date and time that the storm changed from a severe tropical storm to a typhoon?

Note, the date is in the American format (ie month/day/year) and the time is in the following format:

- 00UT = 00.00 hours ie midnight
- 06UT = 06.00 hours ie 6 am
- 12UT = 12.00 hours ie midday
- 18UT = 18.00 hours ie 6 pm

A box like this will appear any time you click on the dots in the map. The boxes contain the information you need to answer this question.

Your answer:

6

### Overview of the storm

3. Click on all the **red dots** on the map - find the fastest speed recorded. What was the speed, and the date and time when it first occurred?

(Note the speed is in **m/s**. Convert your figure into **km/h** by multiplying the speed you get from the GIS map by 3.6)

Your answer:

7

### Overview of the satellite image: Bookmark 3

3. Select **Bookmark 3, Overview of Satellite Image**. Go to the Content Tab and turn on the layer **Haiyan typhoon satellite image**.

- Use the **Ruler Tool** to measure the distance in km from the northern edge of the typhoon to its southern edge.

...and here's the ruler tool.

Your answer:

This is the distance roughly to measure

8

### Damage caused by the storm: Bookmark 4

4. Select **Bookmark 4, storm damage overview**. Go to the Content Tab. Turn off the layer **Haiyan typhoon satellite imagery** and turn on the layer **Haiyan Storm Damage**. Turn on the Legend tab to view the key (red = most damage, yellow = least damage).

- Describe the pattern of damage across the Philippines. You should (i) compare the three main islands of the Philippines (see map to the right) and (ii) use compass directions too.

Your answer (mention the islands & use compass points):

9

### Visayas storm surge: Bookmark 5

5. This task will focus on the **Visayas islands** in the centre of the Philippines, so select **Bookmark 5 Visayas Storm Surge**. Go to Content tab. Turn off the **Haiyan Storm Damage** layer and turn on the **Haiyan Storm Surge** layer and **Route of Haiyan** layer. Select the **Legend** tab to view the key.

- Discuss this statement: "The storm surge was higher in locations closer to the centre of Typhoon Haiyan." To what extent do you agree with this statement? Don't forget to quote figures! You can get those from the key, or by clicking on any of the proportional circles.

Your answer (remember to include both side of this, separated by the word 'however', also quote figures):

10

### Damage to Tacloban City: Bookmark 6

5. Next, we are going to explore the damage caused in Tacloban City. Click on **Bookmark 6, Tacloban City**. Turn on the layer **Building Damage in Tacloban City**. Select the **Legend** tab to view the key (red = collapsed, orange = damaged). Feel free to zoom around and explore the city as you do these questions.

- Describe the pattern of damage across the city. Where are most of the collapsed buildings located? Where are most of the damaged buildings found?

Your answer:

11

### Damage to Tacloban City

- Go to the **Measure** tab at the top. Choose the **Area** tool. Draw around the area of the city with collapsed and damaged buildings to estimate the area affected.

Your answer:

12

Scale

Pattern

Distribution

Scaffolded freedom



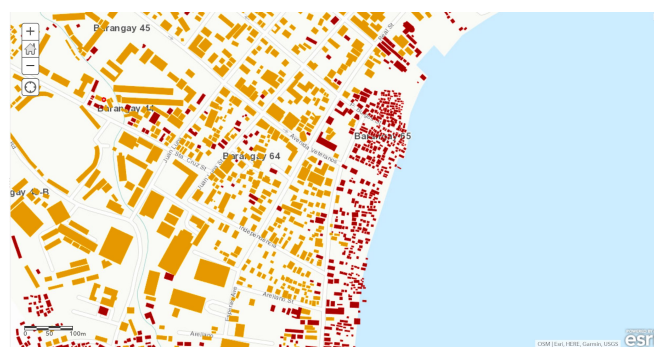
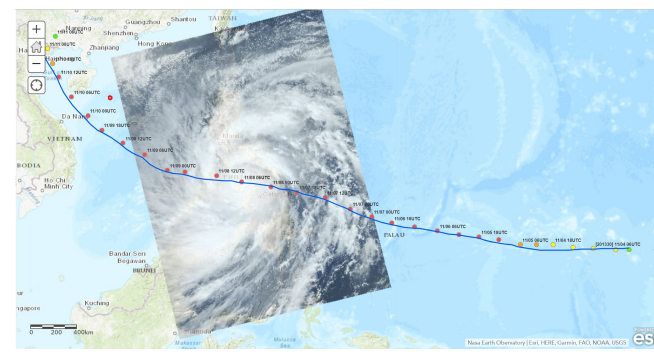
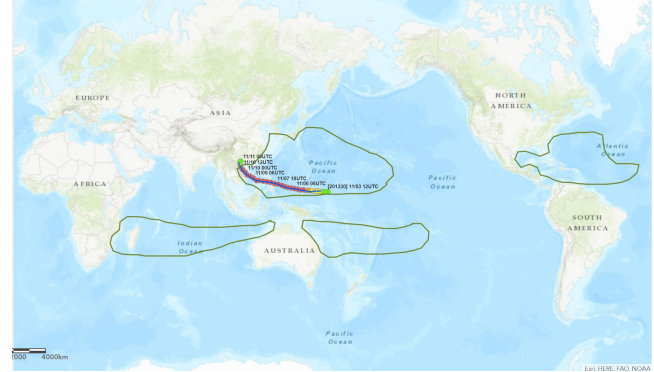
Place

What do the students get  
from the exercise?

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# Scale

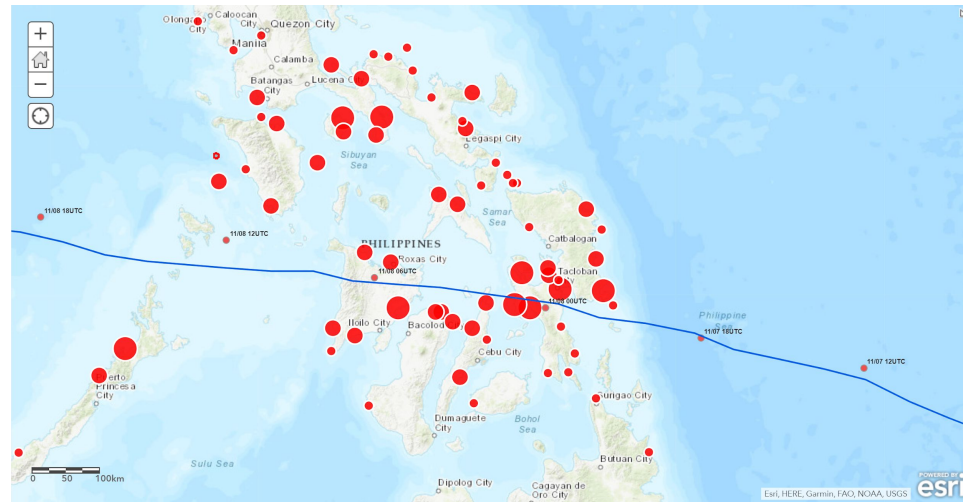
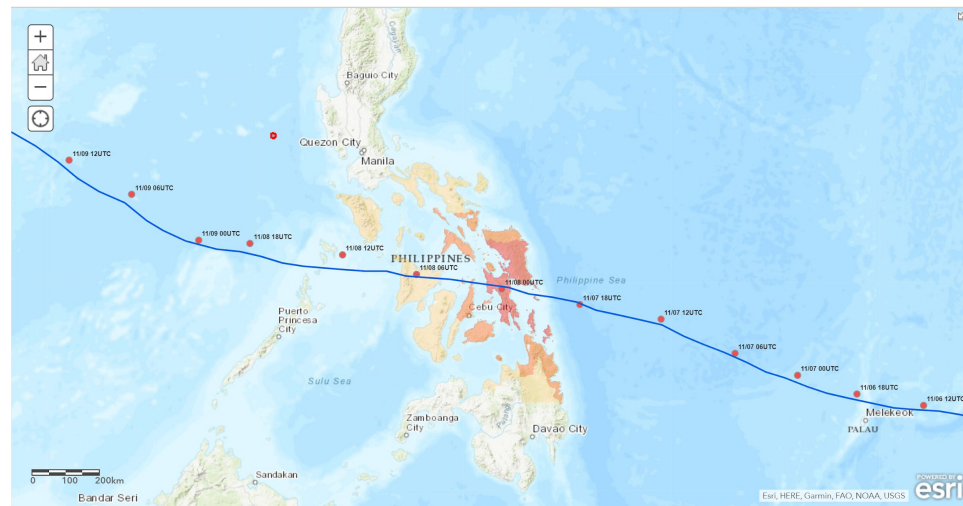
Students are able to engage with the map at a variety of scales: global, regional, national, local. This enables them to explore the space and see connections between the levels of scale in between them, as they begin to construct their sense of place. Students can use the measure tool to take various measurements at various scales.





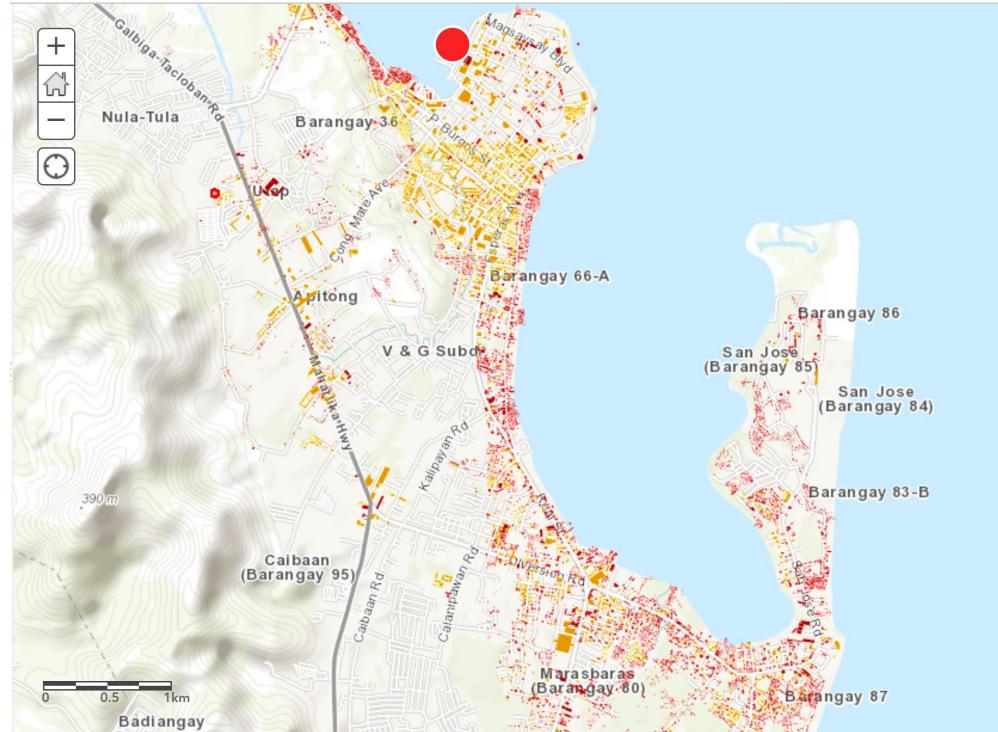
# Pattern

Students can *examine* patterns on the map, using choropleth and proportional circles. But they can *explore* these patterns more richly, as they are able to go in to places that catch their eye and look at the localised factors that might help explain anomalies.



# Distribution

Students can come into a really small scale and look at the distribution of destroyed and damaged buildings, relating this to various factors such as topography and distance from the sea.



# Scaffolded freedom

Due to the guidance provided, students are scaffolded and supported in apply their prior knowledge to this spatial context.

But, given the interactive nature of the GIS map, they can be given freedom to explore the spatial data in much more freedom.

Thus, it can unleash some exploration of **powerful geography** for them, giving them ‘new ways of thinking about the world ... powerful ways of analysing, explaining and understanding ... (and) taking students beyond their own experience.’ (Maude, 2016).

Type	Characteristic
1. Knowledge that provides students with ‘new ways of thinking about the world.’	Using ‘big ideas’ such as: • Place • Space • Environment • Interconnection These are meta-concepts that are distinguished from substantive concepts, like ‘city’ or ‘climate’.
2. Knowledge that provides students with powerful ways of analysing, explaining and understanding.	Using ideas to: <ul style="list-style-type: none"><li>• Analyse e.g., place; spatial distribution</li><li>• Explain e.g., hierarchy; agglomeration</li><li>• Generalise e.g., models (push-pull models of migration; demographic transition)</li></ul>
5. Knowledge of the World	This takes students beyond their own experience—the world’s diversity of environments, cultures societies and economies. In a sense, this knowledge is closest to how geography is perceived in the popular imagination. It contributes strongly to a student’s ‘general knowledge’.

*A typology of geography’s powerful knowledge (Maude, 2016)*

# What do the students say?

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I used this exercise with GCSE pupils during lockdown. So how did they get on with it all alone, without my help? How did they find the operation of the GIS? And how did they get on with the geography of the task? Here are some of their comments

## ENGAGEMENT

Using the GIS is a unique, engaging way of learning. It's a more enjoyable way of learning and understanding the Case Study.

Really fun. I loved the map work

## EASE OF USE

It was very easy to use.

Using the GIS at home was hard at first but I soon got the hang of it. It was quite fun using the different tools to measure the area and distance.

## POWERFUL KNOWLEDGE

It was good to see the path of the Typhoon on a real life map to get an idea of the extent of damage it caused. I enjoyed measuring the areas of damage and size of the typhoon because it allowed you to see how devastating these typhoons can be.

I enjoyed the measuring tools because **it puts things into scale**

I really liked using the GIS. The part I most enjoyed was **getting to explore the map** because I think it was cool how we could explore the damage that happened and **the place it happened in**. It was very interesting.

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