

# PREPARATIONS FOR THE FIELD TRIP



# FIELD TRIP OBJECTIVES

- Learning about the beach site as it is now and how it has changed in the past
- Understanding how the beach will likely change in the future as a result of climate change and climate variability

# Advance preparation and activities to be done at the beach

- 1. Location and research into the beach
- 2. Observing and recording everything about the beach and making a sketch map
- 3. Setting up sites where changes in beach size can be measured (erosion and accretion) and making the baseline measurements and estimating where the average high water mark will be in 20, 40, 60 years time years time
- 4. Conducting a survey about residents' and beach users observations of how the beach has changed over time

# On return from the beach

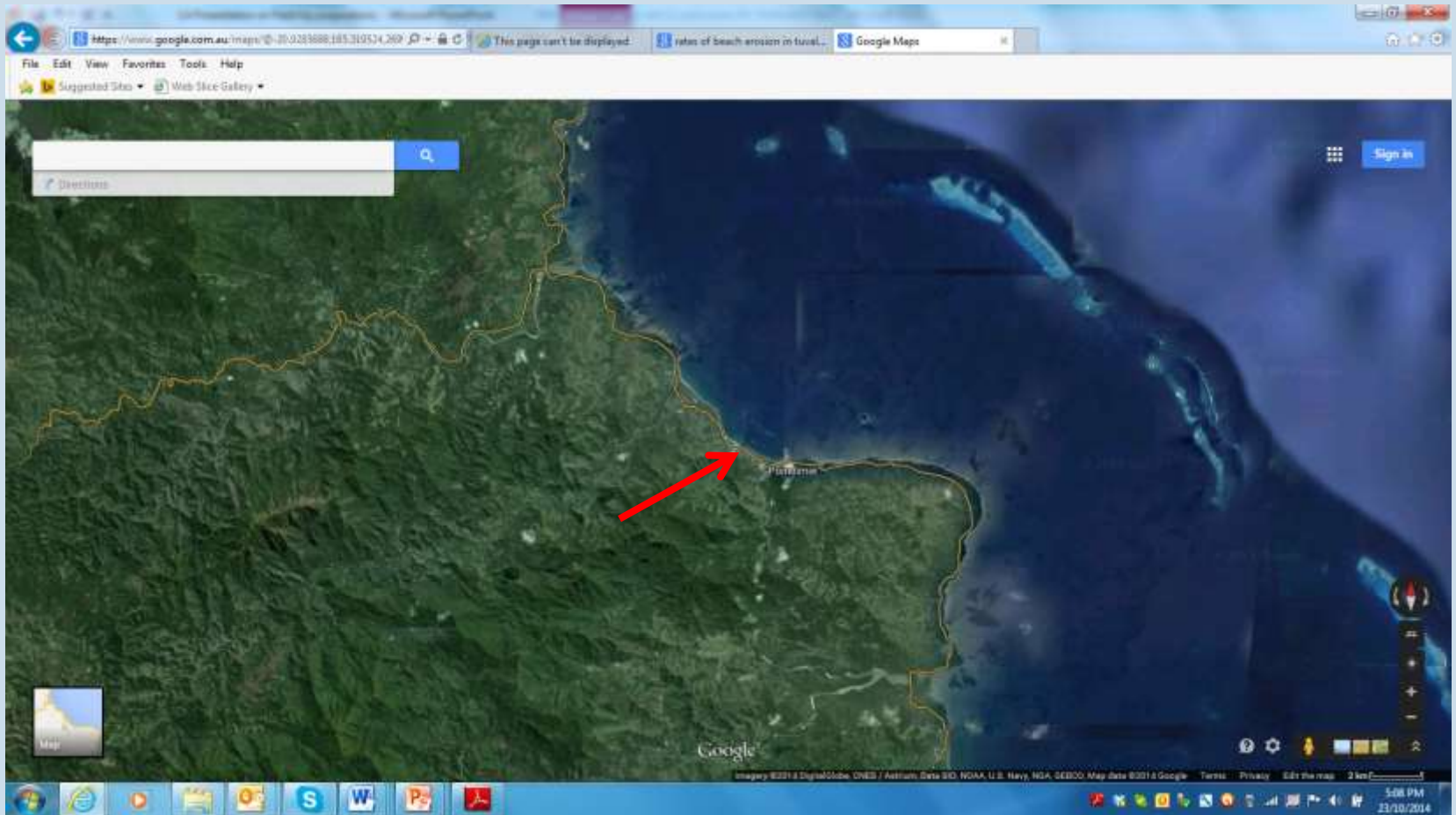
- Review past changes: the results from the observations, measurements and questionnaire; and prepare 2 key statements about past changes in the beach and the level of confidence in your statements
- Review projections for climate change for this location and prepare 1 key statement about how this beach will be in 20 years time and the level of confidence in your statement
- Prepare 1 key statement on what can be done to make the beach more healthy

# **1. LOCATION AND RESEARCH INTO THE BEACH**

# RESEARCH INFORMATION ABOUT THE BEACH SITE

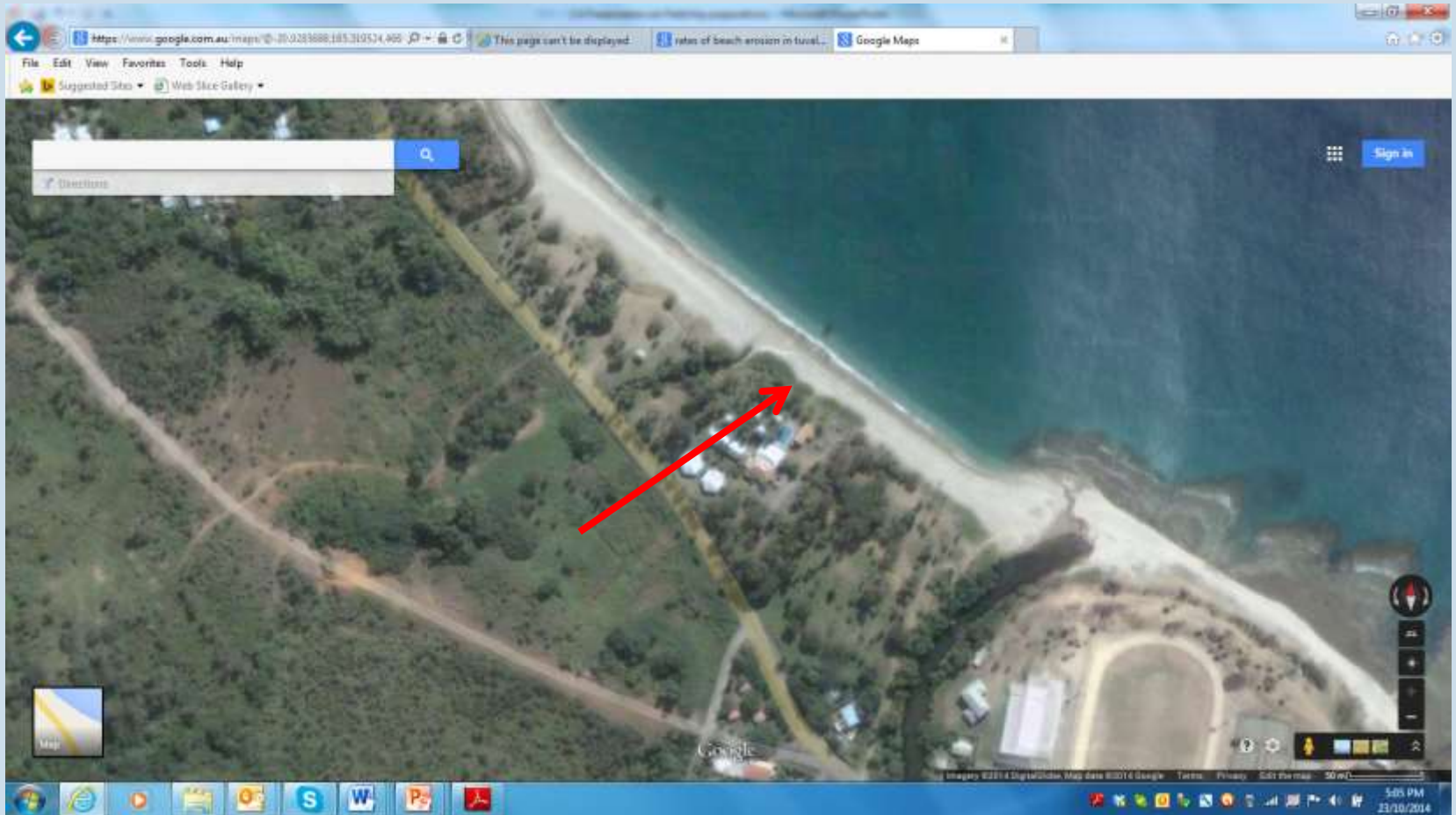
- Research will have to be undertaken for the particular beach site
- Use sources such as the Internet, Google Earth and local experts to find out information about the beach site and how it has changed in the past. Old photographs are another useful source of information
- It is always helpful if a local expert can talk to the course participants either before or during the field trip.
- The following slides give an example of the type of information that was researched for the course when it was conducted in Poindimie, New Caledonia.

# NORTHEAST COAST VIEW OF POINDIMIE





# POINDIMIE

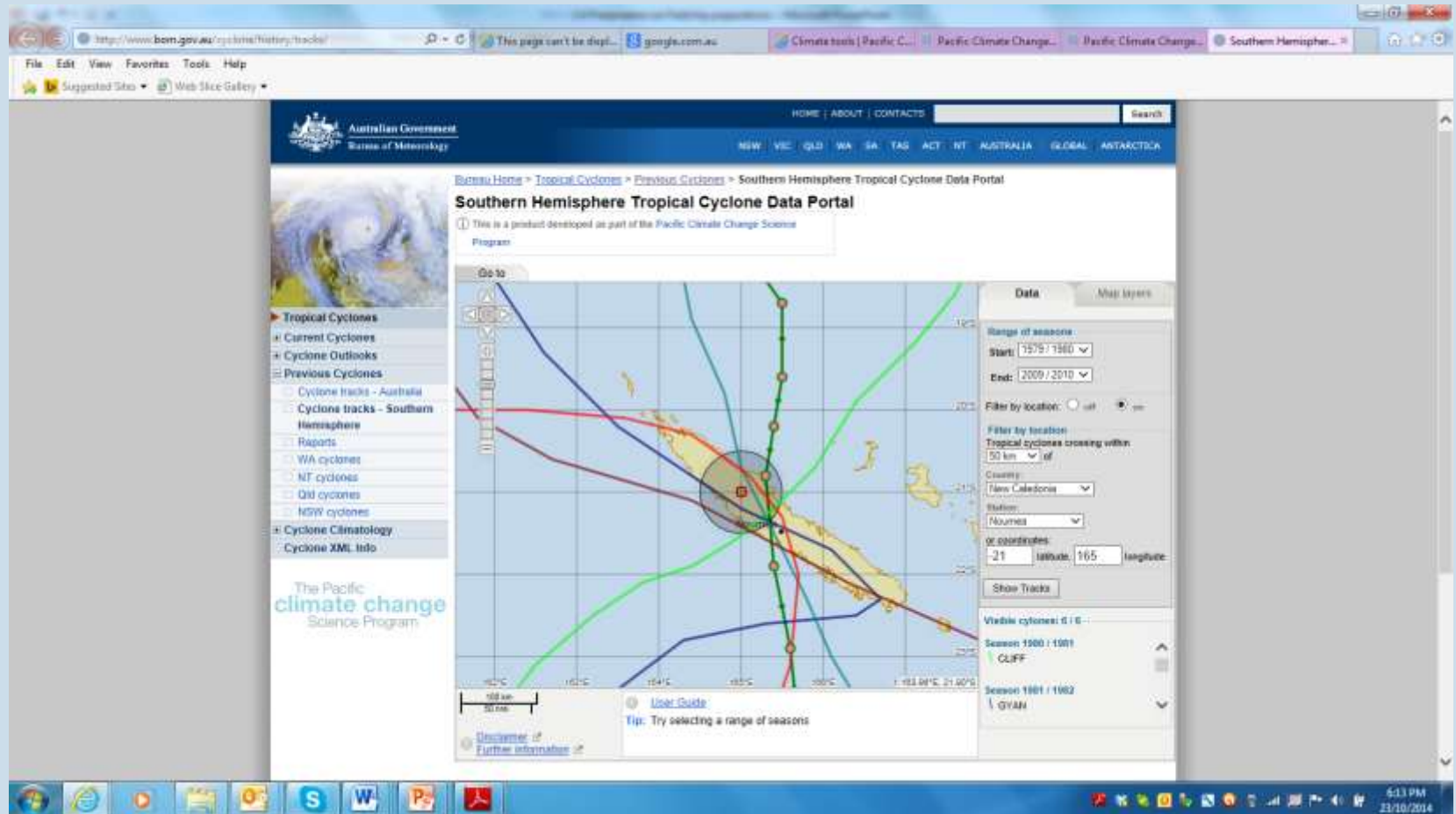




# Research into the beach

- Use the:
  - Internet
  - Google Earth
  - Historical aerial photos from the appropriate government agency
  - Ordinary photos
  - Personal knowledge
- To find out as much as you can about how the beach used to be in the past and how it was used.

# CYCLONES PASSING WITH 50KM OF NOUMEA 1980-2010



## **2. OBSERVING, RECORDING AND MAKING A SKETCH MAP**

# Observing and recording

- Observation
- Recording
- Making a sketch map



# Man-made structures



# Example of a sketch map





# **3. MEASURING EROSION AND ACCRETION**

# Measuring beach width



- Select a stable point behind the beach to act as the reference point
- Take a photo of the reference point
- Using a tape measure to record the distance from the reference point to the high water mark
- Repeat the measurement as often as possible (See Chapter 5 of the Sandwatch Manual)

# PROJECTING FUTURE BEACH CHANGES

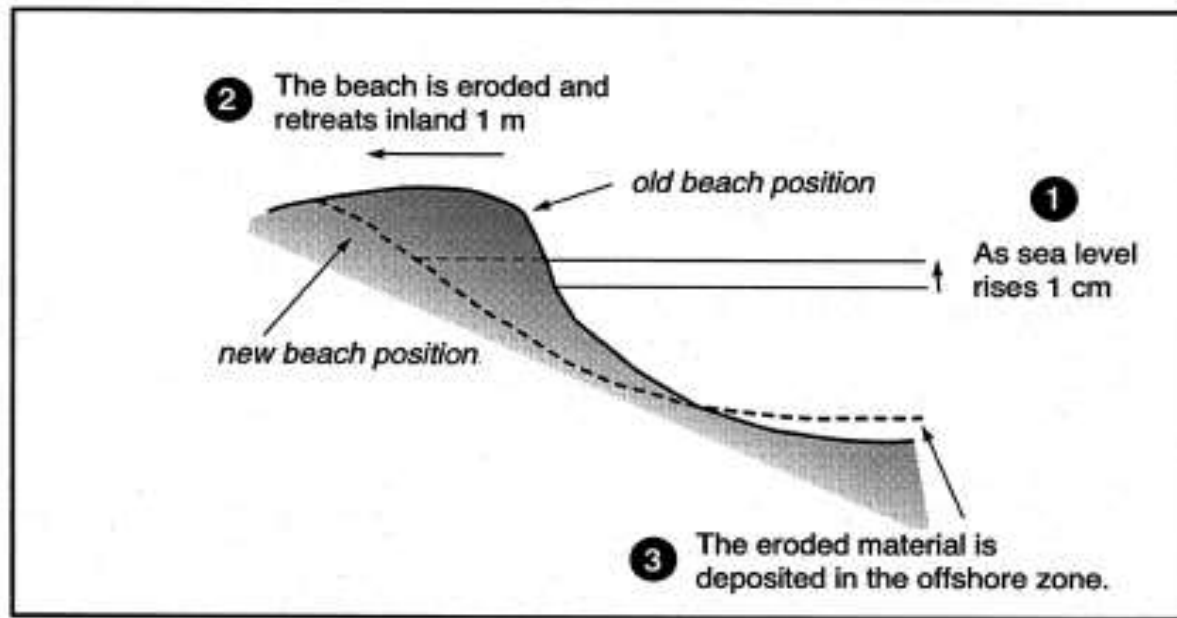
- Each beach is a complex individual system
- Long term measurements of beach changes over time are very sparse in many parts of Africa and SIDS
- **Overall as sea level rises it is most likely that rates of erosion will increase.**
- Atoll islands may behave differently to high islands
- Information about atoll islands is conflicting, some studies indicate the reefs may keep growing upwards with sea level rise; other studies indicate that sparsely populated atoll islands may be inundated with sea water more frequently but may actually grow in size

# PROJECTING FUTURE BEACH CHANGES

## (2)

- To project where the average high water mark may be in 20 years time, use existing erosion (or accretion) rates (if they exist). Erosion/accretion rates are usually measured in metres (or fractions of metres) per year, so just multiply the rate by the number of years.
- If measurements of past changes do not exist for your beach, then use a mathematical model such as the Bruun Rule (see next slide) to provide an estimate. (Note that this model was designed for continental coasts with wide shelves and may not always be appropriate for small islands which often have complex offshore topography)
- The 5<sup>th</sup> Assessment Report of the IPCC (2013) estimates that sea levels will rise globally between 0.26 – 0.98 m by 2100 (0.26 to 0.98 cm/year)

# MATHEMATICAL MODELS: BRUUN RULE



The Bruun Rule, as shown above, shows that as sea level rises by 1 cm, the position of the beach retreats inland by 1 metre, as sand is transported from the beach to the offshore bottom.

# FIELD EXERCISE: MEASURE POSITION OF HIGH WATER MARK IN THE FUTURE

- Use either the erosion rate based on historical beach change measurements, or the rate based on model projections (Bruun Rule)
- Multiply the yearly erosion rate by 20, then by 40 and then by 60.
- Using a tape measure mark out the position of average high water mark in 20 years time, 40 years time, and 60 years time (see next slide)
- Discuss with your group how will this impact the land (dunes, coastal forest, buildings, road, car parking areas etc.) behind the beach?





- Using the erosion rate for your beach, estimate where the beach will be in the future.

# **4. SURVEY OF RESIDENTS AND BEACH USERS ABOUT HOW THE BEACH HAS CHANGED**

# Finding out the views of beach residents and users

- Observing and recording human activities at the beach at different times
- Finding out the views of beach users using questionnaires

■ Analyzing the results  
See Chapter 7 of the Sandwatch Manual for more information.



# Sample questionnaire on why people use a particular beach

## SAMPLE QUESTIONNAIRE

*Objective:* To find out why people use a particular beach

- |    |  |     |    |           |
|----|--|-----|----|-----------|
| 1. | Is the bay safe for swimming?                | Yes | No | Sometimes |
| 2. | Is the water clean?                          | Yes | No | Sometimes |
| 3. | Is the beach clean?                          | Yes | No | Sometimes |
| 4. | Is there good access to the beach?           | Yes | No |           |
| 5. | Are the parking facilities adequate?         | Yes | No | Sometimes |
| 6. | Are the bathroom facilities well maintained? | Yes | No | Sometimes |
| 7. | Is the beach crowded?                        | Yes | No | Sometimes |
| 8. | Is there sufficient shade on the beach?      | Yes | No | Sometimes |
| 9. | How would you like to improve the beach?     |     |    |           |