

# Investigation Report

## Rising in Sea Level



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# 1.

## Introduction

Sea level rising is the term used to describe the level of the sea rising due to: 1) Thermal expansion- Ocean water expanding when heated up and 2) Melting of Glaciers and Polar Ice Caps- additional water flows into the ocean from the melted ice either on land or afloat on the ocean. Sea level has both risen and fallen in the last 20 000 years after the last known Ice Age, creating and destroying land masses. A visible result of this is Barrow Island, which is located 50 kilometres North-west off the Pilbara coast, Western Australia. The islands area is 202km<sup>2</sup>, making it the second largest island in WA. It is one of the most important conservational reserves in Australia due to its diverse collection of animal and plant life both on land and in the surrounding Indian Ocean.

12 000 years ago Barrow Island was part of the mainland but the ecstasy of water increased causing transgression flooding onto the mainland and isolated the land mass of Barrow Island from the mainland.

The process of Sea Level rising has been recorded since the late 19<sup>th</sup> Centuries. From results this year, about 8 mm (0.3 inches) of water from the entire surface of the ocean, falls onto the ice sheets in Antarctica and Greenland as snowfall. If this process didn't occur, the sea level would drop 8mm (0.3 inches) every year. That would leave humans without a large reservoir of water while terminating the marine life.

### 1.2 Purpose

The purpose of this investigation is to outline the factors of the Global Rise in Sea Level with Western Australia's (WA) local island, Barrow Island being a lead example of its aftermath. This investigation is also accompanied with an experiment to prove or dismiss our hypothesis.

### 1.3 Aim

To find out which ice melts faster between the glacial ice and the pack ice in the ocean

## 2. Plan and Design

### 2.1 Investigation Set-up

Pack Ice Vs Glacier



Figure 2.1: Diagram of the setup of the investigation

### 2.2 Table of Variables

<b>Constant (the same)</b>	<ul style="list-style-type: none"><li>• The beaker</li><li>• The time of observation</li><li>• The light bulb</li></ul>
<b>Independent (changed)</b>	<ul style="list-style-type: none"><li>• The type of ice (ice blocks and crushed ice blocks)</li></ul>
<b>Dependent (measured)</b>	<ul style="list-style-type: none"><li>• The time until the ice melts</li><li>• Temperature drop every 5-minutes</li></ul>

Figure 2.2: These are the variables for the investigation

## 2.3 Materials and Equipment

- 2x 500ml beaker
- Scale
- Ice block (like ice in your cold drink)
- Crushed ice
- A light bulb
- Stand
- Stopwatch
- 2x thermometer
- A retort stand
- A clamp
- A boss head

## 2.4 Method and Procedure

1. Fill one of the beaker with water for 100ml
2. Turn on the scale
3. Put one the beaker on the scale
4. Slowly, put in ice blocks into the beaker until it reaches 400g
5. Put the beaker aside
6. Put the other beaker on the scale
7. Slowly, put in the crushed ice for 400g
8. Turn off the scale and put the beaker aside
9. Set up the equipment as diagram below

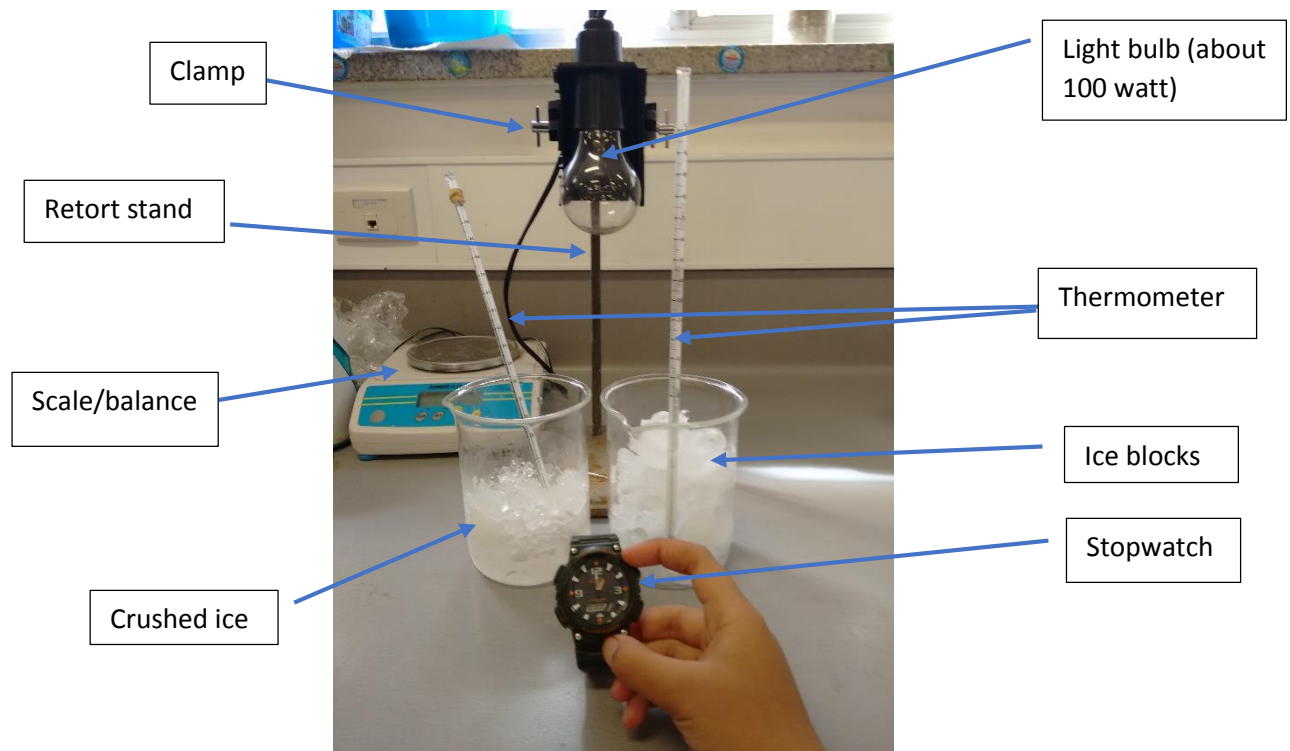


Figure 2.4.1: Diagram of the setting up of the equipment

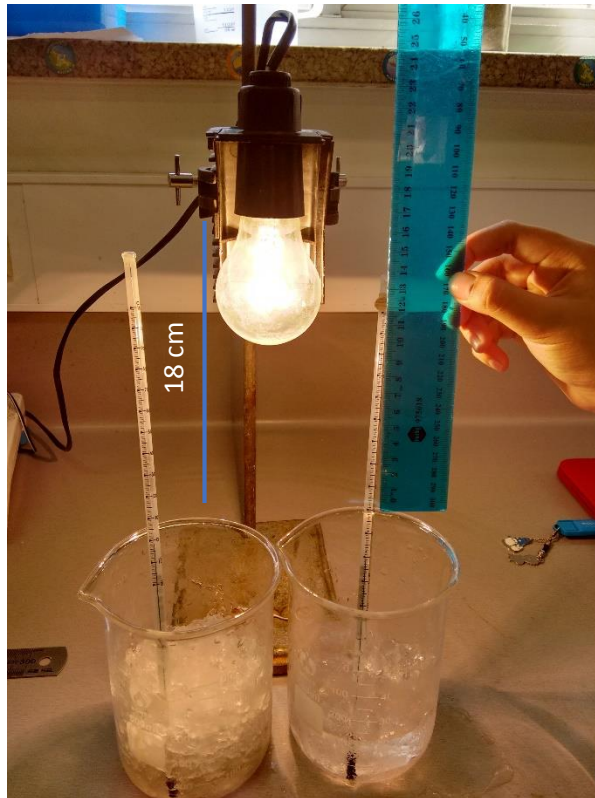


Figure 2.4.2: Diagram of the measurement of how far the light bulb has to be from the very top of the beaker

10. Use boss head to connect the clamp and the retort stand
11. Make sure that the initial temperature of both of the ice are the same/close
12. Turn on the light bulb and start the stopwatch
13. Check and record the temperature of the ices in the beaker every 5-minutes
14. When all of the ice melt, stop the stopwatch, and turn off the lamp
15. Record the result
16. Repeat these steps 2 more times

## 2.5 Hypothesis

The glacier (crushed ice) will melt faster than the ice pack (ice cubes)

### 3. Conducting

#### 3.1 Table of Observations and Measurements

Trial one results

Time	Temperature		Extra Comments
	Shred	Block	
0	0°C	3°C	Turns out that the block ice has warmer temperature than the crushed ice
5	-3°C	2°C	
10	-2°C	3°C	
15	-3°C	4°C	
20	-2°C	4.5°C	

Trial two results

Time (mins)	Temperature		Extra Comments
	Shred	Block	
0	2°C	-3°C	We noticed the temperature is a bit odd but we carried on anyways because we were running out of time
5	2°C	-1°C	
10	1.5°C	-2°C	
15	-1°C	2.5°C	We changed both of the thermometer since the temperature didn't change in 5 minutes
20	-1.5°C	3°C	

4.

## Processing

