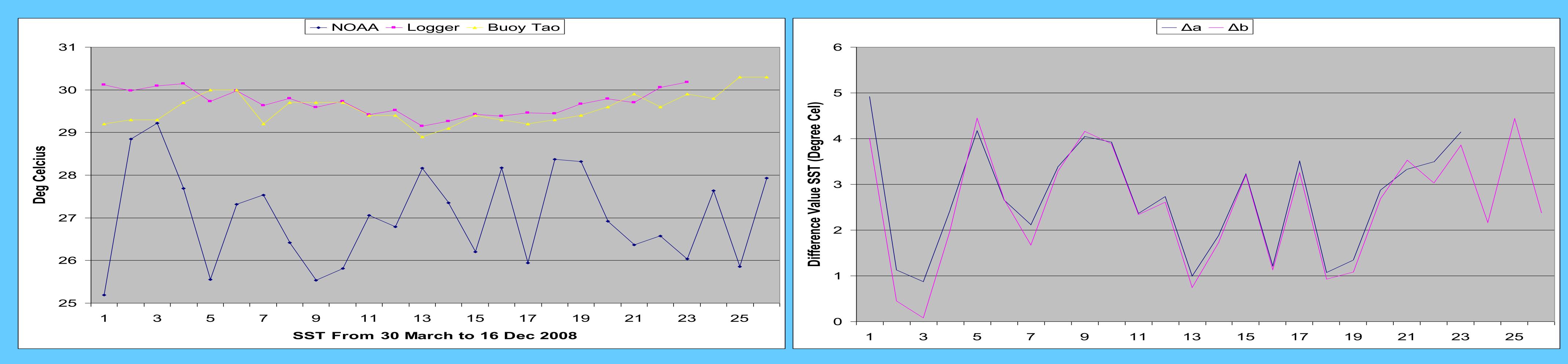
### SEA SURFACE TEMPERATURE (SST) COMPARISON FROM INSITU AND ESTIMATION MEASUREMENT AT CENDERAWASIH BAY PAPUA, INDONESIA

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## 1. INTRODUCTION

The Bird's Head Seascape (BHS) of Papua is home to the world's most diverse coral reefs. Increasing ocean temperatures linked to climate change increased frequency and intensity of coral bleaching. Bleaching risk is usually assessed using SST from satellite but may not reflect local scale temperature patterns. Monitoring SST at BirdHead Seascape has been done since September 2005 through program Ecosystem Base Management - BirdHead Seascape (EBM BHS) that initiatived by Conservation International Indonesia (CII), The Nature Conservancy (TNC), and World Wild Fund (WWF). There are 53 logger HOBOware Pro logger installed in depth 3 and 20 meter at Raja Ampat and Jamursba Medi, 19 at Biak and Cenderawasih Bay, and 6 at Triton Bay, Kaimana. Using logger (insitu) is believed to be more accurate compare to satellite measurement, however area that covered with this method is limited. Hence there is a need of using a technique to get a SST value more accurate but can cover wide area. One of method is repair algorithm used in satellite image processing. Before stepping into the process a validation is needed to compare satellite image with insitu measurement.

### 3.2. Comparison Between Data NOAA, Logger dan Buoy Tao



(a) Comparison between three tools. (b) Plot difference between  $\Delta a = LOGGER vs NO-AA$  and  $\Delta b = Buoy Tao vs NOAA$ 

In general,	this figure	shows that	SST from	satellite N	NOAA measur	ement is
					OOT from 110	

## 2. METHOD

**2.1. Geographic Position**, Cenderawasih Bay National Park Area located with coordinate 134° 06 - 135° 10 E and 01° 43 - 03° 22 S

### 2.2. Data Characteristic

Satelit NOAA-18, All data satellite from NOAA-18 in the year 2008 found around 15 - 30 satellite images that can be used to see SST data. After processing, satellite image croped pixel that same location with logger site.

<u>HOBOware Pro Logger,</u> HOBOware pro logger installed in depth 3 m and record temperature every 15 minutes. Instrument is recovery every 6-12 month and installed at Lemon Island, Rumberpon Island, Nusambier Island, Roon Island, Yoop Island and Tridakna Atoll at depth 3 m, during the year 2008.

lower compared with logger and Buoy Tao. Meanwhile, SST from HOBOware Pro Logger and Buoy Tao are not significantly different. The difference between maximum value of NOAA and logger is 4.18° C, with its minimum of 0.87° C and average is 2.69° C. While NOAA compare to Buoy Tao the maximum value is 4.45° C, minimum is 0.08° C, with average difference value is 2.53° C.

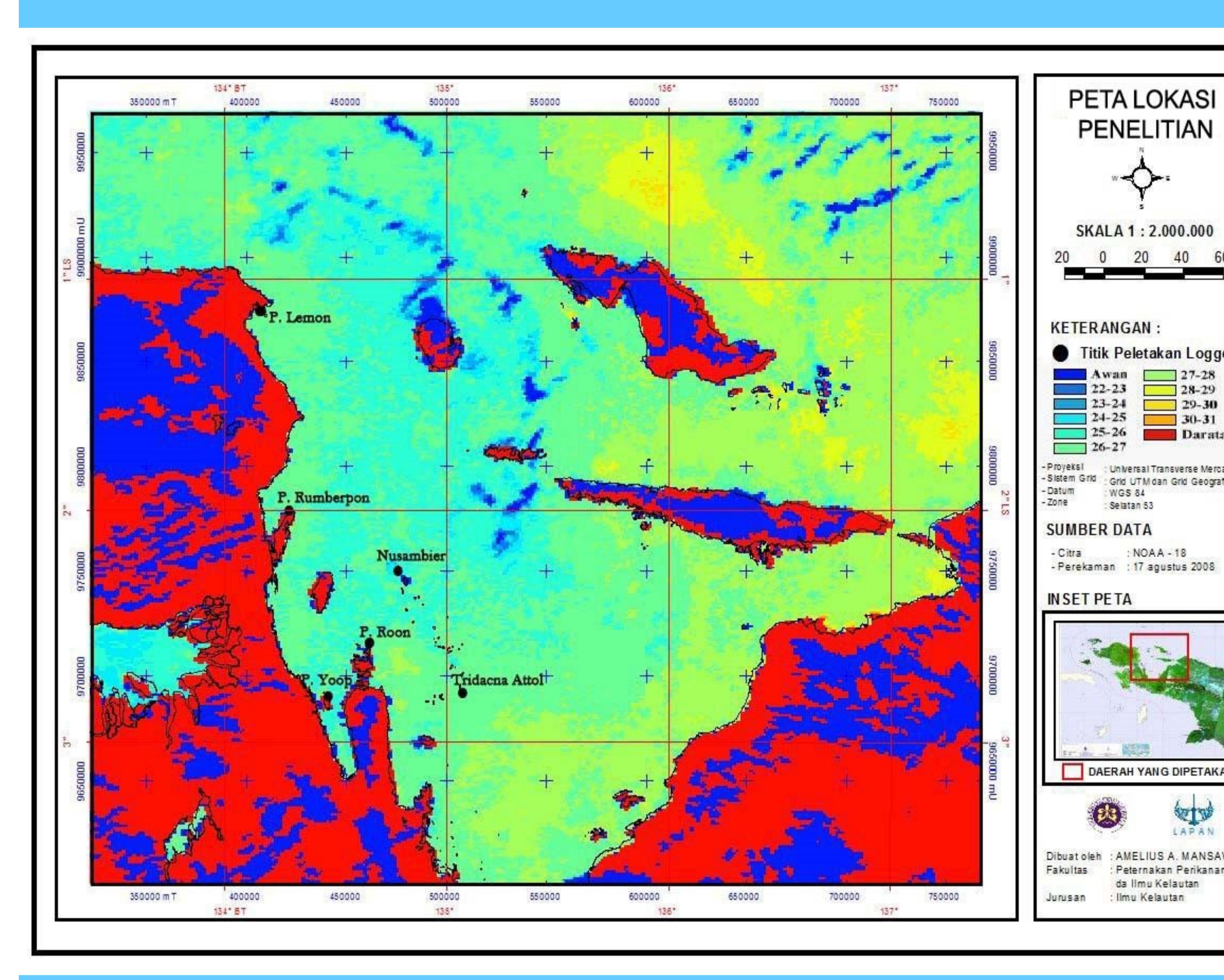
## 3.3. One Way Anova Test NOAA, HOBOware Pro Logger & Buoy Tao

One-way A	NOVA:	Average NO.	AA, Logge:	r and Buoy	Tao	
Analysis	of Vai	riance				
Source	DF	SS	MS	F	Р	
Factor	2	139.770	69.885	72.40	0.000	
Error	75	72.391	0.965			
Total	77	212.162				
				Individua	1 95% CIS Fo	r Mean
				Based on	Pooled StDev	
Level	Ν	Mean	StDev	— — — — — <del> </del> — —		+
AVGNOAA	27	26.805	1.603	(*)		
AVGBuoy	27	29.559	0.354			( )
AVGLogger		29.681	0.319			( * )

## Buoy Tao

Buoy Tao No. 35 where is close with Cenderawasih Bay. Buoy Tao recording every 3-4 day. **2.3. Time Recording Unity** 

Recording time varies among the tools. It is necessary to setting same time interval recording.



# 2.5. Analysis The first data analysis is analysis descriptively to calculate SST mean value from three recorders and difference from average recording result. Statistically, comparison of three SST recording tools is analyzed by using One-way ANOVA.

Source of Varia- tion	SS	df	<b>MS</b>	Fcrit	F Table 0,05 (2:75)	Comparison F <sub>Crit</sub> dan F <sub>Table</sub>
Column Mean	139.770	2	69.885		19,84	$F_0 = 72.40 \ge F_{0.05(2;75)}$ = 19.84
Error	72.391	75	0.965	72.40		
Total	212.162	77				

From figure above there are three kind of tools which is vary to measure SST. Measurement result difference from three tools also may see with compare  $F_{crit}$  with  $F_{table}$ .  $F_{crit}$  bigger or same with ( $\geq$ )  $F_{table}$  meaning that there is SST difference measurement from three tools. Satellite recording for SST is lower because theoretically every tool has different specification and ability (accuracy) to transcribe object (SST). Several things related to temperature measurement with satellite NOAA is extract data processes, from image data to numeric data such as image that cultivated not thoroughly clear from cloud, correction process unfavorable, or ability recording from satellite only several µm/mm into sea (NOAA, 2008).

## CONCLUSION

For Papua using Satellite image is the best choice to gets temperature data. Satellite measurement bias usable to repair LAPAN algorithm which during the time be used in processed satellite image become SST data. SST value much the same between comparison Satellite-Logger and Satellite-Buoy. This information ease the effort to get standard value by using Buoy Tao. Buoy Tao is freely available through internet access. This simplify the process to get the val-

## 3. RESULT&DISCUSSION

3.1. Comparison SST from NOAA & Logger

NoLocationToolNMeanΔA