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UMTAS 2021 submission 47

1 message

UMTAS 2021 <umtas2021@easychair.org> Sat, Aug 14, 2021 at 4:21 PM
To: Muhammad Mazmirul Abd Rahman <mazmirul.94@gmail.com>

Dear authors,

We received your submission to UMTAS 2021 (15th Virtual International
UMT Annual Symposium 2021):

Authors : Muhammad Mazmirul Abd Rahman, Mohd Zahir Ramli and Mohd Shahrizal Ab Razak
Title : Reliability of Shoreline Delineation between Sentinel-2 and Landsat 8 Imagery in Determining Coastal Evolution for DSAS Method: A Case Study in Pahang Coastline
Number : 47

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Thank you for submitting to UMTAS 2021.

Best regards,
EasyChair for UMTAS 2021.

Master Time Table based on Paper-ID

ID	Date	Session-Parallel	Time	Title	Author	Presenter
				Relationships And Growth Parameters Of Carangoides Coeruleopinnatus In Terengganu Waters, South China Sea, Malaysia.	Nurul Aimi Mat Jaafar, Nuralif Fakhrullah Mohd Nur, Mohd Sharol Ali, Min Pau Tan And Rumeaida Mat Piah	Fadzli
36	23/11/2021	2-2	1500	Filtering Of Digital Images By The Convolution Method With A Pulse Characteristic In The Spectral Region	Saida Beknazarova And Mexriban Jaumitbayeva	Saida Beknazarova
37	24/11/2021	2-4	1220	Effect Of Two Strains Of Intestinal Autochthonous Enterococcus Faecalis On Growth Performance, Gut Morphology Of Tor Tambroides And Protection Against Aeromonas Hydrophila	Mohammod Kamruzzaman Hossain, Sairatul Dahlianis Ishak, Md. Abdul Kader, Noordiyana Mat Noordin, Shumpei Iehata And Abol-Munafi Bin Ambok Bolong	Mohammod Kamruzzaman Hossain
38	24/11/2021	3-6	1415	Work-Related Content And Opportunity To Pursue Higher Education Of Science Core Subjects And The Importance Of Biology Subjects In Spm	Mohd Razimi Husin, Hishamuddin Ahmad And Faridah Hanim Yahya	Mohd Razimi Husin
39	23/11/2021	1-3	1245	Application Of Risk-Based Inspection Using API 581 Methodology To Pressure Vessel In Petrochemical Plant	Mohd Khairul Hafiz Khairuldin, Norhayati Rosli And Noryanti Muhammad	Mohd Khairul Hafiz Khairuldin
40	24/11/2021	4-5	1540	An Improve Service Quality Of Mobile Banking Using Deep Learning Method For Customer Satisfaction	Nibras Kadhim Abed, Arfan Shahzad And Ammar Mohammedali	Ammar Mohammedali
41	23/11/2021	2-1	1445	Energy Audit Of A Research University Building: A Case Study	Sharifah Nurain Syed Nasir, Norasikin Ahmad Ludin, Ahmad Afif Safwan Mohd Radzi And Mohd Adib Ibrahim	Sharifah Nurain Syed Nasir
42	23/11/2021	2-1	1500	A Review Of Literature On The Evaluation Of Customer Satisfaction Patterns In Mobile Banking Services	Nibras Abed And Muhummad Khairul Islam	Nibras Abed
43	23/11/2021	3-1	1525	A Mental Model For The Household Sector In The Food Waste Management System In Malaysia	Latifah Abdul Ghani	Latifah Abdul Ghani
44	24/11/2021	3-6	1430	Error Analysis Of English Paragraphs Of Kindergarten School Learners	Md Mahadhi Hasan And Rokshana Yasmin Roxy	Md Mahadhi Hasan
45	24/11/2021	1-5	1055	Assessing The Level Of Disturbance In The Freshwater Ecosystem Using Abundance Biomass Curve (ABC)	Mohamad Aqmal-Naser And Amirrudin Ahmad	Mohamad Aqmal-Naser
46	23/11/2021	3-2	1525	Application Of The Integral Cryptanalysis Method To The Kuznyechik Encryption Algorithm	Bakhtiyor Abdurakhimov, Ilkhom Boykuziyev, Zarif Khudoykulov, Orif Allanov And Abdullaev Sharof	Ilkhom Boykuziyev
47	24/11/2021	4-5	1555	Reliability Of Shoreline Delineation Between Sentinel-2 And Landsat 8 Imagery In Determining Coastal Evolution For DSAS Method: A Case Study In Pahang Coastline	Muhammad Mazmirul Abd Rahman, Muhammad Zahir Ramli And Mohd Shahrizal Ab Razak	Muhammad Mazmirul Abd Rahman
48	23/11/2021	1-3	1300	Existence Of A Unique Solution Of An Infinite 2-System Of First Order Differential Equation In Hilbert Space	Idham Arif Alias, Muhammad Arif Syazani Mohd Yazid And Gafurjan Ibragimov	Idham Arif Alias
49	23/11/2021	2-5	1445	Diversity Of Flower Visitors Of Pistillate Oil Palm (Elaeis Guineensis) Inflorescence In Ladang Jerangau, Hulu Terengganu, Terengganu	Nor Zalipah Mohamed, Harizah Nadiah Hamzah, Muhammad Haffidzie Mohd Shuhaimi, Faiq Zulfaqar Zairy, Muhamad Azrul Shaiful Lizam, Asraf Mohamad Idrus, Nur Fariza M. Shaipulah And Norasmah Basari	Nor Zalipah Mohamed

Reliability of Shoreline Delineation between Sentinel-2 and Landsat 8 Imagery in Determining Coastal Evolution for DSAS Method: A Case Study in Pahang Coastline

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Abstract. Pahang consist of many beautiful beaches that facing South China Sea and most of these beaches are severely treated by erosion. Coastal erosion can lead to permanent land loss at the coastal area which surely impact the livelihood of residential reside near the coastline. There are many methodologies in which can determine coastal changes and for this study multi spectral Landsat 8 and Sentinel-2 were compared to shown reliability of shoreline delineation extraction between the spectral imagery for the period of 2018 to 2021. The Landsat 8 and Sentinel-2 Imagery were downloaded and processed in landviewer and a spectral index i.e., normalized difference vegetation index (NDVI) was applied to differentiate water and landform. The tidal influences were minimized as possible for Landsat 8 1.88 m ±0.21 m and Sentinel-2 2.1 m ±0.18 m. The rate of net changes of shoreline positioning were statistically calculated using two different techniques, namely; End Point Rate (EPR) and Linear Regression Rate (LRR). Analysing between EPR and LRR it shown using Sentinel-2 produced more reliable result compared to Landsat 8 R^2 =0.96 and R^2 = 0.79 respectively. Although, Sentinel-2 and Landsat 8 provide consistent result throughout the study area as compared with National Coastal Erosional Studies 2015 from Department of Irrigation and Drainage.

Keywords: Coastal Evolution, Shoreline Delineation, Sentinel-2, Landsat 8, Digital Shoreline Analysis System.

UMTAS2021

RELIABILITY OF SHORELINE DELINEATION BETWEEN SENTINEL-2 AND LANDSAT 8 IMAGERY IN DETERMINING COASTAL EVOLUTION FOR DSAS METHOD: A CASE STUDY IN PAHANG COASTLINE

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THE STAGES OF PRESENTATION

Introduction

Identify a problem and objective.

Literature

Review literature related to Study Area, Sentinel-2, and Landsat 8

Methodology

Data Acquisition, Image Processing, Shoreline extraction, Rate calculation and Validation

Result

Linear regression rate of Northern Pahang Coastline

Dicussion

Disscusion of pixal size and error.

Introduction

The Problems

NEW STRAITS TIMES

NATION

Heavy rain worsens flooding in Pahang, victims evacuated up to 5,429

By T.N.Alagesh
January 4, 2018 @ 12:27am

Muhammad Faizul Rosly, 14 (left) and his twin, Muhammad Faizrul, carrying their pet rabbits to safety after their village, Kampung Bukit Rangin, was flooded. NSTP Pic by MUHD ASYRAF SAWAL.

KUANTAN: Heavy rain has worsened the floods in Pahang as the number of victims evacuated to relief centres in five districts has jumped up to 5,429

theSun

Log In

Local

RM1.8 billion allocated for flood mitigation, addressing coastal erosion in Pahang

04- 15- 2021 07:26 PM

Bernama

KUANTAN: A total of RM1.8 billion has been allocated to the Pahang Department of Irrigation and Drainage (DID) through carried forward projects under the 12th Malaysia Plan (12MP) for mitigating floods and addressing coastal erosion in the state.

Environment and Water Minister Datuk Seri Tuan Ibrahim Tuan Man said the allocation was also for projects involving reservoirs and dams, as well as forecasting and flood warning programmes.

NEW STRAITS TIMES

NATION

Pahang beaches battered by severe erosion after monsoon high tides

By T.N. Alagesh
January 29, 2021 @ 6:06pm

Severe coastal erosions were identified at 10 beaches including the popular Pantai Cherating and Teluk Chempedak along the state's 271km shoreline between Terengganu and Johor. Some sections were eroded by up to four metres. - NSTP/Asrol Awang

KUANTAN: High tide and rough sea conditions that have been battering Pahang's coastline during the monsoon season have left a trail of destruction.

Introduction

IDENTIFY

Reliability of shoreline delineation using SWIR band from Sentinel and Landsat

OBSERVE

The shoreline changes along Pahang Coastline for the past 4 years.

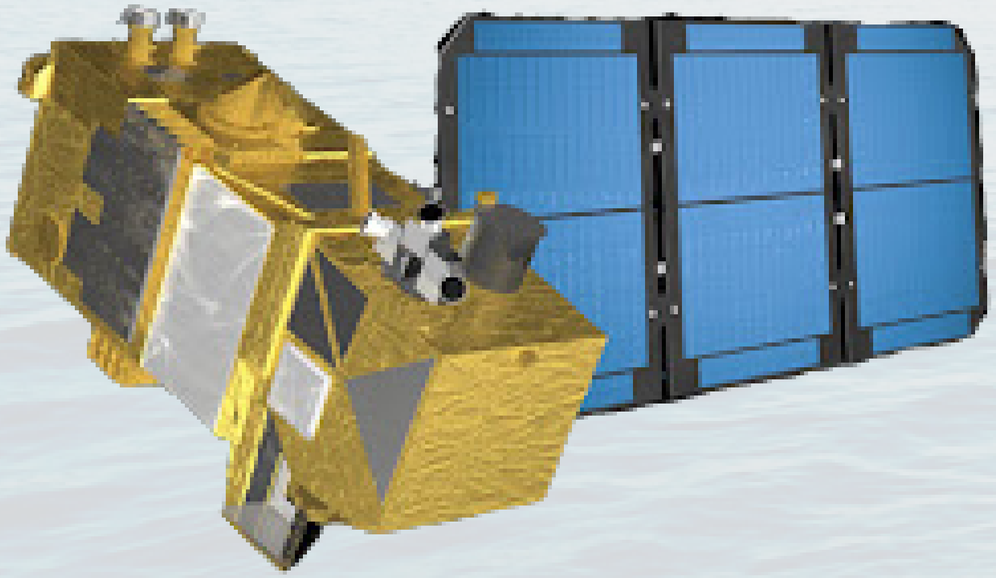
Tg. Batu

Cherating

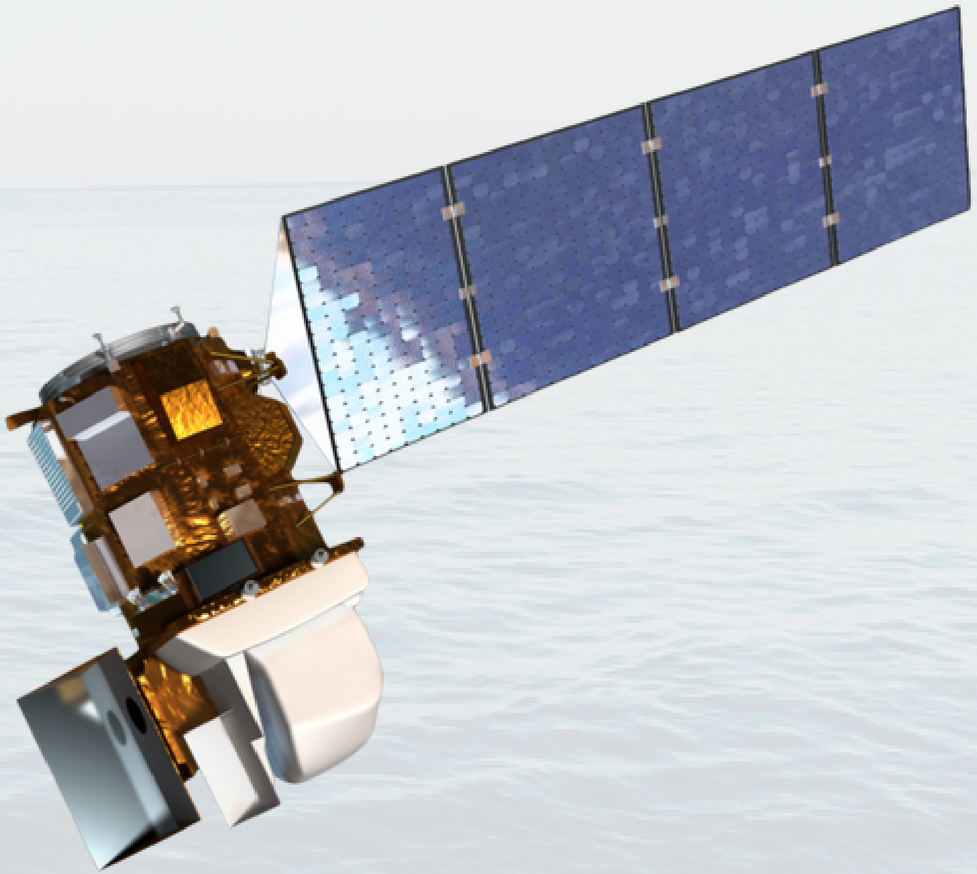
Cherok Paloh

Example of erosion sites along Pahang Coastline

Literature

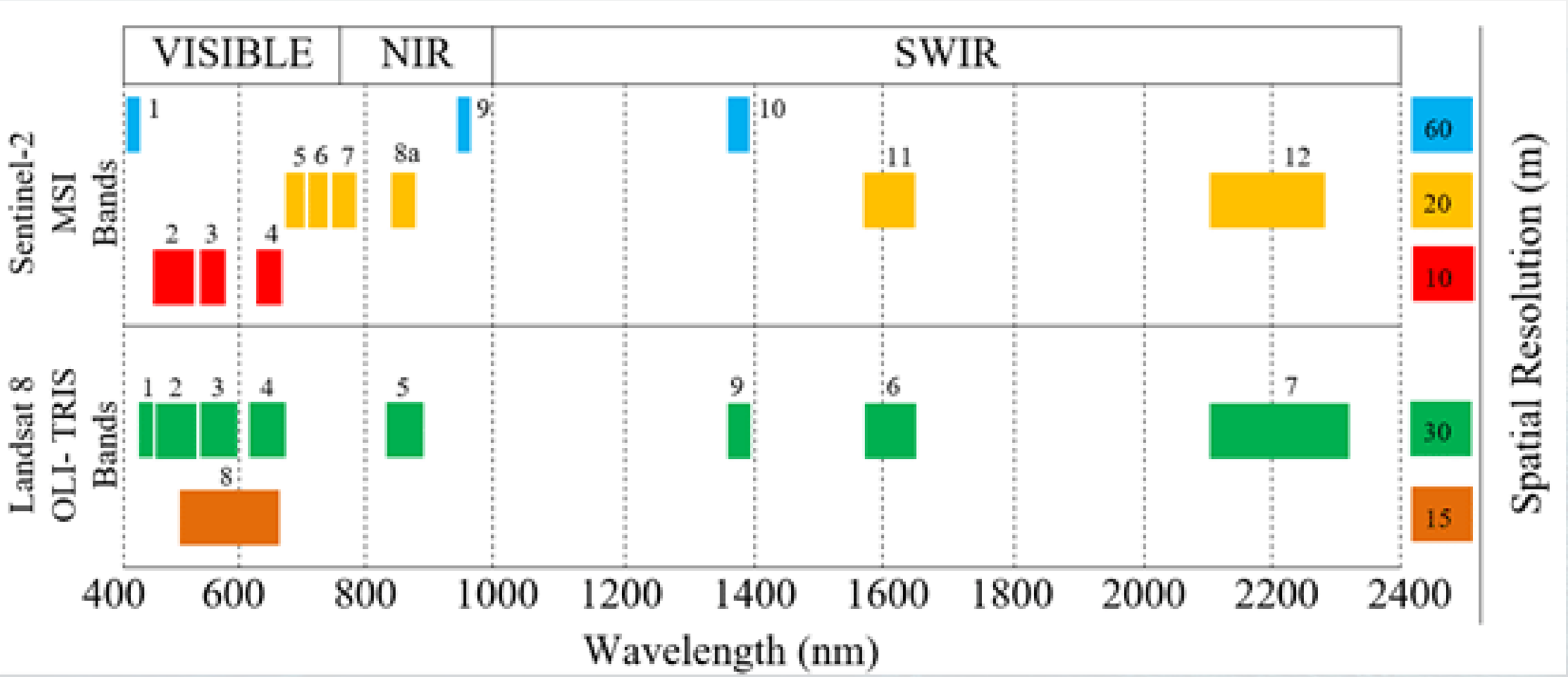


Sentinel-2 MSI



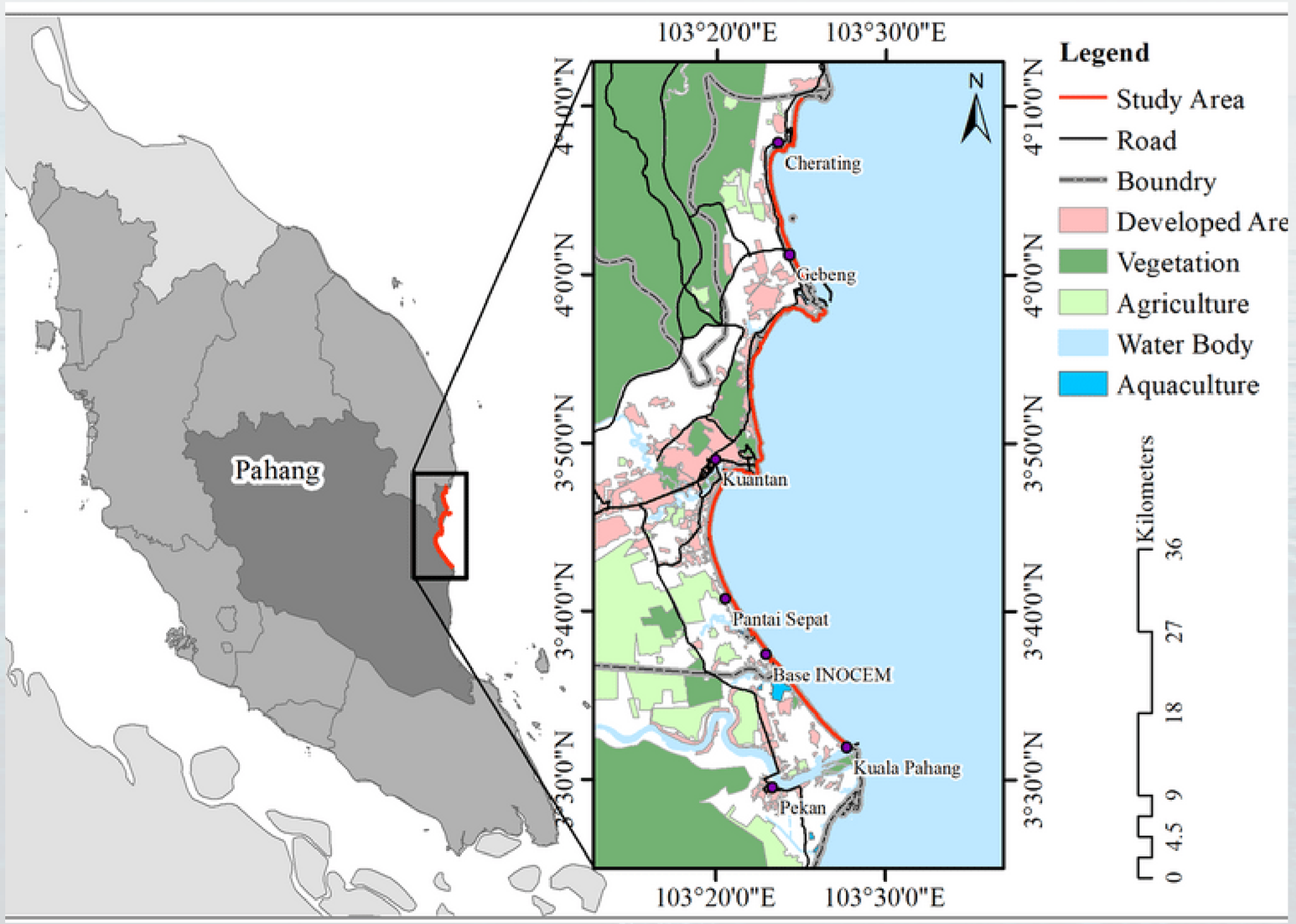
Landsat 8 OLI - TRIS

Literature



Spatial resolution and spectral range occupied by Sentinel-2 and Landsat 8. (Adapted from Pardo-Pascual et al., 2018).

Literature



The study area of Pahang northern coastline from Chendor to Kuala Pahang.

Methodology

Data Acquisition

Image Processing

Shoreline Detection and Extraction

Shoreline Assesment

Shoreline Rate Calculation

Methodology

Data Acquisition

- Tidal fluctuation
- Low cloud cover
- Images are in UTM zone 48N projection with WGS 84 datum

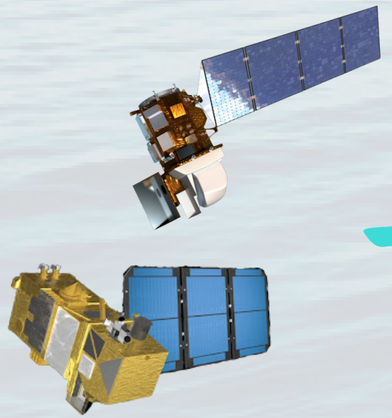
Year	Acquisition Date	Satellite Data	Section/ Tile	Spatial Resolution (m)	Tidal Influence (m)
2018	21/05/2018	Sentinal-2 L1C	48NUK	20	2.2
	22/10/2018	Landsat 8	126/057	30	1.9
2019	08/09/2019	Sentinal-2 L2A	48NUK	20	1.9
	28/09/2019*	Sentinal-2 L2A	48NUK	20	2.2
	15/03/2019	Landsat 8	126/057	30	1.6
2020	20/05/2020	Sentinal-2 L2A	48NUK	20	2.0
	20/05/2020	Landsat 8	126/057	30	1.9
2021	01/03/2021	Sentinal-2 L2A	48NUK	20	2.3
	20/04/2021*	Sentinal-2 L2A	48NUK	20	1.8
	20/03/2021	Landsat 8	126/057	30	2.1
	24/06/2021*	Landsat 8	126/057	30	2.8

*The satellite image consists of clouds. The cloud gaps were filled by using another image from the same acquisition year.

Methodology

Image Processing

Satellite database



Level 1
Level 2

66 GCPs

ENVI®

Cloud cover

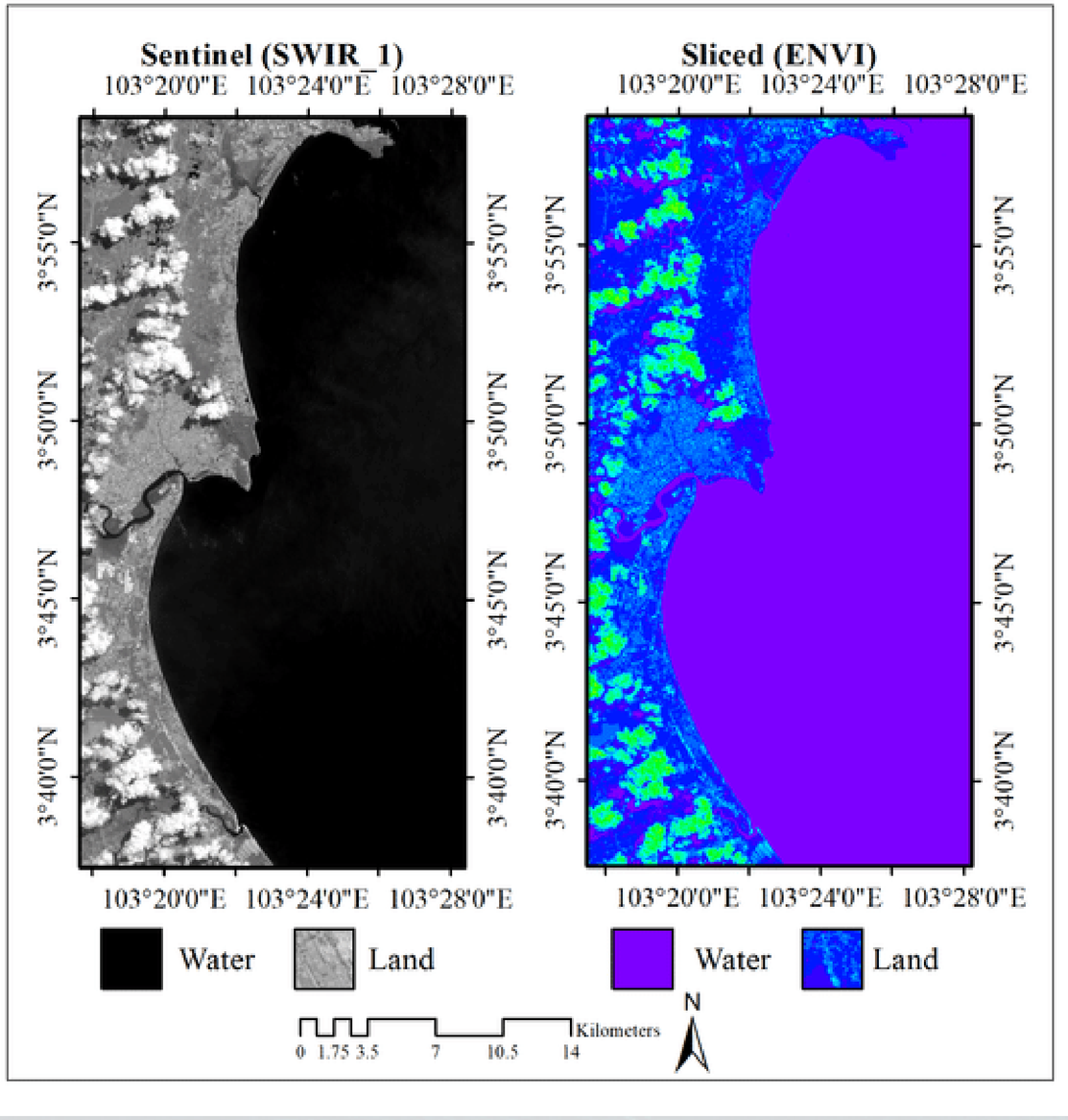
Sentinel-2 RMSE = 0.4 m

Landsat 8 RMSE = 0.41 m

Methodology

Shoreline Detection and Extraction

- The shoreline is the boundary between the land and water.
- The Shortwave infrared 1 (SWIR_1) is used to differentiate waterbody and landform.
- Use of ENVI Color slicing tools to extract the water part.
- The Extracted waterbody is converted to shapefile as the shoreline.

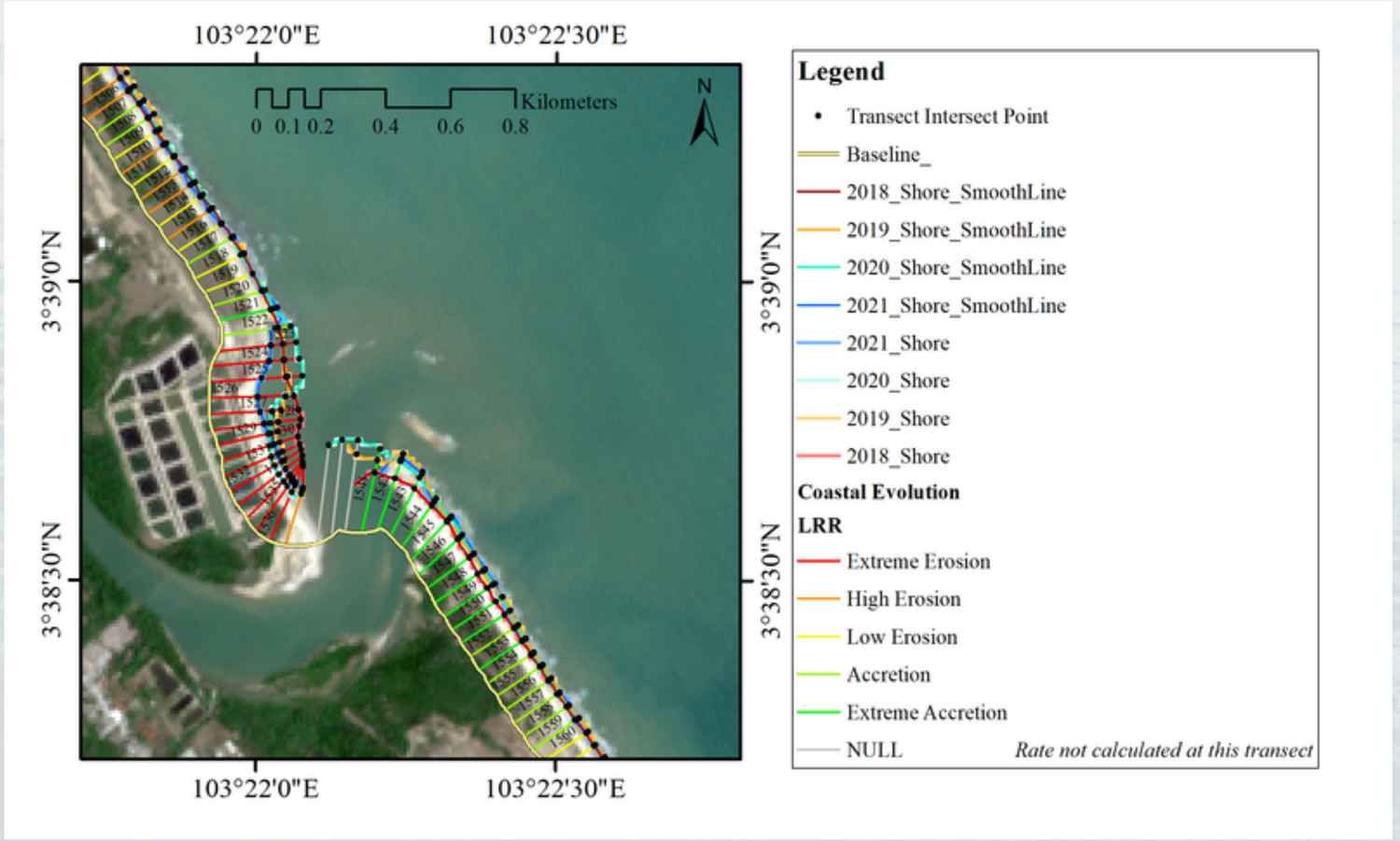


Methodology

Shoreline Assesment

DSAS
DIGITAL SHORELINE ANALYSIS SYSTEM

1. Shoreline Preparation
2. Baseline creation
3. Transect generation
4. Distance computation
5. Shoreline change rate computation



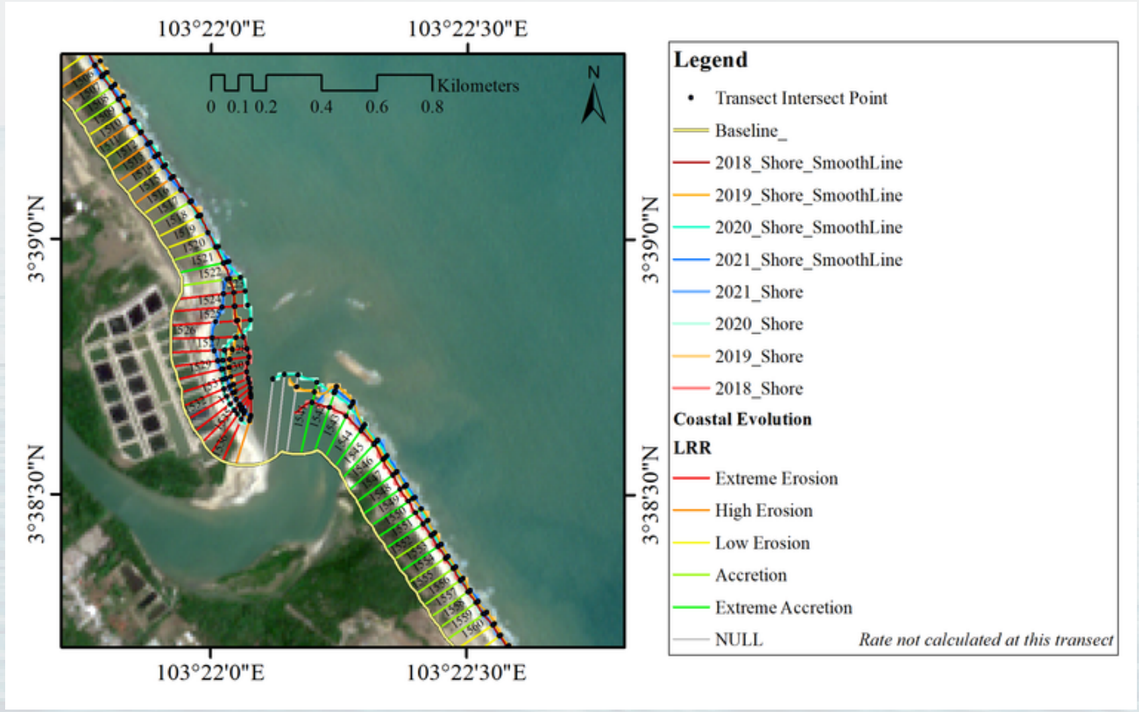
Methodology

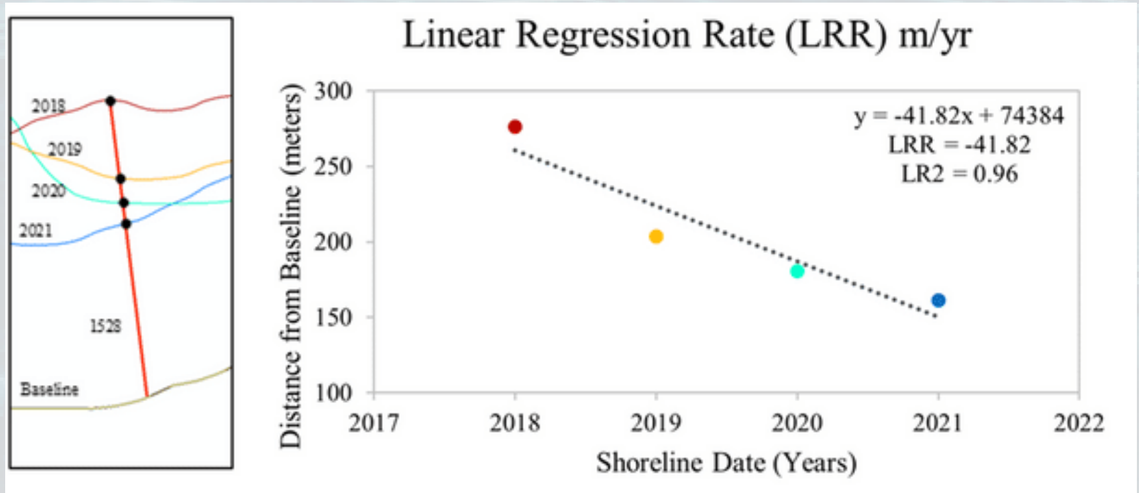
Shoreline Rate Calculation

DSAS
DIGITAL SHORELINE ANALYSIS SYSTEM

- Shoreline change envelope (SCE)
- Net shoreline Movement (NSM)
- Endpoint rate (EPR)
- Linear regression rate (LRR)
- Weighted linear rate (WLR)

1. All data used regardless of the charge of trend or accuracy
2. Statistical method
3. Based on the accepted statistic concept
4. Simple to use





Methodology

Shoreline Delineation Validation

- Shoreline extracted of the year 2021 were chosen for both Sentinel-2 and Landsat 8.
- 66 GCPs from the field survey were used to compare with the extracted shoreline.
- The RMSE is calculated as follows:

$$RMSE = \sqrt{\frac{\sum_{i=1}^{n}(L_{Obs,i} - L_{extract,i})^2}{n}}$$

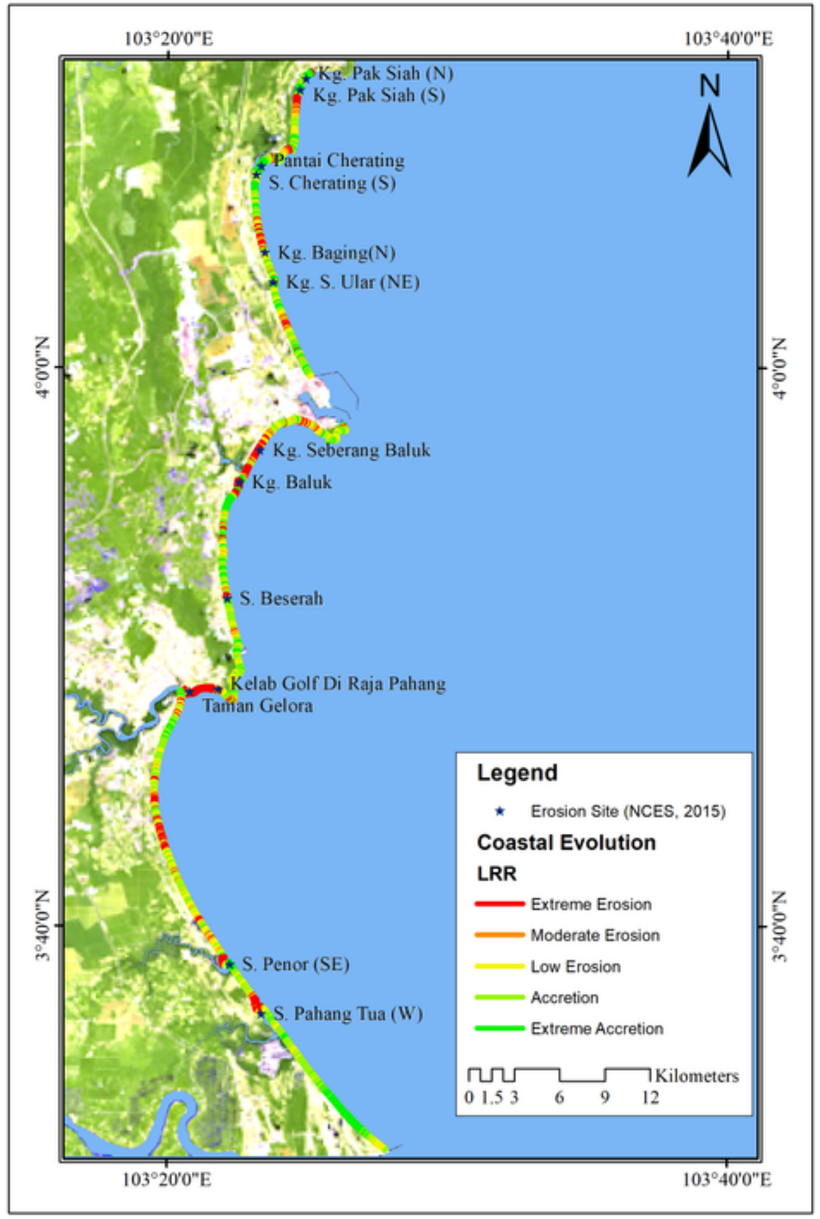
- The normalized form of RMSE is used as it determines the optimal shoreline detector technique.
- The NRMSE is calculated as follows:

$$NRMSE = \frac{RMSE}{\bar{L_{Obs}}}$$

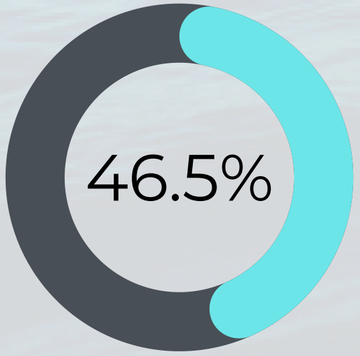
- NRMSE Sentinel-2 (0.009) and Landsat 8 (0.019)

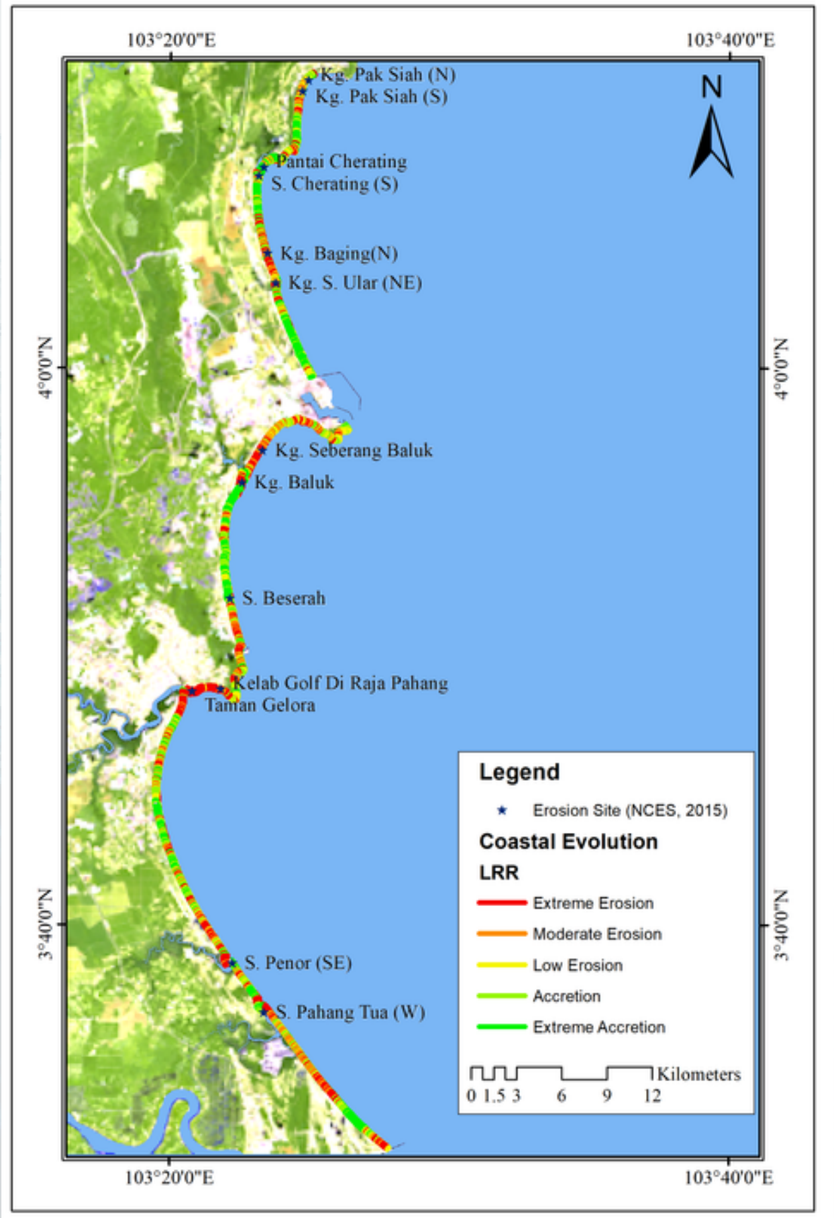
Results

Sentinel-2



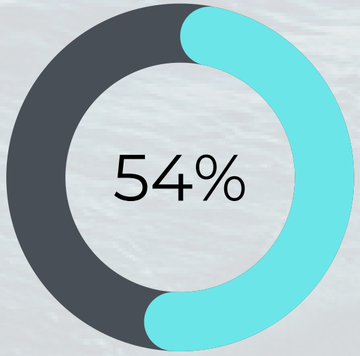
Erosion



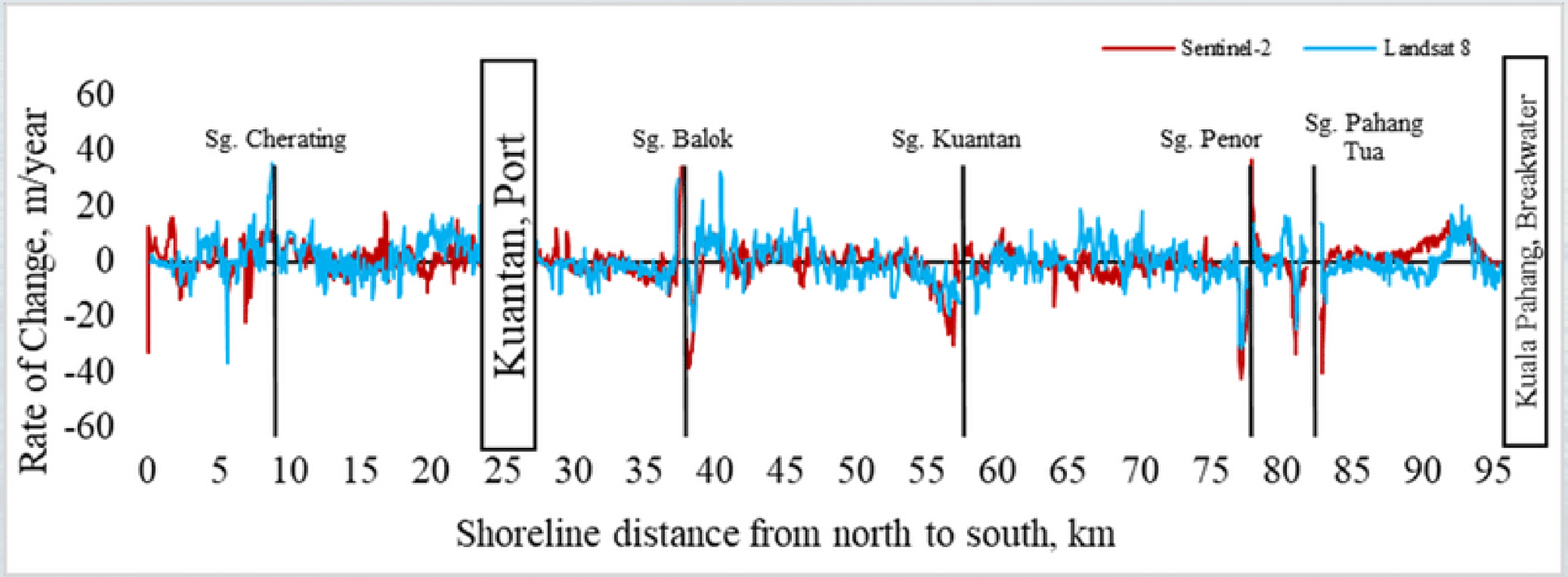


Landsat 8

Erosion

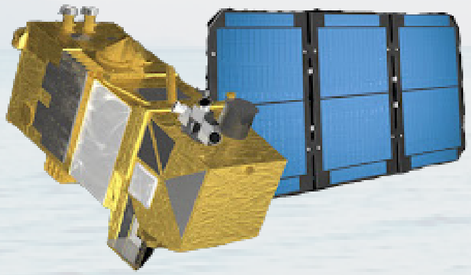


Results



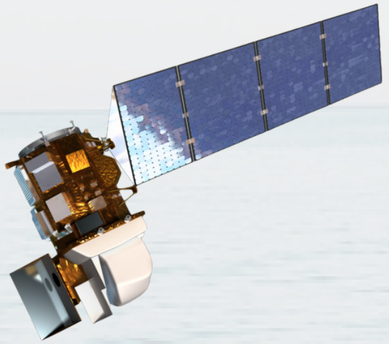
Comparison of linear regression rate between Sentinel-2 and Landsat 8 along Pahang coastline.

Discussion



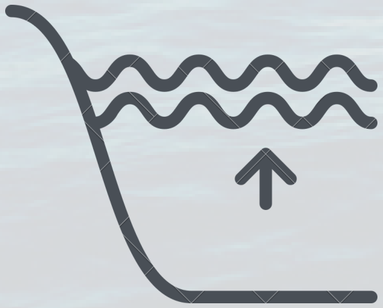
Sentinel-2

pixel size : 20



Landsat 8

pixel size : 30



Tidal Fluctuation Influence

Less Cloud Cover

Thank you!

Mazmirul Abd Rahman