



Ocean Science and
Coastal Engineering

Ocean Science and Coastal Engineering



Suntoyo, PhD
Agro Wisudawan, MT

Edited by
Suntoyo, PhD
Agro Wisudawan, MT



9 783035 710915

ISBN: 978-3-0357-1091-5
Applied Mechanics and Materials Vol. 862
Electronically available at <http://www.scientific.net>



TTP TRANS TECH PUBLICATIONS



Applied Mechanics and Materials

ISSN: 1660-9336, ISSN/ISO: Applied Mechanics and Materials

Editor:

Xi Peng Xu, Huaqiao University, Ministry of Education Engineering Research Center for Brittle Materials Machining, Xiamen, 361021, China, xpxu@hqu.edu.cn

Editorial Board: *see back inside cover.*

Aims and Scope:

“Applied Mechanics and Materials” publishes only complete volumes on given topics, proceedings and complete special topic volumes. We do not publish stand-alone papers by individual authors.

“Applied Mechanics and Materials” specializes in rapid publication of proceedings of international scientific conferences, workshops and symposia as well as special volumes on topics of contemporary interest in all areas which are related to:

- 1) Research and design of mechanical systems, machines and mechanisms;
- 2) Materials engineering and technologies for manufacturing and processing;
- 3) Systems of automation and control in the areas of industrial production;
- 4) Advanced branches of mechanical engineering such as mechatronics, computer engineering and robotics.

Authors retain the right to publish an extended, significantly updated version in another periodical.

Abstracted/Indexed in:

SCImago Journal & Country Rank (SJR) www.scimagojr.com.
Inspec (IET, Institution of Engineering Technology) www.theiet.org.
Chemical Abstracts Service (CAS) www.cas.org.
Google Scholar scholar.google.com.
Astrophysics Data System (ADS) <http://www.adsabs.harvard.edu/>.
Cambridge Scientific Abstracts (CSA) www.csa.com.
ProQuest www.proquest.com.
Ulrichsweb www.proquest.com/products-services/Ulrichsweb.html.
EBSCO www.ebsco.com.
CiteSeerX citeseerx.ist.psu.edu.
Zetoc zetoc.jisc.ac.uk.
Index Copernicus Journals Master List www.indexcopernicus.com.
WorldCat (OCLC) www.worldcat.org.

Internet:

The periodical is available in full text via www.scientific.net

Subscription Information:

Irregular: approx. 30-50 volumes per year.
The subscription rate for web access is EUR 1089.00 per year.
Standing order price for print copies: 20% discount off list price plus postage charges.

ISSN print 1660-9336 ISSN cd 2297-8941 ISSN web 1662-7482

Trans Tech Publications Ltd

Reinhardstrasse 18 • 8008 Zurich • Switzerland
Fax +41 (44) 922 10 33 • e-mail: office@scientific.net
<http://www.scientific.net>

Applied Mechanics and Materials

ISSN: 1660-9336, ISSN/ISO: Applied Mechanics and Materials

Editorial Board:

Cadoni, E., University of Applied Sciences of Southern Switzerland, Department for Construction, Environment and Design, DynaMat Laboratory, SUPSI-DACD, Campus Trevano, Canobbio, 6952, Switzerland;

Cheng, Y.S., Harbin Institute of Technology, School of Materials Science and Technology, Harbin, China, 150001;

Chinakhov, D.A., National Research Tomsk Polytechnic University, Yurga Institute of Technology (Branch); Leningradskaya 26, Yurga, Russian Federation, 652055;

Dodun, O., Gheorghe Asachi Technical University of Iași, Department of Machine Manufacturing Technology; D. Mangeron Blvd, 39A, Iași, 700050, Romania;

Gogu, G., Institut Français de Mécanique Avancée, Campus de Clermont-Ferrand/les Cézeaux, CS 20265; Clermont-Ferrand, 63175, France;

Karama M., Université de Toulouse, INPT - Ecole Nationale d'Ingénieurs de Tarbes (ENIT), LGP (Laboratoire Génie de Production); 47 Avenue d'Azereix, BP1629, Tarbes Cedex, 65016, France;

Krenický, T., Technical University of Košice, Faculty of Manufacturing Technologies with a Seat in Prešov; Bayerova 1, Presov, 080 01, Slovakia;

Zulkifli, R., Universiti Kebangsaan Malaysia, Department of Mechanical and Materials Engineering, Faculty of Engineering and Built Environment; Bangi, Malaysia, 43600;

Also published in these series:

858 (2016) Civil, Architectural, Structural and Constructional Engineering

857 (2016) Innovations in Structural Engineering and Construction

856 (2016) Energy Efficiency in Strategy of Sustainable Production Vol. II

855 (2016) URU International Conference on Science and Technology 2016

854 (2016) ICFIMEMM - 2016

853 (2016) Innovation in Testing and Evaluation of Structural Integrity

852 (2016) Mechanical Engineering Design

851 (2016) Advanced Materials, Structures and Mechanical Engineering II

850 (2016) Proceeding of 3rd International Conference on Electrical and Electronics Engineering 2016

Trans Tech Publications Ltd

Reinhardstrasse 18 • 8008 Zurich • Switzerland
Fax +41 (44) 922 10 33 • e-mail: office@scientific.net
<http://www.scientific.net>



Ocean Science and Coastal Engineering

Edited by
Suntoyo, PhD
Agro Wisudawan, MT

Ocean Science and Coastal Engineering

Selected, peer reviewed papers from the
3rd International Seminar on
Ocean and Coastal Engineering,
Environmental and Natural Disaster Management
(ISOCEEN 2015),
December 10th, 2015, Surabaya, Indonesia

Edited by

Suntoyo, PhD and Agro Wisudawan, MT



Copyright © 2017 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Reinhardstrasse 18
8008 Zurich
Switzerland
<http://www.scientific.net>

Volume 862 of
Advanced Materials Research
ISSN print 1022-6680
ISSN cd 1022-6680
ISSN web 1662-8985

Full text available online at <http://www.scientific.net>

Distributed worldwide by

Trans Tech Publications Ltd
Reinhardstrasse 18
8008 Zurich
Switzerland

Phone: +41 (44) 922 10 22
Fax: +41 (44) 922 10 33
e-mail: sales@scientific.net

and in the Americas by

Trans Tech Publications Inc.
PO Box 699, May Street
Enfield, NH 03748
USA

Phone: +1 (603) 632-7377
Fax: +1 (603) 632-5611
e-mail: sales-usa@scientific.net

Preface

It was my great honor and pleasure to organize The 3rd International Seminar on Ocean and Coastal Engineering, Environmental and Natural Disaster Management (ISOCEEN 2015) in Surabaya, Indonesia on December 10th 2015. The Organizing Committee worked many years for preparing of this seminar and their efforts resulted to full success. This event was held by cooperation among Institut Teknologi Sepuluh Nopember (ITS) especially Department of Ocean Engineering, Tohoku University, Japan, HZ University of Applied Sciences, Netherlands and The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF). This forum was more focused on creating and expanding professional network to foster the relationship between the University, industry, business and communities across the country.

ISOCEEN 2015 was aimed on providing a discussion, for exchanging of knowledge, researches and of recent solutions for many researchers and experts in the field of Ocean, Offshore, Coastal engineering, Environmental and Disaster Management. The results of discussions are presented in this book. We hope this book will be interesting and usefull for many engineers and scientists whose activity related with researches of ocean and development of coastal areas.

Finally, on behalf of the organizing committee of the seminar, sincere appreciation is expressed to all authors who contribute to our seminar. Special thanks are also due to all keynote speakers, invited talks and chairpersons for the efforts in preparing the manuscripts and managing the sessions, respectively.

Suntoyo, PhD

Chairman of Organizing Committee

Committees

Advisory Committee:

- Rector of ITS Surabaya, Indonesia
- Dean of Marine Technology Faculty - ITS, Indonesia
- Head of Ocean Engineering Department, FTK-ITS, Indonesia

Organizing Committee:

- Suntoyo, PhD (Chairman)
- Silvianita, PhD (Secretary)
- Yoyok Setyo Hadiwidodo, PhD
- Dr. Hasan Ikhwan, MSc
- Dr. Wahyudi
- Dr. Eng. Rudi Walujo Prastianto
- Dr. Eng. Muhammad Zikra
- Nur Syahroni, PhD
- Herman Pratikno, PhD
- Agro Wisudawan, MT
- Dirta Marina Chamelia, MT

International Scientific Committee:

- Prof. Hitoshi Tanaka, Dr. Eng. (Tohoku University, Japan)
- Prof. Widi Agoes Pratikto, PhD (ITS, Indonesia)
- Prof. Daniel M. Rosyid, PhD (ITS, Indonesia)
- Prof. Eko Budi Djatmiko, PhD (ITS, Indonesia)
- Prof. Mukhtasor, PhD (ITS, Indonesia)
- Suntoyo, PhD (ITS, Indonesia)
- Makoto Umeda, Dr. Eng. (Tohoku University, Japan)
- Dr. Joost Stronkhorst (HZ University of Applied Sciences, Netherlands)
- Ir. Liliane Geerling R.T.D. (HZ University of Applied Sciences, Netherlands)
- Ahmad Sana, PhD (Sultan Qaboos University, Oman)
- Priyantha Ranjan, PhD (Curtin University, Australia)
- Dr. Eng. Totok Suprijo (ITB, Indonesia)
- Dr. Eng. Purwanto Bakti Santoso (Unsoed, Indonesia)
- Dr. Eng. Sitang Pilailar (Kasetsart University, Thailand)
- Dr. Nguyen Trung Viet (Water Resource University, Vietnam)
- Dr. Taufiqur Rachman (Hasanuddin University, Indonesia)

Table of Contents

Preface	v
Committees	vi

Chapter 1: Hydrodynamics and Morphodynamics

Hydrodynamics and Sediment Transport of Benoa Bay, Semi-Enclosed Bay in Bali, Indonesia

I.G.B.S. Dharma and W. Candrayana	3
-----------------------------------	---

Turbulent Mixing in Raja Ampat Sea

A. Pamungkas, I.M. Radjawane and Hadikusumah	9
--	---

Effect of Tidal Current and Wave-Current Interaction on the Sediment Transport and Morphological Change in the Channel Water Intake

Suntoyo, M.M. Wijaya, Silvianita and H. Ikhwan	16
--	----

Characteristics of High Growth *Casuarina equisetifolia* and High Inundation of Tsunami when Propagating through Greenbelt Vertical Rod

N.A.S. Purwono, Nizam and R. Triatmadja	21
---	----

Shoreline Changes Dynamics at Bangkalan Regency

A.D. Siswanto, W.A. Nugraha and A. Wicaksono	27
--	----

Shoreline Changes in Tuban District in East Java Caused by Sea Level Rise Using Bruun Rule and Hennecke Methods

M.I. Joesidawati and Suntoyo	34
------------------------------	----

Analysis of East Surabaya Shoreline Determination Using Tidal Data, Image Satellite and RTK-GNSS

Khomsin	41
---------	----

Characteristics of Tidal in Surabaya

E.A. Kisnarti	46
---------------	----

Chapter 2: Oceanography, Aquatic Biology, Ecology and Management of Coastal Lands

Preliminary Assessment of Wave Energy Potential around Indonesia Sea

M. Zikra	55
----------	----

Oceanography Data Processing Online Using Internet

Suryadhi and E.A. Kisnarti	61
----------------------------	----

Seasonally Variation of Significant Wave Height for 25 Year Period Based on JMA/MRI-AGCM3.2 Wind Climate Data

M. Zikra, N. Hashimoto, K. Mitsuyasu, T. Pitana and Silvianita	67
--	----

Prediction of Significant Wave Height Using Neural Network in the Java Sea (North of Surabaya)

W.L. Dhanistha, R.A. Atmoko, P. Juniarko and R. Akbar	72
---	----

Landsat 8 Imagery Data Utilization for Mapping the Dynamics of Cooling Water Distribution Based on Changes in SST in the Coastal Waters

D. Saptarini, A.B. Cahyono, C.B. Pribadi, Mukhtasor and H.D. Armono	78
---	----

Sea Level Rise on Tuban Coast in East Java and its Consistency with MAGICC/SCENGEN Prediction	
M.I. Joesidawati, Suntoyo, Wahyudi and K. Sambodho	83
Estimation of Sea Surface Temperature (SST) Using Split Window Methods for Monitoring Industrial Activity in Coastal Area	
A.B. Cahyono, D. Saptarini, C.B. Pribadi and H.D. Armono.....	90
Impact Identification of Estuarine Water Quality to Marine Biota: A Case Study in Wonorejo Estuary, Indonesia	
W. Sakinah, Suntoyo and Mukhtasor.....	96
Characteristics of Temperature and Salinity Distribution in the Wonorejo Estuary, Surabaya, Based on Field Measurement	
A.D. Pahlewi, Suntoyo, Wahyudi and M. Taufik	102
Influence of Seawater to the River Water Quality in Kalibuntung Estuary Southeastern Coast of Surabaya City Indonesia	
Wahyudi, Suntoyo and Sholihin	107
Biodiversity <i>Solen</i> sp. in Madura Island	
E.A. Wahyuni, Insafitri, M.N. Ihsan and G. Ciptadi	115
Effect of Natural Feed on Feed Consumption Level and Feed Conversion Ratio of Tropical Abalone <i>Haliotis asinina</i> on Sea Cage	
Hadijah	121
Median Lethal Concentration (LS-50) of Lead and the Effect on Osmoregulation of the “Red Tilapia” Fish (<i>Oreochromis</i> sp.)	
Nuhman and F. Lailatin	127
The Regional Distribution Map of Carbohydrate Producer and the Feed Material Quality of <i>Vannamei</i> Shrimp in South Sulawesi	
Zainuddin, S. Aslamyah and Haryati	132
Dynamic Model of Land Area Changes in the East Coast of Surabaya	
V.D. Prasita, Nuhman and N. Rosana.....	138
LPI-Based Severity Mapping of Earthquake Induced Soil Liquefaction in Pacitan City Coastal Area Indonesia	
Wahyudi	144
Dynamic Modeling System for Analysis Smelter Development Plan in National Baluran Park, Situbondo	
A. Listriyana, M. Zikra and D.M. Rosyid.....	154
Management of Baluran National Park Resources for Coastal Ecotourism Based on Suitability and Carrying Capacity	
N.I. Nuzula, H.D. Armono and D.M. Rosyid	161
Development Efforts of Coastal Community after Lapindo Mud Flow	
Alaudin, M. Mustain and D.M. Rosyid.....	168
The Combination Process between Disc-Mill and Distillation Evaporation in Producing Salt Diversification Products	
I. Baroroh, B. Suwasono and A. Munazid	174
Coastal Studies for Implementation of Law 27/2007 jo 01/2014 in Sumenep Regency	
A.D. Siswanto and W.A. Nugraha	182
Groundwater Profile Model around Mud Reservoir and Sidoarjo Coastal Area	
Yusman and M. Mustain.....	189

Chapter 3: Port Engineering and Maritime Logistics

A Transport Telematics Contribution to Sustainable Development of Small Islands, Case Study: Maratua Island

S. Nugroho, Murdjito, M.B. Zaman and A.Z. Abidin 197

A Petri Net Model and its Simulation for Straddle Carrier Direct-System Operation in a Container Terminal

P.H.N. Prayoga and T. Shinoda 202

Model of Determining Operation Coverage Area of Port: Case Study East Java

F. Hadi, A. Mustakim, I.T. Yuniarto, S.D. Lazuardi, H.I. Nur and D.H. Islamiati..... 208

Identifying Characteristics of Accidents in Japan's Five Major Ports

A.B. Sulistiyono, W. Mutmainnah and M. Furusho 214

Introducing 4M Overturned Pyramid (MOP) Model to Analyze Accidents in Maritime Traffic System (MTS): A Case Study on Collisions in Japan Based on Occurrence Time

W. Mutmainnah, A.B. Sulistiyono and M. Furusho 220

Study of Port Tariff Structure and Port Pricing Approach

T. Achmadi, F. Hadi, H.I. Nur, I.T. Yuniarto and C. Boyke..... 226

Observation Study the Walking Speed and Distribution of Ship's Passengers as Basis for Passenger Evacuation Simulation

T. Pitana, K.B. Artana, D. Prasetyawati and N. Siswantoro 232

Analyzing the National Logistics System through Integrated and Efficient Logistics Networks: A Case Study of Container Shipping Connectivity in Indonesia

S.D. Lazuardi, B. van Riessen, T. Achmadi, I. Hadi and A. Mustakim 238

Profile of Capture Fisheries in the Southern of East Java as the Basis for the Development of Fishing Ports

N. Rosana and V.D. Prasita..... 244

Chapter 4: Offshore Engineering and Shipbuilding

Behavior Prediction of Ship Structure due to Side Impact Scenario by Dynamic-Nonlinear Finite Element Analysis

A.R. Prabowo, D.M. Bae and J.M. Sohn 253

Reliability Analysis of APN-A Offshore Jacket Using Monte Carlo Finite Element Method

A. Wisudawan, D.M. Rosyid and M.L. Baihaqie 259

Developing the Structural Integrity Management System for Ageing Fixed Offshore Oil Platforms in Indonesia

R.D. Riyanto and Murdjito 265

Fatigue Life Re-Assessment of FSO Spread Mooring System

M. Irfan 271

Effects of Parallel-Middle-Body Relative Length and Stern Form on the Wake Fraction and Ship Resistance

K. Suastika and F. Nugraha 278

An Investigation into the Effect of Bilge Keels to the Roll Motion Response of Fishing Vessel

Hasanudin, J.H. Chen, I.K.A.P. Utama and H. Hendratmoko 284

Wave Load Analysis of the Corvette Ship in the Sea Water of Indonesia	
A. Sulisetyono and T. Putranto	291
Pipe Transmission Project Planning Using What If Analysis Method	
Silvianita, A.H. Winda, M. Yeyes and Suntoyo	296
Strength Analysis of Portable Blast Room Using Modular Glass Reinforced Plastics Wall Panel by Finite Element Method	
A. Windyandari, D.S. Solichin and A.F. Zakki	302
Effect of Underwater Welding in Marine Environment and Surface Welding to Mechanical Properties of Steel Weld Joint	
H. Pratikno	308
Project Delay Analysis on Jacket Structure Construction	
Silvianita, F. Redana, D.M. Rosyid, D.M. Chamelia and Suntoyo	315
Vibration Analysis on the Dog Leg Subsea Pipeline due to Internal Fluid Flow	
D.M. Chamelia, W. Wardhana and Silvianita.....	321
The Effect of Spring System Design on Scavenging of Two Stroke Single Cylinder Spark Ignition Free Piston Linear Engine	
A.Z.M. Fathallah and A.R. Firdaus.....	326
Numerical Model for Prediction the Scour Depth around Two Pipelines in Tandem	
G.S. Lasatira, Suntoyo and H.D. Armono	332
Keyword Index	339
Author Index	343

Oceanography Data Processing Online Using Internet

SURYADHI^{1,a*}, ENGKI Andri Kisnarti^{1,b}

¹Faculty of Engineering and Marine Science, Hang Tuah University, Surabaya, Indonesia

^asoerjadhi@gmail.com, ^bandriuht@gmail.com

Keywords: microcontroller, gateway SMS, server

Abstract. The oceanographic data can be obtained by free and online websites of foreign countries. This oceanographic data are obtained from satellite observations, but this online data is in a coarse resolution with a global coverage space, its usage in certain areas still needs to be combined and validated with the observed data locally or regionally. Thus, this oceanographic data from these local observations some be easily obtained and processed as well as easily accessible by people online, it would require equipments. In this research, the oceanographic data that need to be observed is the speed data, the direction of currents data and the tidal data. The oceanographic data obtained directly from the observed area uses is the sensors that is connected to the microcontroller and sent via a modem. In real time, these data submitted by the microcontroller via the modem that also serves as a gateway SMS directly to the server. From this server, the community can access these online data using the internet.

Introduction

Indonesia as a maritime country, ie. a country with most of the territory is an ocean, should make the marine sector development as top priority. In order that the development in marine sector could be run smoothly then all aspects related, should be well prepared. One of the important aspect of marine development is oceanographic data. Broadly speaking oceanographic data can be grouped into oceanographic physics data, oceanographic chemistry data, marine biological data (including data on fisheries), and marine geological data (including hydrographic data). Some of which belong to the category of oceanographic physics data is tidal, wave, current, and temperature. Some of the above parameters there can be measured directly by using a measurement tool, such as tidal, wave, current, and temperature. [1,2].

Beside using gps, the research about the prediction of sea-level rise in surabaya also using the tidal data. It is used to compare the data from satellite image with the one on the field [3]. The 20 years tidal data then processed by using admiralty method to analyze the sea-level rise of surabaya waters[4].

Nowadays, the oceanographic data can get easily through free and online websites of foreign countries. This oceanographic data is obtained from satellite observations result, but this online data still in coarse resolution with a global coverage space, so for using in certain areas still need to be combined and validated with the observed data locally or regionally. In order for the oceanographic data from these local observations can be easily obtained and processed as well as easily accessible by people, it would require equipments.

Methodology

Research Methods. The methods used in the research of oceanographic data processing online using this internet network is to follow the following stages.

The Design of Electronic Circuits.

The design of electronic circuits made by following the figure diagram block below (Fig. 1):

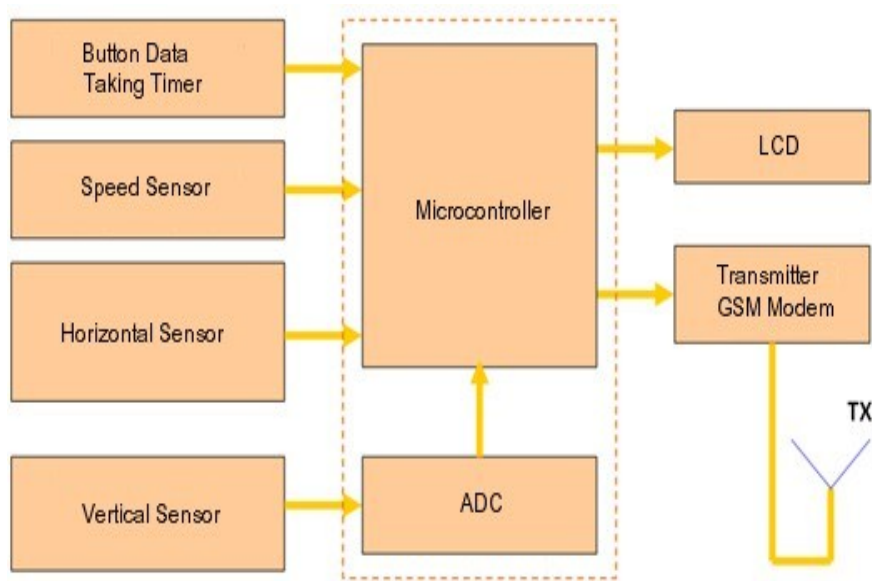


Fig. 1. Block diagram measuring current speed and direction

To measure the speed of sea currents, we used optical sensor in the form of a pair of infrared transmitter and receiver often called optocoupler. Optical sensor reads a perforated disc mounted on propeller shaft. The large number of holes greatly affects the accuracy of the reading speed. To find out the direction of the sea current, we used potentiometer as sensor to know the direction of the vertical and compass sensor for horizontal directions.

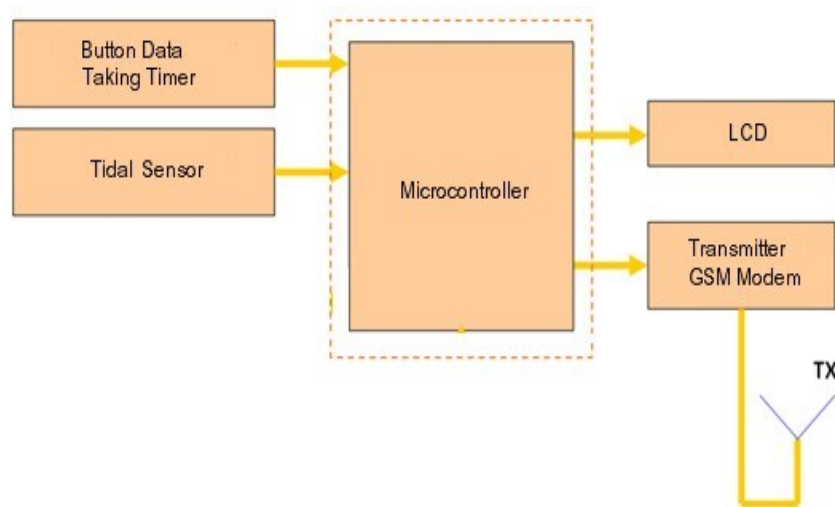


Fig. 2. Block diagram of tidal sensor

To measure the tidal of sea water, we used ultrasonic sensor. Ultrasonic sensor will transmit the signal. When the signal touch the surface of sea water then the signal will reflect and accepted by the set of recipients. Every changes from the height of the surface of sea water will be also obtained the changes of the distance between the surface of sea water with ultrasonic sensors.

The speed data and direction of the currents and tides that were already processed by the microcontroller then sent via modem gsm transmitter. The submitted data which is accepted by the gsm receiver modem will be stored in the web of computer server. These data then processed by the Delphi programs then stored in mysql database. On the server also created a website that will display datas which has been stored in the database and this website can be accessed from any communications gadget like any smartphone, computer or laptop as long as they connected to the internet.

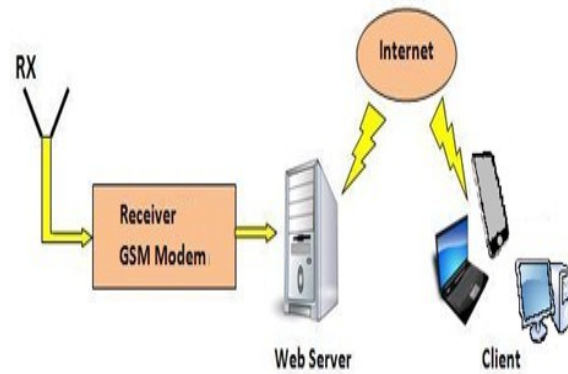


Fig. 3. Block diagram of receiver

Results and Discussion

Figure 4 shows the measurement of the speed and direction of the currents that have been completed.



Fig. 4. The Speed And Direction Of Ocean Currents Gauge

The retrieval location of the speed data and direction of sea currents is at Pasir Putih Beach, Situbondo city. The modem part, power supply and minimum system (microcontroller) placed approximately 1 meter above the sea level, while the vertical direction sensor, the horizontal direction sensor and speed sensors placed in sea water with a depth of approximately 1.5 meters. Data delivery from the measuring instrument to the recipient modem approximately 1 kilometer.

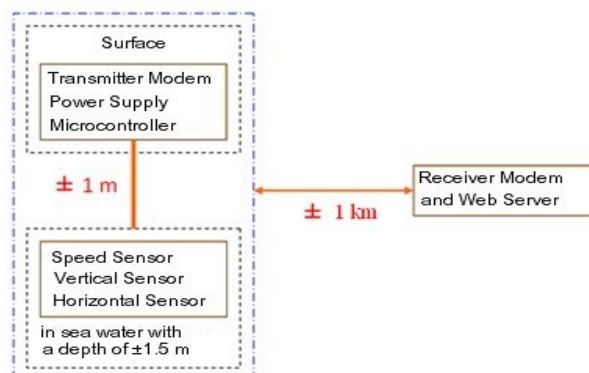


Fig. 5. The gauge position at the data retrieval location

The location of the tidal data of sea water retrieval is at Pantai Kenjeran Surabaya. As for the placement tool is the modem part, power supply and microcontroller are placed above the water surface. Ultrasonic sensor placed overlooking the water with a maximum height of 3 meters above the water surface.



Fig. 6. The tidal gauge

The Speed data, the direction of the currents and tides that are accepted at the moment of data retrieval is set every five minutes. This data is processed by software that exists on a computer server to be stored in the database.

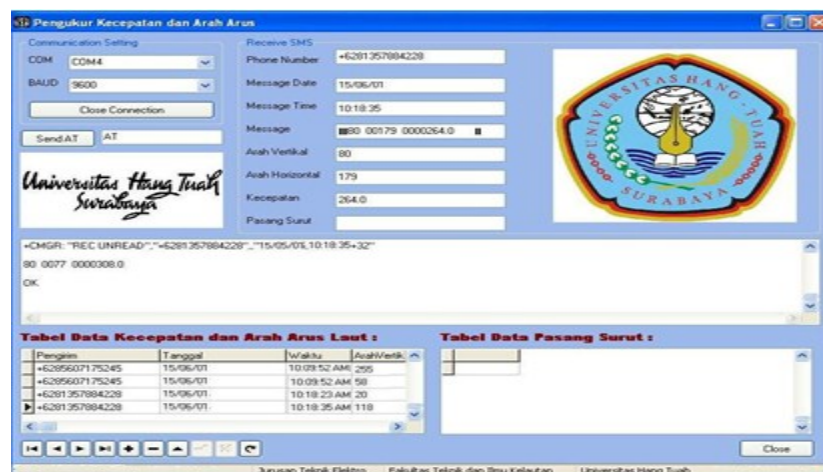


Fig. 7. The software display on computer server when receiving speed data and direction of the currents data

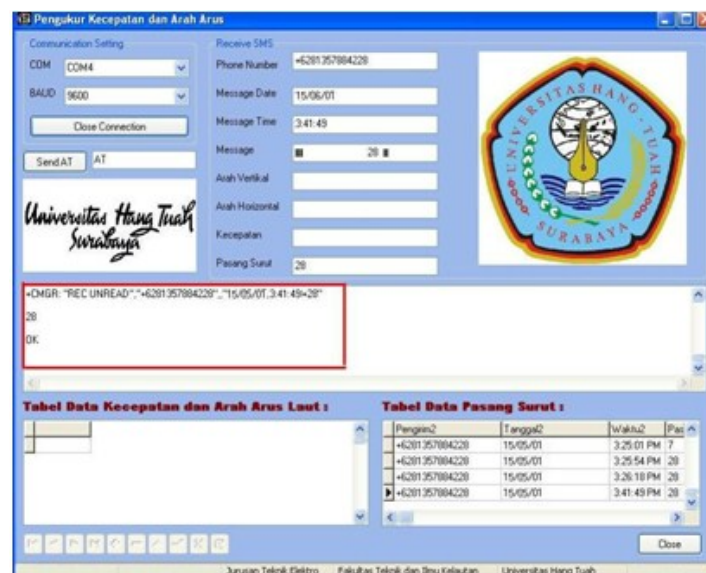


Fig. 8. The software display on computer server when receiving tidal data

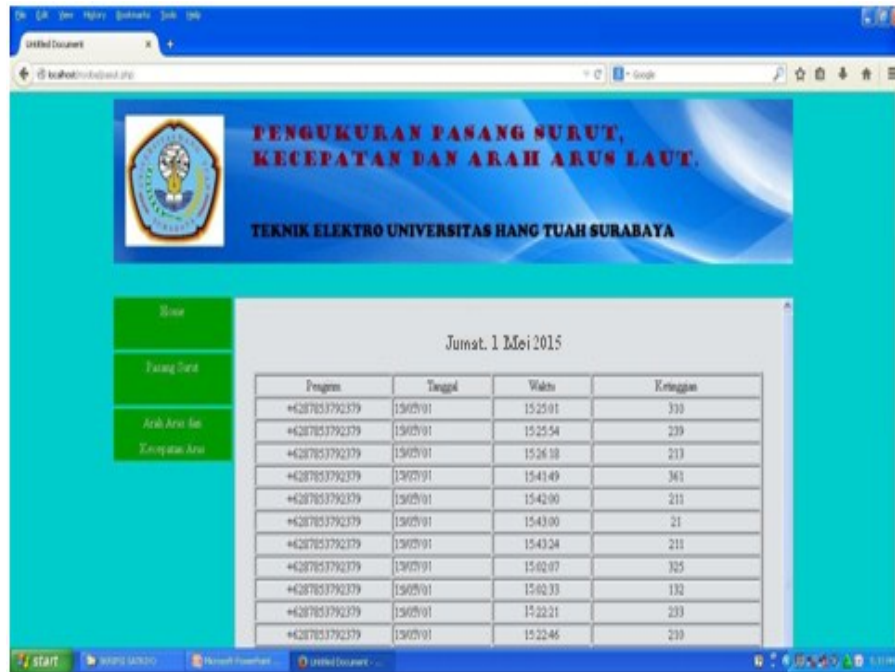


Fig. 9. The web display on user computer

Table 1. Retrieval result of direction data and speed data every 5 minutes

Direction Data and Speed Data (Every 5 minutes)			
Time	Vertical (°)	Horizontal (°)	Speed (Cm/Minute)
08:27:44	170	319	143.0
08:32:48	170	318	473.0
08:37:52	110	312	121.0
08:42:56	140	308	154.0
08:48:00	130	310	143.0
08:53:04	140	307	220.0
08:58:08	150	297	209.0
09:03:11	130	302	374.0
09:08:15	130	303	429.0
09:13:20	140	298	341.0

Table 2. Retrieval result of tides data

Tides Data (Every 5 minutes)		
Modem Time	Server Time	Height (cm)
10:20:12	10:20:22	74
10:24:16	10:24:25	72
10:28:20	10:28:30	65
10:32:24	10:32:34	65
10:36:27	10:36:37	73

Conclusions

Based on the test results and analysis of the data against the speed measuring , the currents direction and tides, we conclude that the sensors which is used can be serve to detect speed changes, currents direction and tidal. Similarly, the microcontroller also can process datas that received from the sensors and can control the delivery data time to computer server via modem transmitter. Modem and modem transmitter both can send data and can receive data within far enough. The software on the server computer can also process datas that received and store them into database. Website that display the speed data, the currents direction and tides can also be accessed by computer users through the browser.

References

- [1] Suryadhi, Transmisi Data Perubahan Ketinggian Air Laut Menggunakan Media Handphone, Jurnal Sains dan Teknologi, 2009, vol. 7, no. 2, pp. 145-158.
- [2] Suryadhi, Rancang Bangun Transmisi Jarak Jauh Data Kecepatan Dan Arah Arus Laut Menggunakan Modem GSM, Proseding Seminar Nasional Kelautan IX Universitas Hang Tuah Surabaya, 2014.
- [3] Viv Djanat Prasita, Engki Andri Kisnarti, Prediction of Sea Level Rise Impacts on the Coastal Areas of Surabaya using GIS. The International Journal of Engineering and Science, 2013, vol. 2, no.7, pp. 01-09.
- [4] Engki Andri Kisnarti, Viv Djanat Prasita, Methods of Tidal Approach for Determination of Sea Level Rise in Surabaya Waters. The International Journal of Engineering and Science, 2014, vol. 3, no. 2, pp. 12-17.