Indian Journal of Geo Marine Sciences

Editorial Board

Dr Shaileksh Naik
Secretary
Ministry of Earth Sciences
CGO Complex, Lodhi Road
New Delhi 110 003
E-mail: secretary@moes.gov.in

Dr S R Shetye
Director
National Institute of Oceanography
Dona Paula, Goa 403 004
E-mail: shetye@nio.org

Dr Ram Boobh
Programme Specialist (Ecological and Earth Science)
UNESCO Office for Bhutan, India, Maldives and Sri Lanka
UNESCO House, B 5/29, Safdarjung Enclave
New Delhi 110 029
E-mail: r.boobh@unesco.org

Dr Wang Chunzai
Oceanographer, NOAA / AOML
Physical Oceanography Division
4301 Rickenbacker Causeway
Miami, FL 33149, USA
Email: Chunzai.Wang@noaa.gov

Dr Dan Longi
Scientist
Australian Institute of Marine Science
PMB No. 3, Townsville M.C.
Queensland 4810, Australia
E-mail: D.Longi@aims.gov.au

Mr Leonard Sonnenschein
President
World Aquarium and Conservation for the Oceans Foundation
701 North 15th Street, 2nd Floor
St. Louis, Missouri 63103, USA
Email: lsaquaman@aol.com

Dr Tonomori Matsuura
Faculty of Science
Graduate School of Science and Engineering
University of Toyama, Japan
E-mail: matsuura@sci.u-toyama.ac.jp

Prof A D Rao
Centre for Atmospheric Sciences
Indian Institute of Technology
New Delhi 110 016
E-mail: adrao@cas.iitd.ernet.in

Dr S C Shenoy
Director
Indian National Centre for Ocean Information Services
Ocean Valley P O Box No. 2 IDA, Jeedimetla
Hyderabad 500 055
E-mail: shenoy@inois.gov.in

Dr Meena Kumari
Deputy Director General
Krishi Anusandhan Bhawan 2
Indian Council of Agricultural Research
New Delhi 110 012
E-mail: meenakumarib@gmail.com

Prof. N. Chandramohan Kumar
School of Marine Sciences
Cochin University of Science And Technology
Cochin 682 016
E-mail: chandramohan.kumar@gmail.com

Prof R Ramesh
Director
Institute of Ocean Management
Anna University, Chennai 600 025
E-mail: rramesh_at@yahoo.com

Dr M R Ramesh Kumar
Scientist ‘G’
National Institute of Oceanography
Dona Paula, Goa 403 004
E-mail: ramesh.kumar@nio.gov.in

Dr Vijay Kumar
Director General
Fisheries Survey of India
Botawala Chamber, Sir P M Road
Mumbai 400 001
E-mail: dg-fsi-mah@nic.in

Prof P M Mohan
Head
Department of Ocean Studies and Marine Biology, Pondicherry University
Brookshabad Campus, P O 26, Junglighat
Port Blair 744 103, Andamans
E-mail: pmmtu@yahoo.com

Director: NISCAIR (Ex-officio)

Editor: Dr. Charu Lata

Phone: 91-11-26962560, 26517565 (Extn-409); E-mail: ijms@niscair.res.in; ijmcsir@gmail.com; Website: www.niscair.res.in

Published by National Institute of Science Communication And Information Resources,
K S Krishnan Marg, New Delhi 110 012, India

The Indian Journal of Geo Marine Sciences (IJMS) is issued monthly.
The Institute assumes no responsibility for the statements and opinions advanced by contributors. The editorial staff in its work of examining papers received for publication is assisted, in an honorary capacity, by a large number of distinguished scientists.

Communications regarding contributions for publication in the Journal should be addressed to the Editor, Indian Journal of Geo Marine Sciences, National Institute of Science Communication And Information Resources, CSIR, New Delhi 110 012, India.

The contents list along with the abstracts of papers published in the latest issue of journal are available on Internet: URL: http://www.niscair.res.in

Annual Subscription, Rs. 3200/- US $ 550*; Single Copy, Rs. 320/- U.S. $ 55* (*inclusive of first class mail)

All correspondence regarding reprints, journal copies, subscription, renewals, claims for missing numbers and advertisements should be addressed to the Sales & Distribution Officer, National Institute of Science Communication And Information Resources, CSIR, New Delhi 110 012. Payments may be made by money order, cheque or bank draft marked payable to NISCAIR, New Delhi. For inland outstation cheques please add Rs. 50.00 and for foreign cheques add $10.00 towards the collection charges.

Phone: 25845359, 25846301,03-07; Fax:(91)(11)25847062; E-mail: sales@niscair.res.in

Claims for missing numbers of the journal will be allowed only if received within three months of date of issue of the journal plus the time normally required for postal delivery of the journal and the claim.

© 2019 Council of Scientific & Industrial Research, New Delhi
Editor’s Note

The *Indian Journal of Geo Marine Sciences* [IJMS] is covered by the following international abstracting, indexing and current awareness services:

- Current Contents/Agriculture, Biology & Environmental Sciences
- Oceanographic Abstracts and Bibliography (Deep-Sea Research)
- Aquatic Sciences and Fisheries Abstracts
- Bioresearch Index of Biological Abstracts
- Meteorological & Geoastrophysical Abstracts
- Oceanic Abstracts
- Chemical Abstracts
- Physical Abstracts
- Agrindex of FAO

**I.P.C. Codes for Papers**

IJMS is attempting to assign IPC codes [International Patent Classification] to all papers published from March 2004. This is a novel initiative for the wider visibility, literature search and to help accessibility of research documents to worldwide user community. For further information on IPC refer WIPO website [www.wipo.int]

**CSIR Journals Go Electronic**

The contents list along with the full text of the papers published in the latest issues of the journal are also available on NISCAIR web site: [http://www.niscair.res.in](http://www.niscair.res.in). We request our contributors to submit their manuscripts for publication as electronic files. The storage medium needed is floppy diskettes (3.5”)/CD. The software preferred for text is MS WORD FOR WINDOWS version 6.0 or upwards. The format should be kept as simple as possible. Submission of electronic illustrations is encouraged (tiff/ jpeg files), but original illustrations would also be needed.

**NISCAIR Policy on Plagiarism**

The system of formal communication in science through publication in primary journals is based on originality and quality of information, being the only criteria for publication. However, there have been tendencies to misuse the system and vitiate the process of science communication for personal benefits. One of the ills, afflicting science communication, is plagiarism. Attempts at plagiarism may range from verbatim copying of extensive material of other authors, misappropriating results/data of others with minor changes in language/presentation without giving credit to original source, and to publishing essentially the same information more than once.

As the premier institution of publishing primary scientific journals in various disciplines of science and technology in India, NISCAIR strongly reiterates its policy of discouraging plagiarism of all kinds. All efforts are made to detect and frustrate attempts at plagiarism through editorial screening and rigorous peer review in respect of communications received for publication in the NISCAIR publications. Cooperation of the scientific community is sought in our efforts to frustrate all attempts at plagiarism.

In case, any attempt of plagiarism is brought to our attention accompanied with convincing evidence, following steps would be taken:

(a) After consulting the respective Editorial Board Members, authors guilty of plagiarism will be debarred from publishing their papers in NISCAIR journals.
(b) Heads of the Departments/Institutes of the offending authors will be intimated of such incidences of plagiarism
(c) Such incidents of plagiarism will be publicized through the concerned NISCAIR journals in consultation with the respective Editorial Board Members.