Editorial

Status of the Journal:

Managing a journal while provides satisfaction gives some headaches. I have been handicapped due to non availability of a structured office. None is in a position to find apt solutions, for want of strong financial base. Since bringing the journal in time and focus on enhanced quality is vital, myself and couple of my colleagues associated with journal's management have got accustomed to bear these inconveniences, mainly because we are motivated by the appreciation and strong support from earth science community. I am personally indebted to Dr (Mrs) Nandini Nagarajan, Editorial Board Member, Dr.ASSSRS.Prasad, Organising Sec of IGU and Dr.MRK.Prabhakara Rao,Assistant Editor of the journal for extending their unequivocal support during crucial phases of manuscripts reviewing and journal's printing and publication. I am also indebted to Dr.P.Sanjeeva Rao of DST, Editorial Board Member for his moral support.

I am happy to inform our journal's impact factor has risen. NISCAIR evaluation has given the journal IF of 0.313 for 2014; as compared to 0.225 for 2013. The change is reflected from April issue. We have also restructured instructions to authors to bring in to focus important points of relevance for present times. I am also happy to tell that young researchers, elders and past Presidents conveyed their appreciation for significant quality enhancement of journal's contents.

However, these positive developments are not sufficient to get due recognition from national and international scientific community. Efforts have been initiated afresh to get recognition from international accreditation channels. It may take some time to convert the journal in to e-journal and then meet various norms fixed by the accreditation channels. If the journal has to survive this is a necessity. Once we get this accreditation many hurdles automatically disappear and we could seek financial support from DST and MOES, for strengthening the base of the journal. I am stressing this as economics show that the journal cannot be sustained for long, as cost of publication has increased exponentially. We are hopeful that the journal will receive sponsored support and backing of scientific community to tide over various problems.

Learning, Teaching and Publishing

Learning should be a continuous process as none can teach something without understanding the importance of a topic he/she is expected to teach. Unfortunately, the learning process is found to take back seat, in many teaching institutes. A recent study has found that 85 % of our university teaching and research is mediocre. It is unfortunate to learn that not a single Indian university is listed in the top 200 global universities. It is found by various committees constituted by the government that teaching has become a routine exercise and both teachers and students are only interested in completing the course, irrespective of the procedures adopted. Technology has made our job of teaching and guiding easy, but unfortunately diluted the importance of learning before teaching. Teachers need to upgrade their knowledge base and help the students in particular and society in general, in gathering wisdom. It is the bounden duty of a teacher to guide his ward to become great. The quest for greatness does not happen through wishing, or through comfort and shortcuts. Greatness is both the goal and the by-product of its own pursuit. Never teach a student to be satisfied with average or even good results. Motivate him to achieve greatness, which not only brings laurels to your student but also brings happiness to you, his TEACHER**.** This process requires teacher or guide to have a clear urge to do his best and aim at the best. As pointed out by Michael Bloomberg (Former Mayor of Newyork City) "A University's obligation is not to teach students what to think but to teach students how to think…..If students graduate with ears and minds closed, the university has failed both the student and society". Unfortunately, his statement applies to at least 75 % of our universities. This rut needs to be cleansed. I am writing this as I

am disturbed by the mediocrity persisting in at least 50 % of manuscripts submitted for publication in our journal by teachers & students, guides & research scholars and senior scientists & juniors. While publishing in international journals, to enhance visibility in international scientific community the authors show considerable attention. Such a focus and attention are not evident in case of manuscripts contributed to Indian journals. As an author, it's not what you say, but how you say it that turns the reader's switch from "off" to "on." The goal is to make the reader stop and say, "Wow…that makes perfect sense and I never thought about it quite that way!". I sincerely request one and all to support our journal, by communicating well structured articles. Such an initiative would make your research and our journal internationally acclaimed. I am indebted to all those who have contributed quality reviews and original papers and those who helped us by properly reviewing manuscripts, amidst their busy schedule. In spite of considerable hard work, we are assiduously striving to encourage publications from young scientists and research scholars. Instead of turning down a manuscript, we are restructuring it spending considerable time. As detailed above I urge and request teachers and guides to screen the manuscripts prepared by their juniors before communicating them for publication.

It is essential for earth scientists to get exposed to environmental issues, as such an exposure alone can make both teachers and students to better utilise their knowledge to benefit the society. It is essential to introduce a 15 day field exposure (as part of dissertation) to understand and address area specific environmental issues. This aspect is given due importance, by the concerned, as per the following news item.

Environmental Studies

The National Green Tribunal (NGT) has asked the University Grants Commission (UGC) to regularly monitor the mandatory implementation of six-month core module syllabus on environmental studies for undergraduate courses in all branches of higher studies. UGC secretary has written to vice-chancellors of all 706 universities in the country seeking compliance of this programme. "Non-compliance will tantamount to contempt of court," the letter cautioned the vice-chancellors. The UGC's communication comes in the wake of the fact that several universities and affiliated colleges are yet to initiate steps for mandatory implementation of environmental studies programme at the undergraduate level. Besides the core syllabus, the UGC has also asked for steps to create awareness among students for preservation of environment. "A step further to this is the concept of 'One Student, One Tree' for which the students will be involved in nurturing a tree for preservation of environment," the letter stated. The National Service Scheme (NSS) and other allied departments in universities may be instructed to ensure that at least one tree is planted by a student during his/her studies in the university/institution, the letter added. This may also be implemented in all the affiliated colleges, it stated. The UGC has asked universities to provide free saplings to students for plantation drives on campuses. "The distribution of publicity material on environmental preservation should also be a part of the programme," the UGC letter stated.(**Source: :**http://timesofindia.indiatimes.com/city/pune/NGT-tells-UGC-to-monitor-undergrad-environment-studies/articleshow/46763260.cms)

This is a positive step. But implementing it, with commitment, needs voluntary involvement. As pointed out by Isaac Asimov "The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom". As such, learned need to support positive initiatives to help the society to properly make use of scientific knowledge. Coercion will not help, as it would defeat the very importance of such an initiative.

Impact of Manmade quality deterioration and Natural Hazards--Existing Reality:

As expected we suffered due to hot summer. It was bearable till 3rd week of May. But abruptly has shown it's true colours from around 20th May till the end of May. In couple of days the situation changed significantly making the summer heat abnormally high, leading to loss of more than 1300 people (as on 27th May and still counting as there is no respite

from Heat Wave) in two states; A.P and Telangana. Situation was equally precarious in northern and eastern parts of the country. In many places mercury shot up beyond 47°C, bringing to focus the quixotic nature of the weather and our helplessness in meeting this natural phenomenon. There were no timely warnings to protect agriculture labour, small and marginal farmers, daily wage earners and street vendors .As stated by Stein et al (Earth & Space Science News, EOS, Apr, 2015, vol. 96, no.7, pp-17 to 19) defending society against natural hazards is a high-stakes game of chance against nature, involving tough decisions. We need to introduce tough decisions, even if they hurt momentarily, in protecting hapless millions from even such minor natural hazards. If our hazard management is not in a position to act promptly in saving life from such hazards one can visualise the plight of affected due to severe hazards like earthquakes, cyclones and floods. It is essential to note that the more a community spends on mitigation, the better off it may be in future.

Severity of summer heat has been enhanced by dusty winds, air pollution with garbage burning and chaotic traffic in urban hot spots, shortage of water and adulterated food, making life miserable especially for children and senior citizens. In spite of significant deterioration of quality that needs overall re-fixing of priorities and targets, we continue to hear assuring statements from those who rule us. Both they and we know the reality. To make things better we have to sacrifice many things, including our craving for materialistic gains of short duration acquired at the expense of our basic values. Even though this may not be the forum to discuss these issues, I felt like writing these couple of sentences, as the overall degradation does affect our day to day life; personal and professional. In addition to natural factors Man`s role in degrading the environment has contributed to our present plight.

After witnessing the tragedy in Nepal we are once again reminded of the oft repeated stern warnings of the Nature. It is essential for one and all to be extra cautious in fragile Mountainous environment. Irrational developmental activities in Uttarakhand led to Manmade Avalanche that wiped out thousands in 2013. Non implementation of safety norms in building structures in Kathmandu Valley coupled with high density population in a limited urban sector enhanced life and property losses due to series of earthquakes and aftershocks starting from 25th April. Specific details of the calamity, as of May, and steps essential to rebuild the torn Nepal are detailed below.

In January issue I pointed out that we need to be prepared for monsoon aberrations as El Nino prediction has turned out to be a difficult proposition, due to unstable Sea Surface Temperatures, wind velocity and direction and unpredictable troposphere dynamics due to enhanced aerosol activity. Some details pertaining to monsoon forecasting, as of mid May are also given below.

Tragedy in Nepal and its impact:

Nature has once again proved it's superiority. It has crushed under its feet hapless thousands and rendered helpless millions. Fragile economy of Nepal has been ruined. All of us, irrespective of stature and wisdom based knowledge, should admit that we can only seek nature's blessings but cannot build chains to control it. That is the bitter truth.

The 2015 Nepal earthquake (also known as the Gorkha earthquake), which killed around 10,000 people , injured more than twice as many and displaced 2.8 million, occurred at 11:56 NST on 25 April, with a moment magnitude (M_w) of 7.8M_w or 8.1M_s and a maximum Mercalli Intensity of IX (*Violent*). Its epicentre was the village of Barpak, Gorkha district, and its hypocenter was at a depth of approximately 15 km. Continued aftershocks occurred throughout Nepal within 15-20 minute intervals, with one shock reaching a magnitude of 6.6 on 26 April at 12:54:08 NST. The country also had a continued risk of landslides. According to the USGS, the temblor was caused by a sudden thrust, or release of built-up stress, along the major fault line where the Indian Plate is slowly diving underneath the Eurasian Plate, carrying much of Europe and Asia. Kathmandu, situated on a block of crust approximately 120 km wide and 60 km long, reportedly shifted 3 m to the south in just 30 seconds. A model of Geo-Gateway,

based on a USGS mechanism of a near-horizontal fault as well as location of aftershocks showed that the fault was an 11° dip striking at 295°, 50 km wide, 150 km long, and had a dip slip of 3 m. The USGS says the aftershock on 26th registered at a shallow depth of 10 km. Assuming that this earthquake was the largest event in this seismic episode, Nepal could expect more than 30 aftershocks greater than magnitude 5 over the following month. As of 1 May 2015, 120 aftershocks had occurred with different epicentres and magnitudes above 4 M_w. Satellite images reveal Mount Everest lost one inch of its height in the Nepal earthquake, but Kathmandu has been lifted by more than three feet. The aftershock pattern has taken a peculiar trend with 7.3 magnitude earthquake on 12th May, followed by a 6.3 mag earthquake in 30 minutes, in addition to at least 10 more shocks of magnitude ranging between 5 and 6.2. Since there are innumerable number of faults crisscrossing each other, it is not clear how the stress propagation will continue, even though a cursory glance at epicentral map indicates activity getting concentrated at the eastern flank of the fault that was ruptured on 25th April. Even though such a trend is normal and indicates expending of remaining energy and gradual attaining of equilibrium, it is necessary to closely monitor the region presently affected and the region east of the present activity. As pointed out by some experts, we do hope the stress release and transfer is confined to one fault and not extending to satellite faults and others that are relatively bigger and extending to far off distances.

Nepal lies towards the southern limit of the diffuse collision boundary where the Indian Plate under-thrusts the Eurasian Plate, occupying the central sector of the Himalayan arc.The convergence rate between the plates in central Nepal is about 45 mm per year. The location, magnitude, and focal mechanism of the earthquake suggest that it was caused by a slip along the Main Frontal Thrust. The earthquake's effects were amplified in Kathmandu as it sits on the Kathmandu Basin, which contains up to 600 m of sedimentary rocks, representing the infilling of a lake.

Every sane person has been saddened hearing about the devastation caused by the series of earthquakes. This calamity has once again exposed our limitations in short term prediction of earthquakes. Every seismologist is earnestly striving to understand specific inbuilt mechanism responsible for release of accumulated stress in space and time. Unfortunately, our efforts are yet to fructify leading to proper mitigation of earthquake resultant misery. It is pointed out by Prof.James Jackson of University of Cambridge that a group of seismologists, even though succeeded in building models that explain in detail probable stress release mechanism due to impending high magnitude earth quake could not do much in saving the hapless thousands of Nepalese, as they were unable to predict onset of the quake. He stated, even though the earthquake generation followed a specific trend as predicted by the experts, it took place much earlier than expected making their studies inadequate in meeting the disaster. The very prediction that the area was expected to experience a high magnitude earthquake needs to be appreciated, even though many learned may pooh-pooh such a statement, as they believe there are number of signals including precursors, available to predict onset of an earthquake of that magnitude and the seismologists have not done their job in a proper manner. I do not want to argue with them, as they seem to know better than seismologists who have spent their life time trying to find solutions to the vexed problem. Irrespective of any criticism, I strongly advocate that seismologists need to continue the practice of looking into different sets of data to identify anomalous signatures, collect additional data pertaining to pre, active and post activity phases, build viable models and caution the governments of Nepal and India about probable future activity (I am sure the committed seismologists are following these well established norms and would come out with apt solutions).Even though I am not exposed to various recent developments, as high magnitude earthquake resultant calamity could push back the economic development by couple of decades, I strongly believe that continued area specific studies and better understanding of regional tectonics will pave way for better results. Even though no specific time frame can be fixed, I do believe that solutions will be found. I state so as we have scientists who have adequate experience and expertise. What we need is a proper platform and a strong force that

can bring together experts to address the serious problem of saving millions from future seismic activity, without digressing from the main theme with irrelevant issues. Such a development can be achieved only when all the stakeholders show interest in preparing disaster mitigation strategies, setting aside professional differences. It is essential to co-operate with each other, including the experts from other countries and suggest a viable future course of action in meeting impending earthquake activity in different segments of Himalayan belt, especially the area specific risk reduction procedures and timely relief measures. Since short term prediction is still beyond our grasp it is essential to give priority to risk reduction procedures, while continue to strengthen surveillance operations.

Brian Tucker, MacArthur Fellow, president of Geo-Hazards International (GHI), while commenting about hazard mitigation efforts in general stated that there is a need for geoscientists to provide information about seismic risk and risk reduction options, as it is critically important. He states that most curiously, this aspect is underrated by disaster risk professionals and also by geoscientists. Few disaster risk professionals have information about the human and economic losses their communities can expect as a result of probable earthquakes, or information about how to reduce these losses. Having this information would help them acquire needed resources and design appropriate programs. The geoscientists' and engineers' responsibility in this process is to translate scientific and engineering advances into language the risk managers and the public can use. Most geoscientists don't realize the importance of providing basic risk information; we may think we're communicating if we publish in our professional journals. He further states from his interaction with learned geoscientists that geoscientists have already learned new, important information about Himalayan tectonics, for example, the relationship among the 1255, 1505 1833, and 1934 earthquakes and the apparent lack of ground rupture. A study from 2015 found a 700-year delay between earthquakes in the region. The study also suggests that because of tectonic stress build-up, the earthquake from 1934 in Nepal and the 2015 quake are connected, following a historic earthquake pattern.

As per his interview with EOS, Tucker is perplexed by the statements that geoscientists and geo-engineering community already know enough about seismic risk in the Himalayas. He has been told that what happened in Nepal is just what the geoscientists expected. Earth scientists and earthquake engineers can see perfectly what will happen to multi-storey, unreinforced masonry buildings with soft first stories when they are subjected to the ground motions that any city in the Himalayas can expect. According to Tucker this is not obvious to the normal government official or the lay public. His remarks are apt and we need to alter our strategies in projecting important outcome of our studies. Yet, I feel providing needed information through publications and scientific symposia/ workshops are the only options available to scientists, as any casual interaction/presentation can be twisted by the media, leading to problems and cleavages. However, I fully agree with Tucker that we geoscientists and earthquake engineers need to accelerate the application of current Earth science and earthquake engineering research into practice. We need to educate ourselves about our community's seismic risk and risk reduction options and then advocate for mitigation actions. It is aptly stressed by Relief and Rehabilitation experts that help should not be confined to the first few days and relief and rehabilitation operations need to be continued at least for couple of years. As pointed out by Kalpana Sharma (The Hindu; 10th May) the biggest challenge in the aftermath of natural disasters is when it recedes from our consciousness. That is precisely when disaster-hit areas require the most attention. The slow and tedious task of rebuilding and rehabilitation can take many years. The process exposes the divisions that exist in many societies and some even exacerbates them. Invariably, the better off, the better connected manage while the struggle for those at the margins is prolonged. Post disaster, the emphasis is on rebuilding structures with earthquake resistance features. While such a strategy is apt, the permanent, and sometimes intractable, problems such as providing basic services are overlooked. This is where the affected communities need to be seen as

participants and not as recipients of aid. Those giving aid need to take the viewpoint of those communities seriously and recognise that people who live in such precarious environments also have a deep understanding of survival strategies. One other aspect that needs attention is our way of interacting with the affected. We need to empathise with the affected and help them through actions and not through senseless interactions. I stressed the importance of common man's participation in developmental and rehabilitation activities and the ethical procedures in taking up geo-engineering practices (A Learning Process-IJEE, August, 2013, v. 6, no. 4 and Sustainable Development, Ethics, Environmental Ethics and Geoethics: A perception; J.Ind.Geophys. Union, Oct, 2013, v. 17, no. 4, pp:369-381).Unfortunately, I could not translate my experiences and perceptions in to useful actions. While admitting it is time we search for better avenues to make one's experiences and perceptions useful to the society, I continue to believe presently adopted policy of publishing in local journals is apt. To strengthen the bondage between scientists and common man some changes are essential in the existing teaching and research system that is constricted by pseudo quality norms. Since the good efforts are getting wasted, for want of recognition by experts, it is necessary to have an independent organisation that can extract relevant information from technical reports, books and research publications and bring the details to the knowledge of planning & administrative personnel and technical experts. Such a channel can help in translating scientific results of societal importance in to viable execution procedures, strengthening the bondage between experts and layman.

Himalayan Belt is ~5000 km long and subdivided in to number of tectonic zones of varied structure. One may say systematic field investigations would help us. Yes, it is true. Field investigations are paramount. But, we should not forget that scanning and continuously monitoring of seismically active zones require a huge quantum of instruments, both conventional surveillance instruments and strong motion gadgets and large number of experts. Even though experts caution future activity would be towards west of the present destruction site, it is not possible to pin point any location, as significant chunks of Himalayas starting from west of Karakoram to southeast of Assam-Myanmar zone are prone to seismic activity. However, the present affected zone and the un-ruptured segments west and east of it need to be studied in detail through different imaging techniques, including high resolution deep reflection profiling and reverse vertical seismic profiling to understand in detail the structural complexities, in the upper and middle crust . As aftershocks may continue for at least 3 months they need to be made use of, in deciphering the finer structure with reduced cost of acquiring data. In this exercise we have to make use of the support extended by international research organisations, instead of censoring such proposals by invoking data safety and data security norms. As of now monitoring closely every segment of Himalayan belt is difficult, due to various factors. However, we should continue to strengthen our efforts to generate and decipher relevant data to narrow down the gaps. A close look in to destruction of buildings in the Kathmandu Valley clearly emphasizes the need to construct dwellings in seismically vulnerable segments of the Indian subcontinent, following well known building codes. The destruction assumed monstrous proportions due to poorly constructed structures in the valley that has thick unconsolidated sediments. In such zones shallow focus earthquake, tens of kilometres away from the valley can generate seismic wave amplification, leading to considerable shaking of surface structures built without following area specific building codes. However, as pointed out by Kalpana Sharma (see above), we should follow ethical norms and use local experiences in building these earthquake resistant structures.

I shudder, like many, imagining about probable level of destruction, in Indo-Gangetic plains and Brahmaputra valley due to predicted 9 M earthquake; irrespective of its location and time of occurrence. It is essential not only to study in detail Uttarakhand-Himachal Pradesh segment but also Sikkim-Bhutan and Assam-Meghalaya sectors, as history points out all these sectors of Himalayas are prone to high magnitude earthquakes and if history is given importance 2015 Nepal earthquake might be followed by an earthquake in Northeast India. Even though there are no authentic studies to support such a conjectured opinion it is better to strengthen

surveillance in all the three sectors cited above, as scientists have noticed significant changes in the stress pattern and presence of favourable conditions for stress accumulation in many locales infested by crisscross faults.

Indian Subcontinent is prone to varied types of natural hazards. Our efforts should be focused to address multiple hazards, following Disaster Continuum model. It is time all the SAARC countries, especially those directly or indirectly connected to Himalayan belt sit together and work out strategies to ameliorate the suffering of millions due to natural hazards, especially earthquakes and water related. We need to build a significantly big trained and committed voluntary group to help governmental channels in meeting post disaster adversities. Many of us are of the opinion that it is necessary to leave Himalayan belt from modern development. This is very essential to save the millions from the wrath of nature that is bruised by these manmade interventions.

Monsoon forecasting limitations and needed initiatives

When it is evident that monsoon aberrations, since 2012, have taken an unpredictable shape experts need to be careful in making statements regarding forecasting. Unfortunately, even after knowing the impact of expert opinion on farming community, some get carried away while interacting with Media. Media in turn, without taking in to consideration the limitations of weather forecasting release news items leading to considerable problems to one and all, especially to the farmer. In 2014 we witnessed chaotic monsoon pattern. Some weather scientists said in February, 2015 that after the exceptionally dry weather in first six weeks of the 2014 season, rainfall is very likely to be better in the following year, going by statistical trends of the past 100 years. While no agency, including the Indian weather office or private forecaster Skymet could forecast rainfall accurately in previous years, they feel this year's rainfall will be normal. "We can now drop the El Nino scare and expect 2015 to be a normal monsoon season," said GP Sharma, vice-president of meteorology at private weather forecaster Skymet Weather Services. (**Source**: http://articles.economictimes.indiatimes.com/2015-02-10/news/59005204_1_el-nino-laxman-singh-rathore-weather-scientists). Farming community suffered due to insufficient rains during November 2014-January 2015 (NE monsoon). When segments of north India received unseasonal rains in February, March and April and southern states (Telangana and A.P) during first half of April ,Rabi crops got damaged significantly. When the farmer is trying to pool in resources to bring out Kharif crops, based on February prediction, IMD officials and Shri.Harsh Vardhan,Union Minister for Science and Technology & Earth sciences released the IMD annual monsoon forecast on 22, April, which states the SW monsoon's overall rainfall prediction for 2015 is 93% (3 % below normal) and the probability of deficit rainfall is higher at 33 %.The report notes that El Nino conditions are likely to persist during the SW monsoon. A close look in to February and April predictions expose our limitations in realistically predicting monsoon pattern. NOAA and Australian Weather Bureau experts, however, state that El Nino impact could be either neutral or minimal and none could predict the extent of impact on Indian monsoon. These statements, like in 2014, have confused not only the common man but also the experts.

In October, 2014 editorial I brought in to focus the importance of Agro-meteorology and advocated field level advisories to help the farmer in selecting proper crop type and carrying out mid course corrections to avoid crop failures. Appropriate advisories can help the farmer in going for area specific cropping pattern. It is pointed out by Dr.B.P.Yadav,Head, Weather Forecasting, IMD that agro-met advisories have been sent to 80 lakh farmers through SMS, News paper reports, radio broadcasts and TV programmes. While appreciating such an initiative I humbly request the learned officials to send these advisories through village level field assistants (who can explicitly explain the implications) through direct contact with the farmers, as many farmers have no in depth knowledge of technical advisories. It is time ENVIS groups are given due importance, as they have needed expertise in understanding area specific problems and needs of farming community. As correctly pointed out by Dr.M.S.Swaminathan (Chairman of the National Farmers Commission) the government should develop a deficient monsoon

strategy well in advance with state- wise contingency plans to deal with a possible below normal monsoon. The contingency plan, however, needs to take in to consideration outbreak of cloud bursts and flash floods, amidst extended dry spells. It is essential mid course corrections to the forecasting are made after mid June and weekly advisories are released thereafter, till the end of NE monsoon, followed by monthly releases during Feb-April phase.

Since El Nino problem can affect us at any time it is essential to have a more reliable prediction mechanism. Since El Nino dynamics can change in a random pattern over a period of 28 months (assuming 2014 El Nino surfaced in June, 2014), we need to be alert at least till the end of 2016 and provide periodical advisories, developing dynamic weather pattern models inserting NOAA and other Global Weather data. A new study published online on April 13, 2015, in the journal *Nature Geoscience* finds that prolonged wind bursts originating in the western Pacific can have a strong effect on whether an El Niño event will occur and how severe it is likely to be. In addition, the paper identifies three distinct varieties or "flavors" of El Niño, and explains how these westerly wind bursts (WWBs) can determine which of these flavors will take shape. The findings should help refine future predictions of these global-scale climate events."These westerly wind bursts are intraseasonal--they're not weather, they're not climate, but somewhere in between," said Raghu Murtugudde, a professor of atmospheric and oceanic science at the University of Maryland who is a co-author on the study. "Our study shows that the wind bursts are definitely having an effect. We better learn to predict them if we are going to have skillful El Niño predictions." **(Source:** Dake Chen et al. Strong influence of westerly wind bursts on El Niño diversity. *Nature Geoscience*, 2015; DOI:10.1038/ngeo2399).

While Planning and administrative channels and farming community are in a dilemma and contemplating various courses of action, one feels bad to learn about the plight of Californians.

California's ongoing drought, which began in 2012, is severely straining the state's water resources, agriculture, and economy and is disrupting ecosystems. Although the drought is the worst on record since instruments began recording aridity levels about 120 years ago, scientists wonder how unusual it is over longer periods of time.

To learn more, Griffin and Anchukaitis analyzed two paleoclimatic records from tree rings to compare this drought with others from the last 1200 years. California's long-lived trees provide a record of hydro climate history through their wide (wet) and narrow (dry) rings.

The first record estimates the Palmer drought severity index (PDSI), a metric of soil moisture based on precipitation and temperature, using tree ring data from a large number and wide variety of sites in the region. The second record, which extends back over 700 years, estimates simple precipitation using tree rings from blue oaks at four sites in central and Southern California. Collectively, these two records provide long-term context for the 2012–2014 droughts in terms of both soil moisture and precipitation.Using PDSI data dating back to 800 A.D., the authors found that dry-soil periods of 3 or more years occurred in California relatively frequently. However, soil moisture deficits accumulated from 2012 to 2014 were more severe than any other short-term period in the record. However, the blue oak tree rings from 2012 to 2014 suggest that although precipitation has been low, it was lower in numerous earlier years. The researchers believe that record high temperatures explain the recent drought's severity, even though precipitation was not unprecedentedly low. (**Source**:*Geophysical Research Letters*, doi:10.1002/2014GL062433, 2014).

The latest study is significant, when one takes in to consideration the strong impact on agriculture activity and dynamics of groundwater. Deficiency in soil moisture is bad in many ways. It leads to erosion and dissipation of soil nutrients, leading to failure of crops. Similar situation is noticed in large tracts of semi arid zones of our country, leading to farmers suicides.

The one common element in recent weather, in USA (and even in India), has been oddness. The West Coast of US has been warm and parched; the

East Coast has been cold and snowed under. An unusually warm patch of surface water, nicknamed 'the blob' when it emerged in early 2014, has become part of a Pacific Ocean pattern that may be affecting everything from West Coast fisheries and water supplies to East Coast snowstorms. The blob relates to a persistent high-pressure ridge that caused a calmer ocean during the past two winters, so less heat was lost to cold air above. The warmer temperatures we see now aren't due to more heating, but less winter cooling. The blob's influence also extends inland. As air passes over warmer water and reaches the coast it brings more heat and less snow, which a recent study shows helped cause current drought conditions in California, Oregon and Washington. The blob is just one element of a broader pattern in the Pacific Ocean whose influence reaches much further -- possibly to include two bone-chilling winters in the Eastern U.S. The blob does not seem to be caused by climate change; it has many of the same effects for West Coast weather. The study predicts that this is a taste of what the ocean will be like in future decades. The scientists further state that It wasn't caused by global warming, but it's producing conditions that they think are going to be more common with global warming. (**Source**: Bond et al. Causes and Impacts of the 2014 Warm Anomaly in the NE Pacific. Geophysical Research Letters, 2015; DOI: 10.1002/2015GL063306).The above studies further confirm that a significant change in global weather pattern has taken a shape in recent times and all the countries need to view this change as part of natural phenomena shaped marginally by Man's interventions.

I do believe the details given above would attract the attention of learned young, who have an urge to contribute to our society's wellbeing.

In this issue:

In this issue, apart from the Editorial and News & Views there are 9 research articles and one letter to the Editor. In the first paper (Thermo-mechanical structure of the Indian continental lithosphere), Manglik presented a brief review of the modeling studies carried out to estimate the mechanical/ thermo-mechanical properties and structure of the Indian continental lithosphere. A synthesis of the results obtained by various approaches reveals two major inferences and the discrepancies in the estimates of the mechanical strength of the Indian continental lithosphere. It is suggested that an integration of the new geophysical images of the Indian continental lithosphere and thermo-mechanical modeling can help in resolving issues associated with the mechanical strength of the continental lithosphere. In the second paper entitled "Groundwater prospecting in Deccan traps covered Tawarja basin using Electrical Resistivity Tomography" Rai et al have presented results of 2-D Electrical Resistivity Tomography carried out in part of Tawarja basin to demonstrate Resistivity Tomography's efficacy in delineation of groundwater potential zones and sites of aquifer recharging in a complex geo-environment. In the third paper ("Geological and Geotechnical Characterisation Using Geophysical Logs – An Example from Adriyala Longwall Project of Singareni Collieries, Telangana, India.) Rao and UdayBhaskar pointed out that the Geogical, geophysical and Geotechnical studies conducted at Adriyala longwall block of Singareni Collieries Company Limited (SCCL), yielded good results. It is emphasized by them that the geophysical logs comprising electrical, density, neutron, caliper, Full Waveform Sonic (FWS) and acoustic image probes can provide reliable geological and geotechnical models required for longwall mining. The basic lithological details, sedimentary features and associated geotechnical risks are interpreted using these logs. Uniaxial compressive strength (UCS) and Geophysical Strata Rating (GSR) maps prepared from geological and geophysical inputs provided an effective means to analyse the competency of immediate overburden, which is considered for long wall mining. In the 4th paper (Establishing Hydrogeophysical....., Maharashtra, India) Krishnaiah stressed that Quantitative assessment of the spatial distribution of intensity of groundwater pollution caused by untreated industrial effluents requires development of numerical transport models ,which in turn needs information on the spatial distribution of hydraulic characteristics of the subsurface. In the absence of dense network of bore holes a well established site specific relationship between geoelectric and hydrogeological parameters of the aquifer was adopted

as an alternative approach to assess the hydraulic characteristics of the subsurface layers. The calibrated relationship helped to assess the spatial distribution of hydraulic conductivity value as an input to construct a pragmatic numerical model. In the 5th paper (A quasi-numerical solution.....Assam-Burma hills in India) Das et al made an attempt to obtain a 3-D meso-scale lee wave solution associated with a meso-scale flow across the Assam-Burma hills (ABH), following a quasi-numerical approach. In the 6th paper (Assesment of Hydroclimatic Condition.....Southern India) Anbazhagan and Jothibasu presented importance of the climatic water balance, drought assessment and agricultural potentiality of Uppar Odai sub-basin located in the Southern part of India, Tamil Nadu state. From the derived indices, drought condition, climatic shift and agricultural potentiality were assessed. The results have indicated that drought condition is prevailing in every alternative year in the sub-basin. In the 7th paper Bandyopadhyay et al carried out a detailed assessment of Snowmelt runoff in the eastern Himalayan region under climate changes scenarios**.** Glacier dynamics needs to be understood as glaciers health is crucial for life saving perennial Himalayan Rivers to survive. In the 8th paper (Quantification of Panchayat-Level Flood Risks in the Bhograi Coastal Block, Odisha, India) Barman et al assessed coastal flood risks through quantification of flood intensity and impacts across the different local Gram Panchayats (GPs) in the Bhograi block. Authors claim that overall, this type of flood hazard risk assessment may prove useful for future environmental planning and management programs in coastal regions. In the last paper (Design of Gravity……measurements) Ganguli et al reported that they have successfully developed a digital filter, namely, gravity energy filter for the improvement of gravity signal-to-noise ratio that immersed in colored noise. As usual News and Views at a glance follows these articles.. To support government's initiative through "Swachh Bharath" the subsection Science News is earmarked to cover topics on pollution, especially the initiatives to clean Ganga . A Letter to Editor by Prof.Umesh Kulshrestha is included as the last article, as it contains useful information on Air Pollution. We do hope you would enjoy the contents of this issue, and as in the past extend your support to journal's wellbeing.

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