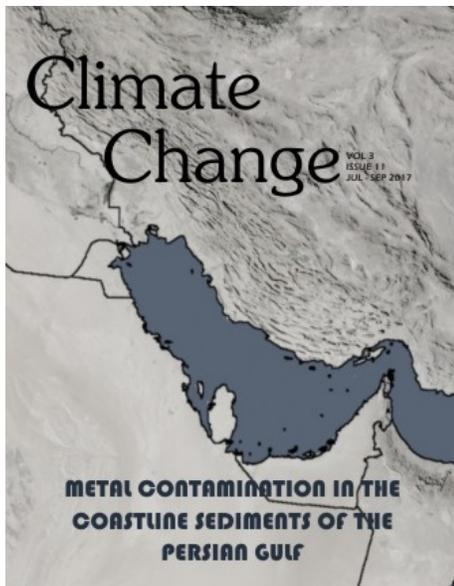


# Climate Change

## About the Cover



Study on heavy metal contamination of sediments and determining the monitoring stations and substations is an important step in improving the efficiency and updating the monitoring networks. In this study sampling stations located in the Persian Gulf were evaluated with principal component analysis and factor analysis techniques. For this purpose nine stations were selected and using qualitative data measured of (Pb, Cd, Cu, Ni) in the stations from 1386 to 1387, stations and substations were determined. Principal component factor analysis (PCFA) was performed using SPSS software. In this process, the correlation matrix with a VARIMAX rotation that perpendicularly of its axes is maintained in it, is used. After formation of the coefficient components matrix, it was attempted to determine the principal stations using PCFA. In this way, principal stations are the parameters which at least one of their coefficients used to form the relevant factors, have relatively high amount. In this study, because of the extent of the study area and a few parameters, this criterion was equal to 0.8. According to the criteria considered it is determined that only in the station G the value of this coefficient between each of the factors considered for this station is less than 0.8 and as a result, this station is a Substation and the other stations are principal stations (Ref: Elaheh Sadatipour, Masoumeh Tahmasebi, Robabeh Vajdi, Mahsa Sanaei, Roohollah Noori. Data analysis of metal contamination in the coastline sediments of the Persian Gulf using principal component factor analysis. *Climate Change*, 2017, 3(11), 842-85, (Image: <http://services.imagico.de>).

# Environmental Planning & Management on Climate change

*Special issue editors*

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## **Climate change and flood hazard**

Bitra Javidfakhr

Natural hazards are linked to climate change and they are likely to increase over the years. The vulnerability to certain natural risks such as flooding and coastal erosion can be exacerbated by climate change. The areas susceptible to the greatest increase in flooding are coastal borders which are affected by subsidence and sea-level rise, rather than fluvial flooding. The hydrologic impact of climate change can increase the occurrences of extreme hydrologic events, heavy rainfall, and droughts. There is always a human tendency to intend to control the environment, avoiding the probable natural hazards. The risk management efforts can be helpful for the society to reduce risks, take advantage of the opportunities and cope with the unexpected challenges in an integrated manner, particularly in the context of long-term risk planning and management in the environments with high rates of natural hazards. The flood risk management generally plans for increasing the existing flood protection levels to the major city areas over the next coming years. Exposure of human settlements and long-lived, strategic assets such as transport and utility networks to flood risk is increasing due to climatic changes.

*Climate Change*, 2017, 3(11), 786-791

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## **Evaluation of the effects of reclaimed urban wastewater on soil calcium carbonate concentration case study: Yazd waste water refinery**

Azam Abolhasanizarjoo, Hasan Khosravi, Mehdi Soltani Gerd-e faramarzi

Water crisis is an important issue in arid and semi-arid regions like Iran. This situation has been exacerbated in recent years because of successive droughts. So the use of unconventional water is increasing in where there is no water with good quality. One of these resources is urban wastewater that can provide nutrient for plant in addition to supplying water. If municipal wastewater does not led to negative impact on physical and chemical properties of soil and water; it can be used for irrigation in de desertification projects. So in this research the effect of reclaimed urban wastewater on soil Calcium Carbonate concentration was assessed in Yazd wastewater refinery. For this purpose, soil samples were collected from depths of 0-30 cm and 30-60 cm in three different regions consist of control area, planting area that was irrigated with reclaimed urban wastewater and region that had no plant but was influenced by treated wastewater. Samples were dried and then transported to the laboratory and Calcium Carbonate concentration was evaluated in all of them and then the results were analyzed using SPSS software. Results showed that the amount of Calcium Carbonate has decreased in planting area that was irrigated with treated wastewater and it has increased in region with no plant that was affected by treated wastewater.

*Climate Change*, 2017, 3(11), 792-796

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## **The analysis of the effects of climate change on geologic natural hazards**

Bitra Javidfakhr

Climate is one of several integrated drivers of change that should be considered in understanding the vulnerability and related risk management options. Active tectonics and climate change are supposed to be key parameters in evolution of large slope movements in mountain belts. The relationship between active tectonics and rock slide development is obviously evidenced in the seismic zones. Climate change influences various environmental aspects and it can generally exacerbate geological hazards. One of the challenges faced by the scientific community comprises understanding the fundamental signals of change in the climate system and the environmental effects. This paper aims to analyze the effects of climate change on different geologic natural hazards. It is suggested to develop the adaptation strategies, challenges, and recommendations to avoid the damages. The quantification of the risks posed by climate change is possible, but there are many restrictions. The adaptation strategy can provide helpful insights to inform policy design and implementation of resilience ideas in risk management. The management index should combine and manage the pattern and process to identify geographic locations at greatest threat from climate change. Such efforts would help society to reduce risks, take advantage of opportunities and cope with changes in an integrated manner.

*Climate Change*, 2017, 3(11), 797-803

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## **Assessment of surface water quality using Water Quality Indexes: A case study of the Baba Aman River, Bojnord**

Somayeh Iranmanesh, Azadeh Atabati, Ghasem Zolfaghari

Baba Amman River is the major sources of water for agriculture, industrial, and household in the city of Bojnord. Water quality monitoring is necessary to ensure that waters can continue to use for many different ways. In this study, surface water quality data for 9 physical and chemical parameters collected from 7 different stations thereby after, before and from city of Bojnordon the rivers were analyzed during the spring season of years 2016. Parameters included dissolved oxygen, fecal coliform, PH, temperature

difference, biochemical oxygen demand, nitrate, turbidity, total phosphorus, total dissolved solids, were measured according to standard methods. Water quality index was then calculated using water quality index (WQI) given by National Sanitation Foundation (NSF) information system. WQI showed that the index for all the 7 stations ranges between 52 and 64 during period of study. Therefore the studies are classified as medium class based on WQI. This category shows that water quality of Baba Amman River is suitable indifferent sectors such as breeding fish species, animals and domestic uses after suitable treatment. Overall, comparison of water quality index in different sampling stations of Baba Amman River showed that 2 stations are nearly poor water quality due to the proximity to the slaughterhouse and wastewater area that indicated with lowest quality and most pollution.

*Climate Change*, 2017, 3(11), 804-809

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### **Investigating the status of air pollution and comparing the concentration of its major pollutants in Shiraz, Iran**

Ghasem Zolfaghari, Fatemeh Arab Amery, Mehri Delsouz

Shiraz, as the eighth polluted metropolis in Iran, is facing the problem of air pollution due to the rapid development. The aim of this study was to evaluate the air pollution status in the city of Shiraz and the concentrations of pollutant gases of carbon dioxide, nitrogen oxides, particulate matter, hydrocarbons and sulfur oxides resulting from motor vehicles, industries and fuel consumption in various sectors. The polluting industries include cement plants, glass wool factory, Dena tire factory, domestic and commercial sources, oil refinery and the petrochemical industries. More than 75% of the air pollution results from fuel combustion in motor vehicles, 22% percent of which is related to the city's old vehicles. The air is more polluted than the allowed limit in terms of amount of carbon monoxide and particulate matter, which primary causes are the traffic and the movement of cars. About 85,000 liters of gasoline and 15,000 liter of diesel are used by the vehicles that produce about 32 tons of carbon monoxide, 3 tons of hydrocarbons and 0.8 tons of nitrogen oxides. The amounts of pollutants are more than the allowed limits in some days and the dust concentration is higher in the summer months. In this study, we provided some suggestions to reduce the air pollutants, including making gas-fueled automobiles, strengthening public transport system such as bus, subway and encouraging people to use public transport system, scrapping the old depreciate, development of examination system as well as determining the industrial areas so that their pollution would not be moved by the wind into the city.

*Climate Change*, 2017, 3(11), 810-815

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### **The impact of winter monsoon on changes of sediments grain size in the sub-tidal zone on northern coasts of Makoran Sea**

Mehran Loghmani, Gilan Attaran Fariman, Abdolbaset Dabirestan

The northern coast of Makoran (Oman) Sea is a habitat for aquatic species; it suffers changes in environmental factors like particle sizing, influenced by the monsoon phenomenon. Therefore, sampling was carried out in 3 time procedures: winter pre-monsoon, winter monsoon, and winter post-monsoon in 3 areas named Ramin, Beris and Pasabandar from the month of October (2015) all the way through March (2016), using a Van-Veen Grab Sampler (0.025m<sup>2</sup>). The results indicated that in the pre-monsoon month, gradation range was 0.04 (sand) to 97.76 (Mud=silt-clay), 0.24 to 96.48 in monsoon month, and 0.04 to 95.76 percent in the post-monsoon period. Overall, 55% of the sediments were composed of silt-clay (0.063 mm). Pasabandar Harbor had the highest amount throughout all seasons, with an average of 66.25± 18.56. Based on the one-way ANOVA, there was no significant difference within the months of sampling in various stations for measuring out the sediments. (P>0.05). According to the Duncan test, the weight of sediments sampled with a sieve below 0.063 mm was remarkably higher than other sieves. Based on the results, the bed texture was of silt-clay in all seasons but in the month of March, or post-monsoon, these particles were smaller than in the earlier months; this was probably because of pacification of flows and deposit of fine aggregate sediments after the severe regional storms in earlier months, changing the texture of the area. On the other hand, spatial and temporal differences in the bed material can be attributed to various factors such as environmental ones.

*Climate Change*, 2017, 3(11), 816-820

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### **Particulate matter and its effect on air quality: Case study - Bojnourd**

Javad Amarloo, Hamid reza Javid, Reza Shekarian, Fateme Rezaee Pirzaman, Ahmad Vahdani

The dust problem and its impact on quality of life is one of the main issues of the environment. Dust particles, especially particles less than ten microns in diameter are many health effects. The aim of this study was to evaluate air quality in Bojnourd over a period of one year (1394). In this study, data collected from the Department of Environment air pollution monitoring stations in North Khorasan, then total of 365 samples of 24-hour average concentration of dust particles (PM10) analyzed. The results were compared with EPA air quality standards. The results show that within a year the frequency of standard pollutants PM10 include good, moderate, unhealthy for sensitive groups, unhealthy, very unhealthy and hazardous, respectively were, 10, 42, 34, 11, 2.5 and 0.5 percent. The March has 8 days with good, and June, July, August and September weren't any good days (50-0), respectively. The results also show that September and summer with highest emissions of PM10 had the worst air quality conditions.

*Climate Change*, 2017, 3(11), 821-825

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### **The investigation of Precipitation Concentration Index in West Azerbaijan (Iran) weather stations**

Tara Shahhosein, Habib Nazarnejad, Farrokh Asadzadeh

Different aspects of rainfall phenomenon, as one of the important meteorological factors that directly affects access to water resources, is very important. Due to significant impacts of rainfall on water resources such as groundwater, surface water, and snow

reservoir, it seems to use indices to explain its changes. Precipitation Concentration Index (PCI) is proposed as an indicator of concentration and distribution of rainfall on annual and seasonal scale. In this study, rainfall data of 66 rain gauges stations at West Azerbaijan province (Iran) during 1993-2010 were evaluated to investigate PCI index. The results showed that the connection index is in the range of 12-22, accordingly, the distribution of rainfall in 79% of stations is relatively seasonal, 20% of stations is seasonal and only one station has the quite seasonal distribution of rainfall. Spatial distribution pattern of PCI index showed that rainfall pattern in the northern parts of the province is relatively seasonal and with the move to South changes to the seasonal pattern.

*Climate Change*, 2017, 3(11), 826-831

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#### **Role of chemical reaction on concentrations of NO<sub>2</sub>, NO, CO and O<sub>3</sub> in warm seasons - case study: Tehran city**

Akbar Mohammadi

The chemical reaction between urban air pollutants is one of the important causes that influence the levels of pollutants in the urban air. The main goal of this research is studying the relation between NO, NO<sub>2</sub>, CO and O<sub>3</sub> use of chemical reaction between them. Data that used in this research is the 24-h average level of nitrogen oxides (NO<sub>x</sub>), monoxide carbon (CO) and ozone (O<sub>3</sub>) in 17 air quality monitoring station in Tehran city in 2012. Methods that used in research are descriptive analyses of 24-h temporal variation pattern of the air pollutant (NO<sub>2</sub>, NO, CO and O<sub>3</sub>), the correlation coefficient between air pollutants (NO<sub>2</sub>, NO, CO and O<sub>3</sub>) and regression analyses of ozone (O<sub>3</sub>). 24-h Temporal Variation pattern of pollutants divided into four periods. Spring periods different with summer periods partially. Correlation coefficients between pollutants are strong particularly between NO<sub>2</sub> and CO. Regression analyses of O<sub>3</sub> indicating linear model used in this study can describe 73.1 percent of spring and 87.2 percent of summer O<sub>3</sub> diurnal variation. The result from this study on the influence of chemical reactions on the quantity of NO, NO<sub>2</sub>, CO and O<sub>3</sub> level in warm seasons in Tehran show these reactions have a distinct role on the concentration of these pollutants.

*Climate Change*, 2017, 3(11), 832-841

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#### **Data analysis of metal contamination in the coastline sediments of the Persian Gulf using principal component factor analysis**

Elaheh Sadatipour, Masoumeh Tahmasebi, Robabeh Vajdi, Mahsa Sanaei, Roohollah Noori

Study on heavy metal contamination of sediments and determining the monitoring stations and substations is an important step in improving the efficiency and updating the monitoring networks. In this study sampling stations located in the Persian Gulf were evaluated with principal component analysis and factor analysis techniques. For this purpose nine stations were selected and using qualitative data measured of (Pb, Cd, Cu, Ni) in the stations from 1386 to 1387, stations and substations were determined. Principal component factor analysis (PCFA) was performed using SPSS software. In this process, the correlation matrix with a VARIMAX rotation that perpendicularly of its axes is maintained in it, is used. After formation of the coefficient components matrix, it was attempted to determine the principal stations using PCFA. In this way, principal stations are the parameters which at least one of their coefficients used to form the relevant factors, have relatively high amount. In this study, because of the extent of the study area and a few parameters, this criterion was equal to 0.8. According to the criteria considered it is determined that only in the station G the value of this coefficient between each of the factors considered for this station is less than 0.8 and as a result, this station is a Substation and the other stations are principal stations.

*Climate Change*, 2017, 3(11), 842-851

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