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**7TH INTERNATIONAL CONFERENCE ON
ENVIRONMENTAL SCIENCE AND TECHNOLOGY**

BOOK OF ABSTRACTS

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WELCOME TO ICOEST 2021

On behalf of the organizing committee, we are pleased to announce that the 7th International Conference on Environmental Science and Technology (ICOEST-2021) is held from June 23-27, 2021 in Belgrade, Serbia. ICOEST 2021 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Environmental Science and Technology. The conference seeks to contribute to presenting novel research results in all aspects of Environmental Science and Technology. The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Environmental Science and Technology. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in all areas of Environmental Science and Technology. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world.

ICOEST 2020 is the oncoming event of the successful conference series focusing on Environmental Science and Technology. The scientific program focuses on current advances in research, production and use of Environmental Engineering and Sciences with particular focus on their role in maintaining academic level in Science and Technology and elevating the science level such as: Water and waste water treatment, sludge handling and management, Solid waste and management, Surface water quality monitoring, Noise pollution and control, Air pollution and control, Ecology and ecosystem management, Environmental data analysis and modeling, Environmental education, Environmental planning, management and policies for cities and regions, Green energy and sustainability, Water resources and river basin management. The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in environmental science and engineering experiments.

Best regards,

Prof. Dr.Özer ÇINAR

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RENEWABLE RESOURCES VERSUS FOSSIL ENERGY AND NEW GREEN ECONOMIC WORLD IN THE EU

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Abstract:

Global energy sector has become cleaner in recent years, but deeper reforms still are needed. It suggests that continued efforts to decarbonize the grid will depend on significant investments in research and development, along with more governmental guidance over transmission planning to enter green economy. The shallow decarbonization of the energy sector has led to a switch from coal to renewables for power generation, and has led to some successes with energy efficiency that have helped hold down growth in energy demand. But, these factors help reduce emissions of conventional pollutants. Those were probably the easy part. Looking ahead to meeting our climate goals, which constitute avoiding to the greatest extent possible the worst effects of climate change, we need deep decarbonization. Therefore, as the radical solution to global warming, the Paris Climate Agreement, made as part of the United Nations Framework Convention on Climate Change, set a common goal among all signatories: reduce carbon emissions enough to keep the global temperature from increasing more than two degrees Celsius from where it was during the pre-industrial era. In this regard, Paris Climate accord is extremely important.

Keywords: Renewable Energy, Green Jobs, The EU, Paris Climate Accord

*

MEASURING DETERMINANTS OF ACCURACY OF KNOWLEDGE ABOUT THE CAUSES OF AIR POLLUTION IN TURKEY

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Abstract:

Climate change is a major global issue and garners wide media coverage since the late 1990s. Public awareness and knowledge is a potentially important social force that can motivate governments and intergovernmental agencies to act on the problem. This study investigates the impact of factors such as age, gender, education, location (small/large cities), employment, social media, responsiveness to climate change on predicting accuracy of people's knowledge about air pollution. Media attention on reduced air pollution during the SARS-CoV-2 (COVID-19) lockdowns in Turkey provided a unique setting in measuring the impact of determinants of knowledge on climate change. The study uses data collected on 1,220 respondents via an online survey tool. The survey is conducted during a nationwide lockdown in May 2020. Logistic regressions using STATA were employed for the statistical analysis. The results show that the likelihood of correctly knowing the causes of air pollution is higher for people above the age of 25, who live in cities with bigger economies, who are female and who view themselves as a responsible citizen. The study also finds that the use of only social media (vs. only mass media or mass media and social media together) increases knowledge about the causes of air pollution. In this study, gender (being female) has consistently been a determinant of climate knowledge in all predictive models. However, according to the results of this study, education does not play a role in identifying correctly the major sources of air pollution in Turkey. As the lack of knowledge leads to lack of action, further research is required to understand the reasons of absence of causality between formal education and climate change knowledge. It is a policy question to identify what could be done to improve the effectiveness of education on improving knowledge about causes of air pollution.

Keywords: Air Pollution, SARS-Cov-2 (COVID-19), Education, Gender

*

EFFECTS OF NANOPARTICLE (AL₂O₃, CUO, TIO₂) ON THE ANTIOXIDANT SYSTEM BIOMARKERS OF FRESHWATER MUSSEL (UNIO TIGRIDIS)

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Abstract:

Mussels are known as the natural filters of the aquatic systems and thus are accepted as one of the best bio-indicator organism. Freshwater mussel *Unio tigridis* is distributed in the freshwater systems in the Southern-east part of Turkey. Although these mussels were used in several toxicological studies, there is no data on their response following metal-oxide nanoparticles (NPs) exposures. This study aimed to investigate the response of the antioxidant enzymes of *U. tigridis* following exposure to Al₂O₃, CuO and TiO₂ NPs. The mussels were exposed to different concentrations (0, 1, 3, 9 mg NP/L) of NPs for 14 days and subsequently, the activities of CAT (catalase), SOD (superoxide dismutase), GPx (glutathione peroxidase), GST (glutathione S-transferase) and GR (glutathione reductase) were measured in the gill and digestive gland. Mussels were fed with cultured unicellular algae (*Chlorella vulgaris*) during experiments. Data showed that the consumption rate of algae by mussels were not significantly altered by NPs. Data also demonstrated that all enzyme activities altered significantly (P<0.05) after NP exposures, most alterations being decreases in CAT activity. Similarly, SOD activity also decreased in the digestive gland, but it increased in the gill. However, enzymes belonging to the glutathione metabolisms (GPx and GST) increased following NP exposures in the digestive gland and gill, though GR activity decreased in both tissues. Data also revealed that most alterations occurred at the highest exposure concentration of NPs. This study representing the first record on the antioxidant system response of *U. tigridis* toward NP exposures suggests that further studies should be carried out to understand better the effects of NPs in aquatic species.

Keywords: Nanoparticle; Mussel; Antioxidant; Biomarker; Toxicity

*

EXPERIMENTAL AND NUMERICAL ANALYSIS OF THE HYBRID CPV SYSTEM

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Abstract:

The research work analyze the impact of the concentration of solar rays on the efficiency of flexible photovoltaic cells. Solar energy is currently one of the fastest-growing sectors among renewable energy sources. It is estimated that further power increase in installations concentrating solar radiation will be exponential. The use of concentrating radiation systems is economically justified in countries with both high insolation levels and relatively low ambient temperatures. With the development of materials technology, the number of potential locations for such installations is increasing. The aim of the research is to broaden the knowledge about the operation of photovoltaic cells with a flexible structure in a beam of concentrated solar radiation. Despite their relatively low-efficiency such cells are significantly more resistant to high temperatures than standard silicon cells. Developing research into this technology can be a great step towards sustainable energy development.

The research work used a stand consisting of two mirror systems, a lamp and a flexible photovoltaic cell. It made it possible to measure the irradiation, heat, and power generated by the cell. The obtained results were then subjected to a numerical analysis which allowed for a technical and economic analysis in a wider aspect - European and Global. The analysis was made in Krakow (Poland), Madrid (Spain) and Codpa (Chile). It showed that solar radiation concentration technology for a flexible cell can increase its power output by up to 1.4 times. It was also concluded that this increase does not depend only on the radiation value but also on the temperature growth of the cell and the efficiency decrease related to this.

Keywords: Concentrated Photovoltaics; Flexible Photovoltaic Cells; Energy Conversion; Green Energy

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THE USE OF SOLAR RADIATION ENERGY: CONVERSION INTO MECHANICAL, ELECTRICAL, THERMAL AND COOLING ENERGY.

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Abstract:

The topic of the paper is the analysis of the possibility of using solar radiation in terms of its conversion into electrical energy, mechanical energy and cooling. The motivation for the considerations is the constantly growing demand for electricity and heat, which leads to an increase in CO₂ emissions. Turning to renewable resources can provide a solution to climate change that is worsening year by year. The study is focused on the energy of solar radiation, which is a widely available, economic and, above all, ecological source of energy. The analysis was based on the results of tests carried out on the existing solar installation which consists of two solar collectors serial connected with a parabolic-dish solar concentrator and is located in Krakow (Poland). Based on the measurements, the generated thermal power was calculated and analyzed in terms of its management. The solar radiation delivered on the day of measurements was 1200 W / m². Three variants of conversion of the obtained thermal energy were considered: into electricity through the use of photovoltaic modules, mechanical energy through the use of a Stirling engine and cooling power through the use of an absorption chiller. For each of the variants, the value of the power that can be generated under the tested insolation conditions and design assumptions was calculated. The conducted analysis showed that by maximizing the incident radiation through its concentration, 1,200 W / m² of solar energy supplied can be processed into 2,000 W of heat, 826 W of electricity, 185 W of mechanical power and 322 W of cold.

Keywords: Solar Radiation; Energy Conversion; Renewable Energy Sources

*

HYDROLOGICAL MODELING AT LADIK LAKE BASIN (TURKEY) USING SWAT

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Abstract:

This study aims to develop a hydrologic model for Ladik Lake Basin in Turkey using the Soil and Water Assessment Tool (SWAT). Ladik Lake is located in the Yesilirmak River Basin in Samsun, Turkey and covers an area of about 10 km². The lake supplies irrigation water to 88 km² command area. In this study, the water volumes in the Ladik Lake were simulated with SWAT. SWAT is a semi-distributed hydrologic model that can be used for simulating hydrology, water quality, crop development, irrigation operations. In this study, SWAT model was established based on digital elevation model, land use, soils, and slope data and meteorological data. Irrigation withdrawals were simulated auto irrigation tool, which simulated the timing and amount of irrigation according to the plant water stress factor. SUFI-2 algorithm available in SWAT-CUP was used for calibration and validation of lake volumes. The model was run at the monthly time step over the period 2010-2017. The Nash-Sutcliffe Efficiency (NSE) between the measured and simulated water volumes was calculated as 0.66 and the coefficient of determination (R²) was calculated as 0.67 for the calibration period (2010-2015). For the validation period (2015-2017), NSE was 0.58 and R² was 0.60. The results showed that SWAT can successfully simulate the hydrological processes in the Ladik Lake Basin.

Keywords: Hydrologic Modeling, Swat, Ladik Lake, Irrigation

**This study was supported by the Erciyes University Research Fund (FDK-2020-10451).*

MODELLING CLIMATE CHANGE IMPACTS AT LADIK LAKE (TURKEY) USING SWAT

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Abstract:

This study aims to determine climate change impacts at Ladik Lake in Turkey using the Soil and Water Assessment Tool (SWAT). Ladik Lake is a natural lake and an ecologically important site located in the Yesilirmak River Basin in Turkey. In recent years, water level changes in the lake raised concerns regarding its future hydrologic and ecological characteristics. In this study, we used a basin-scale hydrological model, developed using SWAT, to simulate sensitivity of Ladik Lake to climatic changes. RCP4.5 and RCP8.5 scenarios developed by MPI-ESM-MR, HadGEM2-ES, and GFDL-ESM2M Global Circulation Models outputs were used for representing future climatic conditions. These models were previously downscaled for Turkey by State Meteorology Service. Maximum and minimum temperature and precipitation projection data were added to the model for 2021-2099 period. Annual reservoir volume data of 78 years from 2021 to 2098 period has been processed using Mann-Kendall Trend Analysis for the determination of trend (Z value) and slope (Q value) magnitude. The detected trends for the GFDL-ESM2M model were positive (upward) for RCP4.5 and negative (downward) for RCP8.5. While the rate of change in the RCP4.5 was 233 m³/year, this value was -77885 m³/year for the RCP8.5 scenario. The trends determined for the HadGEM2-ES model were negative for both the RCP4.5 and RCP8.5 scenarios. The decrease in RCP4.5 was -1111 m³/year, and the decrease in RCP8.5 was -1786 m³/year. For the MPI-ESM-MR model, the detected trends were negative for both the RCP4.5 and RCP8.5 scenarios. The decrease in RCP4.5 was found to be -126620 m³/year, while the decrease in RCP8.5 was -273806 m³/year. Ladik Lake volume decreased in most of the models and scenarios, except for the GFDL-ESM2M model RCP4.5 scenario. The results showed that Ladik Lake's water volumes are very sensitive to future climatic changes.

Keywords: Climate Change, Hydrologic Modeling, Swat, Ladik Lake

**This study was supported by the Erciyes University Research Fund (FDK-2020-10451).*

CLIMATE CHANGE IMPACTS ON POTENTIAL GROUNDWATER RECHARGE IN THE PALAS BASIN, TURKEY

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Abstract:

Climate change poses a major threat for sustainability of groundwater resources. In this study, we aimed to determine how climate change can affect groundwater recharge potential in the Palas Basin. Palas Basin is a semi-arid closed basin located in Kayseri, in the central Anatolia region of Turkey. Agriculture is the major economic activity in the region and groundwater is used extensively for irrigation purposes. In this study, we estimated potential groundwater recharge for the Palas Basin under two representative concentration pathway (RCP) scenarios (RCP4.5 and RCP8.5) projected by HadGEM2-ES, MPI-ESM-MR, GFDL-ESM2M global climate models. All models projected a decrease in mean annual potential groundwater recharge under the RCP8.5 scenario. Under the RCP4.5 scenario, the trends in annual potential groundwater recharge were negative according to the HadGEM2-ES, MPI-ESM-MR models but slightly positive according to the GFDL-ESM2M model. For sustainability of the groundwater system and agricultural activities in the basin, climate change adaptation strategies should be developed for the agricultural sector.

Keywords: Climate Change Effects, Groundwater Potential Recharge Change, Palas Basin

**TUBITAK (118Y178) and Erciyes University (FYL-2019-9562)*

GROUNDWATER VULNERABILITY MAPPING USING DRASTIC MODEL: A CASE STUDY AT THE PALAS BASIN IN TURKEY

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Abstract:

The study aims to estimate groundwater vulnerability against pollution at Palas Basin (Turkey) by using geographical information system based DRASTIC model. Drastic model integrates information for seven hydrogeological parameters: depth to water (D), net recharge (R), aquifer media (A), soil media (S), topography (T), impact of vadose zone (I), and hydraulic conductivity (C) and identifies spatial vulnerability. The study area, Palas Basin, is a hydrologically closed, agricultural basin, where groundwater is used for meeting irrigation and municipal water requirements. Seven hydrogeological parameters were combined to classify the basin into three vulnerable zones (as low, medium, and high). The central part of the basin was identified to be highly vulnerable, while the eastern and southern parts were characterized by moderate to low vulnerable areas. Intensive agricultural activities, widespread in the central basin, create high pollution potential. This study showed that DRASTIC approach provided a simple and efficient tool for evaluating groundwater vulnerability. The results can be used by water managers in groundwater management in the Palas Basin.

Keywords: Aquifer Vulnerability, Drastic, Gis, Palas Basin

*TUBITAK (118Y178)

ASSESSMENT OF WATER CHEMISTRY AND GEOTHERMAL SPRING IMPACT IN A SMALL CATCHMENT ON TIBETAN PLATEAU

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Abstract:

Naturally occurring toxic trace elements in surface water associated with geothermal activity are recognized to be significant and have been identified in many areas of the world. As an important part of Mediterranean-Himalayas geothermal belt, the South Tibetan Plateau is the region where hydrothermal systems are widely distributed. However, the interaction between geothermal and surficial water bodies is rarely elucidated, and associated water quality impact is unclear. In this study, a baseline water quality study was conducted to determine water chemistry effects of spring inputs in the Xiangqu River, a tributary of Yarlung Tsangpo. Thirty sites along a 150-km reach of the river were sampled for major and selected trace elements concentration to evaluate water quality. The river displays a consistent increase in total dissolved solids (TDS) and trace elements reflecting significant geothermal inputs in the upper reach, and reflecting mixing of a low TDS calcium, magnesium-bicarbonate water with a high TDS sodium bicarbonate water. The tributaries dilute these contributions, and a set of elements (e.g., As, B, Li, Sr) follow the same downstream behaviour of major ions. Another group (e.g., Al, Fe, Mn, Cr) show complex downstream patterns, which may be a result of non-conservative processes, such as precipitation/dissolution, sorption, and complexation. The results highlight the potential pollution elements As and B, for they are strongly enriched in geothermal spring water and behave conservatively in river water.

Keywords: Geothermal Spring · Tibetan Plateau · Hydrochemistry · Solute Sources · Water Quality

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FABRICATION OF 2-DIMENSIONAL (2-D) POROUS CO₃O₄ AS A ROBUST AND EFFECTIVE HETEROGENEOUS CATALYST FOR PEROXYMONOSULFATE ACTIVATION TO DEGRADATE AN EMERGING CONTAMINANT IN WATER.

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Abstract:

As salicylic acid (SA) represents one of the most typically used intermediates in pharmaceuticals, it is considered as an emerging contaminant and the introduction of SA in water may cause adverse effect to ecological system and human health. Thus, it is urgent to remove SA from water. While traditional techniques (e.g., adsorption, membrane filtration, biodegradation) are inefficient to completely remove SA from water due to its durability and low biodegradability, advanced oxidation processes are employed to degrade SA using highly reactive radicals (i.e., SO₄•⁻, OH•). Recently, peroxymonosulfate (PMS), a commercial-available reagent and environmental-friendly, is extensively employed to produce reactive radicals, and Cobalt (Co)-based catalysts are validated as efficient materials for PMS activation. Thus, the fabrication of robust and effective Co-based catalysts is still high desirable. In this study, we proposed fabricating a 2-dimensional (2-D) hexagonal porous Co₃O₄ using a Co-based coordination polymer consisting of Co and trimercaptotriazine (CoTMC) as a precursor. Through one-step calcination, CoTMC was converted into Co₃O₄, which exhibited 2-D nanosheet-like morphology and porosity, forming hexagonal porous Co₃O₄ (HPCO). This HPCO was then used for activating PMS to degrade SA in water. After 120 min, 100% of SA was achieved using HPCO which is much higher than that of commercial Co₃O₄ NP. The activation energy (E_a) of SA degradation using HPCO+PMS is 70.2 kJ/mol. HPCO could also remain its high catalytic activities in the presence of surfactant and salts; and it could be reusable for multiple consecutive cycles. These results confirm that HPCO is a promising and effective Co-based heterogeneous catalyst for PMS activation.

Keywords: Salicylic Acid, Emerging Contaminant, Aops, PMS, Cobalt, Heterogeneous

**This work is supported by the Ministry of Science and Technology (MOST), Taiwan.*

SYNTHESIS AND CHARACTERIZATION OF A NATURAL CELLULOSE PRODUCT FROM BIOWASTE

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Abstract:

In recent years, there has been a significant increase in agricultural wastes in the world in parallel with the changing economic conditions and increasing demand-consumption. Despite this size in the production of agricultural products, there is a serious agricultural waste that cannot be evaluated economically, is a source of biomass and bioenergy, and can be input to bio-products. By utilizing this natural product, cellulose-sourced wastes, biomass will be recovered beneficially, new and low-cost industrial bioproducts will be produced and brought into the economy. In this context, the transformation of the factory wastes of the tea plant, which is an important cellulose source, into a product called "cellulose aerogel" and the characterization of this product constitute the main purpose of this study. In line with the purpose, the following objectives were achieved by taking cellulose, a natural polymer, obtained from agricultural waste, into the center;

- * To isolate cellulose from factory wastes of tea plant produced in Rize city in Turkey,
- * To obtain cellulose hydrogel by dissolving cellulose in NaOH / Urea cold (-12 ° C) solution,
- * To obtain a gel with the solvent exchange of the cellulose solution in various solvent environments.
- * As a result of solvent change, to increase the durability of the material called "solvogel" by protecting the cellulose molecular skeleton structure.
- * To obtain "cellulose aerogel" which is a porous and durable product by drying the solvogel with lyophilization (freeze drying) method,
- * To carry out the characterization of the cellulose aerogel obtained by various methods.

Keywords: Bio-Waste, Tea, Aerogel, Agriculture

*

THE STATE OF EUROPEAN HAKE (*MERLUCCIIUS MERLUCCIIUS* *LINNAEUS, 1758*) IN THE AEGEAN SEA, TURKEY

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Abstract:

Fish species are the important food sources since being one of the important protein for the humankind. There is considerable fishery potential in Turkey. Anchovy, sardine, horse mackerel and tuna species are the important catches for the pelagic zone while cod, whiting, halibut and european hake are important species for the demersal zone in the world fisheries as a high catch amount in the world. Demersal fish species have a high value in the world, however the catch ratios of the demersal fish species are low according to the pelagic fish species. The Aegean Sea has a unique value in the Mediterranean having precious status, hydrographic, ecologic and geomorphologic structure. The Black Sea waters which flowing to the north Aegean Sea by the Turkish strait system, makes there productive region. By this reason the fishing activities and commercial species are important in the north Aegean Sea. The European hake fishery has a significant value in the region as well. The catch amounts for the last decade are 1256 tons in 2010, 921.1 tons in 2011, 892 tons in 2012 and 676 tons in 2013, 642 tons in 2014, 706 tons in 2015, 783.8 tons in 2016, 1011.3 in 2017, 1019.3 in 2018, 1269.6 tons in Turkey and 1142.9 tons in Aegean Sea in 2019. In this study European hake fishery in the Aegean Sea summarized, the catch amounts compared with the other countries and advices offered with the management strategies.

Keywords: Aegean Sea, European Hake, Trawl, Fishery

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UNINTENDED CONSEQUENCES OF CLIMATE POLICIES : “GREEN PARADOX” AND AN ENVIRONMENTALIST EUROPE’S GREEN DEAL SOLUTION

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Abstract:

Both economic theory and experience of EU countries that have attempted to build a green-energy economy that will create green jobs .

Therefore, green paradox argues that some designs of climate policy,intended to mitigate carbon emissions,might actually increase carbon emissions,at least in the short run.The reason for this possibility is that fossil fuels are non-renewable scarce resources .

On the other hand, climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, Europe needs a new growth strategy that will transform the Union into a modern, resource-efficient and competitive economy, where The EU aims to be climate neutral in 2050.

In this context,the EU will also provide financial support and technical assistance to help those that are most affected by the move towards the green economy.

It could be said that the EU’s efforts alone are not enough to tackle environment problems like climate change. Finally,in order to solve both green paradox and global warming EU’s 27 member states and its institutions must take steps as is explained in Europe’s Green Deal clearly.

Keywords: The Eu,Green Paradox, Europe Green Deal ,Climate Change

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IMPLEMENTATION OF STORMWATER WETLANDS FOR THE PROTECTION OF DRINKING WATER RESERVOIRS

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Abstract:

Stormwater wetlands have functions of both mitigating impacts of stormwater runoff and improving water quality. They also contribute to many other ecosystem services such as providing wildlife habitat. In this study, implementation of stormwater wetlands upstream of the Omerli Reservoir, which is one of the major drinking water reservoirs of Istanbul, was investigated. The reservoir faces an urbanization problem and receives a significant amount of diffuse pollution load from several tributaries during rainfall events. To mitigate the impacts of stormwater runoff and to maintain the water quality in the reservoir, stormwater wetlands were designed in two major streams joining the reservoir. The total available land area for wetlands were 76000 m² and 14700 m² for the Buyukgol Stream and Uzundere Stream, respectively. The wetland layout consisted of a sedimentation basin followed by two parallel tracks of wetland cells. Each track had three wetland cells: a densely vegetated cell (for filtering and surface processes), a moderately vegetated cell (for aeration and nitrification) followed by another densely vegetated cell (for denitrification and capture of algae). This study is the first example of stormwater wetland design in drinking water basins in Turkey. The design described here can be an example for future studies in drinking water basins facing similar problems and provides insight into stormwater management with additional ecosystem benefits.

Keywords: Wetlands, Drinking Water Reservoirs, Water Quality, Stormwater Management, Stormwater Treatment

**This study was supported by Istanbul Water and Sewerage Administration (ISKI)*

ENVIRONMENTAL MANAGEMENT PLANNING AND POLICIES OF MARINE POLLUTION AT THE CANAKKALE STRAIT (DARDANELLE)

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Abstract:

The Istanbul Strait (Bosphorus), the Canakkale Strait (Dardanelles), and the Marmara Sea are; the components of the Turkish Straits Sea Area-TSSA, one of the most significant sea routes used for global maritime transport. Turkish Straits Sea Area, from past to present, has historical, geopolitical, geographical, strategic, and economic significance. Owing to the 1936 Montreux Convention, the management and control of the Turkish Straits have been passed to the Republic of Turkey. The Turkish Straits are a natural waterway that is unique in the world. There are settlements on two sides of both Istanbul and Canakkale Straits, and transportation provides by bridges that provide land passage. The control and maintenance for maritime safety and management processes such as local shipping traffic between the two coasts, innocent transit in international maritime transport, security navigation, and marine environmental management are under the authority of the Republic of Turkey. With the increased factor of energy transportation from the Black Sea recently, the Turkish Straits have gained more importance. This study is trying to explain Environmental Management Planning and Policies of Marine Pollution by Ship transportation at Canakkale Strait.

Keywords: Turkish Straits Sea Area (Tssa), Canakkale Strait (Dardanelle), Oil Pollutions, Collusion, Marpol

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ANALYSIS OF TEMPERATURE AND RELATIVE HUMIDITY VARIATIONS IN THE LARGE-CALIBER AMMUNITION CONTAINERS OF NATO AND EASTERN CONCEPT DEPENDING ON THE CHANGE OF SEASONS

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Abstract:

The design and materials used for large-caliber ammunition containers significantly affect on its lifespan, safety and functional reliability during the handling and storage process. All ammunition containers should protect the ammunition in the required operating environment during extreme weather conditions, in terms of water resistance and protection from corrosion and fungi, and ammunition inside of the containers needs to withstand all shocks caused during the handling and transport. There are significant differences in the design, construction and materials used for the containers of NATO concept and ammo containers of Eastern concept. The basic differences between these two concepts are reflected in the degree of protection of ammunition during extreme changes in temperature and relative humidity in ammunition storage and inside of containers. The NATO concept of ammunition container is consisted of outer and inner lining, where outer lining is usually made of wood or steel sheet. The inner lining protects the contents from the influence of environmental parameters (temperature, relative humidity). The Eastern concept of a large-caliber ammunition containers usually does not have an inner lining. The aim of the experimental research carried out in four different containers, was to identify and analyze the degree of variations in temperature and relative humidity in ammunition containers of NATO and Eastern concept during the storage, depending on the change of seasons. Using a Tinytag Plus TGIS-1580 data logger, the changes in temperature and relative humidity were measured, inside and outside of ammunition magazine, inside the ammo box and inside of fiber container. Experimental research showed large influence of the design of outer and inner lining of ammunition containers on measurement results of environmental parameters. Since ammunition is expensive and tends to have a longer lifespan, it is necessary to implement NATO concept of ammunition containers on ammunition packaging of the Eastern concept.

Keywords: Environmental Parameters; Measurement; Storage; Ammo Containers

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GRASSLAND ECOLOGICAL RESTORATION BASED ON THE RELATIONSHIP BETWEEN VEGETATION AND ITS BELOW-GROUND HABITAT ANALYSIS IN STEPPE COAL MINE AREA

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Abstract:

Coal mining activities have caused severe disturbances to the regional ecosystem and soil properties. Studying the relationship of vegetation and its below-ground habitat (RVBGH) is of great significance to the coal mine land ecological restoration. To identify the optimal thickness of the soil layer for mine land ecosystem recovery and characterize the changes of the reclaimed soil-vegetation ecosystem, we studied natural and reclaimed grassland at the coal mine of Baorixile, located in Hulunbuir Steppe, Northeastern China. The vegetation and its below-ground habitat (BGH), including “root mass” and soil properties in the soil profile (0~100 cm), were surveyed in the natural and different year-reclaimed grassland. The “root mass” is the part of root system that has the most amounts of root hairs, which is the functional zone for plant growth. The RVBGH was identified by the “root mass” and plant water extraction depth, measured through the isotope δD and $\delta^{18}O$ method. Firstly, the BGH of natural grassland was identified as a “double layer” vertical structure, with the “root mass” of $37.11 \pm 2.57\%$ fine roots at 0-20 cm range and $30.44 \pm 2.67\%$ at 20-40 cm range. The annual and perennial plant “root mass” was found at 0-20 cm and 20-40 cm depth, respectively. Secondly, an optimal thickness of the soil covering of 30-40 cm was proposed for grassland reclamation. Thirdly, along the reclamation chronosequence, the values of the reclaimed vegetation properties (height, density, coverage and diversity) increased and a deep root system was established. The “root mass” increased from one layer to double layer and the amount of total fine roots increased from 1621 ± 231.9 to 4459 ± 456.0 . Moreover, the reclaimed soil properties of organic matter, cation exchange capacity, available N and P also increased. The study proposed that vegetation restoration was significantly correlated with its BGH, suggesting that vegetation BGH recovery is crucial in ecological restoration.

Keywords: Vegetation Below-Ground Habitat, Root Mass, Covering Soil Thickness, Ecological Restoration, Succession

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