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Effect of Environmental Deflector on Air Exchange in Slurry Pit and Concentration Distribution in a Two-dimensional Ventilation Chamber

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Hydrology I (85)

OP-530

AN APPLICATION OF A 3-D HYDRODYNAMIC MODEL IN A VERY SHALLOW LAGOON

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In this paper objectively analyzed data as well as simulated results are presented for the area of Kotychi lagoon NW Peloponnese, Greece. A 3-D hydrodynamic model was used to describe the velocity, temperature and salinity fields. Simulation results are in good agreement with the observed data illustrating the role of the atmospheric forcing in determining the variability of the circulation.

OP-535

FUZZY RULE RAIN AND TEMPERATURE PREDICTION FOR WATER MANAGEMENT OF VOLVI HYDROLOGICAL BASIN

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No summary submitted.

OP-540

EVALUATION OF ALTERNATIVE SCENARIOS OF WATER RESOURCES MANAGEMENT AND CROP PATTERNS IN LAKE KARLA BASIN THROUGH EMERGY ANALYSIS

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Sustainable decision-making in irrigated agriculture forms a challenge for the regional policy, as the integration of environmental, economic and social aspects is necessary for the development of rural areas. This challenge becomes even greater and restoration measures should be adopted in areas, where scarce water and land resources are competing among environmental preservation and highly productive agriculture. Emergy analysis represents a tool that corresponds to this challenge by incorporating both environmental and economic resources in the agricultural production systems. The common measure (or indicator) for evaluating all flows and storages of energy and materials is solar Emergy, defined as the amount of available solar energy used up to make a product or service, expressed as solar emJoules (sej). This method has been applied in Lake Karla basin, which is located at the south-eastern side of Thessaly Region in Greece. The aim of this study is to compare the current use of resources and environmental impact of the agricultural region and furthermore to assess alternative cropping scenarios in the reference area, integrating economic and environmental criteria. The results indicated that the sustainability of various crops should change if the reservoir of the restored Lake Karla is in operation for irrigation.

OP-545

INVESTIGATION OF GROINS EFFECT ON SCOUR OF RIVER BENDS BY A PHYSICAL MODEL

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Scour of river banks especially in meanders changes the river path and causes a lot of damages to the Agricultural lands and properties which have been located near the river banks. For example, the rate of bank erosion in the United States varies from 1.5 m at the Obion- Furked dair in the west Tenesy to 14 m at the Kansas River [5]. Several methods such as gabions, submerged vanes, groins etc. have been used to control scour of river bank especially at outer side. Groins can be classified into two groups: permeable and impermeable types, which can be used at submerged or unsubmerged states [4]. The flow characteristics and shear stress distribution at bends with fixed bed was investigated by Yen [8]. Engelund [2] investigated the river bed variations in two dimensions. The flow conditions, sediment transport, bed topography and sediment size interactions at the river bend were studied by Bridge [1]. Negate et. al. [3] investigated variation of path at rivers with fixed width and erodible banks. Also, many investigators such as Ujttewaal [6] and Weitbrecht [7] studied the distance

between groins and reported that this distance can be a function of river width, groins length, flow velocity and angle of groins to the river outer bank. In this study, a physical model has been built to investigate effect of three types of groins include permeable, semi permeable and impermeable types. The physical model include a channel of 73 cm width, 45 cm height and 115 m long with two intakes and four bends of 45, 90, 135 and 180 degrees. This model was built in the Shahid Bahonar University of Kerman. Experiments were carried on the 45 degree bend. Overall 27 experiments were done with different types and patterns of groins. The first experiment was done without using any groin, which is resulted a considerable scour at the outer bank. Application of groins reduce scour at the channel outer bank significantly. Among different types of groins, experiments show that application of permeable groins resulted better scour protection compare to the two other types. Groins with more permeability results less scour, but the distance between groins should be reduced, as a result, the number of groins in a specified length of river should be increased which is not economical. Groins with variable permeability across the length were used. Experiments results show better scour protection at the channel outer bank.

Livestock Environment Aerial Quality I (90)

OP-550

EFFECT OF ENVIRONMENTAL DEFLECTOR ON AIR EXCHANGE IN SLURRY PIT AND CONCENTRATION DISTRIBUTION IN A TWO-DIMENSIONAL VENTILATION CHAMBER

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Variations of air exchanges in slurry pit with four angles of an environmental deflector, namely 0° (parallel to the side wall or without deflector), 30°, 45° and 90°, were investigated using a tracer gas method. The investigations were performed in a two-dimensional ventilation chamber in the Air physics Lab, University of Aarhus. Ventilation rates used in the experiments were 100 and 200 m³/h. The experiment results showed that using the deflectors of 30°, 45° and 90° the airflow patterns were obviously changed in the room space near the slatted floor and in the head space of the pit compared with the setup without deflector. It was also found that of all the deflector angle performances with respect to air-exchange ratio and concentration distribution, the deflector position of 45° in two airflow rates cases behaved better with the lowest pit ventilation and the highest concentration in the head space.

OP-555

DEVELOPING OF A TURNING TRACTOR FRONT LINKAGE

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No summary submitted.

OP-560

APPLICATION OF WIDE RANGE AEROSOL SPECTROMETER TO SPECIFY PARTICULATE EMISSIONS FROM ANIMAL HUSBANDRY FROM 5 NANO METER TO 20 MICROMETER

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The object of this work was to apply a standardized method for measuring and modelling particle size distributions down to small nano meter scale for the first time ever to agricultural sources and to test the method at different stables and animal species. The particle size distribution and the particle number concentration were measured in a particle range from 5 nm to 20 µm within 59 size channels using a wide range aerosol spectrometer (WRAS), Grimm Inc. Ainring. The WRAS consists of a light scattering aerosol spectrometer (LSAS), Grimm Inc. model 1.108 and a scanning mobility particle sizer (SMPS+C), Grimm Inc. model 5.403 with 5.500. The measured particle size distributions have been compared with lognormal distributions, calculated by assuming four particle size-modes. The results show particle formation due to gas-to-particle conversion from typical agricultural gaseous precursors for particles smaller than 10nm diam-