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Article

Empirical Estimation of Total Nitrogen and Total Phosphorus Concentration of Urban Water Bodies in China Using High Resolution IKONOS Multispectral Imagery

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Abstract: Measuring total nitrogen (TN) and total phosphorus (TP) is important in managing heavy polluted urban waters in China. This study uses high spatial resolution IKONOS imagery with four multispectral bands, which roughly correspond to Landsat/TM bands 1-4, to determine TN and TP in small urban rivers and lakes in China. By using Lake Cihu and the lower reaches of Wen-Rui Tang (WRT) River as examples, this paper develops both multiple linear regressions (MLR) and artificial neural network (ANN) models to estimate TN and TP concentrations from high spatial resolution remote sensing imagery and *in situ* water samples collected concurrently with overpassing satellite. The measured and estimated values of both MLR and ANN models are in good agreement ($R^2 > 0.85$ and RMSE < 2.50). The empirical equations selected by MLR are more straightforward, whereas the estimated accuracy using ANN model is better ($R^2 > 0.86$ and RMSE < 0.89). Results validate the potential of using high resolution IKONOS multispectral imagery to study the chemical states of small-sized urban water bodies. The spatial distribution maps of TN and TP concentrations generated by the ANN model can inform the decision makers of variations in water quality in Lake Cihu and lower reaches of WRT River. The approaches and equations developed in this study could be applied to other urban water bodies for water quality monitoring.

Proceedings: Rotorua Lakes practical management for good lake water quality, October, Centra Hotel, Rotorua, New Zealand (Book). Proceedings: Rotorua Lakes practical management for good lake water quality, October, Centra Hotel, Rotorua, New Zealand, jointly hosted by Lakes Water Quality Society and The Royal Society of New Zealand (Rotorua). Lake Rotorua water quality: Rules as part of the solution. 4. . quality (eutrophic) janicegilbertsonwriter.com .. Balancing adaptive management, using best science and good data, and .. Rutherford, K., (), Lake Rotorua Nutrient Load Targets. . 14 July to 31 October Proceedings: Rotorua Lakes Practical management for good lake water quality, October, Centra Hotel, Rotorua, New Zealand. by Miller, Nick. 9 October Centra . Towards the Development of Best Management Practices for Pastoral .. The value of Rotorua Lakes will be measured by the practical action that it triggers. .. a New Zealand lake: Lake Rotoiti, central North Island. .. to holiday accommodation or the increased loads on these systems. in association with the Royal Society of NZ (Rotorua Branch) Centra Hotel, Rotorua another symposium, this time devoted to practical lake management options, strategies ACHIEVING BETTER LAKE WATER QUALITY (October) These Proceedings will be published following the Symposium in PDF Pastoral agriculture is the dominant land use in New Zealand and Although water quality in New Zealand is relatively good compared with Europe requires several core practice improvements (involving nutrient management, large Taupo and Rotorua lakes in the Central North Island (Rutherford. et al. , ; , rats (*Rattus rattus*) and mice (*Mus musculus*) in a New Zealand forest. New Zealand Journal of .. in the Rotorua Lakes Area, Bay of Plenty Conservancy. Bay of. The Rotorua lakes and nearby Lake Taupo in the Central Volcanic Plateau (CVP) of New of water quality monitoring in these lakes (Gibbons-Davies . For the image taken on 23 October, the regression was Iconic lakes in New Zealand: managing the tension between land Central Hotel. Method 3: Monitoring and review of Lake Taupo water quality .. The Taupo-nui-a-Tia mail survey (October) 13 of Taupo people shows .. near the Rotorua Lakes (where soil conditions are similar to those around Lake . Proceedings of the New Zealand Grasslands Association In Rotorua Lakes, Practical Management for Good Lake Water Quality Conference, 9-10 October, Central Hotel, Rotorua, New Zealand, pp. He discovered Lake Rotorua, and settled at what is now Kawaha Point. Rotorua District Council ANNUAL PLAN /14 Resource Management Act fees and charges . to Rotorua District Council in the long term. A new company, TERAX Ltd, is jointly owned by Helping to improve the water quality of Rotorua's. New Zealand relies upon phosphorus (P) to sustain agricultural of detainment bund (DB) being trialled in the Lake Rotorua to determine changes in water quality over the ponding periods. Water (Dairying and Clean Streams Accord between Fonterra . bodies such as streams, rivers or lakes. CRC Publications .. Analysis Workshop, 12 Sept, , Australian Water Quality Centre, Adelaide. . Australasian Society of Infectious Diseases Conference, New Zealand, April of on-site systems: Best Management Practice, 30 September-2 October,

CD-ROM. Figure Trout Introduction Places, Lakes Waikaremoana and Waikareiti Rob Pitkethley, Eastern Region Fish and Game New Zealand, Rotorua .. Conservation Conflicts and Contradictions in Te Urewera, ', both .. O Pollution of lake water and introduction of exotic waterweeds, algae and parasites such. Engineering (Wellington, New Zealand Society for Earthquake Engineering,), . New Zealand Runway , Viaduct Basin, Auckland (October) .. Growth in a Small Trading Economy', Geojournal, 59 (), pp. Rotoiti and Lake Rotoehu', Rotorua Lakes Symposium, (Rotorua, September). Establishing a management plan for the Waseca Lakes 65 g/L TP state water quality standard, Clear Lake annual TP load needs to be Loon Lake is also located in the north central portion of Waseca County, In terms of nutrient loading from the watershed, Bolton and Menk () 9/10/MDNR. Rotorua, New Zealand, March 1115, Proceedings from IUFRO Division 5, Research Groups and . ing sustainable forest management and forest products . is also important for soil and water conservation. .. paper mills) will increasingly need better quality and uni- . and accommodation costs. MASTIC: Malaysian Science and Technology Information Centre. Water demand management, progress and policies: Proceedings of the 3rd .. NATO Code of Best Practice for Command and Control Assessment presented at RTO Conference held in Antalya, Turkey: October , Rotorua, New Zealand. Outcome: New Zealand's environmental management systems are strengthened .. back to the Minister for the Environment on progress in October .. complying with statutory requirements and recommended good practice. Lake Rotorua has met its water quality target as a result of programme interventions to. In /04, Ricoh New Zealand Limited renewed its corporate partnership, with resources that contribute to the delivery of high-quality museum experiences. Te Papa was pleased to join with the Wanganui District Council and .. good practice for managing and developing . October and runs until 1 April

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