

CONVERGING TOWARDS SUSTAINABILITY

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Edited by
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Session PM1A

TEMPORAL VARIATION OF NUTRIENTS IN TRANSITIONAL SEASONAL PERIODS (DRY - RAINY) IN THE JAGUARIBE ESTUARY- CEARÁ, BRAZIL

Samara Aranha Eschrique, Elisabete de Santis Braga, Rozane Valente Marins

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This study in the Jaguaribe Estuary aimed to observe the changes in hydrochemical properties in two important transitional periods i) rainy to dry period in 2007, and ii) dry to rainy, in 2008. This estuary is under shrimp farms and domestic effluent inputs that contribute with nutrients to the system changing dynamics depending on the seasonal period. Samples of salinity, dissolved oxygen and nutrients (silicate and phosphate) were taken and the temperature data was recorded in two fixed stations for analysis. The data showed differences in the two temporal periods sampled according to fresh water input and marine influence, also reflecting on nutrient data. In 2007 the ranges went from 2.3-23.3 for salinity, 92.41-232.62mM for silicate, and 1.29-2.65mM for phosphate. In 2008 ranges went from 18.1-38.2 for salinity, 1.33-74.19mM for silicate, and 0.19-3.93mM for phosphate. This study is included in the INCT-TMCOcean Project (CNPq Proc. 573601/2008-9).

NUTRIENTS AS INDICATORS OF ENVIRONMENTAL CHANGES IN TWO BRAZILIAN ESTUARINE SYSTEMS

Samara Aranha Eschrique, Elisabete de Santis Braga, Rozane Valente Marins, Vitor Gonsalez Chiozzini

This study quantified nutrients in two contrasting estuarine systems: Iguape (SP) on the southeastern coast of Brazil, influenced by erosion, agriculture and urbanization, and under the influence of an important river flow (Ribeira de Iguape), which reaches the estuary via artificial channel (Valo Grande); and, Jaguaribe (CE), on the northeastern coast under semi-arid climate, submitted to domestic and shrimp farm effluents. The hydrochemistry during the rainy period in June 2007 (Jaguaribe) and February 2009 (Iguape) showed strong influence of terrestrial drainage reflected by low salinity between 2.30 and 4.50 (Jaguaribe) and from 0.04 to 0.84 (Iguape). Dissolved nutrient concentrations vary considerably. In the Jaguaribe: N-ammonium (8.04-13.51 μ M), nitrite (0.03-0.09 μ M), nitrate (0.30-0.43 μ M), phosphate (1.60-1.94 μ M) and silicate (202.20-232.62 μ M); which were different from Iguape: N-ammonium (0.76-2.04 μ M), nitrite (0.20-0.30 μ M), nitrate (15.27-16.08 μ M), phosphate (1.47-1.68 μ M) and silicate (98.89-187.56 μ M). Data showed nutrients can be an important tool to monitor the environmental impact of human activities. INCT-TMCOcean, CNPq 573601/2008-9.

DISSOLVED INORGANIC PHOSPHORUS AS TERRESTRIAL INPUT INDICATOR IN TWO SECTORS OF CANANÉIA-IGUAPE ESTUARINE- LAGOON COMPLEX, BRAZIL

Livia Haubert Ferreira Coelho, Elisabete de Santis Braga

This study evaluated the dissolved phosphate distribution in northern (Iguape) and southern (Cananéia) sectors of an estuarine-lagoon complex. Samples were taken in two seasonal periods (summer-winter, 2009) in 16 points including samples from Ribeira de Iguape river. Phosphate data were observed associated to environmental parameters such as pH and salinity. In general, the southern sector was classified as a haline to mixohaline with salinity and pH increases to the sea direction. The northern sector was oligohaline in function of the intense river water input facilitate by the Valo Grande, an artificial channel that links the river to the internal part of estuary. The phosphate concentrations were high in the river and at Iguape region when compared to the Cananéia values, whose showed clear gradient of dilution to the sea. During the winter, concentrations of P were higher than summer values maintained the strong anthropic influence at northern part. CNPq 573601/2008-9.

THE ROLE OF UREA IN THE COASTAL NITROGEN BIOGEOCHEMICAL CYCLE AS A SIGN OF ENVIRONMENTAL HEALTH

Elisabete de Santis Braga, Janaína Lopes Rodrigues Torres

The urea is an organic nitrogenous compound present in coastal environment introduced by excretion of some terrestrial and aquatic animals, including human being. The estuarine-lagoon complex of Cananéia-Iguape shows anthropic differences between northern and southern regions. Iguape is characterized beyond human occupation, by the presence of an artificial channel that introduce fresh water into estuary. Cananéia is naturally preserved. The northern part showed salinity from 0.04 to 1.75 and urea from 0.66 to 1.49 μ M. In the southern part, the salinity ranged from 17.97 to 31.44 and the urea values ranged from 0.01 to 2.46 μ M. Analyses performed in samples taken during 13h, in two fix points showed the deuration capacity of the southern part with association to the tide action. The more constant urea values were observed in northern part, with similar values to the Ribeira river water. This study belongs to VAGRA and INCT-TMCOcean projects.

CHLOROPHYLL A IN MACRO-VEGETABLE AS AN INDICATOR OF THE ENVIRONMENTAL IMPACTS IN THE CANANEIA-IGUAPE ESTUARINE-LAGOON SYSTEM – SP, BRAZIL

Carlos Eduardo Stein, Elisabete de Santis Braga

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The integrity of chlorophyll-a molecule is an excellent indicator of the state of the vegetable biomass and its determination in microalgae is very common. The macro-vegetable as the smooth cordgrass *Spartina alterniflora* is a potential agent to monitoring the environmental health and changes considering some biometric parameters and also the chlorophyll a concentration, but the traditional determination methods including extraction with solvent in a slow and difficult process. The use of extraction with Dimethyl-Sulfoxide represents a facilitation to obtain the chlorophyll a from this vegetable and a comparison with the traditional extraction with acetone 90% certified this procedure that showed values 6% of increase. Data obtained, summer 2009 from the northern of the aquatic system, submitted to a more important anthropic influence varied from 0,05 to 0,089 $\mu\text{g/g}$ while from the south varied from 0,03 to 0,06 $\mu\text{g/g}$, indicating the possible use of pigment contents to infer the environmental changes.

ENVIRONMENTAL CHANGES AND THE INFLUENCE ON THE ARTISANAL FISHERY ACTIVITIES IN THE CANANÉIA-IGUAPE ESTUARINE-LAGOON COMPLEX –SP, BRAZIL

Esther Nespoli de Oliveira, Elisabete de Santis Braga

The maintenance of artisanal fishing activities in two sectors of this estuary is very influenced by the environmental changes resulted from anthropic influences, overall in the northern part of the complex around the Iguape city. This region had an exceptional decrease of salinity and hydro chemical alterations due to the Ribeira river input facilitated by "Valo Grande" an artificial channel. The continuous input reveal changes in water quality (salinity, nutrients, suspended material), that leaves to biodiversity and distribution modifications of the ichthyofauna that reflect on the fishery. The social effects considering the economic benefit and the monetary application represent a problem to maintain a commercial price and quality of the aquatic products. A sequence of interviews with fishermen that work in two distinct sector of this system associated to the chemical water data allow to form a real profile of the situation of the artisanal fishing and the environmental quality.

CYTOGENETIC DISRUPTION IN FISHES AS BIOINDICATOR OF THE ENVIRONMENTAL QUALITY IN TWO ESTUARINE SYSTEMS UNDER DIFFERENT EXPOSITION TO ANTHROPOGENIC INFLUENCES

Leonardo Shintio Kuniyoshi, Elisabete de Santis Braga

Considering that the estuaries constitute hydrological systems exposed to anthropic activities, the estuarine fishes can be used to indicate the contamination process available by the bio-concentration of elements and also by cytogenetic alteration. In this study, the observation of micronucleus in the blood cellules of estuarine fishes showed be a very important in the genotoxicity monitoring water quality. About 2000 blood cells of fishes captured at Santos and Cananéia estuaries, at winter 2006 were observed using a microscopy. These two estuaries are submitted to different anthropic impacts and the first one is strongly industrialized. The 24 individual from 12 species obtained from Cananéia estuary did not presented micronucleus in erythrocytes, while in a group of 45 fishes belong to 10 species, from Santos estuary, the micronucleus observation reaches 0,2%, that is important in a classification of genotoxicity effect in fishes under contaminated environment. FAPESP2005/50769-2, CNPq552437/2007-7 and INCT-TMOcean 573601/2008-9.

Session PM2A

TIDE INFLUENCE ON HYDROCHEMICAL PARAMETERS IN TWO COASTAL REGIONS OF SÃO PAULO (BRAZIL) UNDER DIFFERENT ENVIRONMENTAL OCCUPATIONS

Vitor Gonzalez Chiozzini, Kátia Leite Agostinho, Ricardo Delfim, Elisabete de Santis [Braga](#)

This study observes the changes in the hydrochemical parameters in function of the tide influence in two coastal environments at São Paulo-Brazil: i) Southern sector (Cananéia region), with hydrological properties strongly associated to tide currents, pluvial inputs and where the salinity reaches high values; ii) Northern sector (Iguape region), submitted to erosion process, agricultural and urban occupation showing lightly sea tide influence due to an enormous fluvial input across the Valo Grande Channel. Both regional sectors belong to same coastal system constituted by estuaries and lagoons forming an estuarine-lagoon complex. The observations were performed in a wet period under spring tide influence increasing the environmental answers in terms of salinity and dissolved nutrient variations.

DISSOLVED ZINC, CADMIUM AND LEAD IN TWO PORTIONS OF THE CANANÉIA-IGUAPE ESTUARINE-LAGOON COMPLEX AND ITS POTENTIAL EXPORTATION TO THE ADJACENT SYSTEMS

João Carlos Cattini Maluf, Elisabete de Santis Braga

The southern and northern sectors of Cananeia-Iguape estuarine-lagoon complex (São Paulo, Brazil) were studied in autumn-2007 (CNPq-INCT-TMCOcean-VAGRA Projects) to evaluate their hydrochemical characteristics considering the concentrations of dissolved zinc, cadmium and lead. The methodology used was anodic stripping voltammetry. In the southern sector the zinc concentrations ranged from 0.134 to 0.341 mg L^{-1} , the cadmium from 0.006 to 0.020 mg L^{-1} and the lead from 0.036 to 0.100 mg L^{-1} . In the northern sector the zinc concentrations ranged from 0.115 to 0.389 mg L^{-1} , the cadmium from 0.012 to 0.024 mg L^{-1} and the lead ranged from 0.089 to 0.236 mg L^{-1} . These concentrations were below the limits proposed by the Brazilian environmental law (CONAMA) although revealing anthropic impact in the north region with exporting potential to the southern region and to the continental shelf. Higher trace metal concentrations were observed in the bottom waters near to the sediment.