

wiseman_metadata_intertidal

Project Name	Start Date	End Date	Lat range	Lon range
WISE-Man	2019-07-28	2019-08-25	49.036343 49.117665	-68.553014 -68.170023

Role	Name	Affiliation	Email
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Citation:

Université du Québec à Rimouski. Aquatel Laboratory. (2019). WISE-Man Project (WaterSat Imaging Spectrometer Experiment), characterization of shallow inland and coastal waters. [Version 1.0] Data published on St. Lawrence Global Observatory-SLGO. [<https://slgo.ca>]. Access date: [YYYY-MM-DD].

Project Description:

The WaterSat Imaging Spectrometer Experiment (WISE) for optically shallow inland and coastal waters assessment (the WISE-Man project)'s objective was to demonstrate the potential of hyperspectral imagery for mapping bathymetry, water column quality (or inherent optical properties) and retrieve bottom properties in order to respond to the pressing needs of science (e.g. ecology, geomorphology, coastal risk), resource management and defense operation. Within this framework ,an intensive fieldwork campaign was conducted in the Manicouagan / Baie-Comeau region (Québec, Canada) in July-August 2019. The database includes several datasets (csv files) related to water optical properties, water biogeochemistry and bio-optical properties of intertidal vegetation. This particular database refers to the samples taken within the intertidal sector.

Funders:

Canadian Space Agency (FAST program 2017), Department of Fisheries and Oceans (DFO) (Ocean protection plan), Réseau Québec Maritime (RQM), Québec-Océan network, UQAR, NSERC discovery grant to Simon Bélanger.

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data_dictionary_intertidal_wiseman.csv

Description:

The “data_dictionary_intertidal_wiseman.csv” file contains the description and units of all parameters included in each dataset (each csv file). Parameter’s names are based on SeaBass standardized field names when possible (<https://seabass.gsfc.nasa.gov/wiki/stdfields>).

Dataset Contact:

Name	Affiliation	Email
Veronique Theriault	UQAR	veronique_theriault2@uqar.ca

Instruments:

NA

Sampling and Analysis:

NA

References:

NA

intertidal_station_wiseman.csv

Description:

This dataset is used as a reference table and contains basic information on stations sampled in the intertidal zone, by foot. Date, latitude, longitude, wind, cloud cover, species of vegetation and % cover, sediment type and % cover are among the parameters included in the dataset. The “station_id” column is the primary key to link to which other intertidal datasets can refer to to perform joins.

Dataset Contact:

Name	Affiliation	Email
Veronique Theriault	UQAR	veronique_theriault2@uqar.ca

Instruments:

NA

Sampling and Analysis:

NA

References:

NA

biomass_lai_intertidal_wiseman.csv

Description:

Biomass and leaf area index (LAI) of macroalgae from the intertidal zone.

Start Date: 2019-07-28

End Date: 2019-08-07

Dataset Contact:

Name	Affiliation	Email
Brigitte Légaré	UQAR	Brigitte.Legare@uqar.ca
Romy Léger-Daigle	UQAR	Romy.Leger-Daigle@uqar.ca

Instruments:

Instrument Type	Manufacturer	Model	Instrument Features / Calibration
NA			

Sampling and Analysis:

Sampling: Quadrat of 30 cm x 30 cm were sampled on the littoral (intertidal zone) of Manicouagan Peninsula in July and August 2019 at low tide. The percent cover was estimated in the field for each quadrat. The entire vegetation was removed from the quadrat to determine the plant density per m², the number of photosynthetic active leafs, leaf length, foliar area and the Leaf Area Index (LAI). Data related to leaf (number, length, and foliar area) were obtained from 3 plants (or stem) randomly chosen in each quadrat. Those selected plants were representative of the whole quadrat.

Analytical procedure: Foliar area was determined with ImageJ software. For biomass, the vegetation was rinsed, drained and weighted for wet weight. Vegetation was then placed at 60 degrees C for 48h to 72h until completely dry, and weighted again for dry weight.

References:

NA

sedimentchla_intertidal_wiseman.csv

Description:

Chlorophyll a and phaeopigments concentration in sediment from the intertidal zone.

Start Date: 2019-07-28

End Date: 2019-08-06

Dataset Contact:

Name	Affiliation	Email
Brigitte Légaré	UQAR	Brigitte.Legare@uqar.ca

Instruments:

Instrument Type	Manufacturer	Model	Instrument Features / Calibration
Fluorimeter	Turner Design	TD10-AU	

Analysis:

Sampling: Core samples were collected within the first 15 cm of the sediment with a 60 mL truncate syringe in the intertidal zone at low tide. Two replica (A and B) were sampled per site. The core samples were transferred in a sealed cylinder and stored in a cooler until the crew return. The first 1-2 cm were used for this analysis.

Analytical procedure: Chlorophyll a and phaeopigments concentration in the sediment were measured in the lab with a Fluorimeter TD 10-AU (Christian Nozais lab at ISMER/UQAR). Three readings were made for each replica, which were averaged to give one value per replica. The results presented are the average of the value for A and B, for each station, with the corresponding standard error.

References:

- Jeffrey, S.W. et Humphrey, G.F. 1975. New spectrophotometric equations for determining chlorophylls a, b, c1 and c2 in higher plants, algae and natural phytoplankton. *Biochem. Physiol. Pflanzen* 167 : 191-194.
- Parsons, T. R., Maita, Y. et Lalli, C. M. 1984. A manual of chemical and biological methods for seawater analysis. Pergamon Press, Toronto, 173 p.
- Trees, C. C. et al. 2002. Fluorometric Chlorophyll a : Sampling Laboratory Methods, and Data Analysis Protocols. *Ocean Optics Protocols For Satellite Ocean Color Sensor Validation, Revision 5, Vol. 5.*

Rb_asd_long_intertidal_wiseman.csv

Description:

Bottom reflectance measured with the ASD in the intertidal zone. Refer to the “intertidal_station_wiseman.csv” dataset for additional information on the stations sampled (ex. sediment type, macroalgae cover, etc), based on “station_id”.

Start Date: 2019-07-28

End Date: 2019-08-07

Dataset Contact:

Name	Affiliation	Email
Brigitte Légaré	UQAR	Brigitte.Legare@uqar.ca

Instruments:

Instrument Type	Manufacturer	Model	Instrument Features / Calibration
Spectroradiometer	Analytical Spectral Device (ASD)	FieldSpec Handheld 2	Calibrated spectralon panel used as reference

Sampling and Analysis:

Sampling: The instrument was used over emerged vegetation at low tide, in the intertidal zone. The instrument had a spectral resolution of ~3 nm covering a spectral range from 325 to 1075 and was fitted with a bare fiber optic with a 25° field of view (FOV). For each station sampled, a plot area was defined to cover a homogeneous part of each vegetation community. At least 10 to 15 field spectrometer measurements were taken at random over each homogeneous plot. This ensured that the random spectral measurements on each plot covered the range of variance within the homogeneous vegetation plot. The ASD collects five spectra for each measurement and then averages.

Analytical procedure: The remote sensing reflectance was computed following Mobley 1999, based on the total upwelling radiance from the water as measured by the instrument; the skylight reflectance that depends upon the sun-viewing geometry, sea state (i.e., wind speed) and instrument FOV; the sky radiance coming from the direction of specularly reflected sky light; the up-welling radiance and reflectance of the spectralon panel. The instrument integration time and dark current subtraction were systematically applied for each radiance measurement. The sensor viewing zenith angle of ~40° and an azimuth difference between the solar and sensor planes between 90 and 135° was chosen to minimize the sun glint contamination (Mobley

1999). The wind speed and sun-view geometry was recorded systematically to perform the sky glint correction.

References:

- Mobley 1999, Estimation of the remote-sensing reflectance from above-surface measurements, Applied Optics, 36:38,7442, Optical Society of America, 10.1364/AO.38.007442