

			 [5]
J. (John) E. Lewis	<u>E. (Edzer) Pebesma</u> [6]	<u>A. (Alex) Brenning</u> [7]	<u>T. (Tom) Hengl</u> [8]

Topics: Space-time data in R, remote sensing images in R, working with time series of images (bricks and stacks), spatial databases, spatial statistics for modelling environmental data. The general topic of this Summer School is **analysis and visualization of spatio-temporal rasters with R + OS GIS**.

R packages / OS GIS of interest: [raster](#) [9], [spacetime](#) [10], [RSAGA](#) [11], [rgdal](#) [12], [maptools](#) [13], [gstat](#) [14], [plotKML](#) [15], [GSIF](#) [16], [SAGA GIS](#) [17], [FWTools](#) [18], QGIS and similar.

Read more: [software installation instructions](#) [19]

Who is invited:

PhD students, environmental sciences, soil scientists

Location:

Faculty of Forestry, Geomatics and Geography [20], on the campus of Laval University, a few kilometers from the heart of Quebec City. The **Centre for forest research** [21] (CEF) will provide, free of charge, two classrooms and one seminar room with a capacity of up to 60 people. A free, fast and unrestricted access to the internet will be provided through the University's wireless network.

This map shows directions to get from the student accommodations on [University Laval campus](#) [2] (Pavillon Alphonse-Marie-Parent, A) to the course venue (Pavillon Gene-H. Kruger, B). This represents a 10 minute walk.

[View Larger Map](#) [22]

Main lecture room: [GHK-2320-2330 \(Kruger Room\)](#) [23]

Secondary lecture room: ABP-1111

Closest Airport: [YQB](#) [24]

Distance from airport to the University: about 18 min (12.2 km). Transportation from airport to hotel best by taxi.



[25]

The programme:

The provisional working program (this programme will be continuously updated):

DAY 0 - Sunday 26th of May: informal meeting / ice-breaker

On Sunday May 26 in the afternoon, starting at **16:00** we will have an icebreaker BBQ dinner with beers and burgers for those who want to chill and meet some people and get an early feel of the place. This will take place in front of the Gene-H. Kruger building (inside if it rains).

The Gene-H. Kruger building is located on the Université Laval campus. It is about 10 minutes walking distance from the Pavillon Aphonse-Marie-Parent (student accommodation) and from the closest bus terminal (Pavillon Desjardins bus stop).

DAY 1 - Monday, 27th of May: introduction / linking R and OS GIS

<i>time</i>	<i>topic</i>	<i>format</i>	<i>lecturer</i>
9.00-9.15	Opening speech from CEF director		L. Bernier
9.15-10.30	Welcome note and course overview (introduction to GEOSTAT [26])	lecture	T. Hengl J.D. Sylvain G. Drolet
10.30-11.00	Coffee break		
11.00-11.45	<u>Spatial and spatio-temporal data classes and methods in R</u> [27]	lecture	T. Hengl
11:45-12:30	<u>Introduction to Time Series</u> [28]	lecture	J. Lewis
12.30-13.30	Lunch		
13.30-15.00	<u>Importing and analyzing remote sensing data in R (raster, sp, spacetime and plotKML packages)</u> [27]	demo	T. Hengl
15.00-15.30	Coffee break		
15.30-17.00	Linking R with external GIS packages	demo	T. Hengl
17:00-18:00	Web-inar #1: Raster data processing in R	video	R. Hijmans

18:00-20:00	Crash course in R (a catch-up session) / Crash course in Geostatistics	computer practical	J. Lewis / T. Hengl
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DAY 2 - Tuesday, 28th of May: programming spatial data analysis with R

<i>time</i>	<i>topic</i>	<i>format</i>	<i>lecturer</i>
9.00 - 10.30	<u>Introduction to spatial data modelling</u> [29]	lecture	J. Lewis
10.30 - 11.00	Coffee break		
11.00 - 12.30	<u>Import, reformatting, overlay, aggregation and export of spatial data (packages: raster, sp, spacetime)</u> [29]	computer practical	J. Lewis
12.30 - 13.30	Lunch		
13.30 - 15.00	<u>Spatial interpolation</u> [30]	lecture	J. Lewis
15.00 - 15.30	Coffee break		
15.30 - 17.30	<u>Spatial interpolation</u> [30]	computer practical	J. Lewis
19:00-??	Gala dinner (logistics will follow)		

DAY 3 - Wednesday, 29th of May: combining R and SAGA GIS

<i>time</i>	<i>topic</i>	<i>format</i>	<i>lecturer</i>
9.00 - 10.30	<u>Statistical geocomputing combining R and SAGA GIS</u> [31]	lecture	A. Brenning
10.30 - 11.00	Coffee break		
11.00 - 12.30	<u>Statistical geocomputing combining R and SAGA GIS: Land cover classification case study</u> [31]	computer practical	A. Brenning
12.30 - 13.30	Lunch		
13.30 - 15.00	Statistical and machine-learning classification methods for spatial modeling and remote sensing	lecture	A. Brenning
15.00 - 15.30	Coffee break		
15.30 - 17.00	Classification and predictive performance assessment with R	computer practical	A. Brenning
17:00 - 18.00	Seminar #2 : Compositionnal data in R	lecture	S.-É. Parent

DAY 4 - Thursday, 30th of May: Open day

<i>time</i>	<i>topic</i>	<i>format</i>	<i>lecturer</i>
9.00 - 10.30	Geostatistical theory for Kriging revisited (dealing with missing data / change of support)	lecture	A. Brenning
10.30 - 11.00	Coffee break		
11.00 - 12.30	Computing with big rasters in R	lecture	T. Hengl, A. Brenning
12.30 - 13.30	Lunch		
13.30 - 15.00	Bayesian geostatistics in R	lecture	J. Lewis
15.00 - 15.30	Coffee break		
15.30 - 17.00	3D soil mapping using Quebec data (with visualization in plotKML)	lecture	T. Hengl
17.00 - 19.00	5-7 social CEF meeting	social activity	

DAY 5 - Friday, 31th of May: automated geostatistics using time-series of covariates

<i>time</i>	<i>topic</i>	<i>format</i>	<i>lecturer</i>
9.00 - 10.30	<u>Automated geostatistics using multisource data</u> ^[32] (GLM-kriging)	lecture	T. Hengl
10.30 - 11.00	Coffee break		
11.00 - 12.30	<u>Automated geostatistics</u> ^[32] (packages: gstat, GSIF, plotKML)	computer practical	T. Hengl
12.30 - 13.30	Lunch		
13.30 - 15.30	Spatial prediction (2D+T)	lecture	T. Hengl
15.30 - 16.00	Coffee break		
16.00 - 17.00	Seminar #3: "Raster/vector analysis with PostGIS and R"	webinar	D. Golicher

DAY 6 - Saturday, 1st of June: analyzing spatio-temporal data

<i>time</i>	<i>topic</i>	<i>format</i>	<i>lecturer</i>
9.00 - 10.30	<u>Analyzing spatio-temporal data (spacetime package)</u> elected topic ^[33]	lecture	E. Pebesma

10.30 - 11.00	Coffee break		
11.00 - 12.30	<u>Analyzing spatio-temporal data (spacetime package)</u> elected topic ^[33]	computer practical	E. Pebesma
12.30 - 13.30	Lunch		
13.30 - 15.00	selected topic	lecture	E. Pebesma

DAY 7 - Sunday, 2nd of June: excursion

Accommodation:

On-campus summer accommodation available for visitors from May to August. To book a room at the on the web site of the housing of Laval University click [here](#) ^[34]. When booking a room refer to: Geostats Quebec 2013 - Event 213177. Prices: regular rooms - shared bathroom - 43\$+taxes single occupancy - 60\$+taxes double occupancy.

Important dates:

- Registration deadline: 1 February 2013
- Published rankings: 15th of March 2013
- Deadline registration fees: **1 April 2013** ^[35] (no extensions possible)

Organizing committee:



- J.-D. (Jean-Daniel) Sylvain ^[36] - summer school secretary, logistics, invitation letters
- G. (Guillaume) Drolet ^[37] - logistics, invitation letters
- E.B. (Étienne) Racine - logistics, lecture rooms, coffee and lunch breaks
-

- P. (Pierre) Racine [38] - logistics, lecture rooms, coffee and lunch breaks
- T. (Tom) Hengl [39] - registrations, website materials, daily programme

Sponsors / hosting institution:

This event is sponsored by the **Faculty of Forestry, Geomatics and Geography** [20], Laval University, the **Centre for forest research** [21] (CEF), **Synergie Direction événementielle** [40] and **Boréal** [41].

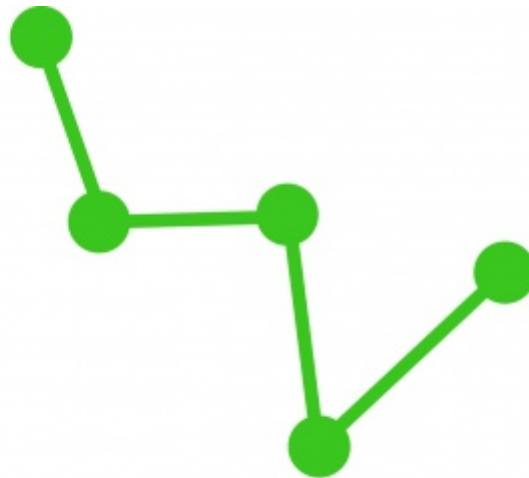


UNIVERSITÉ
LAVAL

Faculté de foresterie, de géographie et de géomatique

[20]

SYNERGIE
DIRECTION ÉVÉNEMENTIELLE [42]



boreal

[43]

WWW.BOREAL-IS.COM

Image:



Summer school on analysis and
visualization of spatio-temporal
rasters with R + FOSS GIS
from May 26th - June 1st 2013
Quebec City, Canada

What's GEOSTAT ?

The **GEOSTAT Quebec City 2013 summer school** is the 8th in a series of summer schools organized by R and FOSS GIS developers and enthusiasts. GEOSTAT aims at PhD students and R-sig-geo enthusiasts in a range of environmental and GIS sciences.

The main idea of GEOSTAT is to promote various aspects of statistical analysis of spatial and spatio-temporal data using FOSS GIS tools: R, SAGA GIS, GRASS GIS, FWTools, Google Earth. GEOSTAT is made of mini-conferences and hands-on exercises focused on the latest developments in software for spatio-temporal statistics. Members of the GEOSTAT scientific committee are typically the main developers and maintainers of the R + OS GIS tools.

Main topics ?

The participants will learn how to import and organize space-time data (time series of rasters) and how to program statistical and geographical analyses using a combination of R and OS GIS functionalities.

Where is it ?

The school will be hosted at the Faculty of Forestry, Geomatics and Geography, on the campus of Laval University, Quebec City, Canada.

Registration deadline:
February 1st 2013

For more information on the program and registration process, go to our website:

http://geostat-course.org/Quebec_2013

