GIS for Public Health

Facilitator
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Dr. Kees de Hoogh, Swiss TPH, University of Basel

Description
The physical and social environment that surrounds us plays an important part in our health and wellbeing. The geography concept of ‘place’ thus cannot be ignored in public health. Whether investigating the level of environmental pollution, access to recreation or health services, or the patterns or spread of disease, Geographic Information Systems (GIS) provide the standard platform for exploring spatial attributes and relationships between our environment and health.

This course offers an introduction to GIS and how it is used in public health and epidemiological research. It will introduce students to the basics including: working with and integrating spatial and non-spatial data; geographic scale and spatial precision; projections; geocoding; visualisation; thematic mapping; and understanding spatial relationships. Specific skills and tools will also be introduced in relation to methods for route analysis and for spatial linkage of exposure, contextual and confounder information for epidemiological or health risk assessment studies. Students will apply their new skills in a case study based on available datasets for defined topics.

This course will be a mix of lectures, demonstrations and practical time for hands-on data analysis in ArcGIS and QGIS (emphasis on ArcGIS).

No prior knowledge of GIS is required, though completion of pre-course work is essential preparation for this intensive course.

Objectives
Students will gain knowledge in the fundamentals of GIS for spatial data handling and analysis. By the end of the course, students will

• Understand how GIS can be used to enhance public health and research;
• Be able to acquire, add, manipulate, visualize and map spatial data in a GIS; and
• Be able to perform basic spatial analyses in ArcGIS and QGIS.
Dates | 8 – 12 November 2021  
Part 1 Basic training: 8 – 10 November 2021  
Part 2 Project: 11-12 November 2021 online project partner work  

Eligibility  
Open to PhD students of SSPH+ public health program; other students and external participants are welcome to apply for limited spaces  

Course Structure  
5-days hands on experience on GIS software, interspersed with real-time lectures. The course includes pre-course and homework assignments, and a written report on the practical case study.  

Part 1 (1 ECTS) includes exercises, in class discussion and pre-course and homework assignments.  

Part 2 (1 ECTS) involves working in pairs to conduct a project selected from available topics. Assessment will be based on a short written report including well-designed and executed maps, due 2 weeks later.  

Participants will use their own laptops. Software and install instructions will be provided for ArcGIS and QGIS (separate instructions will be sent). Please note installation is the responsibility of the participant, in consultation with your IT service if needed.  

Assessment  
Part 1 assignments; Part 2 written report.  
All assignments due 29 November 2021  

Credits  
Max 2 ECTS (1 ECTS for each part); N.B it is possible to only take Part 1, but not only Part 2  
Preparation/homework 8 h, Contact 45 h  
(1 ECTS corresponds to appr. 25-30 hours workload)  

Location  
Part 1 Basic training: Online in zoom  
Part 2 Project: Online in zoom breakout rooms  

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https://ssphplus.ch/en/graduate-campus
<table>
<thead>
<tr>
<th>Course Fees</th>
<th>Description</th>
<th>Fee (CHF)</th>
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<tbody>
<tr>
<td>SSPH+ PhD Students</td>
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<td>30.-</td>
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<tr>
<td>PPHS PhD Students</td>
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<tr>
<td>External MD/PhD Students</td>
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<td>600.-</td>
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<td>External Academics</td>
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<td>1700.-</td>
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<tr>
<td>Other Participants</td>
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<td>2500.-</td>
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(The cost scheme depends on the Number of ECTS. Per ECTS participants are asked to pay 300,- CHF, 850,- CHF or 1250,-CHF, respectively)

Registration

Please register online on our website

Registration date

8 October 2021
## Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
<th>Mon 8 November</th>
<th>Tues 9 November</th>
<th>Wed 10 November</th>
<th>Thurs 11 November (KdH, DV, BF)</th>
<th>Fri 12 November (KdH, DV, BF)</th>
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</thead>
<tbody>
<tr>
<td>0900-1045</td>
<td>1h45</td>
<td>Course Intro (KdH)</td>
<td><strong>Projections and geocoding</strong></td>
<td>Open source GIS Intro (KdH)</td>
<td>Group work: Case study</td>
<td>Group work: Case study</td>
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<td></td>
<td></td>
<td>Quick start to GIS Intro (DV)</td>
<td>Intro (DV) Exercise 1 (1h15)</td>
<td>Exercise 4 (1h30)</td>
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<td></td>
<td><strong>Applied GIS</strong></td>
<td><strong>Exercise 7 (1h30)</strong></td>
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<tr>
<td>1045-1100</td>
<td>15</td>
<td><strong>Break</strong></td>
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<tr>
<td>1100-1200</td>
<td>1h</td>
<td>Quick start to GIS continued (30min)</td>
<td>Lecture 2 Exposure assessment using GIS (KdH 30min)</td>
<td>Lecture 3 Mapping and Communication (ME 30min)</td>
<td>Group work: Case study</td>
<td>Group work: Case study</td>
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<td></td>
<td>Lecture 1 GIS in Epidemiology (DV 30min)</td>
<td>Recap (30min)</td>
<td>Time to finish off earlier exercise (30min)</td>
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<tr>
<td>1200-1300</td>
<td>1h</td>
<td>Lunch</td>
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<td>1300-1500</td>
<td>2h</td>
<td>Spatial relationships and analysis Intro (KdH) Exercise 2 (1h45)</td>
<td>Health risk assessment Intro (DV) Exercise 5 (1h45)</td>
<td>Automation in GIS Intro (KdH) Exercise 8 (1h45)</td>
<td>Group work: Case study</td>
<td>Group work: Case study</td>
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<td>1500-1515</td>
<td>15</td>
<td><strong>Break</strong></td>
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<td>1515-1700</td>
<td>1h45</td>
<td>Working with raster data Intro (KdH) Exercise 3 (1h30)</td>
<td>Decision making with Route Analysis Intro (KdH) Exercise 6 (1h30)</td>
<td>Recap (1h45)</td>
<td>Group work: Case study</td>
<td>Group work: Case study</td>
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DV: Danielle Vienneau; KdH: Kees de Hoogh; Marloes Eeftens (ME); Benjamin Flueckiger (BF)