



▪ General information

- Title of the workshop: **Introduction to GIS and Spatial Analysis for Epidemiologists: Using ArcGIS**
- Name of instructor(s) and short biographies and contact information of the workshop organizer(s):
  - **The workshop is organized in collaboration with University of Minnesota, USA and Federal Center for Animal Health (FGBI ARRIAH), Russia.**
  - **The instructors are:**
    - **Fedor Korennoy, Federal Center for Animal Health (FGBI ARRIAH), Russia, [korennoy@arriah.ru](mailto:korennoy@arriah.ru).** Fedor is a Research Scientist and GIS specialist in the area of veterinary epidemiology. Holding professional certifications in ArcGIS and in Risk Analysis in Animal Health and Food Safety, Fedor teaches some courses for veterinary researchers and university students on the application of spatial and quantitative methods in veterinary epidemiology and biogeography.
    - **Prof. Andres Perez (DVM, PhD), Department of Veterinary Population Medicine, University of Minnesota, USA. [aperez@umn.edu](mailto:aperez@umn.edu).** Andres has led a number of educational activities (teaching courses, workshops, leading consultancies) on quantitative epidemiology on disease modeling, spatial analysis, risk analysis in several countries including Australia, Argentina, Belgium, Canada, Chile, India, Italy, Mexico, Pakistan, Panama, Russia, Spain, South Africa, the UK, the US, Uganda, Uruguay, and Tajikistan.
    - **Dr. Julio Alvarez (DVM, PhD), Centro de Vigilancia Sanitaria Veterinaria (VISAVET) and Departamento de Sanidad Animal, Facultad de Veterinaria, Universidad Complutense, Madrid, Spain. [jalvarez@umn.edu](mailto:jalvarez@umn.edu).** Julio has been an instructor-consultant on educational activities on quantitative epidemiology, including spatial epidemiology and risk assessment, performed in Spain, Argentina, Canada and Thailand.
    - **Dr. Kaushi Kanankege (DVM, PhD), University of Minnesota, USA, [kanan009@umn.edu](mailto:kanan009@umn.edu).** Kaushi is a recent PhD graduate and a postdoctoral associate. She has been a teaching assistant and an instructor for multiple coursework on infectious diseases, epidemiology, and spatial analysis at the University of Minnesota.
- Workshop's learning outcomes: **The workshop is designed for officials and researchers in veterinary science wishing to learn basics of disease mapping and spatial analysis. By the end of the workshop participants are expected to learn and be able to apply basics of data management and visualization in ArcGIS; use basic and advanced methods of spatial analysis to reveal space and space-time patterns of animal disease spread; use ArcGIS embedded tools to convert animal disease data into various formats required by specialized research software.**
- **Basic hand-on experience with ArcGIS is required (user interface, data manipulation), though quick refresher will be provided at the beginning of the workshop. Some basic knowledge of statistics is desirable but not required.**

- The history of the workshop: have you offered this workshop before? Yes [  ] No [  ]. If yes, please provide a brief summary of the venues, dates, and approximate attendance numbers. **The workshop is based on several regular courses led by Fedor Korennoy: 1) an online course for veterinary researchers in Russia (2019); attendance number: 12; 2) an undergraduate course for Geography students at Lomonosov Moscow State University (2018-2019), attendance number: 15; 3) in a concentrated format this workshop was conducted at the Department of Veterinary Public Health, University of Minnesota (2017), attendance number: 8.**
- Workshop specifications
  - Do you prefer to organize a pre- or post-workshop? Pre [  ] Post [  ] Either [  ].
  - What's the minimum and max number of attendees for the workshop? Min [ **8** ] Max [ **25** ]
  - What's the duration (days) of the workshop (max. length is 2 days, but contact us at [GeoVet19@ucdavis.edu](mailto:GeoVet19@ucdavis.edu) if you want to propose a longer workshop e.g. 3-4 days): [ **2 days** ]
  - A package of accessories that includes one laptop projector, power strips, extension cords, Easel Board and adapters will be provided. Please contact us at [GeoVet19@ucdavis.edu](mailto:GeoVet19@ucdavis.edu) if you need additional material. **Desktops (preferably) or laptops with ArcGIS installed are needed for every participant. ArcGIS license should be of version 10.3 or higher. Spatial Analyst module is essential. ArcGIS Pro is desirable. If no ArcGIS licenses are available, we can contact ESRI to order student licenses.**
  - What is the proposed cost (USD) of the workshop for the participants: [ **300 USD full; 150 USD student** ].
- Workshop contents and schedule

Day	Time	Topic	Presenter	Format
1	8.30-10.30	Choosing coordinate systems and projections, Principles and basic tools of spatial statistics: mean center, standard deviational ellipse,	Fedor Korennoy	Theory + Computer lab
	10.30-11.00	Coffee Break		
	11.00-12.00	Basic tools of spatial statistics: mean center, standard deviational ellipse	Fedor Korennoy	Computer lab
	12.00-1.00	Lunch		
	1.00-3.00	Autocorrelation, hot spot analysis & Tools of spatial analysis: density estimations	Julio Alvares, Fedor Korennoy	Theory + Computer lab
	3.00-3.30	Coffee Break		
	3.30-5.00	Autocorrelation, hot spot analysis & Tools of spatial analysis: density estimations.	Julio Alvares, Fedor Korennoy	Computer lab

		Geographically Weighted Regression		
2	8.30-10.30	Kriging & co-kriging, its applications in ArcGIS	Andres Perez, Kaushi Kanankege	Theory + Computer lab
	10.30-11.00	Coffee Break		
	11.00-12.00	Kriging & co-kriging, its applications in ArcGIS	Andres Perez, Kaushi Kanankege	Computer lab
	12.00-1.00	Lunch		
	1.00-3.00	Space-time analysis: space-time cube and its applications	Fedor Korennoy	Theory + Computer lab
	3.00-3.30	Coffee Break		
	3.30-5.00	Space-time analysis: space-time cube and its applications	Fedor Korennoy	Computer lab