Consideration about a topographic expression by comparison on various Geopark maps

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The authors collected many maps of each Geoparks and considered the effect of topographic expression of these maps.
The authors is trying the questioning about a map expression of the Geopark maps targeted for the participant and the interpreter to Geotours in The North Ibaraki Geopark. The authors will have a plan to ask the person concerned of Geopark maps in the Kanto area neighborhood for concentration of opinions and information about the backgrounds that they chose the topographic expression in particular. In this presentation, the authors report the result which considered the indispensable item in a topographic expression of Geopark maps.

Keywords: Geopark, map, topography expression

Development and publishing of the high speed rendering web site for slope gradation map and shaded map

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We developed and published the high speed rendering web site for slope gradation map and shaded map of the various part of Japan. In this website, PNG elevation tile based on elevation tile of of the Geospatial Information Authority of Japan tile is used. We chose the simplest method using three points to calculate solpe.

Keywords: slope, elevation, PNG elevation tile, geology, smart tile

Geospatial analysis of moving routes of bicycles using probe data

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Various policies have been recently taken to promote the use of bicycles as urban traffic in many cities around the world. However, for implementing such bicycle use promotion policy, building a bicycle road network concerning the improvement of the bicycling environment should be carefully assessed. The OD (origin to destination) data have often been utilized in many study cases on the traffic performance of the bicycle. However, since actual cyclists may take various routes, not only the shortest one but a longer route where the cyclists feel comfortable. In this research, therefore, network analysis on the actual bike movement trajectory is analyzed using the probe data (Strava Metro) which summarizes the movement of cyclists for each road segment, whose tracks are recorded by GNSS receivers. We then try to provide objective information which can be the basis of the discussion for building optimal bicycle roads encouraging the comfortable use of bicycles in cities.

Along with the probe data of bicycles, topographic environments and land use data were collected for five cities including Melbourne (Australia), New York (USA), Austin (USA), Chicago (USA), and Paris (France). Spatial analysis was performed using these data. Regarding the bicycle trajectory, the three points, including commuting use, weekend use, and use ratio on weekdays and weekends, were focused to be compared with the urban structure. Characteristic features of bicycle use for each city, as well as common features among the cities, were clarified: for instance, in Melbourne, commuting users tend to pass curved roads near parks more frequently rather than straight roads. Also, the use of roads in suburban areas is more frequent in weekends. Like this, it is observed that the frequent use of bicycles is found in or near parks, or characteristic topographical environments such as rivers and ridges, suggesting that the bicycle use strongly depends on the urban environments. Classification of bicycling networks is possible for different existing urban structures. It was also shown that the use ratio of bicycles in the central and peripheral areas is different for each city. These findings can be used for promoting future bicycle policies, including the construction of a wide-area bicycle network that incorporates existing urban structures, and optimal routes and connection distances.

Keywords: Bicycle, Probe data, GNSS, Spatial analysis

Spatial diffusion of emerging and re-emerging infectious disease: A case study of Influenza type A/H1N1pdm09 in Japan, 2009-2010

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Influenza is the most widely distributed viral zoonotic disease on the Earth. In Japan, a seasonal Influenza epidemic occurs around November to March every year. Among the three types of viruses A, B, and C, Influenza type A may cause a pandemic because of a new type of virus.

This study, examines the spatial diffusion process of Pandemic Influenza A/H1N1pdm09 in Japan. Whereas in various studies examined the pandemic from various fields, few ones considered the detailed diffusion process in Japan from spatial aspects. In particular, mapping its spatial distribution at different spatial scales is required to analyze the diffusion process and its regional differences in detail. In this study, we made multiscale analysis of the diffusion process by mapping at global scale, national scale, and local scale with GIS.

We used infectious disease surveillance data of pandemic season in 2009 to 2010. At the global and national scales, we used patient data from the National Institute of Infectious Diseases (NIID) of Japan, and at the local scale, we used the data from outbreaks at school facilities. The study area at the local scale is Wakayama prefecture, located in the southern part of the Kinki district. This area has regional characteristics of the northern region included in the Keihanshin metropolitan area, and southern region of depopulation area in mountainous lands of Kii Peninsula.

The global and national scale maps revealed that patient arrived taking two routes, mainly in the United States and Southeast Asian countries in May 2009. One is the route from Kansai International Airport, and the other is the Kanto region and Tohoku region from Narita Airport. The spatial diffusion within Japan is supposed to take path according to inter-regional ties.

The peak of the epidemic in Wakayama Prefecture is November 2009; there are it took six months to reach this peak in Wakayama Prefecture from the first confirmation in the Kinki district. An increase in outbreaks began in September 2009. From the distribution of closed facilities, it became clear that it gradually diffused from the northern part included in the metropolitan area to the south part of the prefecture.

These results provide not only emerging and re-emerging influenza but also basic information on daily epidemic prevention.

Keywords: Spatial diffusion, Influenza type A/H1N1pdm09, Japan, Geographical Information System (GIS)