

Geographical Information System (GIS) in detection of risk zones to mental health

01/10/2015 : 15.00 - 16.00 h.

Parallel Session 3 :

Symposium 299:

Detecting individuals at mental risk.

Speaker:

Dr. Manuel Esteban Lucas-Borja

Engineer. Department of Agroforestry and Genetics Science and Technology.

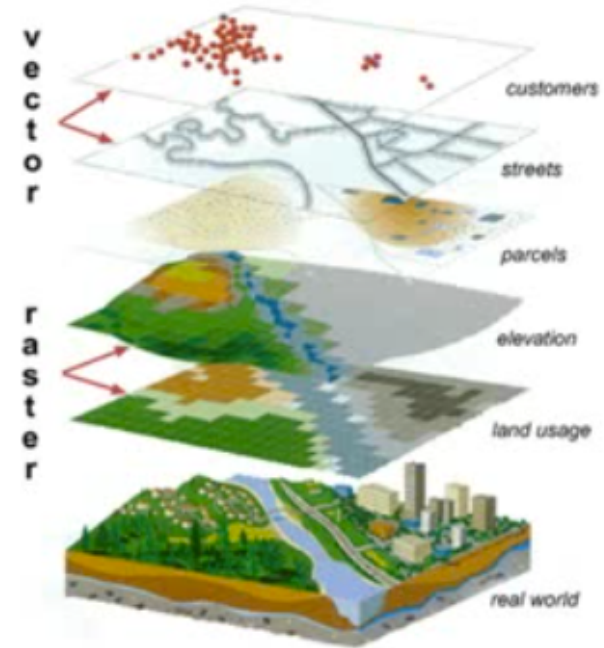
University of Castilla La Mancha.

ManuelEsteban.Lucas@uclm.es

ENMESH

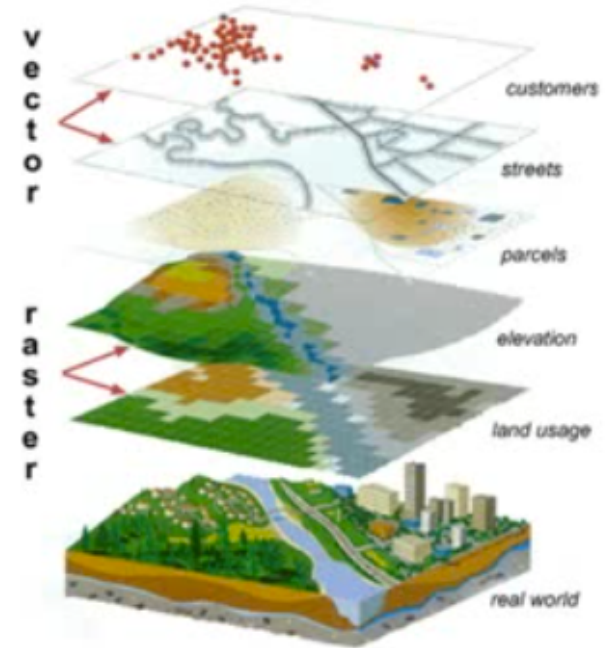
Geographical Information System (GIS) in detection of risk zones to mental health

- What is a GIS?
- What can be done with a GIS
- How GIS works
- Examples
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.



Geographical Information System (GIS) in detection of risk zones to mental health

- What is a GIS?
- What can be done with a GIS
- How GIS works
- Examples
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.



Geographical Information System (GIS) in detection of risk zones to mental health

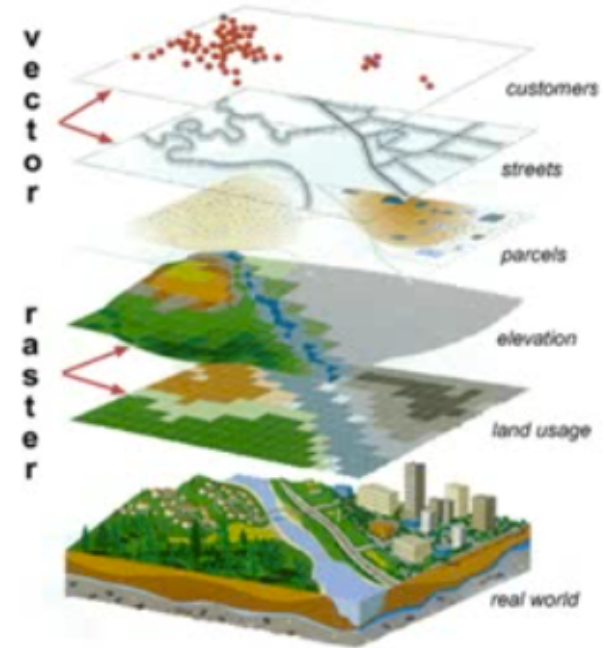
A **geographic information system (GIS)** can be defined as a set of hardware, software, data, methods and people. Its aim consists in the management, analysis and display of geographically information.



A **GIS** lets us visualize, analyze, and interpret data to understand relationships, patterns, and trends.

Geographical Information System (GIS) in detection of risk zones to mental health

- What is a GIS?
- **What can be done with a GIS**
- How GIS works
- Examples
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.



Geographical Information System (GIS) in detection of risk zones to mental health

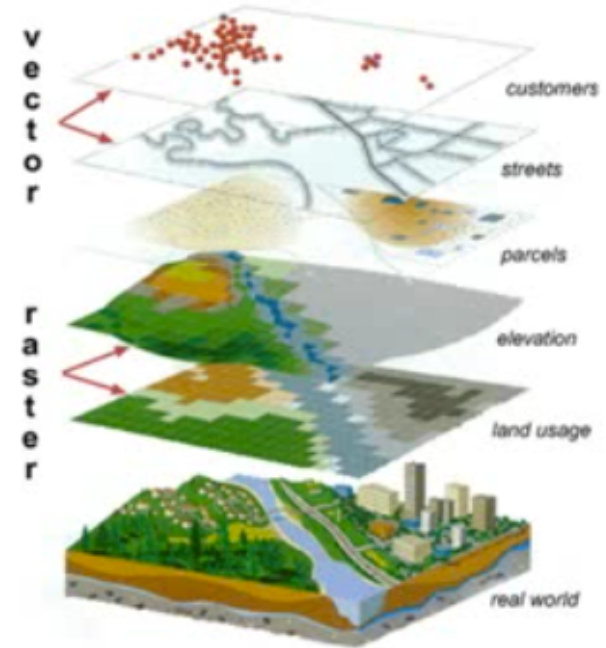
- We can visualize, analyze, and interpret data using maps about:
 - The position of things (i.e. coordinates)
 - The quantities of things (i.e. population)
 - The densities of things (i.e. density of population)
 - What happens inside a specific area (i.e. risk or damage)
 - What is nearby within a user defined distance
 - The evolution/change of phenomena...



Natural disasters

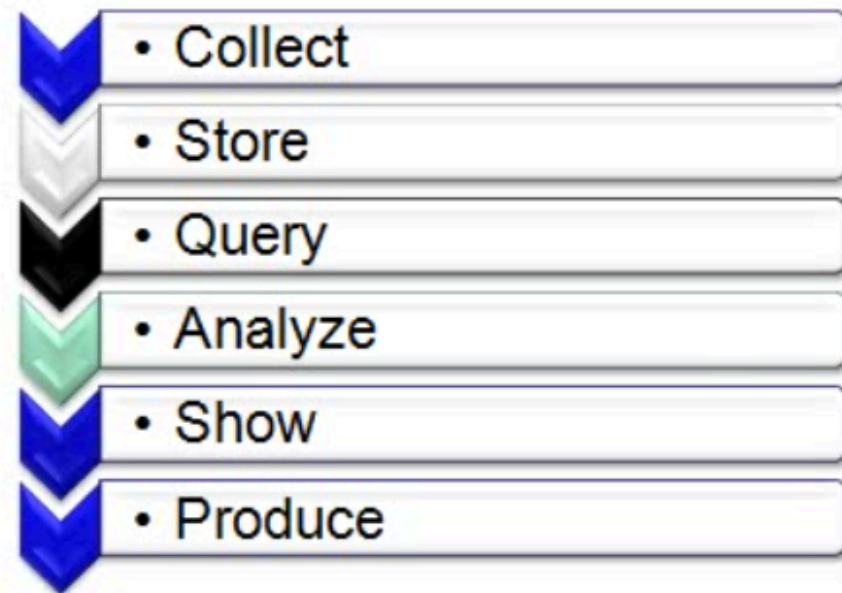
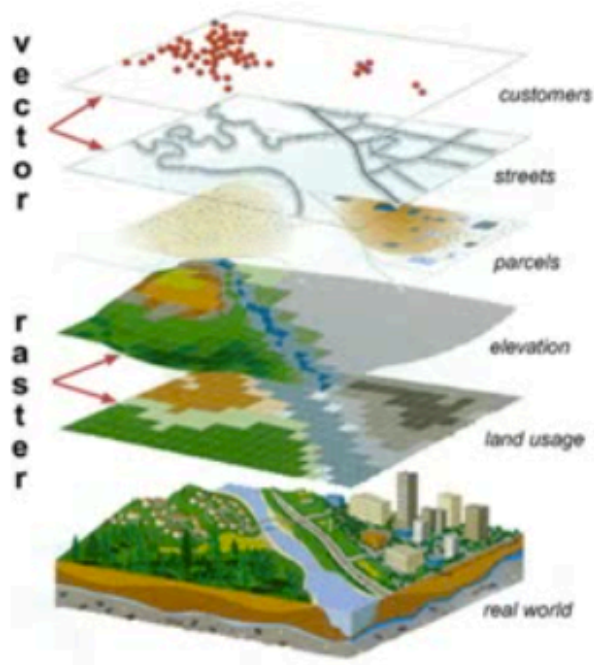
Geographical Information System (GIS) in detection of risk zones to mental health

- What is a GIS?
- What can be done with a GIS
- **How GIS works**
- Examples
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.



Geographical Information System (GIS) in detection of risk zones to mental health

GIS stores geographic information in separate layers



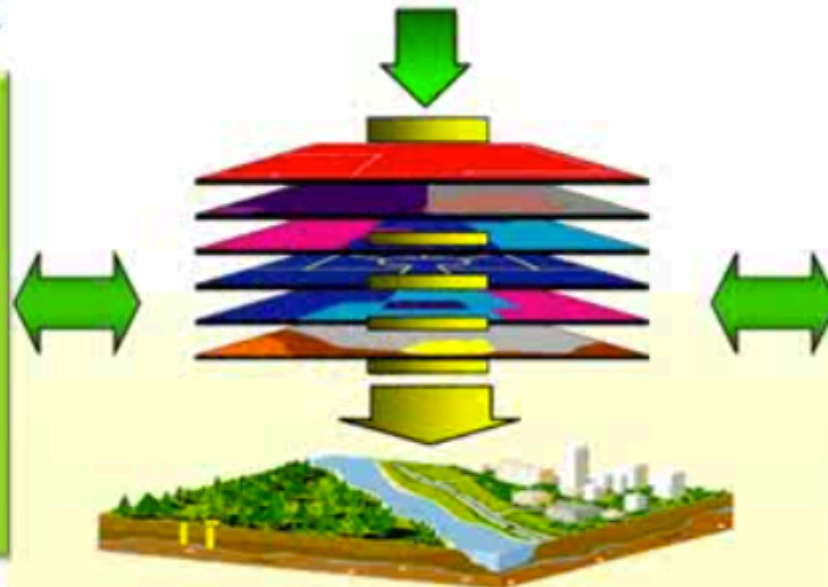
Geographical Information System (GIS) in detection of risk zones to mental health

Integrates geographic information, and not only, in a....

DECISION SUPPORTING SYSTEM that
Represents real world through data structured in layers
Organizes data for fast and effective analysis
Provides tools for planning and management

Resources analysis

- Water
- Roads
- Coast
- Urban ares
- Vegetation
- Cadastre



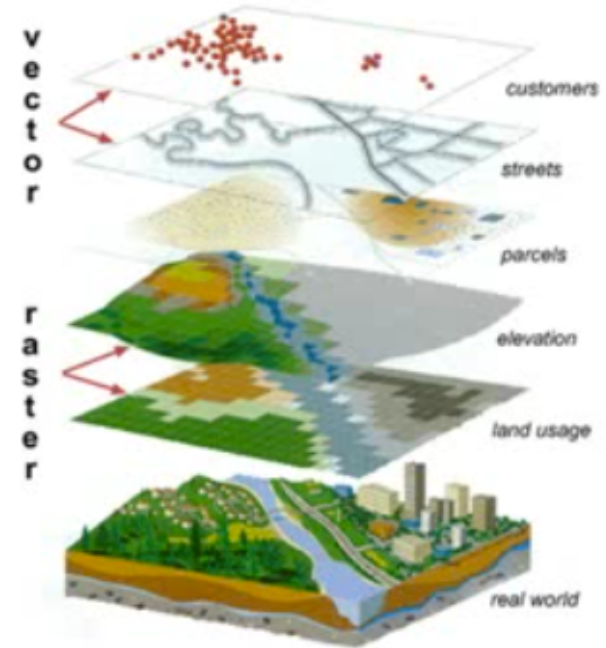
Problem solving

- Fires
- Pollution
- Forestry
- Agriculture
- Tourism

HEALTH

Geographical Information System (GIS) in detection of risk zones to mental health

- What is a GIS?
- What can be done with a GIS
- How GIS works
- **Examples**
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.



Geographical Information System (GIS) in detection of risk zones to mental health



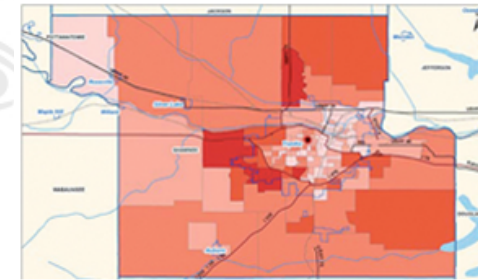
Business

GIS helps retailers, real estate professionals, insurers, and others to visualize, manage, and analyze any business asset.



Defense & Intelligence

GIS plays an important role in assessing terrorist targets, battlefield planning, and military facilities management.



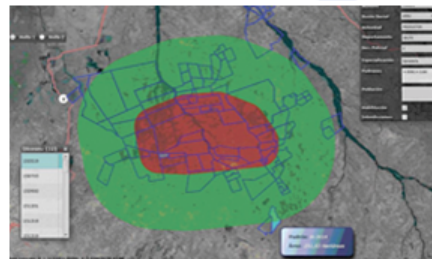
Education

GIS provides educators with tools to help students develop a greater understanding of our world.



Mapping & Charting

GIS allows aeronautical, cartographic, and nautical organizations to implement an effective and efficient workflow.



Natural Resources

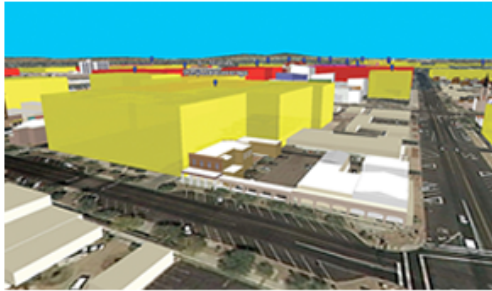
Natural resource professionals rely on GIS to help make critical decisions as they manage the earth's resources.



Public Safety

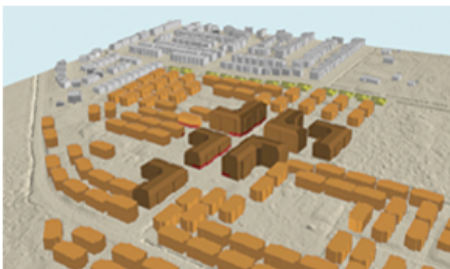
GIS gives public safety personnel the ability to visualize relationships and reveal trends critical to response and planning.

Geographical Information System (GIS) in detection of risk zones to mental health



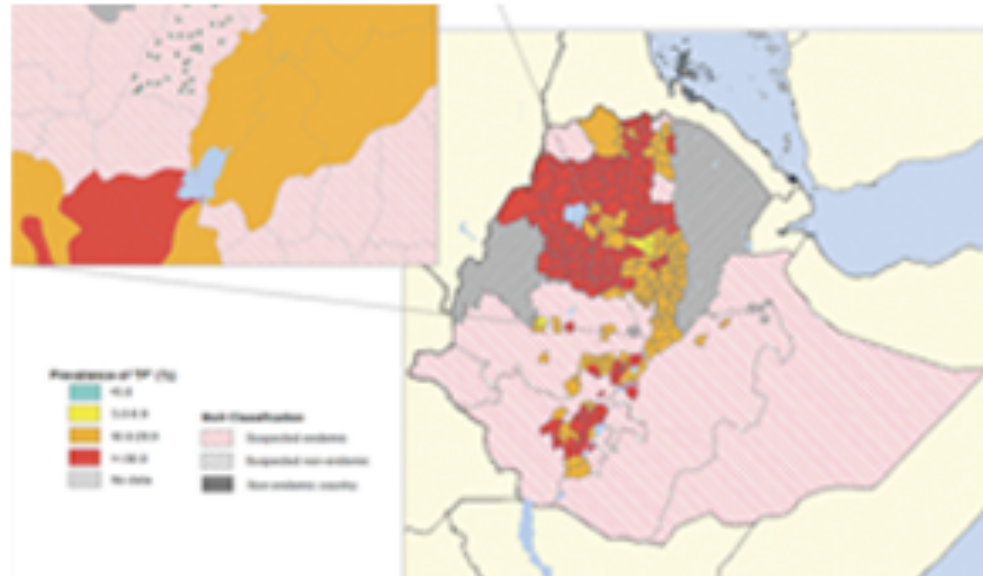
Transportation

Transportation professionals use GIS to help in managing, planning, evaluating, and maintaining transportation systems.



Government

GIS helps governments increase efficiency, reduce costs, improve coordination, and deliver transparency and accountability.

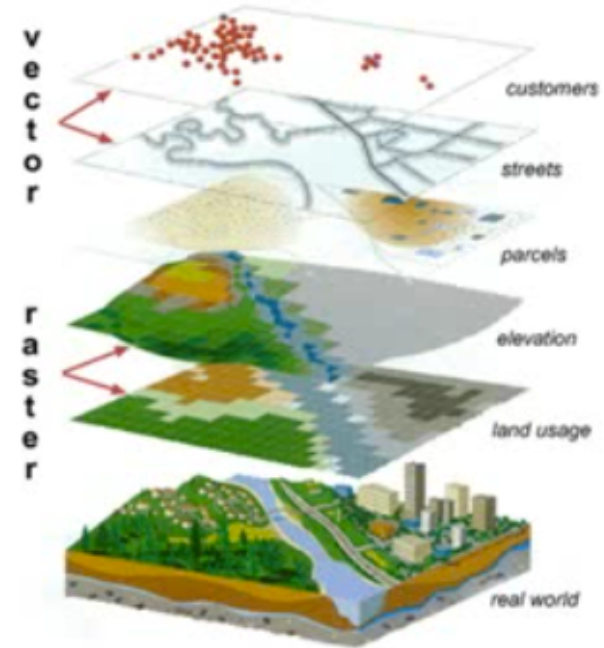


Health & Human Services

GIS helps health organizations leverage limited resources and positively impact individuals, families, and society.

Geographical Information System (GIS) in detection of risk zones to mental health

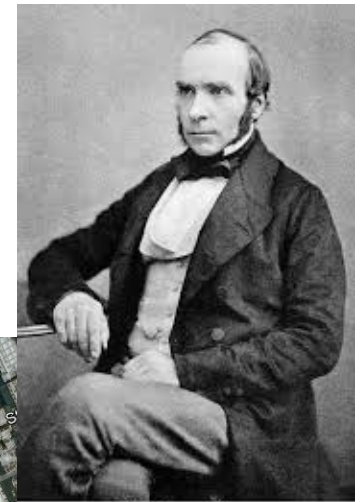
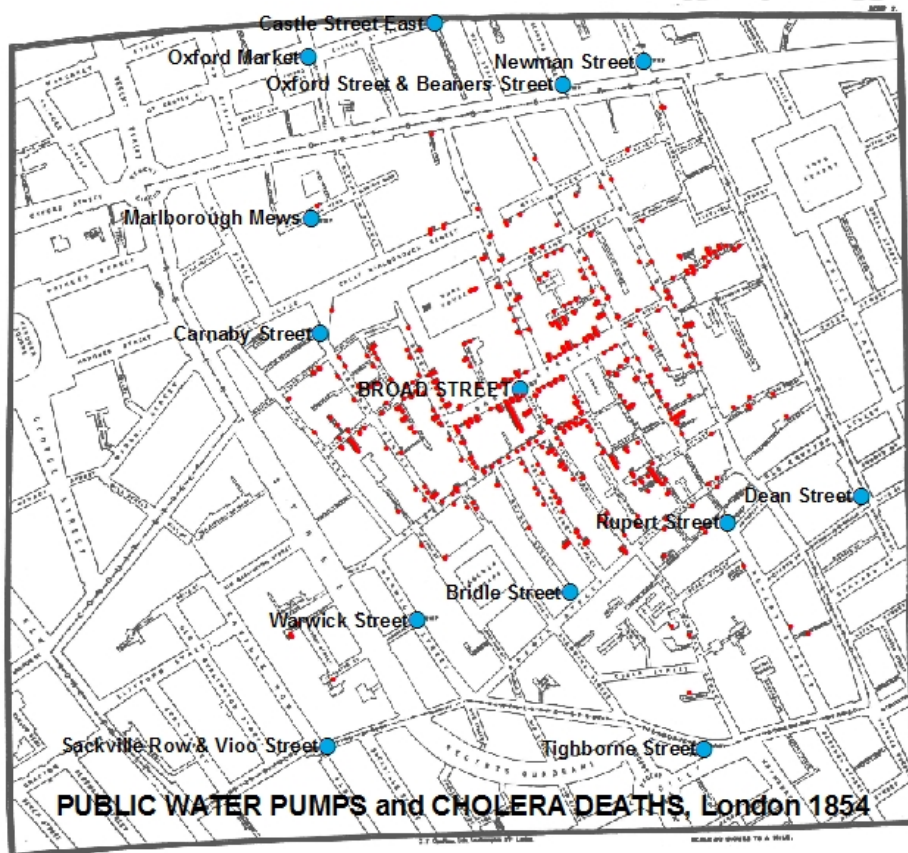
- What is a GIS?
- What can be done with a GIS
- How GIS works
- Examples
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.



1.- Introducción

The first **geographical analysis** of disease data – plotting points on a map and looking for relationships:

Snow's map (1854), demonstrating the spatial clustering of cholera deaths around the Broad Street well, provided strong evidence in support of his theory that cholera was a water-borne disease



John Snow



Geographical Information System (GIS) in detection of risk zones to mental health



Transform community health.

Modernize your approach to health and human services and transform the health of your community. With Esri maps and spatial analysis, you can prioritize spending, site service locations, and identify vulnerable populations. The result? Better outcomes for patients, stakeholders, and the public. Map your way to better health with Esri.

"Through understanding our data, we can better appropriate scarce resources to manage and care for unique populations."

*Jefferson McMillan, Medical Informatics Researcher
at Children's National Health Systems*

Geographical Information System (GIS) in detection of risk zones to mental health

Review article

Emerging applications of Geographic Information Systems (GIS) in community and local mental health research

James S. Brown*

INTRODUCTION

Medical geography or the use of geography to study disease traces back to ancient times¹. After the late 17th-century, medical geography became more formalized with developments in cartography and the introduction of maps of disease distribution.² By the 20th-century, medical geographers developed sophisticated statistical methods of geographical epidemiology to create maps allowing the spatial analysis of health-related issues.³ For example, in mental health research, spatial analysis of geographic patterns of mental disorders led to the correlation of urban environments with increased risk for severe mental disorders.⁴ During recent years, technological innovation in computer mapping referred to as geographic information systems (GIS) significantly enhanced the analysis of health questions in small local areas such as census blocks and neighborhoods. GIS analyses have shown superiority to classical geographic techniques in these small areas that eluded accurate investigation in the past.

doi: 10.5455/aim.2014.22.402-405

ACTA INFORM MED. 2014 DEC 22(6): 402-405

Received: 15 September 2014 • Accepted: 30 November 2014

© AVICENA 2014

Published online: 19/12/2014

Published print: 12/2014

REVIEW

Health Based Geographic Information Systems (GIS) and their Applications

Evangelos C. Fradelos¹, Ioanna V. Papathanasiou², Dimitra Mitsi³, Konstantinos Tsaras², Christos F. Kleisaris⁴, Lambrini Kourkouta⁵

State Mental Hospital of Attica "Daphne", Greece¹

Nursing Department, Technological Educational Institute of Thessaly, Greece²

General Hospital of Athens "Elpis", Greece³

Nursing Department, Technological Educational Institute of Crete, Greece⁴

Nursing Department, Alexander Technological Educational Institute of Thessaloniki, Greece⁵

Corresponding author: Ioanna V. Papathanasiou, RN, MSc, PhD, Assistant Professor, Nursing Department, Technological Educational Institute of Thessaly, Greece. Phone: +302410684444. E-mail: iopapathanasiou@yahoo.gr, papathan@teilar.gr

ABSTRACT

Medical researches as well as the study of the Earth's surface, better still, geography are interlinked with each other; their relationship dates from antiquity. The science of Geographic Information Systems and, by extension, Geomatics engineering belongs to a discipline which is constantly developing at a global level. This sector has many applications regarding medical / epidemiological research and generally, the social sciences. Furthermore, this discipline may act as a decision making tool in the healthcare sector and it might contribute to the formulation of policies into the healthcare sector. The use of GIS so as to solve public health issues has an exponential increase and has been vital to the understanding and treatment of health problems in different geographic areas. In recent years, the use of various information technology services and software has lead health professionals to work more effectively.

Key words: Geographic Information Systems, applications, medical research, public health.

Geographical Information System (GIS) in detection of risk zones to mental health

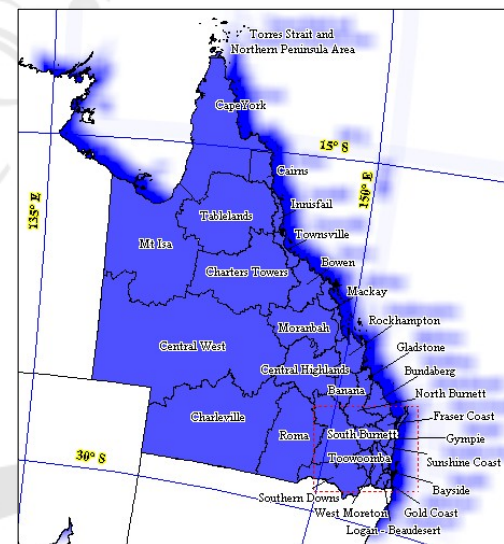
Using Geographic Information Systems (GIS) to Understand Mental Health Needs, Utilization and Access within a Social Context in California and in Three Selected Counties

A Project of the Center for Reducing Health Disparities
UC Davis School of Medicine

Sponsored by the
Mental Health Services Oversight and Accountability Commission
(MHSOAC)

Prepared by
Marlene M. von Friederichs-Fitzwater, PhD., MPH
Assistant Professor of Hematology & Oncology
UC Davis School of Medicine
Director, Outreach Research & Education Program
UC Davis Cancer Center

Report on GIS and public health spatial applications



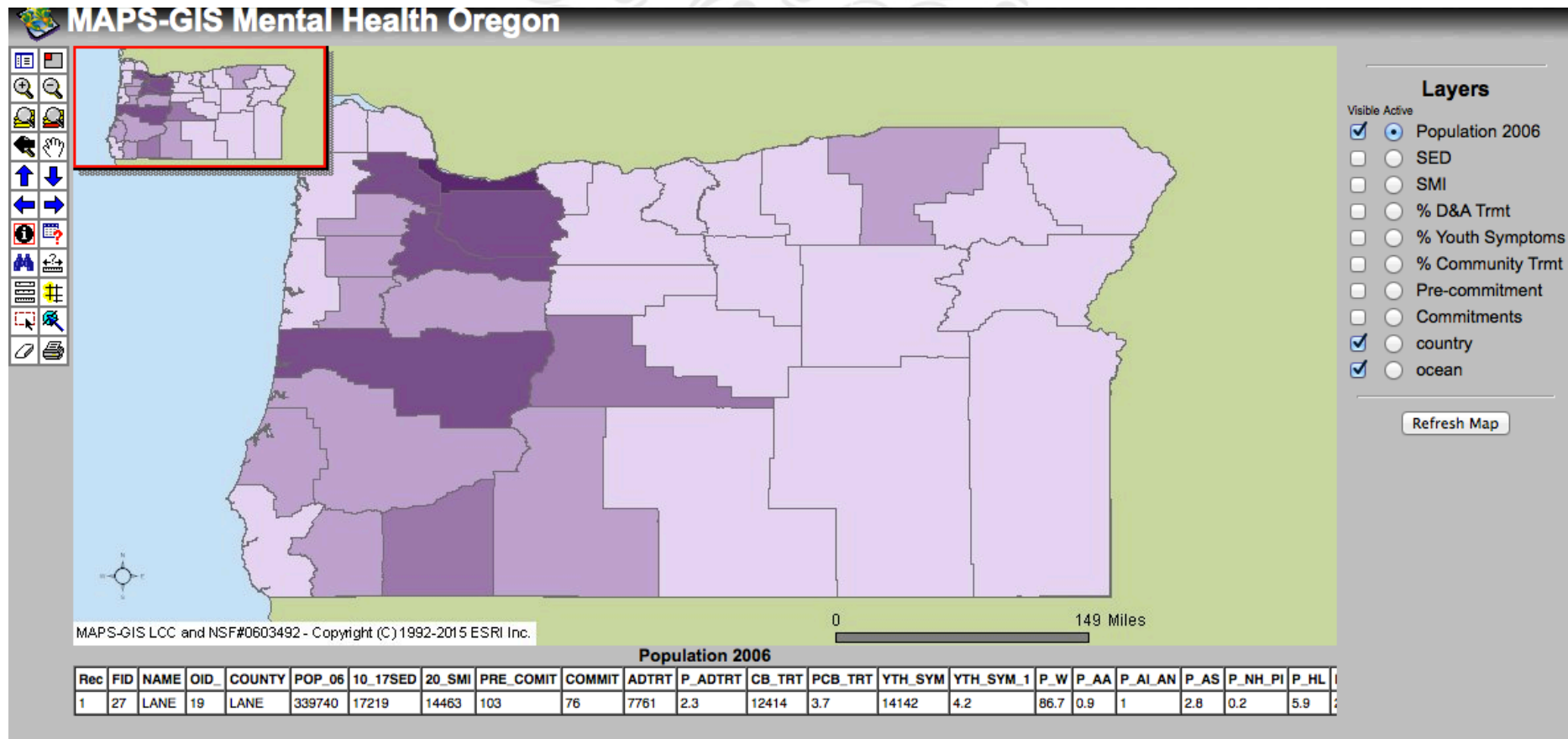
"Disease ecology is inherently integrative and spatial, and GIS provides the environment in which the biophysical, social, behavioural, and cultural worlds can be combined for a systemic understanding of health and disease."¹

Public Health Services Branch
Queensland Health



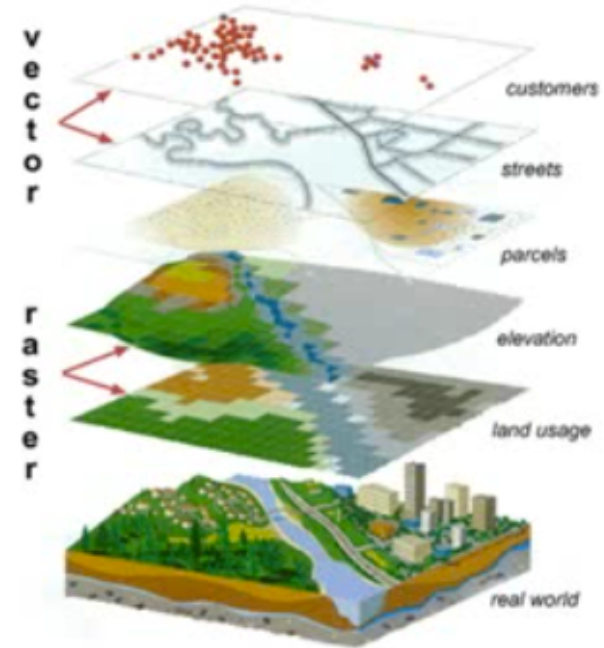
Queensland Government
Queensland Health

Geographical Information System (GIS) in detection of risk zones to mental health



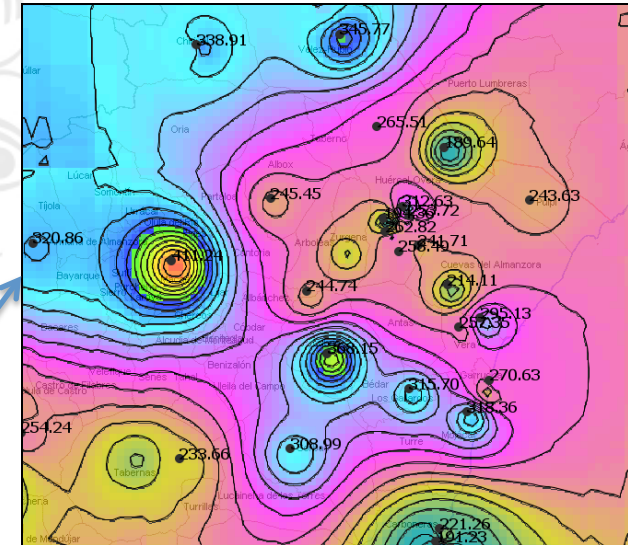
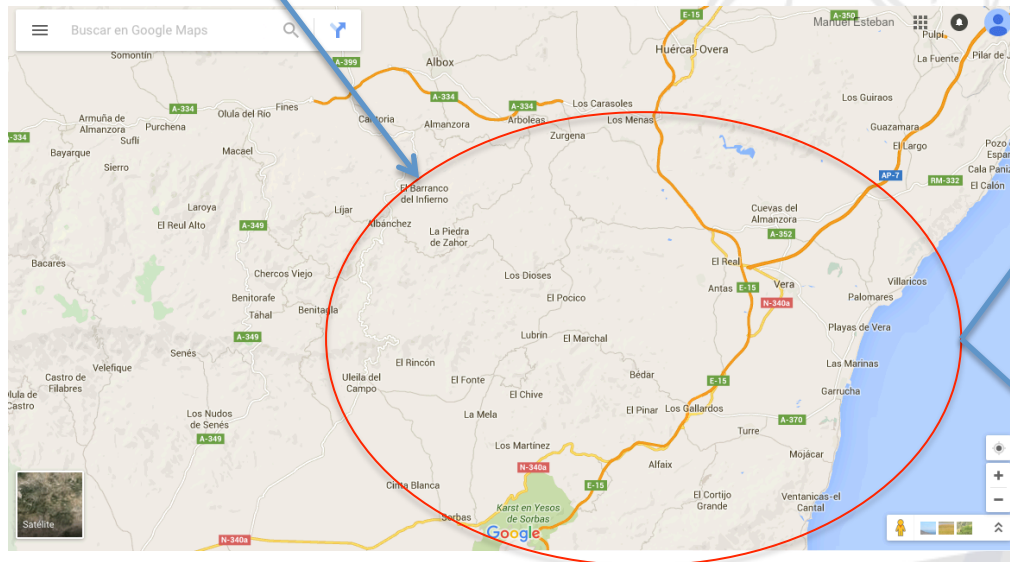
Geographical Information System (GIS) in detection of risk zones to mental health

- What is a GIS?
- What can be done with a GIS
- How GIS works
- Showcase
- Health & Human Services
 - Some examples
 - Flooding and mental risk: A case-control study.

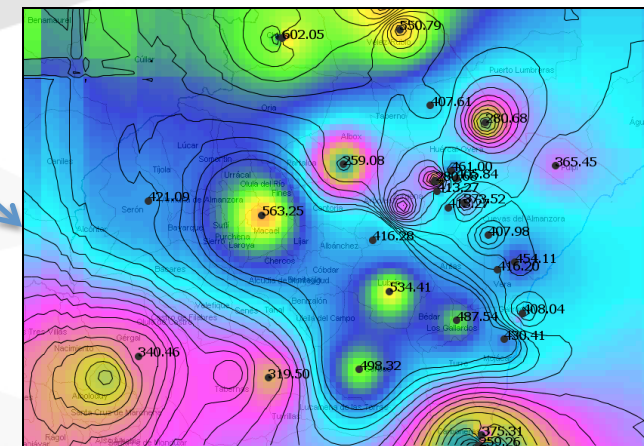


Geographical Information System (GIS) in detection of risk zones to mental health

Flooding and mental risk: A case-control study.



Mean annual precipitation (1950-2012)



2012 (flooding)

Work done using GIS:

- 1º Detecting a natural disaster (flooding) location
- 2º Analysing an affected and a control population

¿Relation between flooding and mental health population?

Geographical Information System (GIS) in detection of risk zones to mental health

"To date, most mental health research has focused largely on biomedical pathways. Increasingly, however, researchers are considering how **people's environments**—the physical and cultural contexts in which they live—influence the prevalence and consequence of mental health disorders"

Doug Richardson
(Executive Director, Association of American Geographers)

Geographical Information System (GIS) in detection of risk zones to mental health

- Many thanks to the people involved in this work:

Profesionales Área Gestión Sanitaria Norte Almería :

Andrés Fontalba Navas. Psiquiatra

Juan Francisco García Masegosa. Médico Atención Primaria

Macarena Marín Olalla. Psiquiatra

Pilar Lucas Borja. Psiquiatra.

Javier Pastor Hurtado. Farmacia

Francisco Aguilera Manrique. Unidad Calidad y Formación

Virginia Gil Aguilar. Médico Atención Primaria

Marta Ruiz Serrano. Médico Atención Primaria

Iván Plaza Nieto. Médico Atención Primaria

Ana María Iranzo Luna. Médico Atención Primaria

Universidad de Málaga

Departamento Psiquiatría y Fisioterapia

Prof. José Miguel Pena Andreu



Servicio Andaluz de Salud
CONSEJERÍA DE IGUALDAD, SALUD Y POLÍTICAS SOCIALES



UNIVERSIDAD
DE MÁLAGA

Thanks for your attention!