

49th Session of the United Nations Statistical Commission

# Integrating statistical & geospatial information in Mexico: Public health applications and the way forward

## *Statistical-Geospatial Integration Forum*

“Integrating statistical, geospatial, and other Big Data to leave no one behind”  
Panel 1: Addressing inequalities and safeguarding public health

**Julio A. Santaella**  
President of INEGI  
*March 5, 2018*

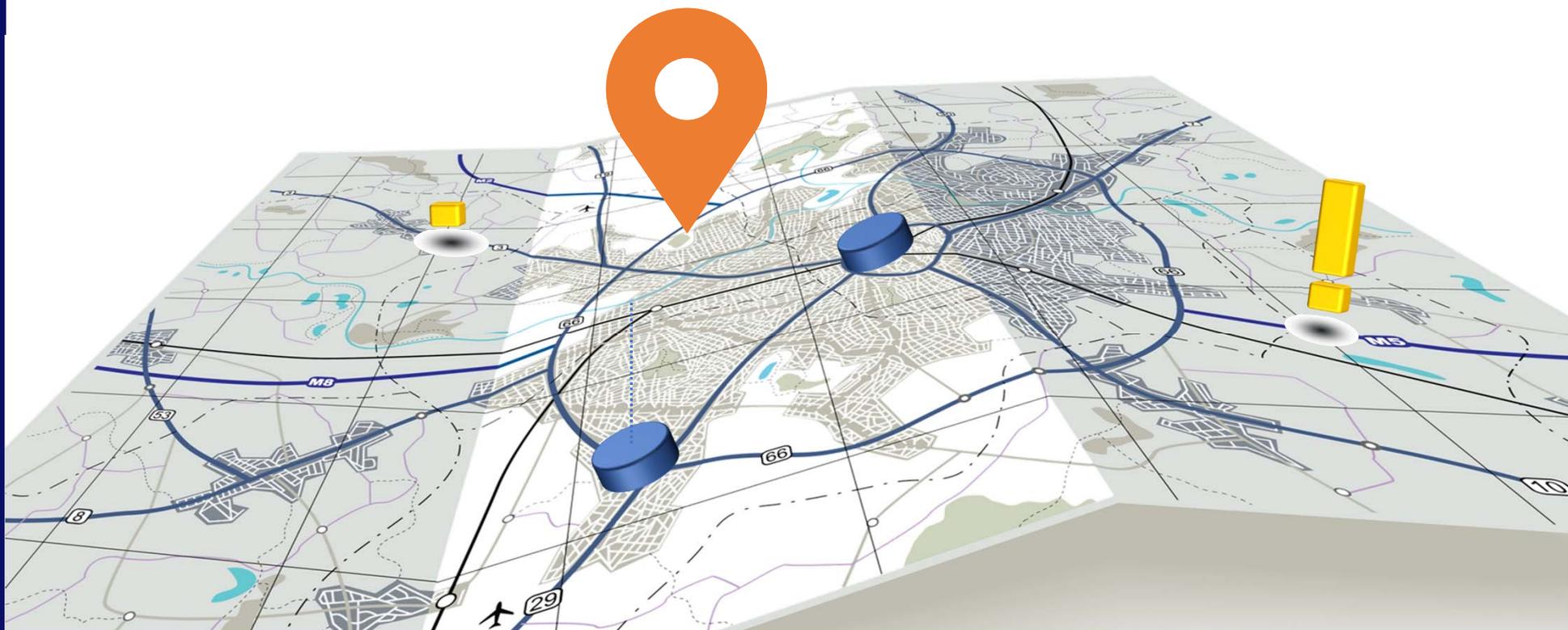


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**In the new data ecosystem, integrating geospatial and statistical information is no longer a *nice-to-have* but a *must-have***

# How is this integration done in Mexico?

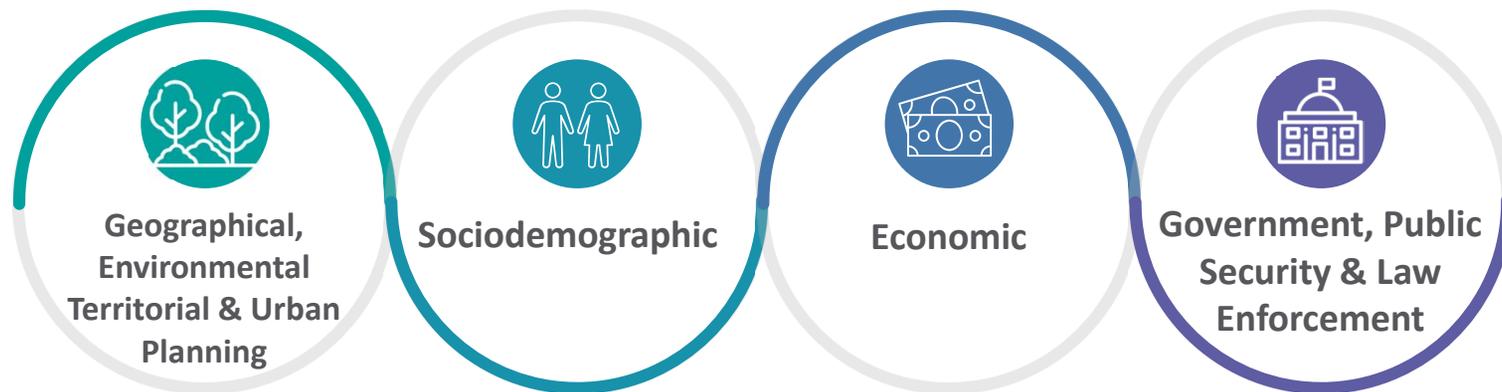




**This integration occurs naturally in Mexico since 1983 because INEGI is responsible for the generation of both statistical and geographical information**

## SNIEG: Mexico's institutional framework to produce statistical & geographical information

Coordinated by INEGI, Public Entities that produce statistical and geographical information are organized in **4 Subsystems of Information** that interact with each other



A glass globe with a stethoscope and a syringe on a blue background. The globe is the central focus, with a stethoscope wrapped around it and a syringe visible in the lower right. The background is a light blue gradient.

# Integration examples from public health

## Hospitals per capita

- **Integrating statistical and geospatial information in a GIS** allows for a detailed analysis of the supply of hospitals services in specific areas (municipality of Ecatepec)



 Hospital

- **There are 47 hospitals (26 private & 21 public) in Ecatepec**
- **Ecatepec has a population of 1,677,678**
- **There is a hospital for every 35,695 persons**
- **47% of these hospitals have 10 employees or less**

## 2014 Sonora river toxic spill

- On August 6, 2014, 40,000 cubic meters of toxic chemicals were poured into the Sonora river, thus becoming the worst disaster of this type in Mexico

**How does the integration of statistical and geospatial information serve to address this kind of disasters?**



**It is necessary to be able to locate in a GIS both, the body of water and the settlements that could be affected**



## 2014 Sonora river toxic spill

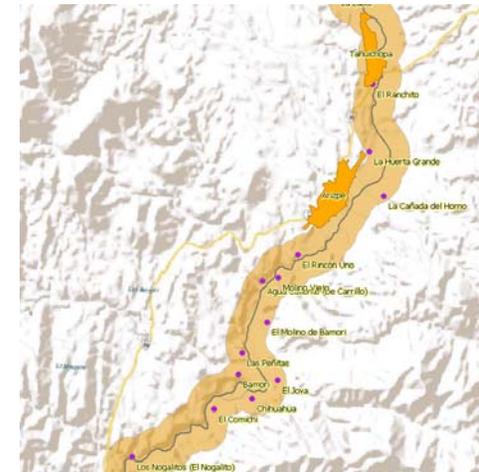
- We define a buffer of 500 meters on both banks of the river and then locate the settlements within the buffer

### 500 meter buffer

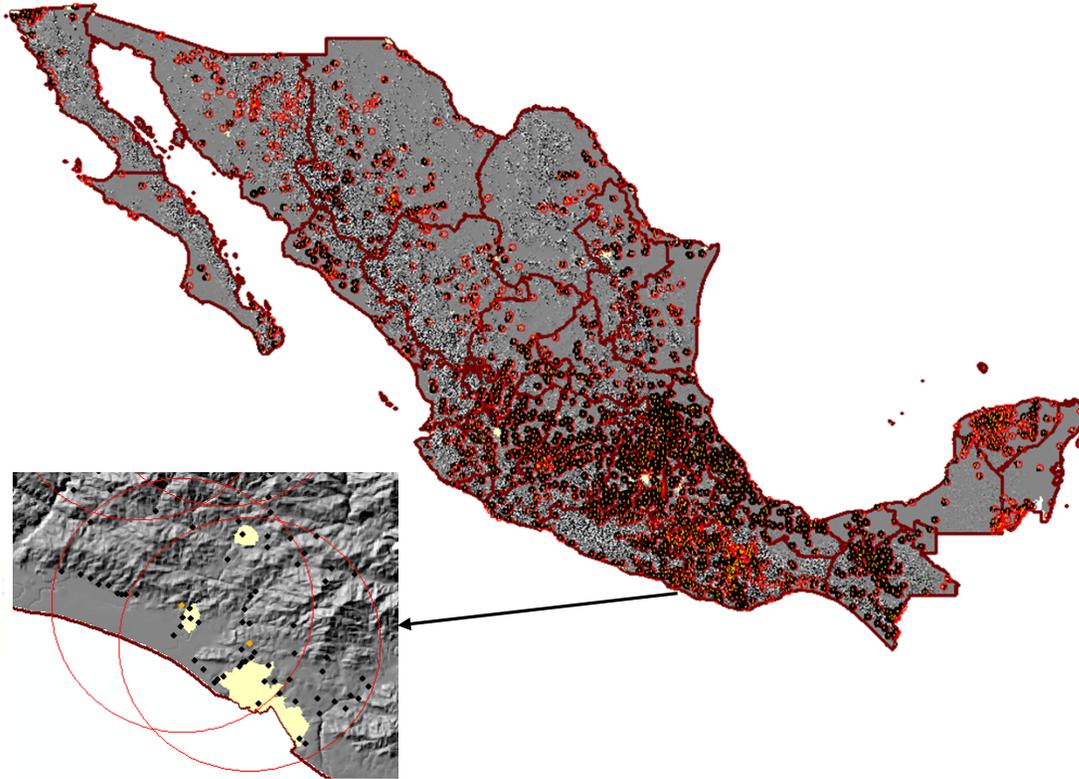


- **60 rural settlements** are identified that could potentially be affected by this incident
- **Equivalent to 12,682 inhabitants**

### Settlements within the buffer

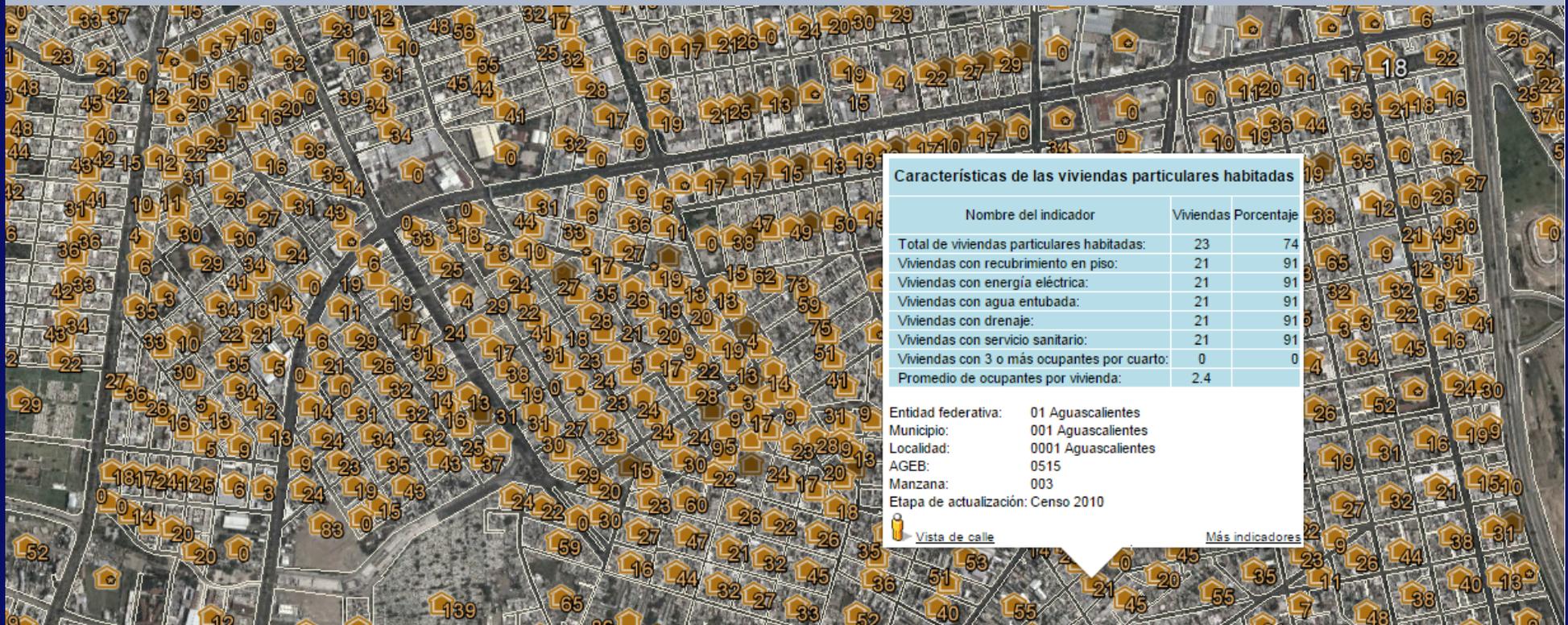


## Settlements within a 10-kilometer radius of an urban solid waste final disposal site (USWFDS)



In Mexico, there are 77,266 settlements within a 10km radius of a USWFDS which corresponds to a population of 57,794,698 inhabitants

# SDG Indicator 1.4.1 - Proportion of the population living in households with access to basic services

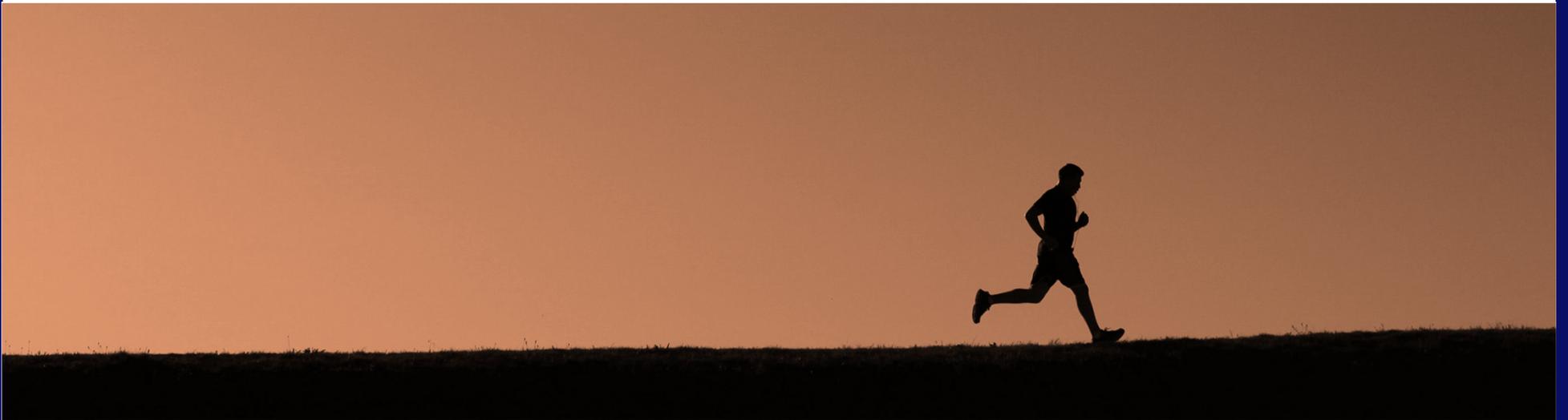


Input - National Housing Inventory

**Major steps have been taken to exploit the integration of geospatial and statistical information**

...

**... but there is still a long way to go**



**2030**



**2028**

**2024**

**2020**

**2018**

**We must establish a clear roadmap in order to achieve our goals**

# Big

Data

# Big

Opportunity

Big Data

a tool yet to be fully exploited

# Big

Challenge



# Potential use example:



## Twitter as a source for mental health assessment

- Objective: to **exploit the expressions stated in tweets** to make inferences regarding the **mental health condition** of the users
- A **machine learning process** will be used.
- A training set will be constructed **with tweets written by:**
  - **Patients diagnosed** with some psychological condition, and
  - **People who do not have this type of conditions**
- We seek to find the **written expression patterns of those who have some psychological condition** and, if possible, the type of condition



# The world needs definitions

**Who do Geospatial Big Data belong?**

**Information vs privacy dilemma**



**NSOs & NGIs**

## **Partnerships with third parties**

**Technology developers, telecom companies, think tanks, Information generators or holders, etc.**



## Final remarks

- **The integration of statistical & geospatial information is crucial** in order to understand of complex phenomena
- **The use of integrated information helps address phenomena in different fields, such as public health**
- Nevertheless, **involvement of third parties is critical** to speed up the process and boosts NSOs and NGIs efforts
- **Advantage of each party expertise and resources** must be taken so **partnerships are of the utmost importance**



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