

# "Motivation and overall concept of the Geostat project"

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The European Forum for the Integration of Geography  
and Statistics (EFGS)

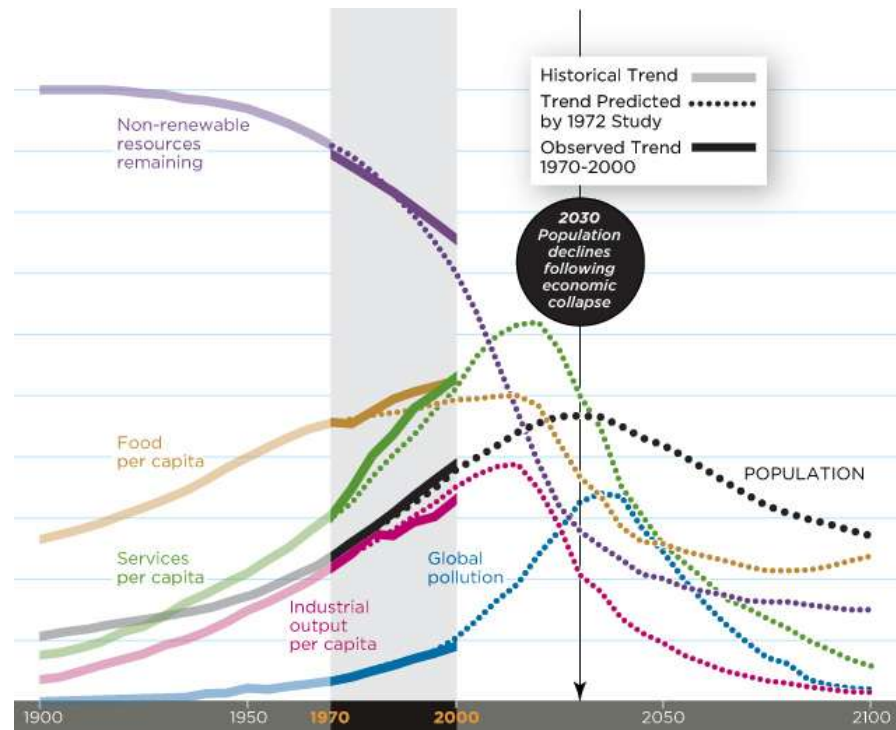
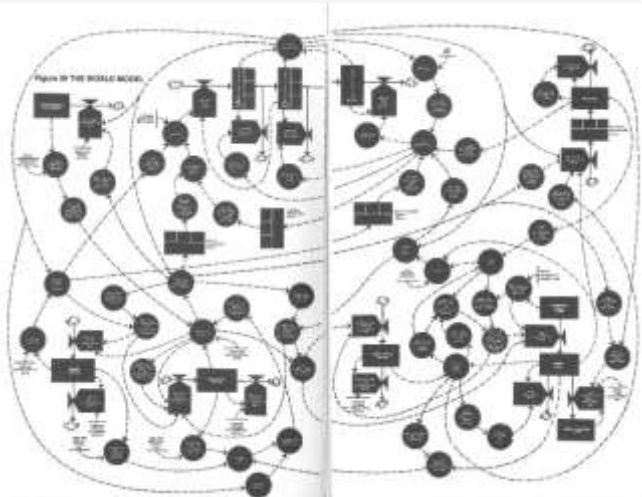
# Spaceship Earth

(A man- environmental system)

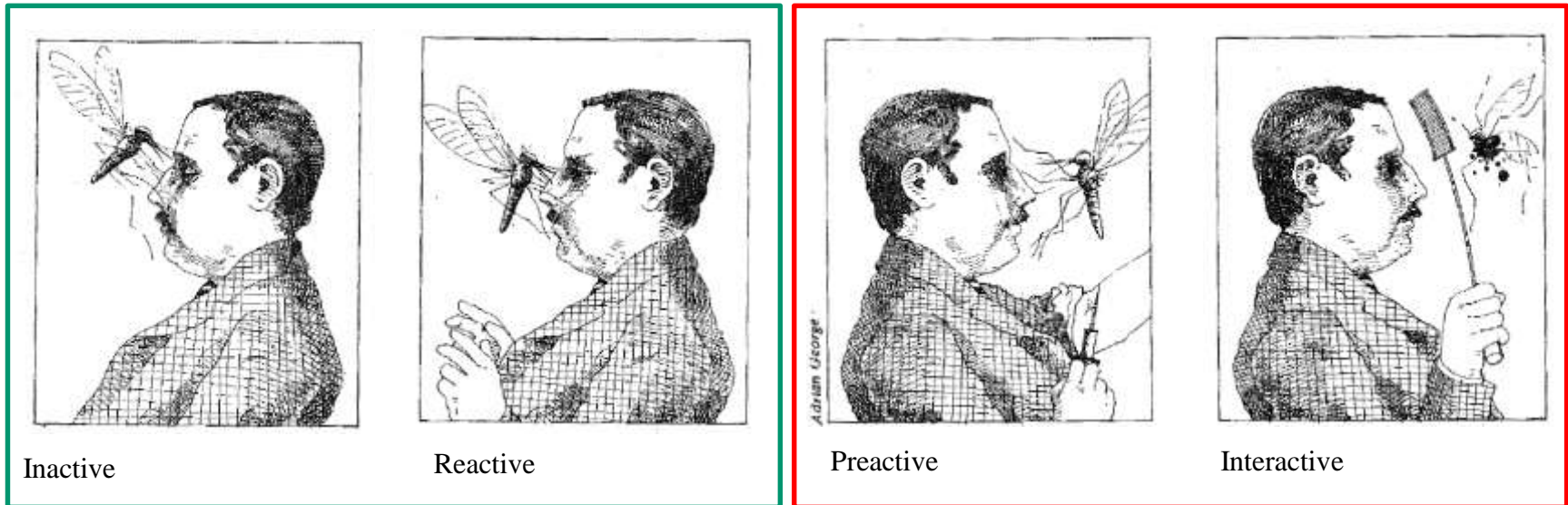


 Earth From Space – Apollo 17  
NASA Langley Research Center      12/7/1972      Image # EL-1996-00155

# Our world on the edge



## Government actions, direct and indirect



Inactive

Reactive

Preactive

Interactive

### Ex-post Strategies

(Conservative “Business as usual” attitude)  
Statistics for accounting and benchmarking

### Ex-ante Strategies

(Progressive “Lets face it” attitude)  
Statistics for spatial and temporal analysis

Russell Ackoff’s Strategies of management:

# “If you cannot describe it, you cannot manage it”

(The contributions of the Geostat project(s))

1. A joint EFGS / EUROSTAT ESS Euro- grid proposal
  - *to develop the spatial dimension of the European statistical system to harmonise the ESS and better serve administrative-, scientific-, and practical- projects.*
  - A harmonised point- based foundation for all NSI statistics to serve both official and scientific needs. (this should serve the description of all types of discrete phenomena) suited for use with a standard system of methods for spatial analysis to delineate discrete observations into continuous (cross border-) phenomena on land and/or sea.
2. A joint EFGS / EUROSTAT UN GGIM proposal
  - *to serve the development of the Inspire annexes, the GISCO dataset and other similar datasets into an integrated set of tools to serve government action on all levels of public authority from local to global.*
  - A standard GGIM layer- based object description could serve all projects according to an integrated ecological approach hierarchically structured in Scope, scale and time.



# A strategy for sustainable development (Two obstacles)

Complexity: A GGIM must provide a description of the world as a hierarchical system of systems, supra-systems and subsystems where each system is considered in terms of a “kit of parts” and an “interacting whole”.

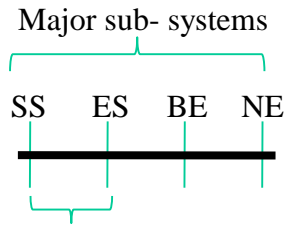
Control: The ecological method requires that the evaluation of any action targeted at one part of a major sub-system, natural or man-made, should consider its impact on both this part and that of the man environmental system as a whole.



# 1. Complexity Systems Theory

*The world is complex beyond human understanding.*  
Systems theory is a strategy to reduce this complexity  
down to a scale and complexity that can be described  
understood by human beings.

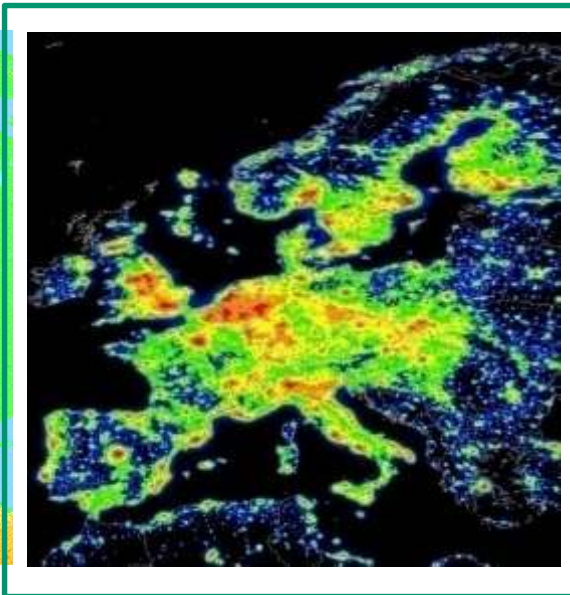
# Reduction of complexity 1: Scope



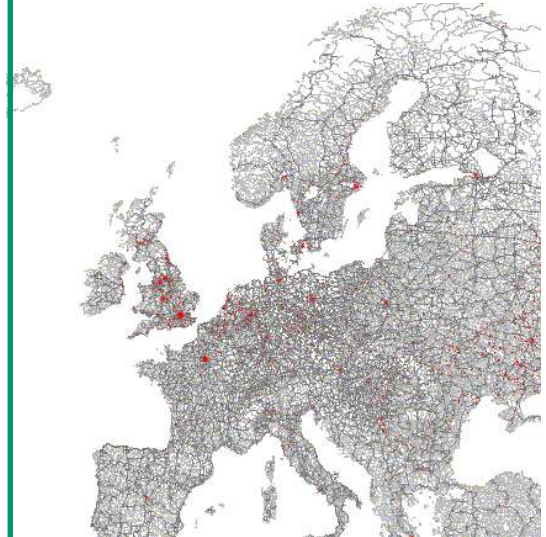
Society (S) Environment(E)



**Natural Environment (NE)**  
(Structures & Processes)



**Socioeconomic Systems (SS & ES)**  
(Structures & Processes)



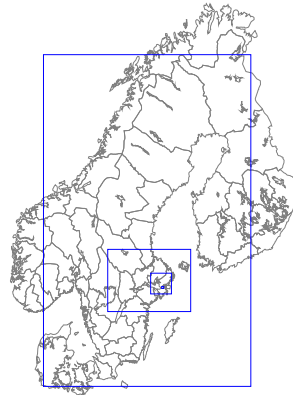
**Artificial Environment (BE)**  
(Structures & Processes)



## Reduction of complexity 2: Scale

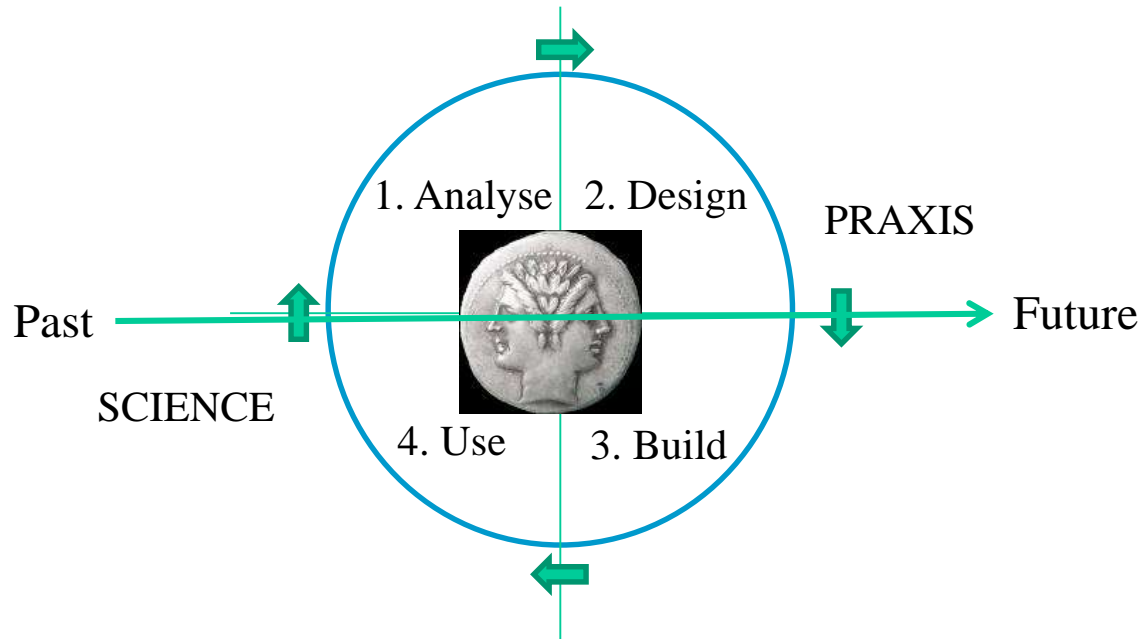
Six levels of public authority from local to global:

1. 10000 km window/100km grids (Global scale)
2. 1000 km window/10km grids (Scale for international (macro) regions)
3. 100 km window/1km grids (Scale for national regions)
4. 10 km window/100m grids (Scale for communes and urban districts)
5. 1 km window/10m grids (Scale for urban neighbourhoods)
6. 100 m window/1m grids (Scale for urban blocks)



# Reduction of complexity 3: Time

(Complex systems, natural or artificial evolve)



Past: RESEARCH

The present is the to a great extent the consequence of past actions

Present : ACTION

Short time actions to ensure the satisfaction of current needs

Future: VISIONS

Long term actions to ensure desirable future state of MES



## 2. Control Cybernetics

*“Complex systems are not built, they develop”.*

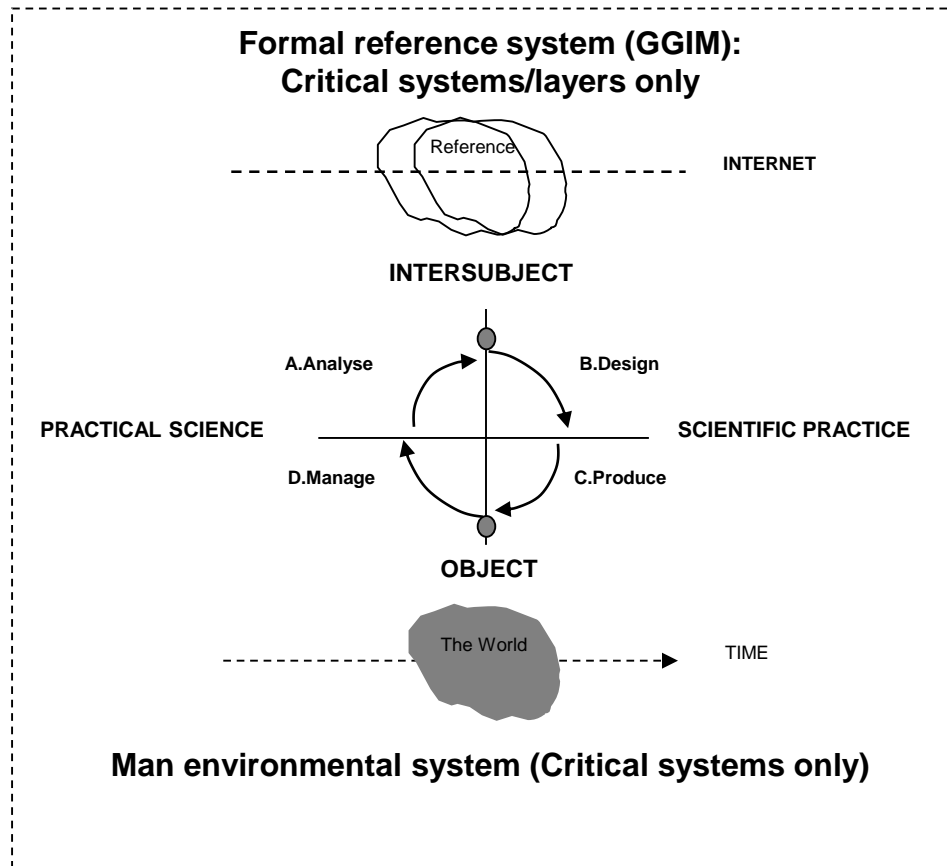
Cybernetics is the science of Goal directed systems. This approach to control of complex systems emerged (again) early in the early 1950ies, but came to practical use with the digital revolution. It exploits the advantages of regarding the idea of system development and its management as one integrated whole.

# The Cybernetic idea



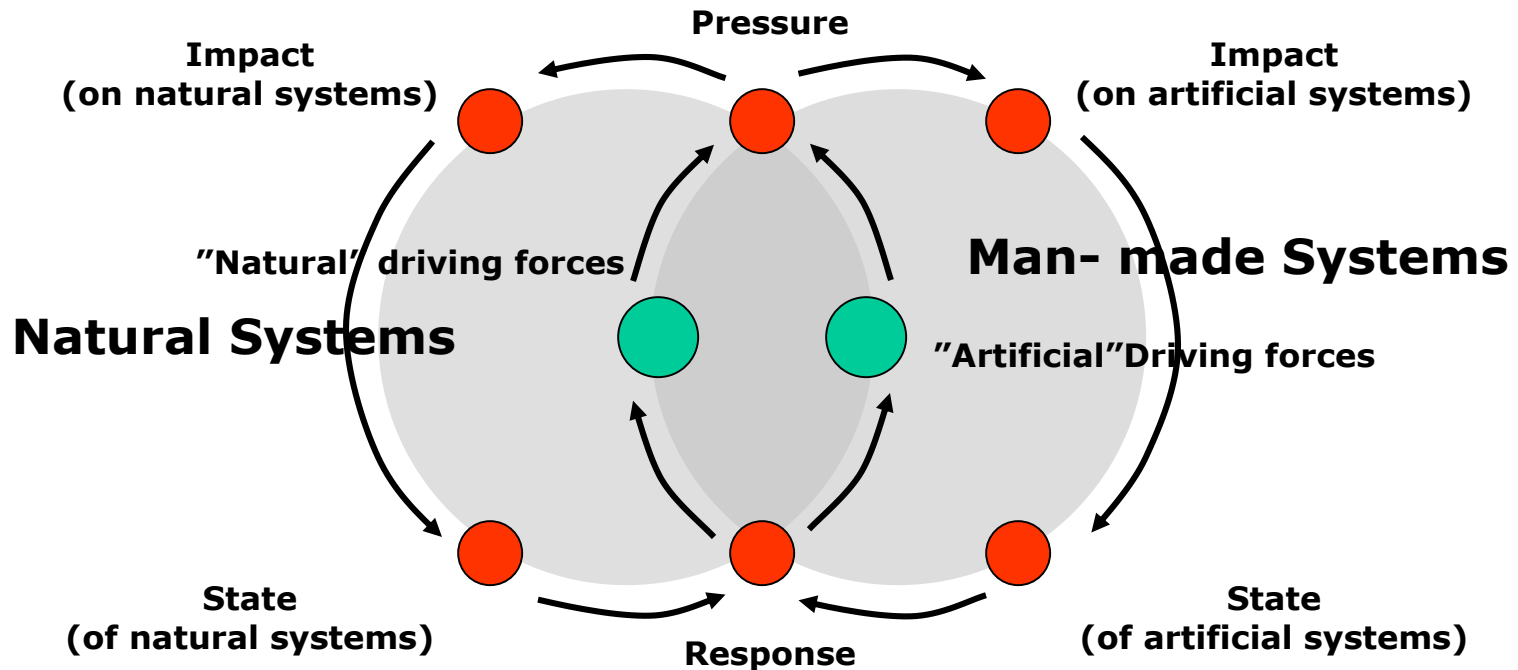
# A Darwin Machine

(For the evolution of man environmental systems )



# Feedback

(Ecological approach to man environmental systems)

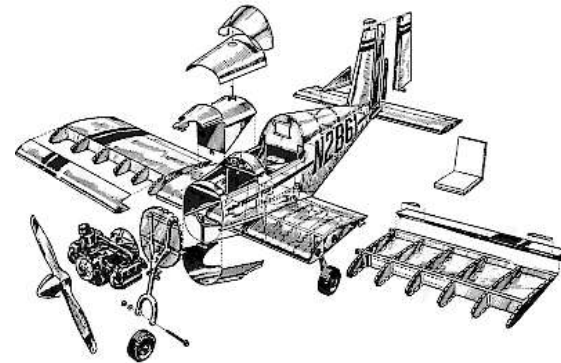
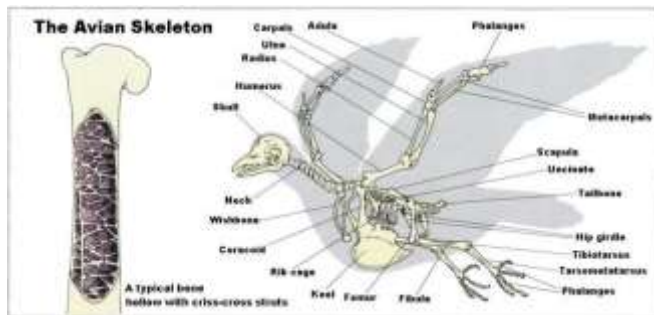


## In search of a concept for the UN GGIM

Concept for a UN GGIM system of qualified information system to serve as a foundation for direct and indirect government action on all levels of public authority from local to global.

# A System of Systems

(Systems as both “kits of parts” and “interaction wholes”).

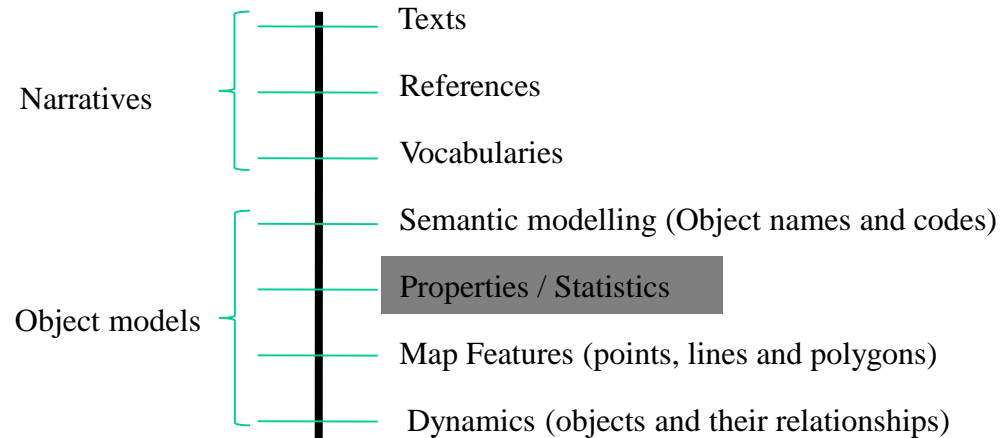




# Spatial and temporal data infrastructure

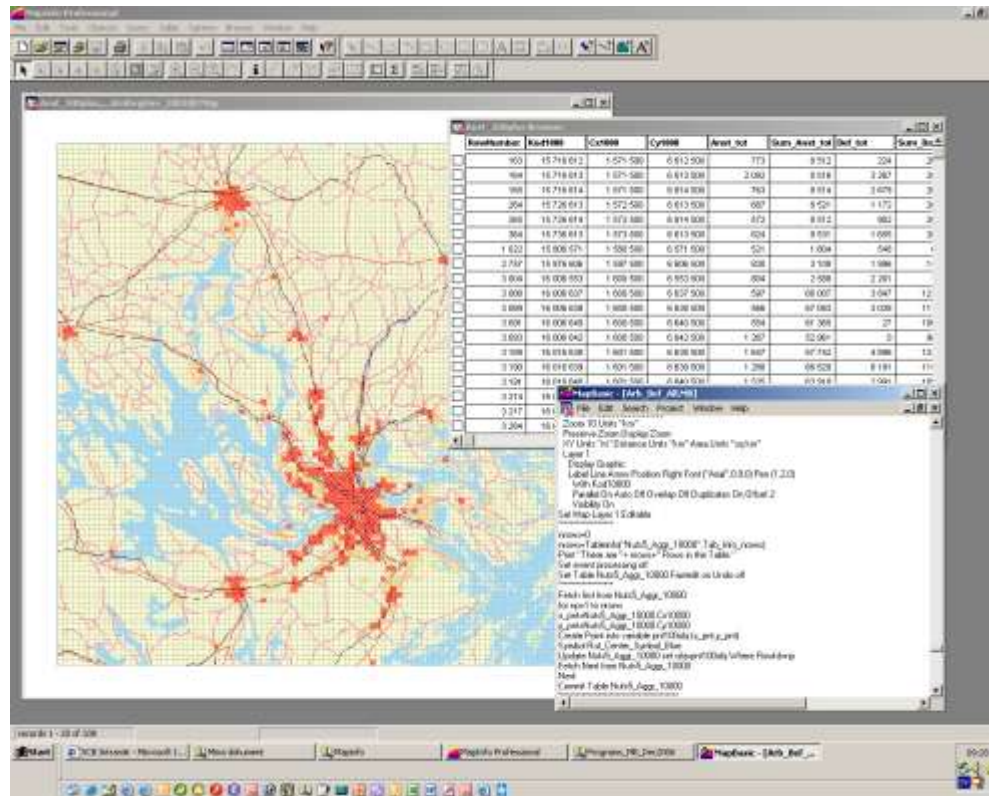
(The object approach)

Object / layer strategy for data Infrastructure



# GIS

## The integration of Geography and statistics

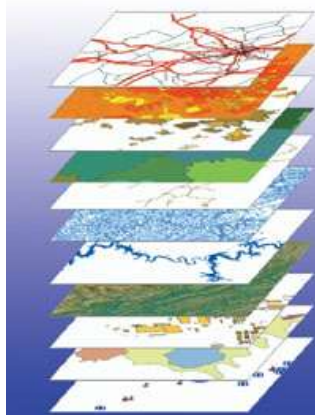


# The ecological approach

## The Inspire Annexes

### An example:

- A project for the develop the Man-made environment.
  1. Will focus on the task at hand that is to improve mainly physical man-made structures.
  2. Will have to consider (seriously) the impact of (and the consequences for) on the broader context ( the natural environment, the economic system, and the socio-cultural system.)



### Focus:

- **BE: Man-made environment**
  - Layer ((maps & statistics) theme 1)
  - Layer ((maps & statistics) theme 2)
  - Layer ((maps & statistics) theme ...n)

### Context:

- **NE: Natural environment**
  - Layer ((maps & statistics) theme 1)
  - Layer ((maps & statistics) theme 2)
  - Layer ((maps & statistics) theme ...n)
- **ES: Economic system**
  - Layer ((maps & statistics) theme 1)
  - Layer ((maps & statistics) theme 2)
  - Layer ((maps & statistics) theme ...n)
- **SS: Sociocultural system**
  - Layer ((maps & statistics) theme 1)
  - Layer ((maps & statistics) theme 2)
  - Layer ((maps & statistics) theme ...n)

# The EFGS UN-GGIM concept

- GGIM a hierarchical strategy to describe a 4D world
  - A truly operative GGIM requires a shared object strategy to serve the integration of Geography and Statistics
- One object structure (integration of geography and statistics)
  - Narratives (Alpha- numeric texts with images)
  - Object models (Names, codes, Attributes, Features, time)
- Scale (over all scale intervals from local to global)
  - GGIM (Global scale)
  - EGIM (Europe (global region))
  - NGIM (National scale)
  - RGIM (Regional scale))
  - CGIM (Commune)
  - LGIM (Local scale)
- Scope (on the whole scope (all sub- systems))
  - Environment (real (physical) systems)
    - NE (Natural environment)
    - AE (Artificial / man- made environment)
  - Society (Artificial systems)
    - SS (Socio- cultural system)
    - ES (Socio- economic system)
- Time (through time to mark the iterative process)
  - Time series at regular intervals (yearly?)
  - Simulations

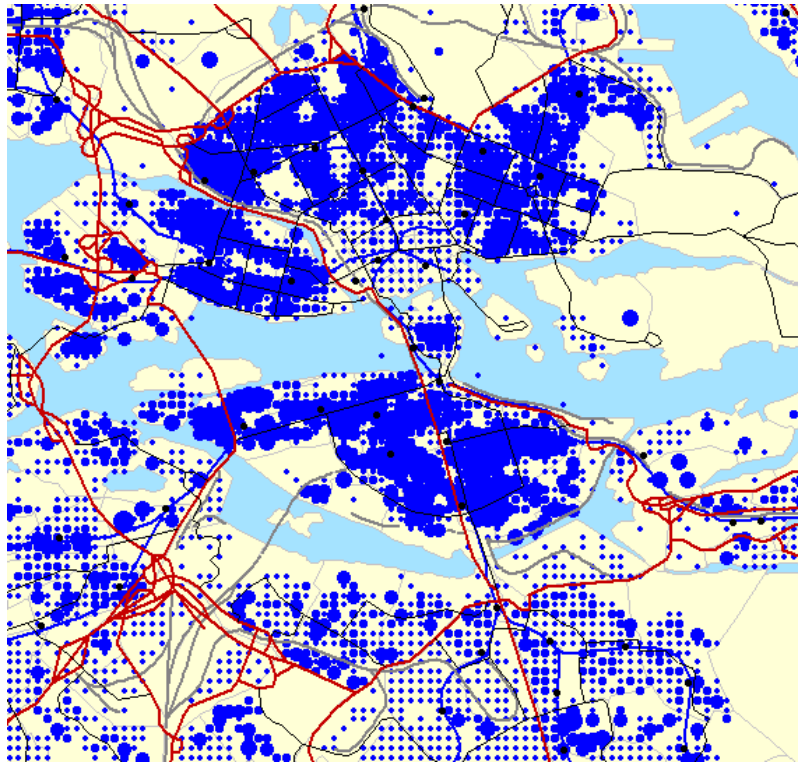
## The Geostat projects

A harmonised point- based European statistical system.

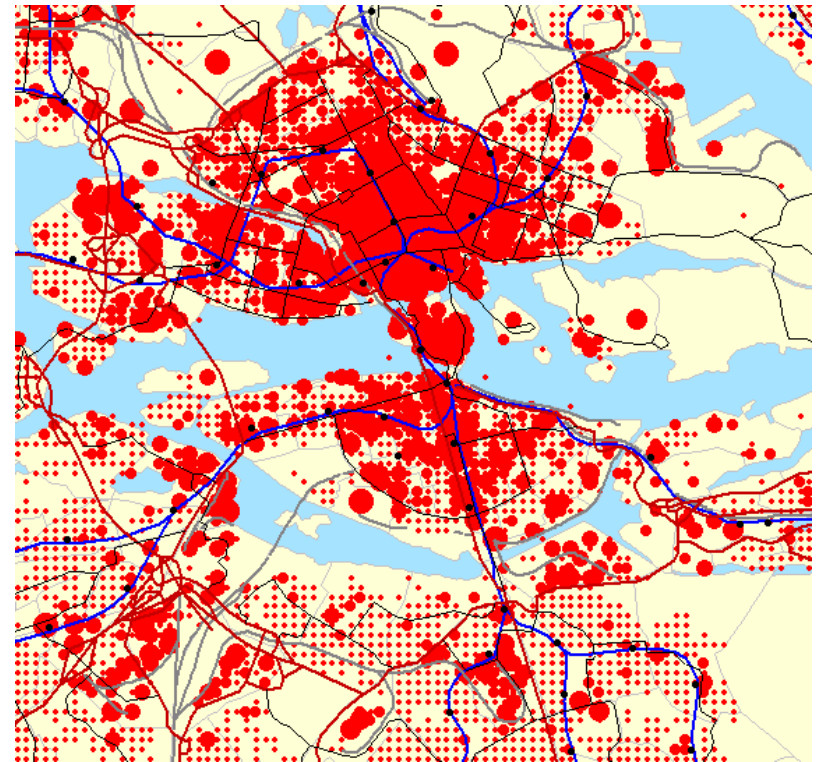
Part of a GGIM integrated system of information based on crossover (inter- disciplinary) information produced with the scientific method.

# A Dataset

(Day time and night time population on grids)



**Night time population (2004)**



**Day time population (2004)**

# A production process to produce it

1. Data Modelling (the design for the product)
  1. Semantic modelling (the identification of critical objects to be modelled)
2. Production of object variables (point- based spatial statistics)
  1. Input
    1. Data Capture
  2. Data processing
    1. Geobase (A spatial Database system for statistics)
    2. Geo-referencing (top- down, bottom- up and hybrid)
    3. Compilation of core datasets (The EU Geostat grid dataset)
    4. Confidentiality and clearance of other sensitive issues
  3. Output
    1. Dissemination (Distribution methods, Business model etc.)
3. Aggregation of integrated datasets(for use on all levels of public authority from local to global)
  - Buildings, addresses or real estate units
    1. Local datasets (It on this level that all concrete action is designed, planned and implemented))
    2. Commune level datasets
    3. Regional datasets
    4. National datasets (National datasets the source for most higher- level bottom- up datasets)
    5. European datasets
    6. Global datasets
4. Use Cases (Narratives from all levels from local to global)
5. Overall quality assessment

## Iterative development

- To be developed over time  
The dataset and the harmonisation processes to be developed over time in a series of well defined iterations. Data capture.
- Geostat projects
  - Iteration 1: Geostat 1A                      2009 & 2010 (closed)
  - Iteration 2: Geostat 1B                      2011 & 2012 (closed)
  - Iteration 3: Geostat 1C                      2013 (in process)
  - Iteration 4: Geostat 2                        2014 & 2015 (contract not yet signed)
  - Iteration 5: Geostat 3                        2016 & 2017 (not discussed)
  - Iteration 6: Geostat 4                        2018 & 2019 (not discussed)
  - The 2020 round of EU Censuses



Thank you for your attention!

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## An afterthought

- “Still, in the dense and dark night which envelops remotest antiquity, there shines an eternal and inextinguishable light. It is a truth that cannot be doubted: The civil world is certainly the creation of humankind. And consequently, the principles of the civil world can and must be discovered within the modifications of the human mind. If we reflect on this, we can only wonder why all the philosophers have so earnestly pursued a knowledge of nature, with God only God can know as its creator, while they neglected to study the world of nations, of the civil world, which people can in fact know because they created it”.

(Gianbattista Vico (1668- 1744): §331 in “The new Science”)

