# ΣΧΕΔΙΑΣΜΟΣ ΧΑΡΤΩΝ Ο.Υ. ΓΙΑ ΤΗ ΧΡΗΣΗ ΤΟΥΣ ΣΤΗ ΔΙΑΔΙΚΑΣΙΑ ΛΗΨΗΣ ΑΠΟΦΑΣΕΩΝ

*Δρ. Ευαγγελία Δράκου*

*Επίκ. Καθηγήτρια, Τμήμα Γεω-πληροφορικής*

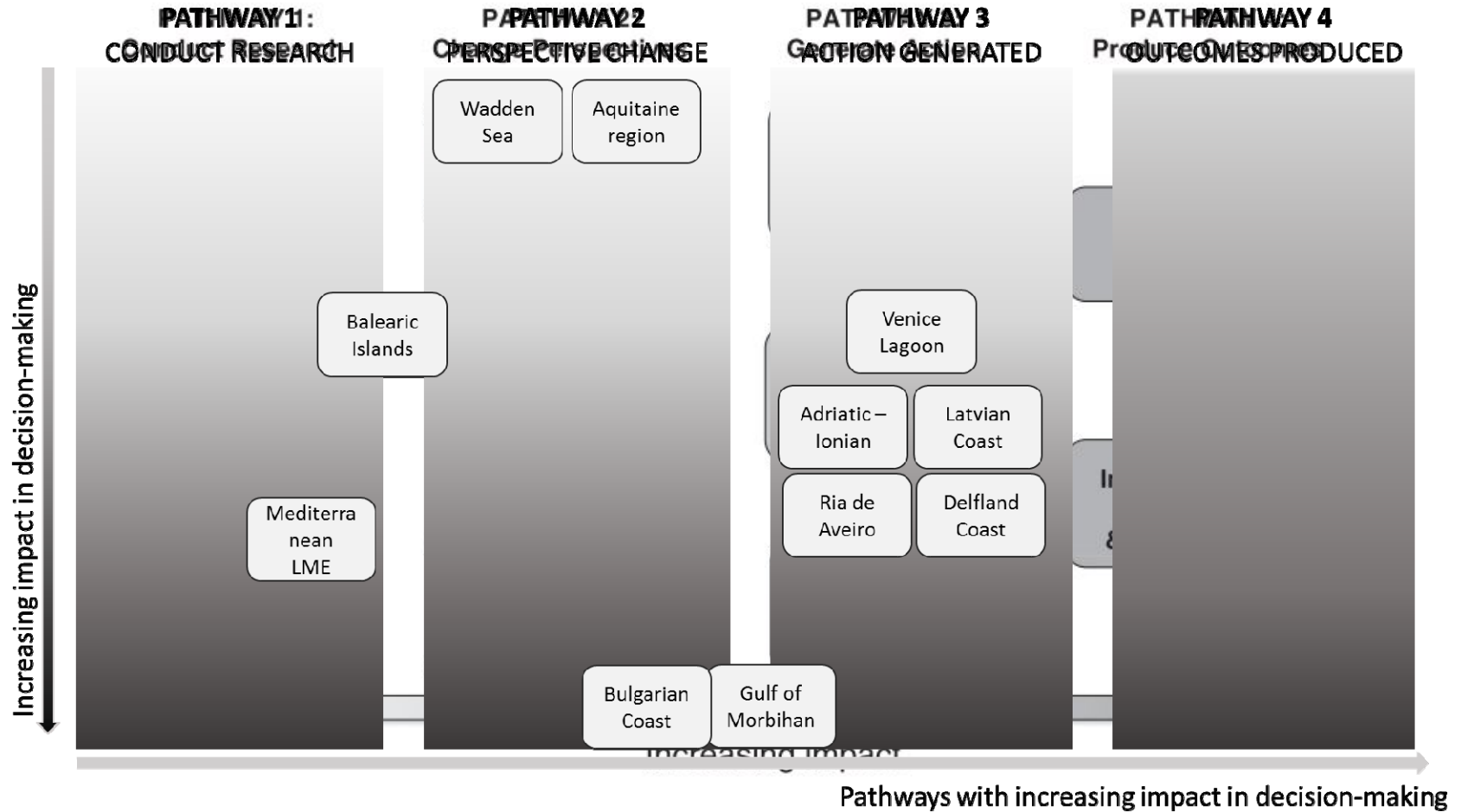*Πανεπιστήμιο Twente, Ολλανδία*

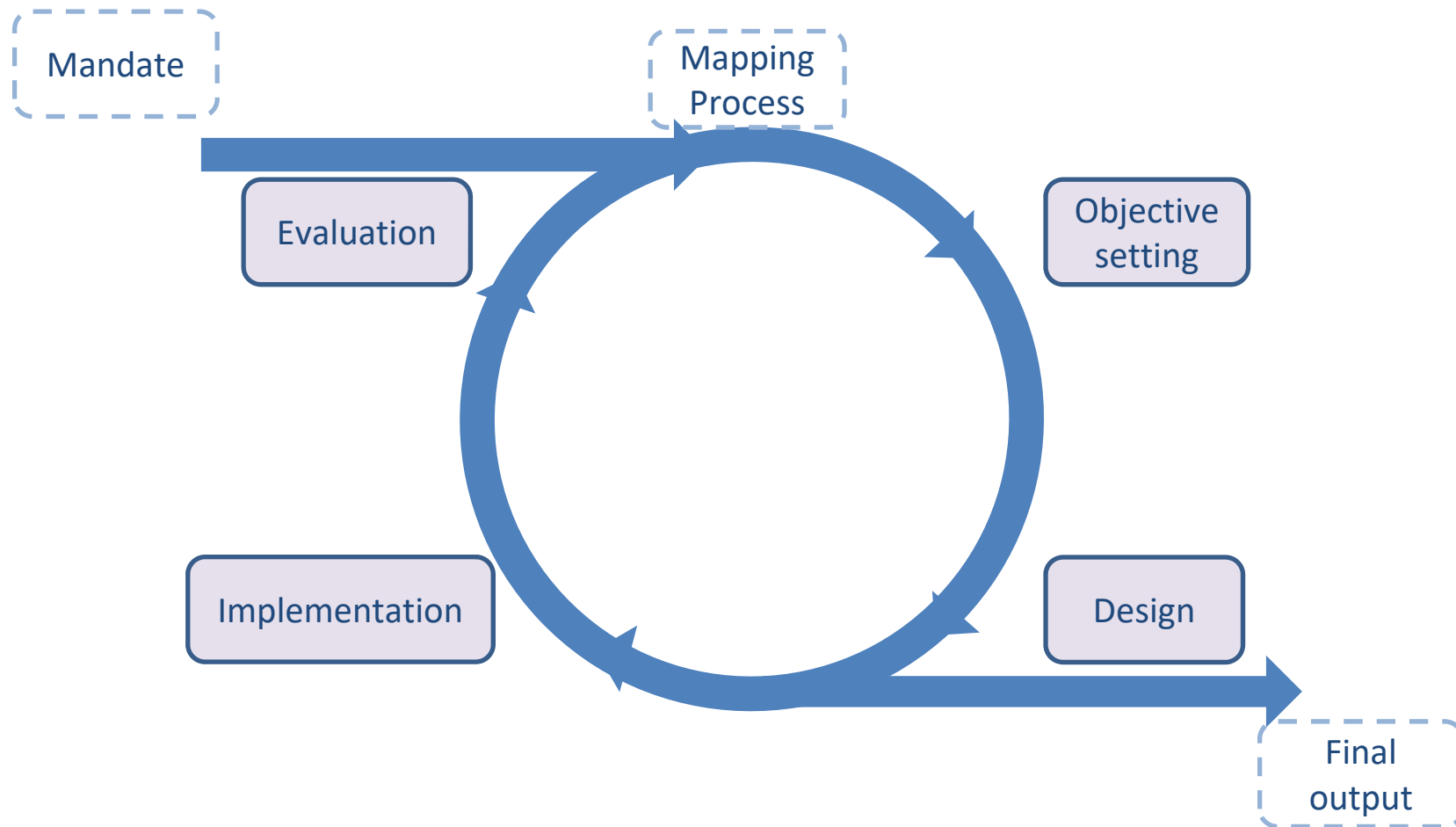*e.drakou@utwente.nl*

# ΧΑΡΤΕΣ Ο.Υ.

*«Οι χάρτες Ο.Υ. είναι ένα εργαλείο το οποίο βοηθά στην καλύτερη*

*επικοινωνία μεταξύ επιστημονικής κοινότητας – φορέων λήψης*

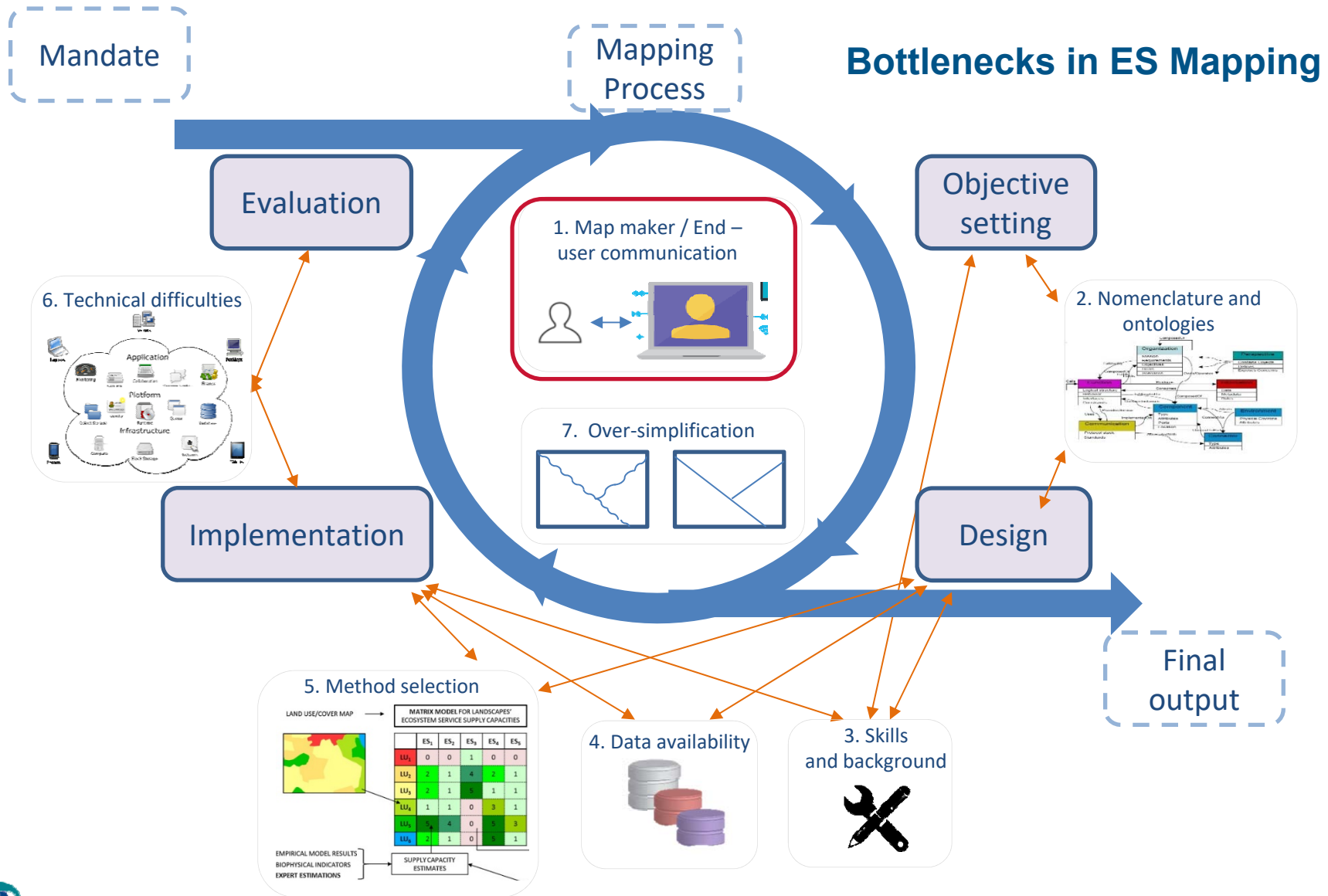*αποφάσεων – πολιτικών διαχείρισης – κοινωνίας πολιτών»*

Interrelations humans-
ecosystem
Various indicators  →  Map  →  EU Biodiversity
Strategy for
2020 - Action 5  →  Support
Decision-making

# Ο.Υ. ΣΤΗ ΔΙΑΔΙΚΑΣΙΑ ΛΗΨΗΣ ΑΠΟΦΑΣΕΩΝ



Πηγή: Ruckelshaus et al 2015; Drakou et al 2017

# ΧΡΗΣΗ ΧΑΡΤΩΝ Ο.Υ. ΣΤΗ ΛΗΨΗ ΑΠΟΦΑΣΕΩΝ



Mandate

Mapping Process

Objective setting

Evaluation

Implementation

Design

Final output

Πηγή: Palomo et al 2018

4

# ΧΡΗΣΗ ΧΑΡΤΩΝ Ο.Υ. ΣΤΗ ΛΗΨΗ ΑΠΟΦΑΣΕΩΝ



Πηγή: Palomo et al 2018
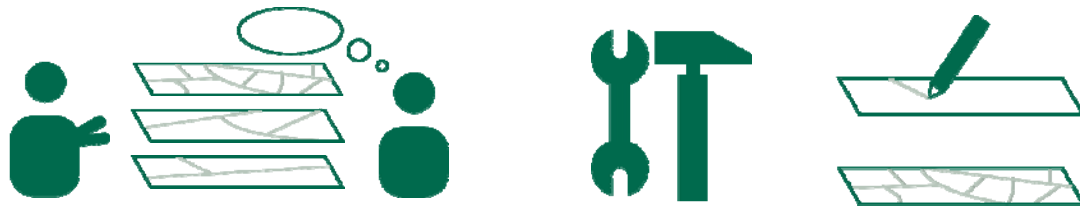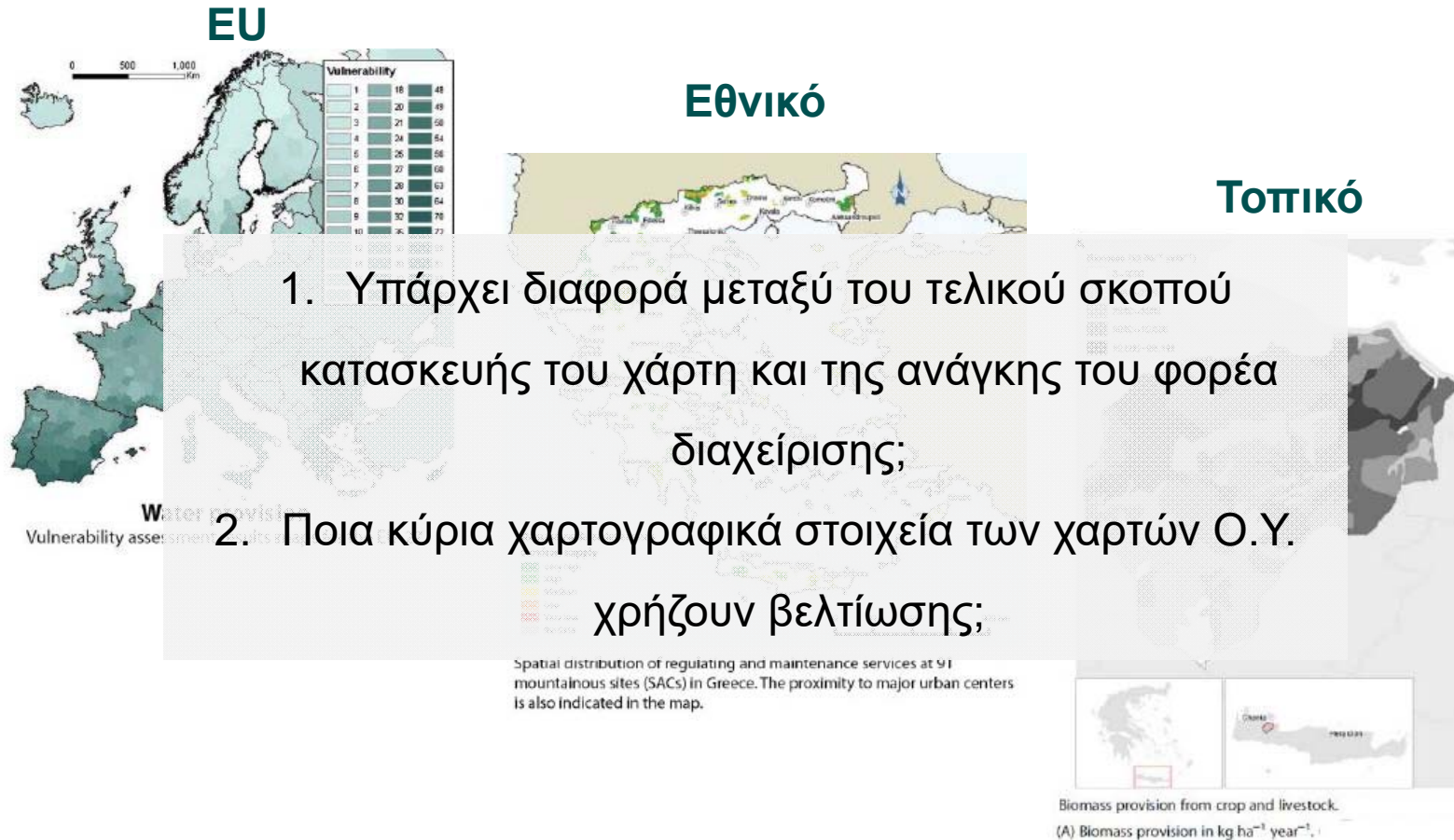
# USER-CENTERED DESIGN (UCD) ΣΕ ΧΑΡΤΕΣ Ο.Υ.

- User-Centered Design

  - puts "*the **user at the center** of the map development process*"

- User requirement analysis

  - **tasks**, **characteristics**, **preferences** and use **context** of the user and the **purpose** of the map[6]

- Provide a detailed **description** of and **recommendations** for the **use and user requirements** of ecosystem service maps.
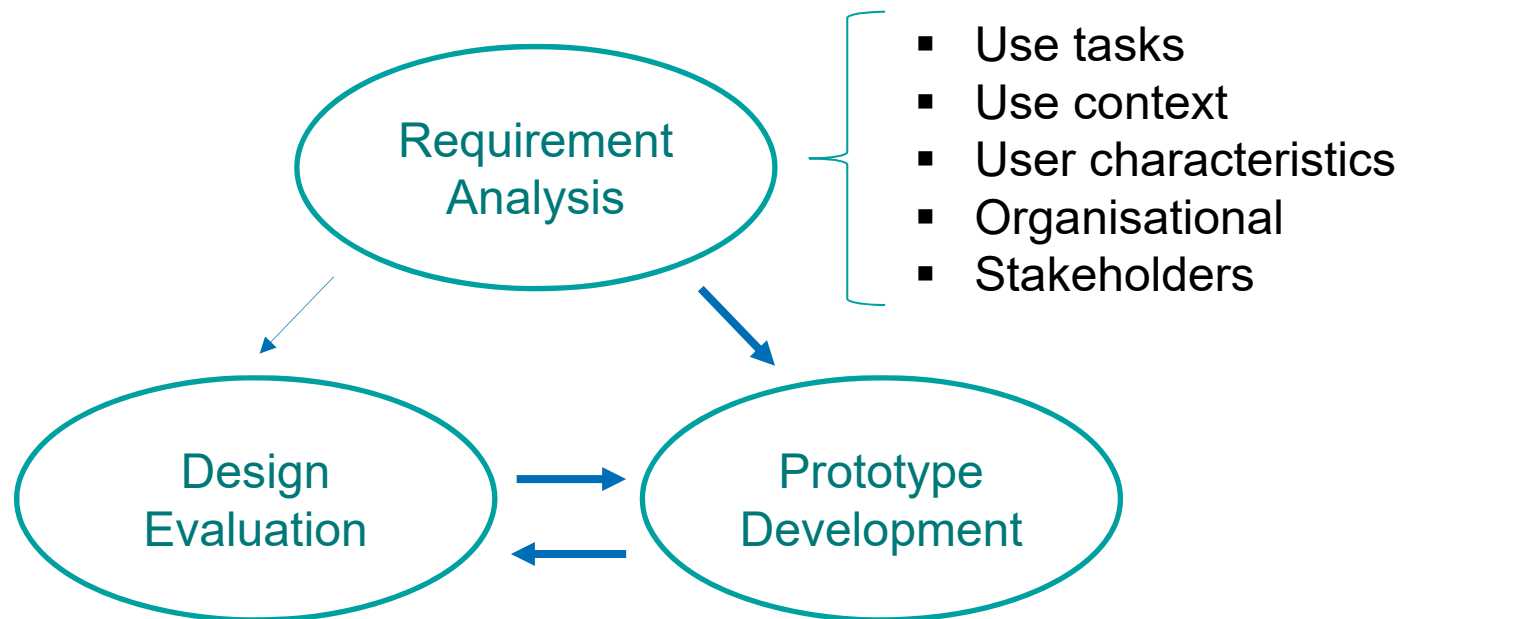
**Action 5**
Biodiversity
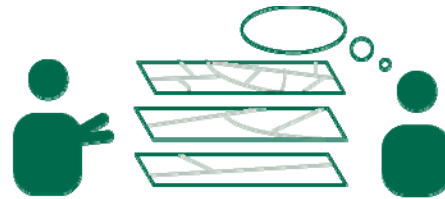Strategy 2020

# USER-CENTERED DESIGN ΣΕ ΧΑΡΤΕΣ Ο.Υ.

**EU**

**Εθνικό**

**Τοπικό**

1. Υπάρχει διαφορά μεταξύ του τελικού σκοπού κατασκευής του χάρτη και της ανάγκης του φορέα διαχείρισης;

2. Ποια κύρια χαρτογραφικά στοιχεία των χαρτών Ο.Υ. χρήζουν βελτίωσης;

Water provision
Vulnerability assessment

Spatial distribution of regulating and maintenance services at 91 mountainous sites (SACs) in Greece. The proximity to major urban centers is also indicated in the map.

Biomass provision from crop and livestock.
(A) Biomass provision in kg ha⁻¹ year⁻¹.

# USER-CENTERED DESIGN ΣΕ ΧΑΡΤΕΣ Ο.Υ.

**User-Centered Design**: Ο τελικός χρήστης του χάρτη ως βασικός συντελεστής της διαδικασίας χαρτογράφησης Ο.Υ.
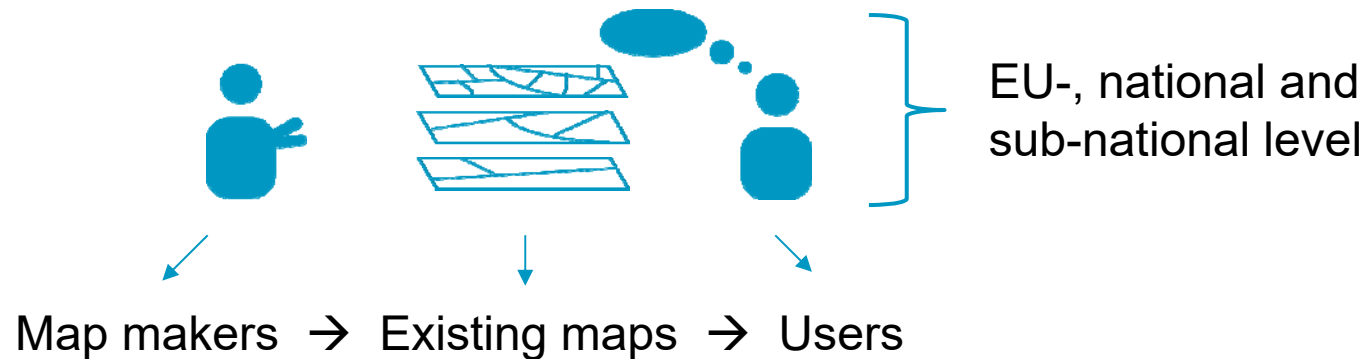


- Use tasks
- Use context
- User characteristics
- Organisational
- Stakeholders

Requirement Analysis

Design Evaluation

Prototype Development

**Action 5**
Biodiversity
Strategy 2020

# USER-CENTERED DESIGN IN ES MAPS
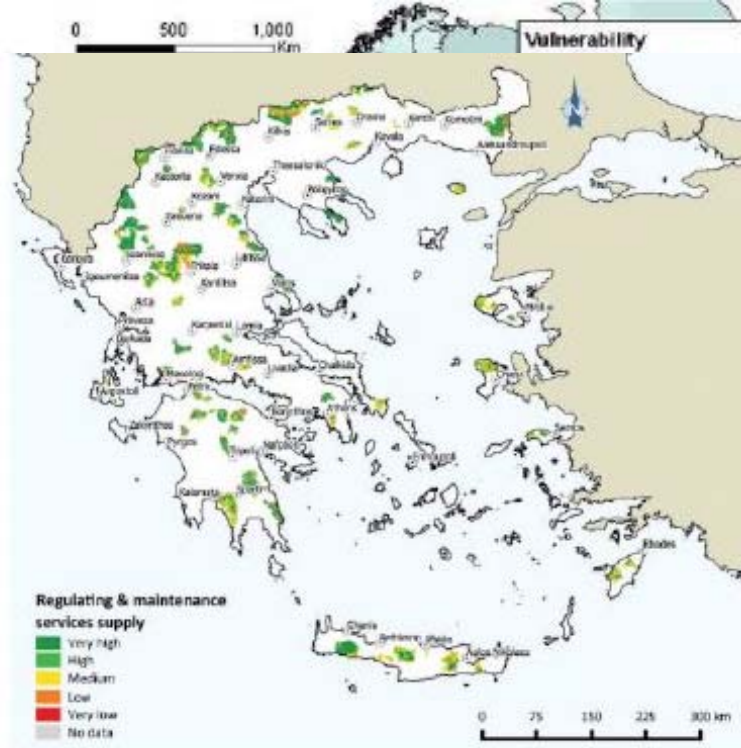
## 1. REQUIREMENT ANALYSIS

Με την ανάλυση προτεραιοτήτων μπορεί να δοθεί μια εκτενής περιγραφή των αναγκών της τελικής **χρήσης** και των τελικών **χρηστών** χαρτών Ο.Υ.



Map makers  →  Existing maps  →  Users

EU-, national and
sub-national level

## 1. REQUIREMENT ANALYSIS

| Users' perspective | Map-makers' | Usability evaluation of existing maps |
|---|---|---|
| | | **Task execution** exercise: <br> ▪ think-aloud <br> ▪ observation |

Vulnerability

Π.χ. ποια είναι η έκθεση του
Π.χ. ποια είναι η προστατευόμενη
πληθυσμού σε πλημμύρες
ορεινή περιοχή με την πιο χαμηλή
στην Τσεχία;
παροχή Ο.Υ. ;

Spatial distribution of regulating and maintenance services at 91
mountainous sites (SACs) in Greece. The proximity to major urban centers
is also indicated in the map.

vulnerability assessment results maps for the EU-27

Regulating & maintenance
services supply

Very high
High
Medium
Low
Very low
No data
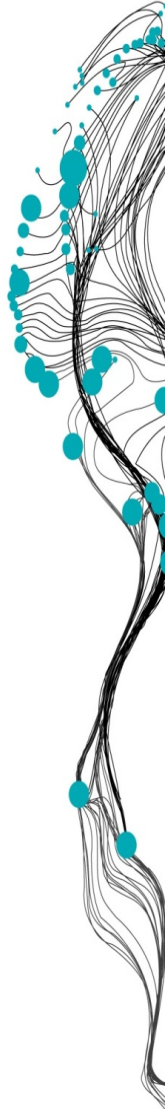
# USER-CENTERED DESIGN IN ES MAPS

## 1. REQUIREMENT ANALYSIS – παραδείγματα

| Title | ES Category | Location and Scale | Citation | ES Attribute | Type of map | Example |
|---|---|---|---|---|---|---|
| Mapping water quality-related ecosystem services: concepts and applications for nitrogen retention and pesticide risk reduction | Provisioning | The Elbe, Germany _National scale_ | (Lautenbach et al., 2012) | Supply | Choropleth map |  |
| How to calculate the spatial distribution of ecosystem services Natural attenuation as example from The Netherlands | Provisioning | Netherlands _National scale_ | (Van Wijnen et al., 2012) | Potential | Choropleth map |  |
| National Parks, buffer zones and surrounding lands: Mapping ecosystem service flow | Provisioning | Spain _Sub-national scale_ | (Palomo, Martín-López, Potschin, Haines-Young, & Montes, 2013) | Benefit | Dot map |  |

# USER-CENTERED DESIGN IN ES MAPS

## 1. REQUIREMENT ANALYSIS – παραδείγματα
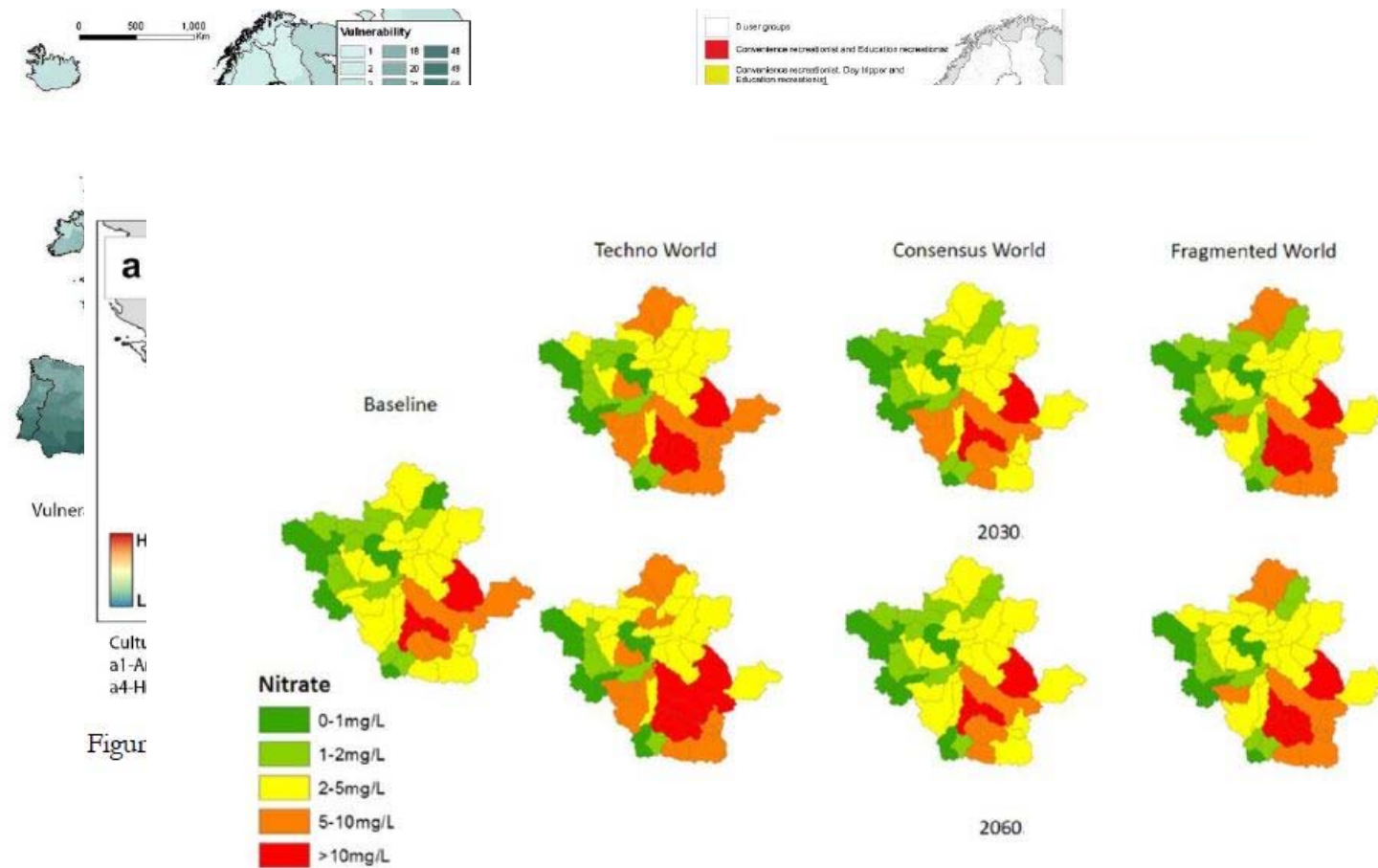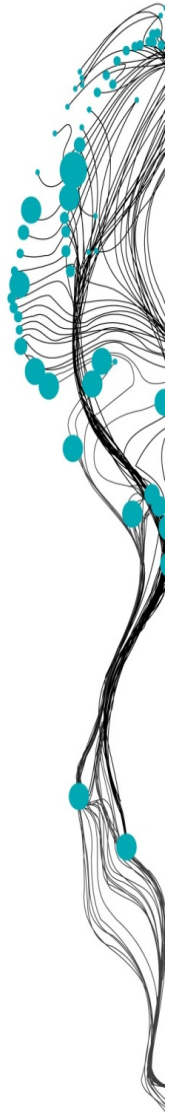
# USERS' PERSPECTIVE

| | EU | National | Sub-national |
|---|---|---|---|
| Use purposes | Policy<br>Communication and raising awareness | Policy<br>Management decisions<br>Risk assessment<br>Information | (Policy)<br>Management decisions<br>Monitoring purposes<br>Public communication and raising awareness<br>Educational purposes |
| Decision influence | No | No | Not used yet |
| Decision process | During, with other types of evidence | | |

"*Only **data** for example that can contribute to designated better policy is important*"

"*I sometimes say to myself, ok, people made this map, what the hell is it going to be used for... in practice*"

# MAP-MAKERS' PERSPECTIVE

- **Use purposes** do not strongly differ

- **Tools**: Data processing and modelling

  - "*The representation of that it has not been kind of the focus […] we [are] using the simplest that we can to actually show spatially the results*"

- **User involvement** only once, no feedback from final product

  - "*maps help us make our job better*"

- **Science-policy gap**

# USERS' AND MAP-MAKERS' PERSPECTIVE

- **Business context**
  - Users mostly willing to use ESM
  - Willingness to produce for user

- **Use purpose**
  - Not strongly different
  - Vague

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| Issue | Solution |
|---|---|
| Visual impairment | Use colour combinations, which are distinguishable for the most common variations of colour-blindness:<br>• "red and blue<br>• red and purple<br>• orange and blue<br>• orange and purple<br>• brown and blue<br>• brown and purple |

| | Description and map content | Add explanatory description explaining the map content e.g. displayed eco-system service or type.<br>Adjust the description and map content to the background knowledge of the audience. |
|---|---|---|
| Colour scheme structure | Spatial resolution | Ensure the spatial resolution matches the map scale, and generalize data e.g. through aggregation, if required (Brewer, 2016). |

| Issue | Solution |
|---|---|
| Number of categories and colours in legend | Diverging/sequential colour scheme: Use maximum five hues of the same colour (Peterson, 2009).<br>Qualitative colour scheme: Use maximum 10-12 different colours (Peterson, 2009). |
| Legend units | Include the units (if available) in the legend. |
| Font size | Legible font size of map description, map labels, legend labels and title. |
| Image resolution | Export raster format (e.g. jpg) with resolution of 300-400 dpi (Brewer, 2016; Peterson, 2009). |
| Title | Have a title, which describes the intent of the map either on top or bottom of the layout (Peterson, 2009). |

# USER-CENTERED DESIGN IN ES MAPS

User-Centred Design: Ο τελικός χρήστης στο κέντρο της διαδικασίας χαρτογράφησης Ο.Υ.
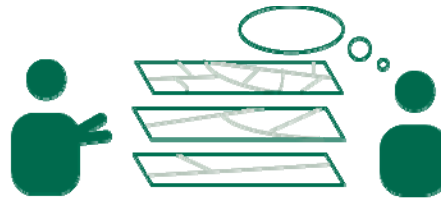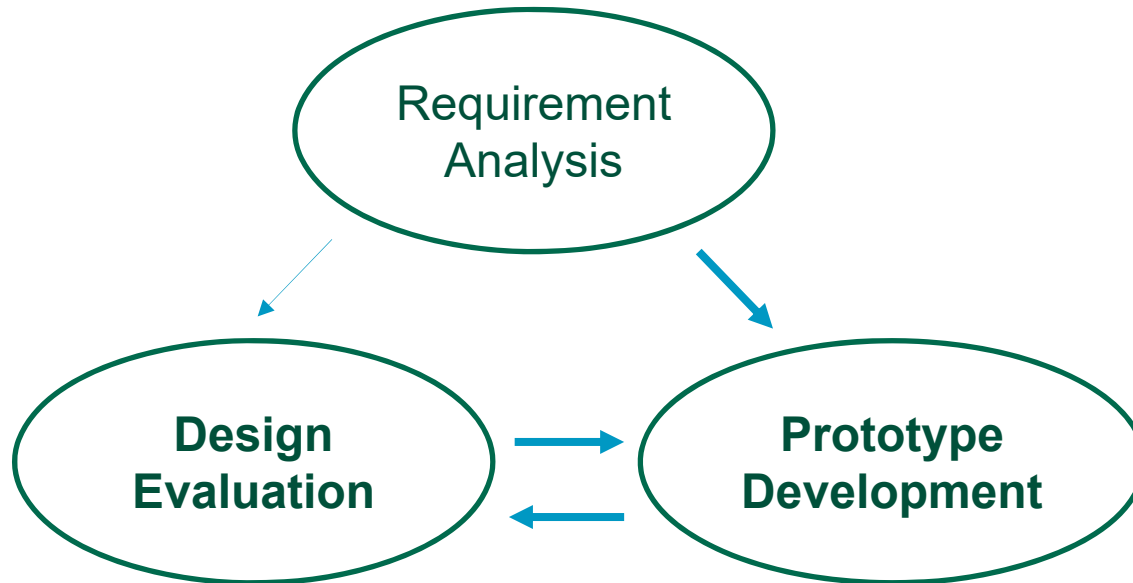
# ΠΡΟΤΑΣΗ ΒΕΛΤΙΩΣΗΣ ΧΑΡΤΩΝ

## Original
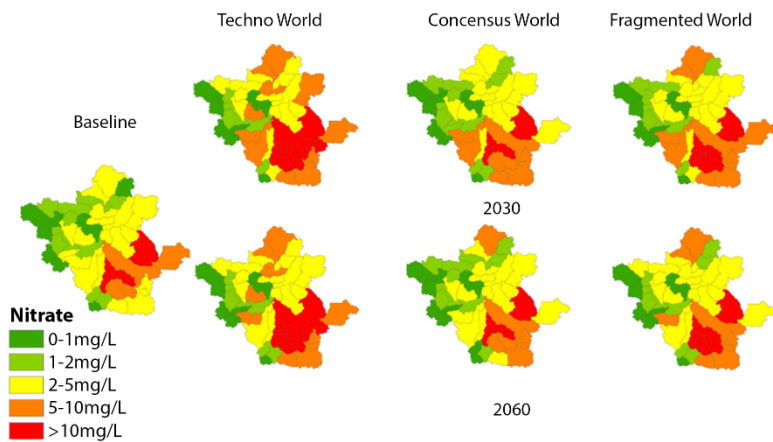


Average nitrate concentration in water for the baseline period (1995–2005) and the three future scenarios (2030 and 2060) in the Pinios basin

*Βασικές αλλαγές*

*Χρήση χρωμάτων*

*Τοποθέτηση τίτλων*

*Επεξήγηση*

## Proposed suggestion
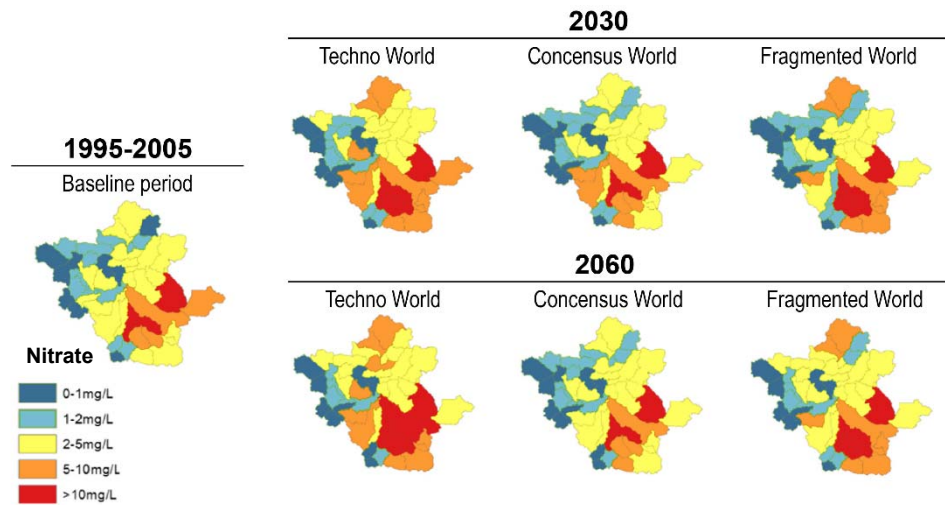


Average nitrate concentration in water for baseline period (1995-2005) and the three future scenarios (2030 and 2060) for the pinos basin

- Techno World: Explanation
- Concencus World: Explanation
- Fragmented World: Explanation

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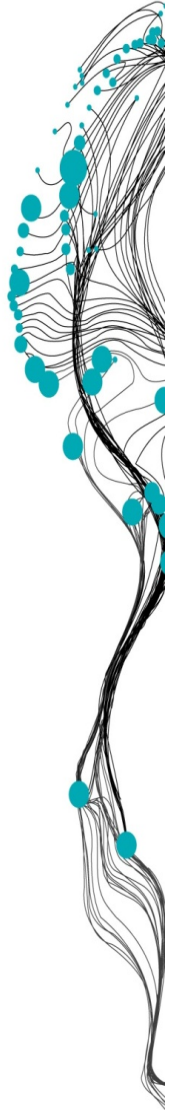
# ΠΡΟΤΑΣΗ ΒΕΛΤΙΩΣΗΣ ΧΑΡΤΩΝ

- **Training** on cartographic map design principles

- **Application of User-centred design** and **inclusion of the users** in the mapping by actively consulting them e.g. by asking about specific geographic questions they need to answer or participatory approaches

- **Iterative, repeated communication** between the **map-maker and user** throughout all stages of the map creation

- **Training on map use** and development of **guidelines** for ES maps and the ES concept for prospective users

- **Capacity building** between researchers and stakeholders

# ΣΧΕΔΙΑΣΜΟΣ & ΑΞΙΟΛΟΓΗΣΗ ΠΡΟΤΥΠΟΥ

**https://app.maptionnaire.com/en/5178/**

# ΣΧΕΔΙΑΣΜΟΣ & ΑΞΙΟΛΟΓΗΣΗ ΠΡΟΤΥΠΟΥ



Ecosystem service map for Doñana National Park, Spain - 2013

# ΤΕΛΙΚΑ ΣΤΑΔΙΑ

# ΧΡΗΣΗ ΧΑΡΤΩΝ Ο.Υ. ΣΤΗ ΛΗΨΗ ΑΠΟΦΑΣΕΩΝ



Πηγή: Palomo et al 2018
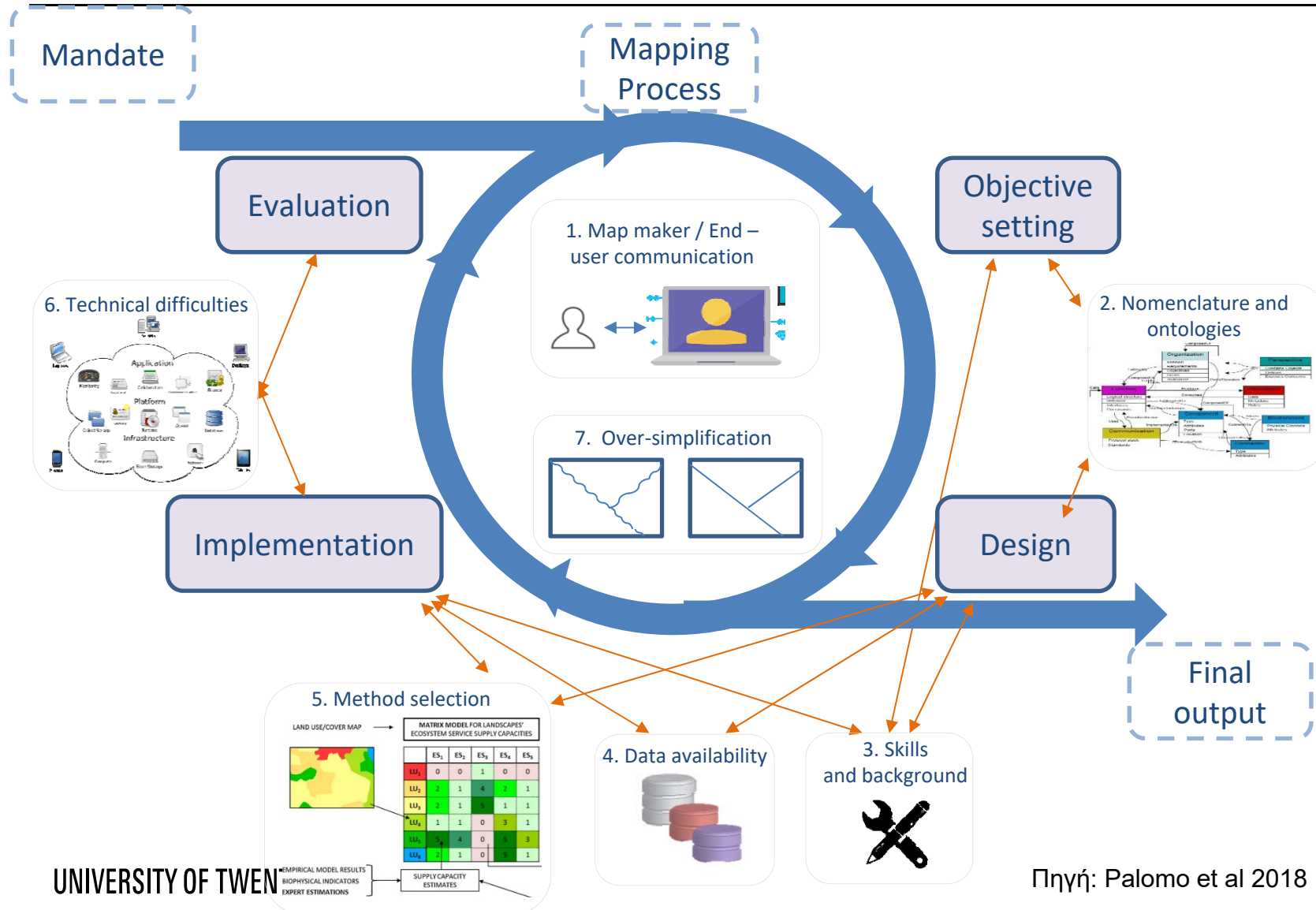
# ΧΡΗΣΗ ΧΑΡΤΩΝ Ο.Υ. ΣΤΗ ΛΗΨΗ ΑΠΟΦΑΣΕΩΝ

ΕΥΧΑΡΙΣΤΩ

ΓΙΑ ΤΗΝ

ΠΡΟΣΟΧΗ ΣΑΣ