
NORWEGIAN UNIVERSITY OF LIFE SCIENCES
MDCCCLIX

Cultural-Historic landscapes of Europe
The landscape perception perspective

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OUTLINE

- The Landscape Convention, from a perception perspective
- What is landscape perception?
- Visual landscape assessment
- The VisuLands framework
- The advantages of using different data sources, what is included in the INSPIRE Annexes and what is not.
- Conclusions

The European Landscape Convention – from a perception perspective

- Landscape (ELC definition): An area, *as perceived by people*, whose character is the result of the action and interaction of natural and/or human factors
- Landscape perception at the heart
- Landscape change, monitoring landscapes
- All landscapes, everyday and extraordinary
- Public wishes and involvement, landscapes are important to people

Landscape perception

- Vision vs visual perception

- Perception is the process of attaining awareness or understanding of sensory information

  - Which elements we focus on vs elements we can see
  - A concious experience

- Visual perception implies both viewing and evaluating the view in relation to function

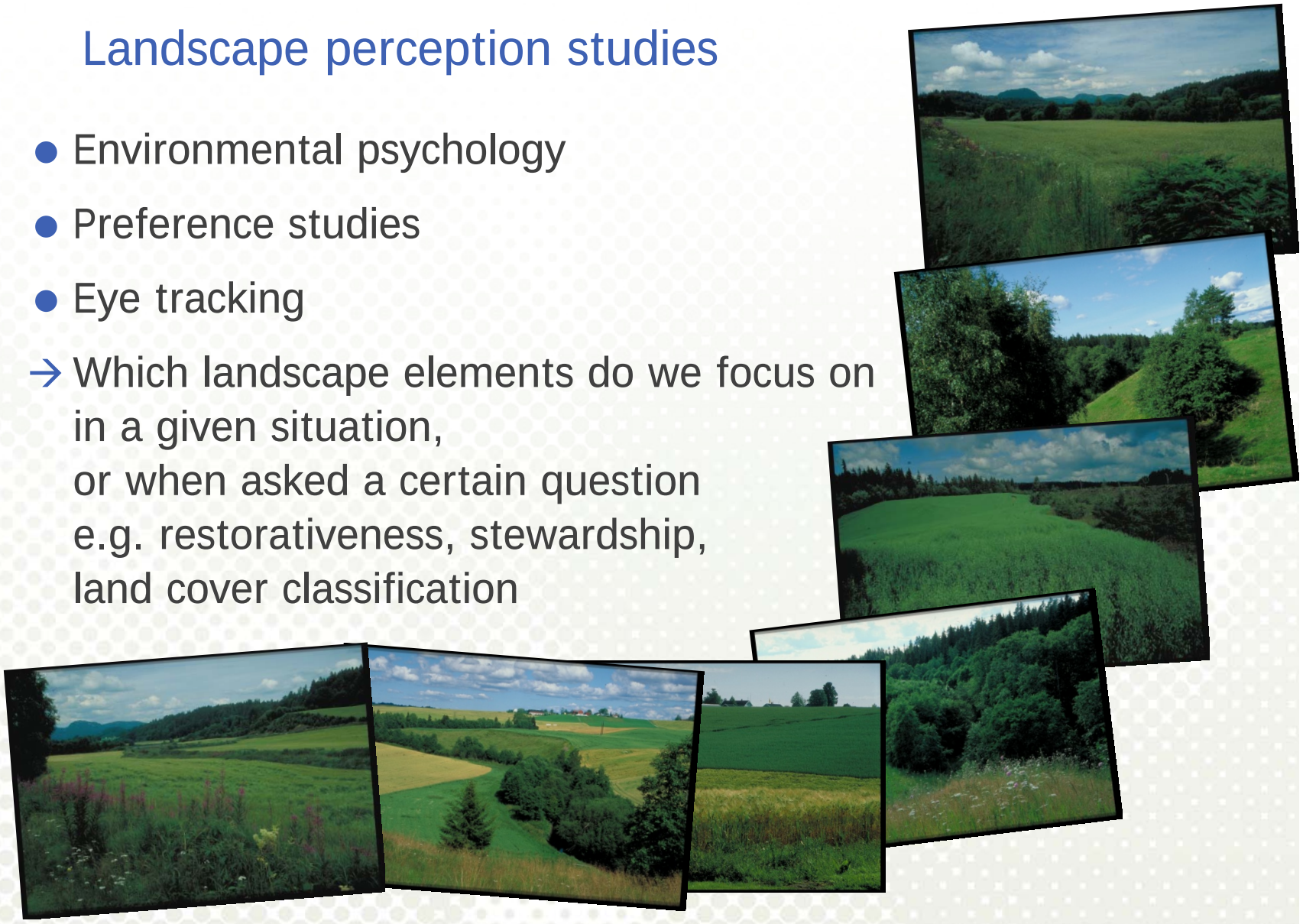
Landscape perception

- Related to human functioning and behaviour
  - Information processing theory (Kaplan and Kaplan, 1989)
  - Prospect-refuge theory (Appleton, 1975)
- Related to personal interests and context
  - Affordances
  - Landscape in the eye of the beholder
- Perceived landscape beauty

Landscape perception studies

- Environmental psychology
- Preference studies
- Eye tracking

→ Which landscape elements do we focus on in a given situation,
or when asked a certain question
e.g. restorativeness, stewardship,
land cover classification



Visual landscape assessment

- Assessing the landscapes that we perceive
- Key aspects of visual landscapes, which elements, attributes and qualities is it that people perceive
- There are numerous environmental indicators in use in landscape analysis and planning, including indicators for measuring visual landscape expression
- Many indicators have been ”adopted” by scientific fields far from their origin (e.g. indicators borrowed from landscape ecology for use within landscape aesthetics)

Visual landscape assessment

- ..but how do visual indicators relate to perception?
- we need to know what indicators indicate → theory-based indicators rather than applying what's available
- Linking visual indicators to landscape aesthetic theory → the VisuLands framework

The VisuLands framework

- A conceptual framework for assessing landscape visual character using indicators

AIMS:

- Provide a theory-based framework for visual landscape assessment for researchers and planners

- Predict and analyse the visual effects of landscape change

BUILDING A CONCEPTUAL FRAMEWORK

- Literature review comprised of
  - Academic literature, guidelines & handbooks, policy documents
- main approaches
  - professional
  - environmental psychology
  - landscape preferences
- underlying theory
  - humanistic, cultural, ethics & professional knowledge-based
  - evolutionary theories

BUILDING A CONCEPTUAL FRAMEWORK

- Identified 9 key concepts describing visual landscape structure
- Stewardship, naturalness, complexity, coherence, disturbance, visual scale, historicity, imageability, and ephemera

Tveit, M., Ode, A., and Fry, G. (2006) Key concepts in a framework for analysing visual landscape character. *Landscape Research*. 31, 229-255.

Ode, Å., Tveit, M., Fry, G., 2008, Capturing Landscape Visual Character Using Indicators: Touching Base with Landscape Aesthetic Theory, *Landscape Research* 33(1):89-118.

Ode, Å., Tveit, M. S., et al. 2010. Advantages of using different data sources in assessment of landscape change and its effect on visual scale. Ecological Indicators 10(1): 24-31.

VisuLands project

- Visualization Tools for Public Participation in Managing Landscape Change
- EU funded project with partners in 6 European countries
- Conceptual framework development with input and feedback from the VisuLands partners including End User group

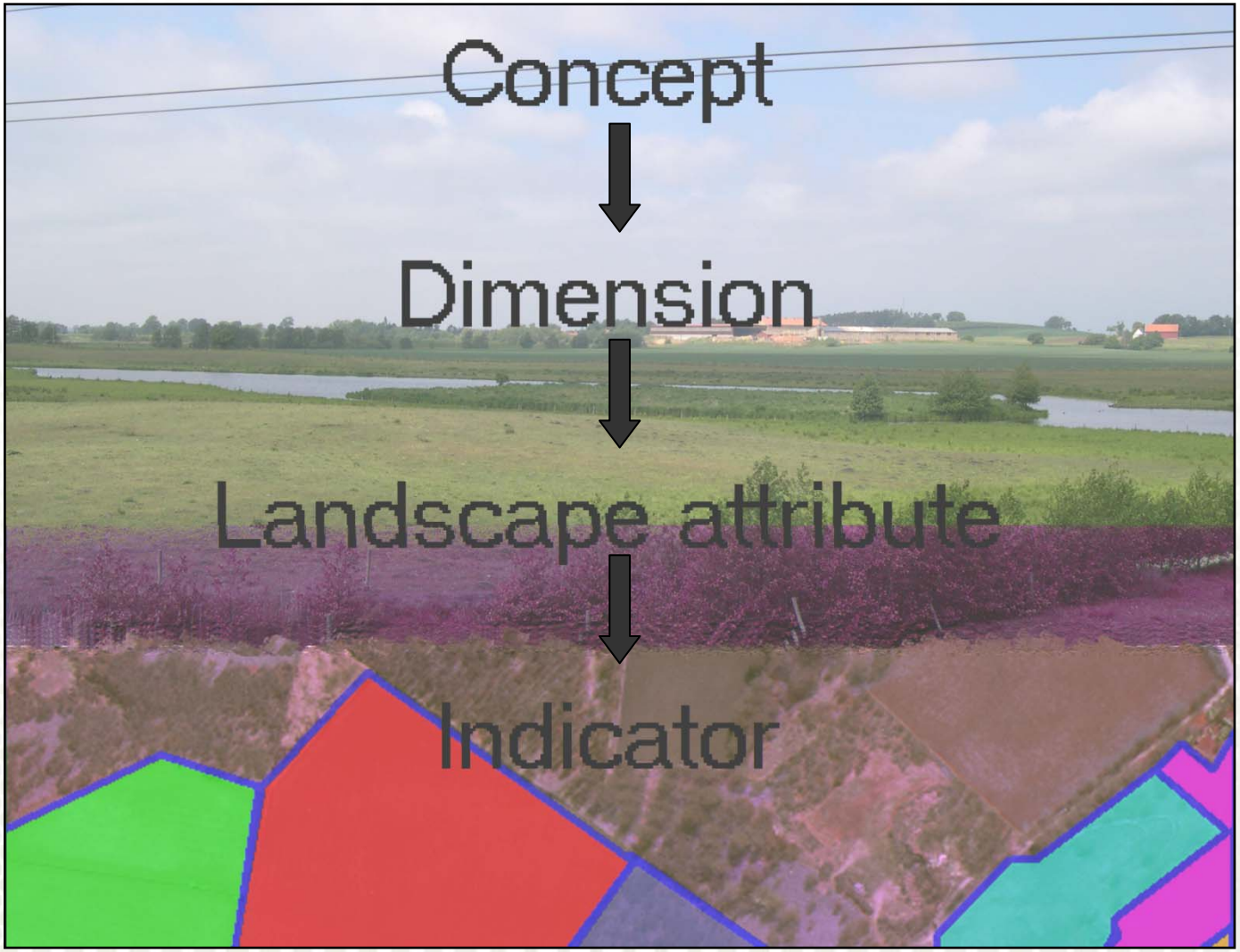
Nine key aspects of visual landscapes

Stewardship	Sense of order and care, perceived human care through active and careful management
Coherence	Unity of a scene, repeating patterns of colour and texture, correspondence between land use and natural conditions
Disturbance	Lack of contextual fit and coherence, constructions and interventions.
Historicity	Historical continuity and historical richness, different time layers, amount and diversity of cultural elements
Visual scale	Landscape rooms or perceptual units: their size, shape and diversity, degree of openness.

Nine key concepts (cont.)

Imageability	Qualities of a landscape present in totality or through elements; landmarks and special features, both natural and cultural, making the landscape create a strong visual image in the observer, and making landscapes distinguishable and memorable.
Complexity	Diversity, richness of landscape elements and features, interspersion of pattern
Naturalness	Closeness to a preconceived natural state
Ephemera	Change with season and weather.

HIERARCHICAL STRUCTURE LINKING INDICATORS TO THEORY

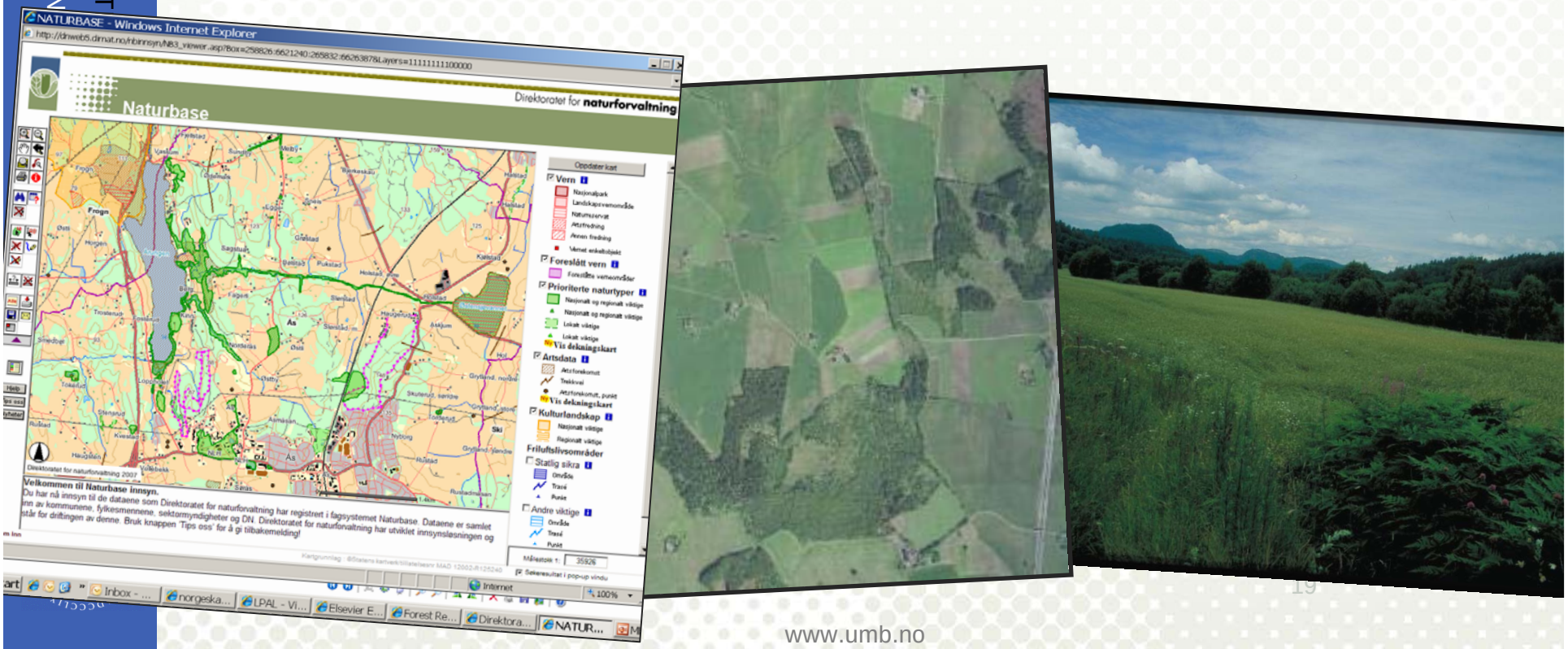


The VisuLands framework

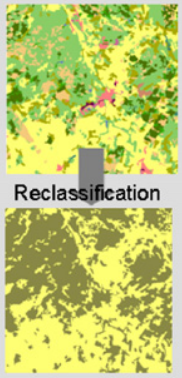
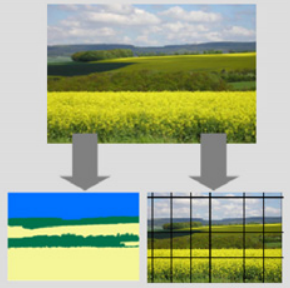
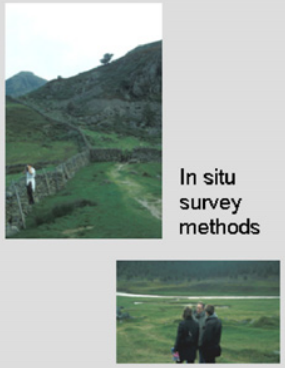
STEWARDSHIP					
Sense of care	Upkeep		Sense of order		
Man made structures: Buildings Linear features (fences, paths, hedgerows, edges)	Vegetation		Management		
Condition/ maintenance of man-made structures; buildings, linear features	Presence of weeds	%Abandoned land and stage of succession	Manage-ment frequency	Manage-ment type	Manage-ment detail

Data sources

- All indicators in the VisuLands framework are assessed in relation to available data sources; land cover, orthophotos, photographs and field surveys



Data sources – VisuLands framework

	Land cover	Aerial photographs	Landscape photographs	Field studies
1. Open area indicators				
Example of basic data processing				
Proportion of open land	% of open land	% of open land	% of open land	Proportion of open land
Patchiness of open areas	Number of open patches	Number of open patches		
Size of open patches	Area measurement of open patches	Area measurement of open patches		
Shape of open patches	Shape Index	Shape Index		
Viewshed size	Size of viewshed	Size of viewshed		
Viewshed shape	Shape Index	Shape index	Classification of shape (1-3)[a]	Classification of shape (1-3)[a]
Depth/breadth of view	Length of radius of view	Length of radius of view	Estimation of depth of view (1-3)[b]	Estimation of depth of view (1-3)[b]
2. Obstruction of the view indicators				
Density of obstructing objects		Density of obstructing objects	Density of obstructing objects	Density of obstructing objects
Degree of visual penetration of vegetation			Proportion of vegetation with different levels of visual penetration (1-4)[c]	Proportion of vegetation with different levels of visual penetration (1-4)[c]

[a] e.g. 1 = one large open area; 2= split open area; 3 = patchy open area; [b]e.g. 1=short; 2= medium; 3= long; [c] e.g. 1= blocked; 2=dense; 3=semi-open; 4= open

Landscape visual assessment and INSPIRE

Annex II themes

- Elevation, terrain data (Digital Terrain Model) and surface data (Digital Elevation Model).
- Land cover data
- Orthoimagery

Annex III themes

- Buildings
  - condition, nature, height, size
- Land use, boundaries
- Production and industrial facilities
  - particularly related to visual disturbance
- Agricultural and aquacultural facilities
  - nature of facility, kind of production
- Habitats and biotopes
  - classifications and site descriptions (ecological aesthetic?)
- Species distribution
  - ephemera, landscape experience
- Energy resources
  resource type, quantification

Landscape visual assessment and INSPIRE

Land cover data

- Scale relevant for perception
- Level of detail
  - linear features, e.g. stone fences, tree rows
  - unambiguous classification
  - meaningful categories in terms of perception
    (current project using eye tracking identifying such categories)

→ Orthoimagery often valuable supplement to land cover data

Landscape visual assessment and INSPIRE

- Some aspects of landscape perception requires other data sources than the ones offered by INSPIRE
- Landscape photos and field studies are necessary supplements
- Surveys in specific areas and contexts may be necessary
- Airborne laser scanning, forest inventories - position, species, height and crown size at individual tree level
  → Valuable for visual landscape assessment

Experiences from applying the VisuLands framework

- Uneven distribution/availability of indicators (may INSPIRE help?)
- Interrelationships and intertwined indicators, some are opposites some re-enforce each other
- Suitability of different data sources depends on purpose of application (monitoring, scenario assessment, scale)
- Sensitivity to changes in indicators differs between groups of respondents

Experiences from applying the VisuLands framework

- Numbers were helpful in communicating scenarios e.g. VisuLands respondents said they missed numbers to support the scenarios
- Data availability important limitation
- Indicator sensitivity varies
- Importance of scale
- Land use classification schemes and level of detail determine indicator values

Landscape visual assessment and INSPIRE

- Although the use of indicators in visual landscape assessment is very common, it is important to remember that many of the indicators applied are more or less directly from other scientific fields

➔ Important to link back to landscape aesthetic theory to understand what indicators indicate

➔What does it mean in terms of people's landscape perception?

Landscape visual assessment and INSPIRE

- European Landscape Convention takes a comprehensive approach to landscapes
- Treating the whole and complex landscape as a sum of its elements or separate attributes as expressed through indicators is a simplification
  → Essential to be aware of the limitations
  → Aim for integration
- Further studies necessary identifying the relationship between what people see (what we can measure) and what they perceive

Thank you for your attention!

The VisuLands framework in planning (1)

How to implement in planning process

- Impact assessments (the visual part)

  - VisuLands framewok a useful tool for planners Many indicators GIS based, easily implemented
  - Available information, linked to e.g. Arealis, Norge Digitalt, WMS-tjenester fra Skog og landskap, Naturbase and other map based internet sources.
  - Combine different planning focuses, culture, environment, aesthetics etc
  - The hierarchical structure offers the opportunity to apply the framework on different levels of abstraction

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The VisuLands framework in landscape planning (2)

- Monitoring of landscape change
  Rate of change, type of change, impacts of change

  e.g. Analysis of historical change, maps, orthophotos or photos
- Scenario development
  - predicting visual effects
- Communicate change

  Visualisations/
  Virtual reality

  - e.g. Climate change
  effect on snow or land cover,
  reafforestation,
  short rotation forests

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Implementation of the VisuLands framework so far

- VisuLands application in study areas (indicator level)
  - research projects and EIAs
  - national landscape monitoring program (Sweden)
- VisuLands scenarios and visualisations (indicator level)
- Useful in different contexts; rural, urban
- Inclusion of accessibility indicators

Photo: Pepe Giner Ivars