

Rediam...

AS

SW



Projet cofinancé par le Fonds Européen de Développement Régional (FEDER)
Project co-financed by the European Regional Development Fund (ERDF)

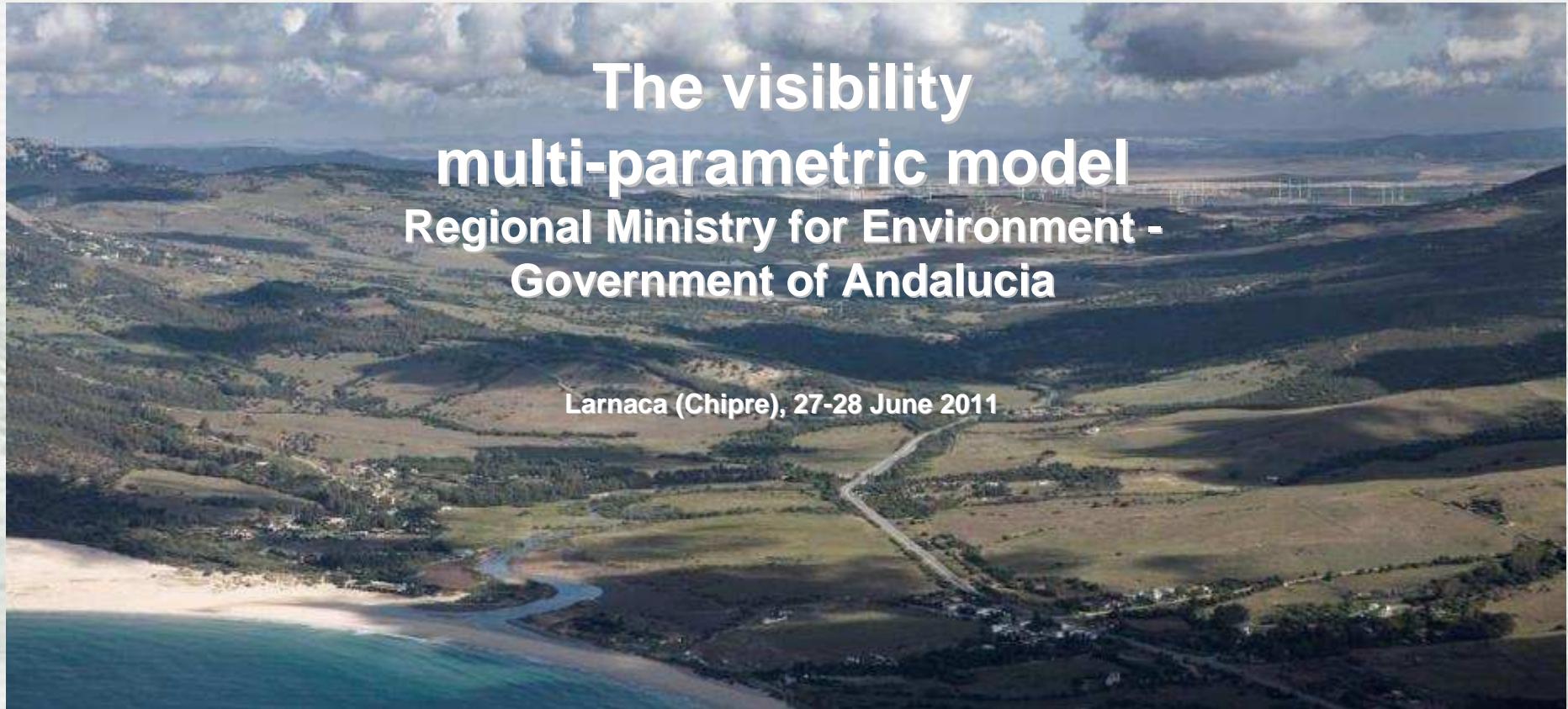


JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE

The visibility multi-parametric model

Regional Ministry for Environment - Government of Andalucia

Larnaca (Chipre), 27-28 June 2011





Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

INDEX

1.- Landscape Treatment in the Environmental Information Network of Andalusia (REDIAM)

2.- Multi-parametric Visibility Model – Concepts

3.- Multi-parametric Visibility Model – Practice



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

The Environmental Information Network of Andalusia (REDIAM)

Visita Virtual a la REDIAM
Red de Información Ambiental de Andalucía

Biblioteca

Statistics

Investigation

OGC Services

Maps

Mapa Menú

Rediam...

Lines of work and information projects

The Environmental Information Network of Andalusia's activities, and the associated projects in each area, are structured around the following lines of work:

- ✓ Reference cartography
- ✓ Biophysical recognition and environmental cartography
- ✓ Development of Information Subsystems
- ✓ Applied research for the development and integration of GIS and remote sensing technologies in Environmental Management
- ✓ Support environmental planning and integration of information
- ✓ Environmental Information Dissemination
- ✓ Statistical programme of the Regional Ministry of Environment
- ✓ Management and development of the Environmental Information Network
- ✓ Remote sensing



Unión Europea

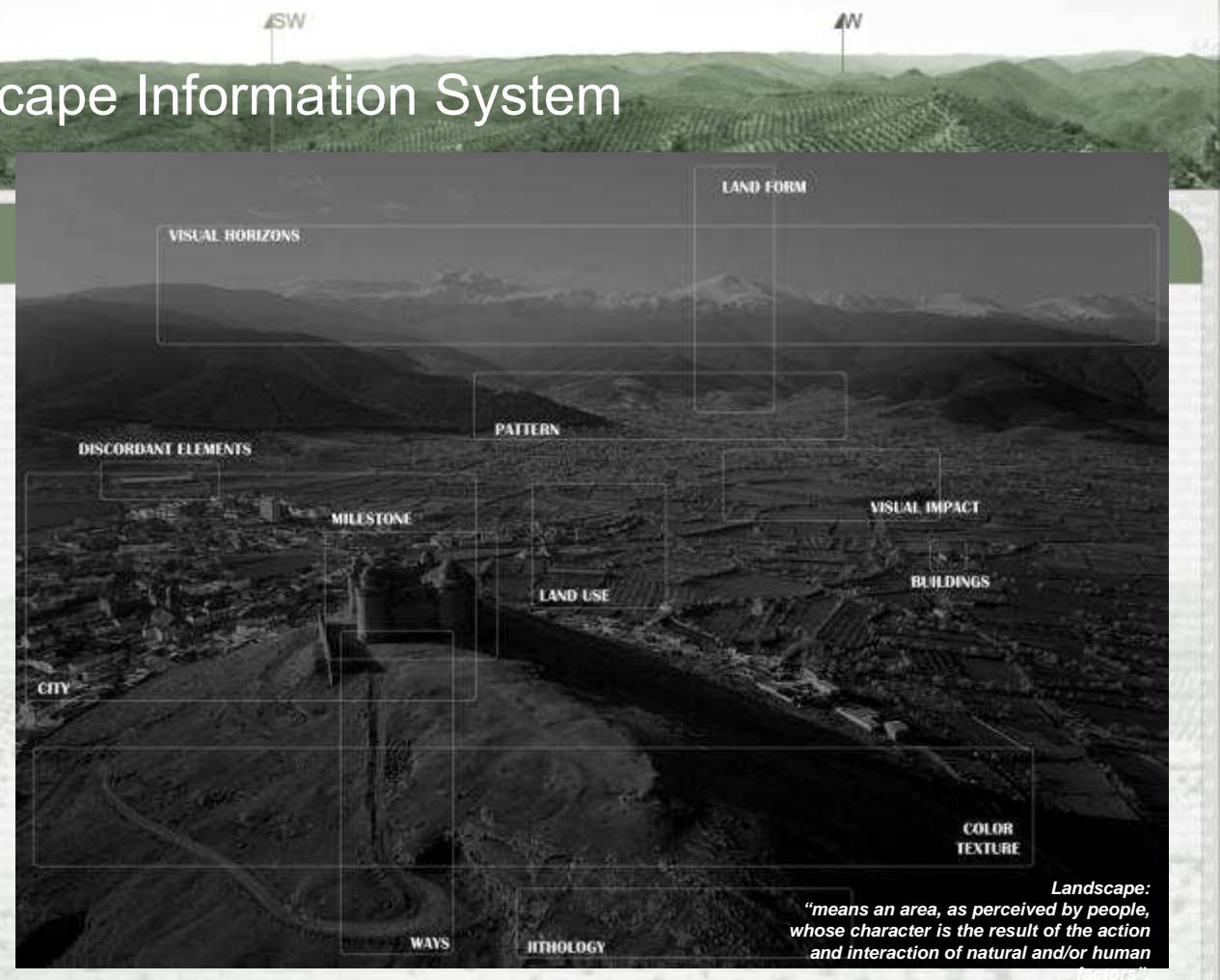
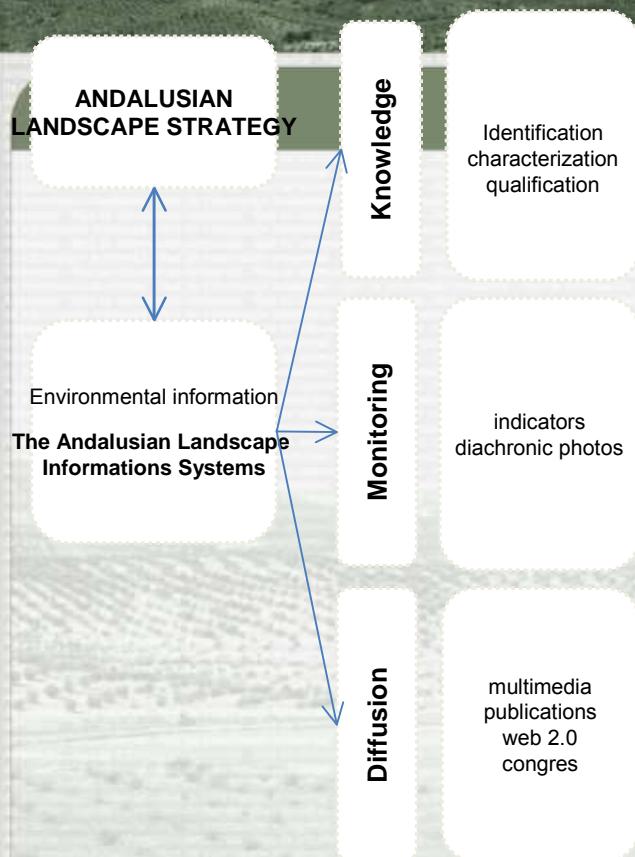
Fondo Europeo
de Desarrollo Regional



Rediam...



The Andalusian Landscape Information System





Rediam...

Andalusian Landscape Map

- ✓ The first work about landscape map in Andalusia.
- ✓ Scale 1/100.000 (useful for recognition at regional level)
- ✓ Hierachical Clasification System:
 - ✓ 5 landscape categories,
 - ✓ 19 landscape areas,
 - ✓ 85 landscape unit
- ✓ Map is the base for landscape index





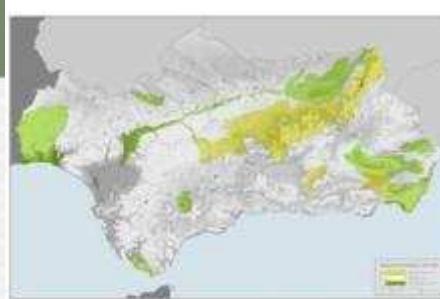
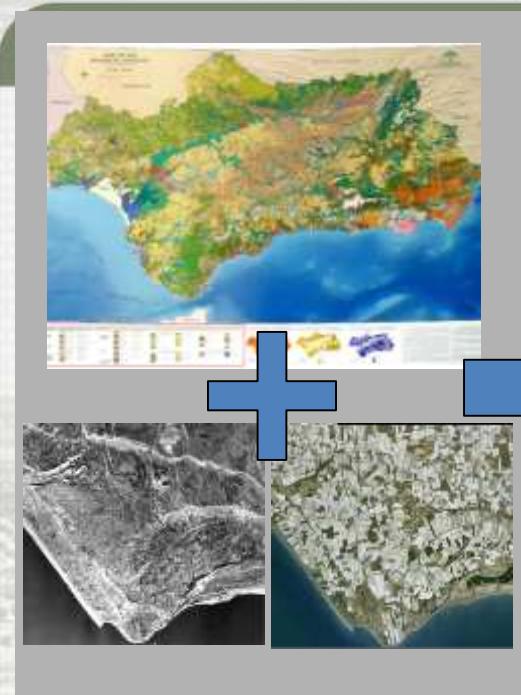
Unión Europea

Fondo Europeo
de Desarrollo Regional

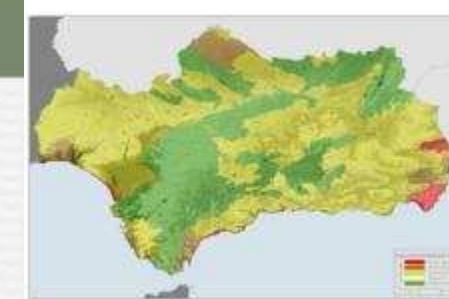


Rediam...

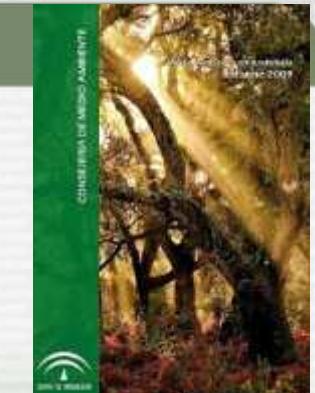
Indicators



WEALTH EVOLUTION



NATURALITY EVOLUTION



DEFINITIONS

The **Wealth index** refers to the number of different types of physiognomic units present in a particular area (a greater wealth more types). Is a quantitative indicator.

The **diversity index** - through Shannon's formula - is the rate at which physiognomic units are distributed. The most diverse areas are those with the highest number of physiognomic units (wealth) and at the same time, present a more balanced distribution within its territory.

Finally, the **natural index** measured by proportion, the weight that natural type of physiognomic units, in relation to the total surface area.

DIVERSITY EVOLUTION



Unión Europea

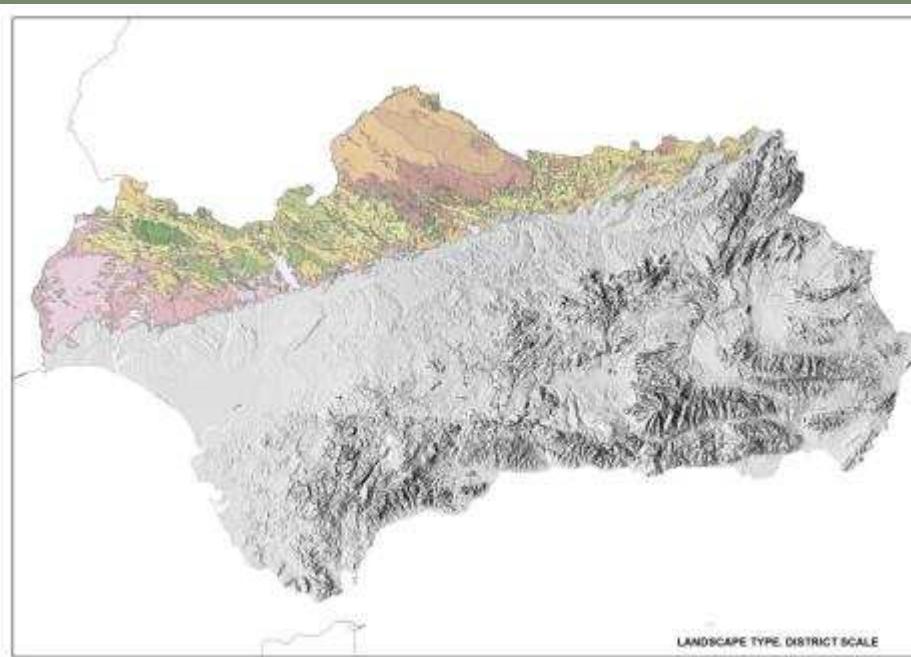
Fondo Europeo de Desarrollo Regional



Andalusian Landscape Inventory



Redium...



ESTRUCTURA DEL SISTEMA

Este sistema se divide en tres tipos principales:

- Áreas de manejo:** Unidades administrativas que agrupan a los propietarios y usuarios de tierra.
- Áreas de manejo intensivo:** Unas 100 mil hectáreas que incluyen bosques, pastizales y cultivos.
- Áreas de manejo extensivo:** Unas 1.500 mil hectáreas que incluyen bosques y pastizales.

TIPOS DE SISTEMAS DE GESTIÓN

Los sistemas de gestión se dividen en tres tipos:

- Sistemas de manejo intensivo:** Se caracterizan por una alta densidad de población y una alta actividad económica.
- Sistemas de manejo extensivo:** Se caracterizan por una baja densidad de población y una baja actividad económica.
- Sistemas de manejo mixto:** Se caracterizan por una mezcla de ambos tipos de sistemas.

TIPOS DE SISTEMAS DE GESTIÓN

Los sistemas de gestión se dividen en tres tipos:

- Sistemas de manejo intensivo:** Se caracterizan por una alta densidad de población y una alta actividad económica.
- Sistemas de manejo extensivo:** Se caracterizan por una baja densidad de población y una baja actividad económica.
- Sistemas de manejo mixto:** Se caracterizan por una mezcla de ambos tipos de sistemas.



Rediam...

Photolibrary

✓ Specific landscape photos
Metadating



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...



Publications

The background image shows a panoramic view of a rural landscape with green hills and fields, likely the Guadiamar valley. Four directional arrows (N, S, E, W) are overlaid on the image.

Publications:

- MANUAL PARA LA DIVERSIFICACIÓN DEL PAÍSAJE AGRARIO** (Cover image shows a collage of agricultural landscapes).
- Paisajes de Andalucía** (Cover image shows a landscape with palm trees and mountains).
- Paisaje Cultural y Estructura Socioeconómica**
Valor ambiental y demanda turística en un territorio mediterráneo (Cover image shows a landscape with mountains and water).
- CONSEJERÍA DE MEDIO AMBIENTE** (Logo)
- LA RESTAURACIÓN ECOLÓGICA DEL RÍO GUADIAMAR Y EL PROYECTO DEL CORREDOR VERDE**
LA HISTORIA DE UN PAÍSAJE ENERGÉTICO (Cover image shows a landscape with a river and people).
- Mapa interactivo paisajes de Andalucía** (Cover image shows a map of the Andalusian landscapes).
- De la nieve al trigo**
Un recorrido sonoro y musical por los paisajes de Andalucía (Cover image shows a snowy mountain and a wheat field).
- Paisajes de Andalucía** (Cover image shows a sunset over a landscape).
- DEPARTAMENTO DE MEDIO AMBIENTE DE LA JUNTA DE ANDALUCÍA** (Cover image shows a landscape with a road and mountains).
- INTERACCIONES** (Cover image shows a landscape with a road and mountains).
- VALORES SOCIALES** (Cover image shows a landscape with a road and mountains).
- CONSERVACIÓN** (Cover image shows a landscape with a road and mountains).
- CONTRIBUCIÓN AL CLIMA** (Cover image shows a landscape with a road and mountains).
- CONTRIBUCIÓN A LA BIODIVERSIDAD** (Cover image shows a landscape with a road and mountains).
- CONTRIBUCIÓN A LA AGROALIMENTARIA** (Cover image shows a landscape with a road and mountains).
- CONTRIBUCIÓN A LA INDUSTRIALIZACIÓN** (Cover image shows a landscape with a road and mountains).
- CONTRIBUCIÓN A LA CULTURA** (Cover image shows a landscape with a road and mountains).
- CONTRIBUCIÓN A LA SOCIEDAD** (Cover image shows a landscape with a road and mountains).



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

INDEX

1.- Landscape Treatment in the Environmental Information Network of Andalusia (REDIAM)

2.- Multi-parametric Visibility Model – Concepts

3.- Multi-parametric Visibility Model – Practice



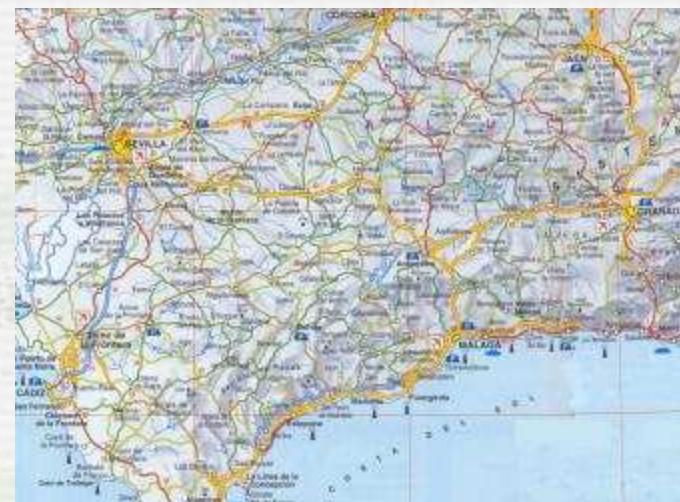
Redium...

Concepts – Parameters definition.

Only two sources:

1.- Digital Elevation Model (DEM)

2.- Local accessibility model

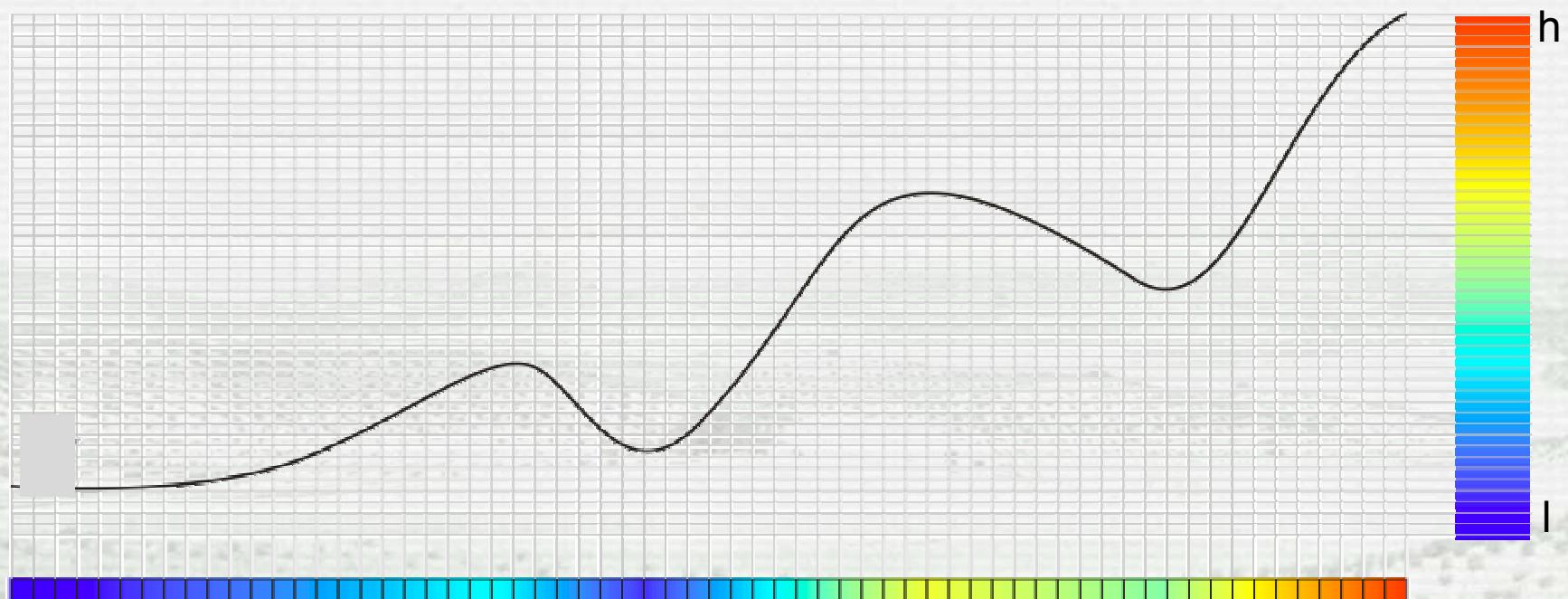




Rediam...

Concepts – Parameters definition.

1.- Height





Unión Europea

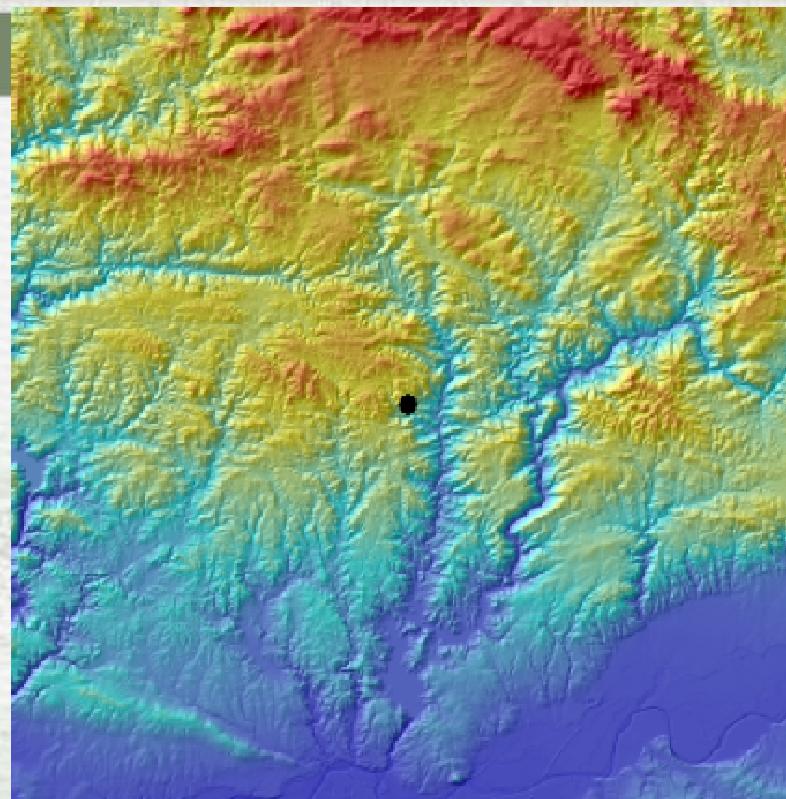
Fondo Europeo
de Desarrollo Regional



Rediam...

Concepts – Parameters definition.

1.- Height





Unión Europea

Fondo Europeo
de Desarrollo Regional



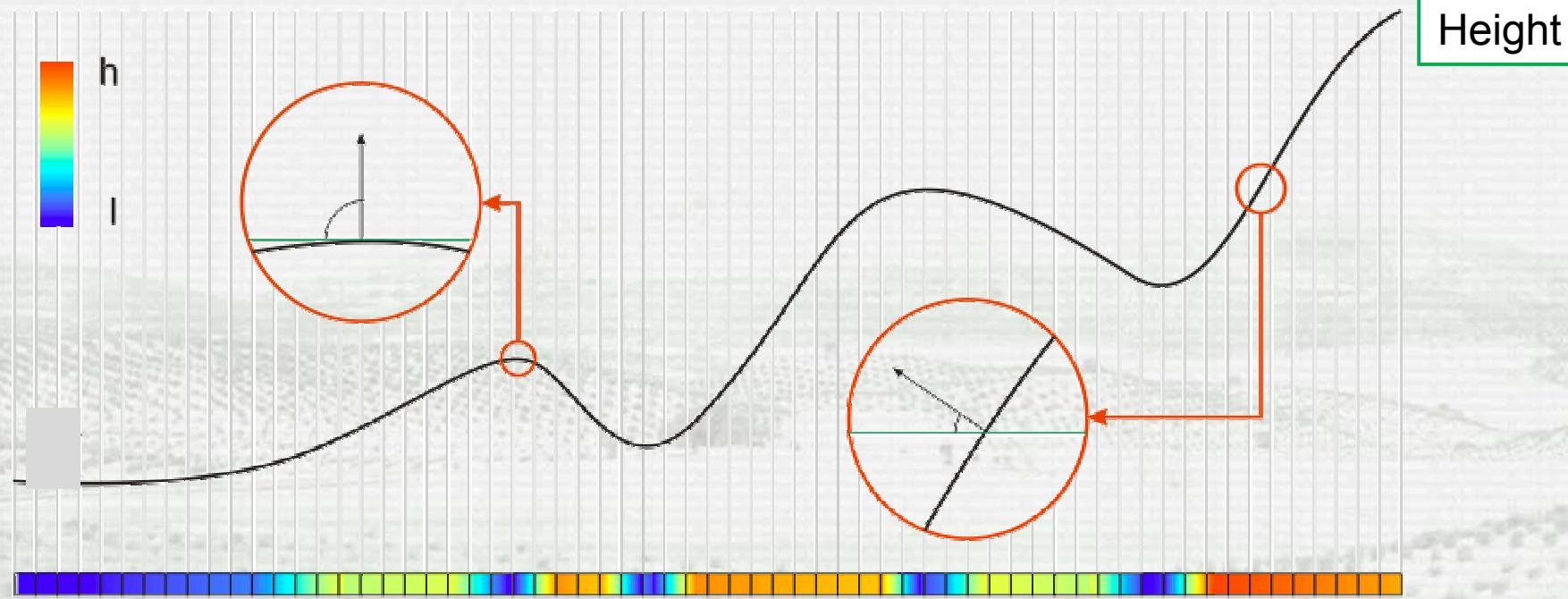
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Parameters definition.

2.- Slope & aspect





Unión Europea

Fondo Europeo
de Desarrollo Regional



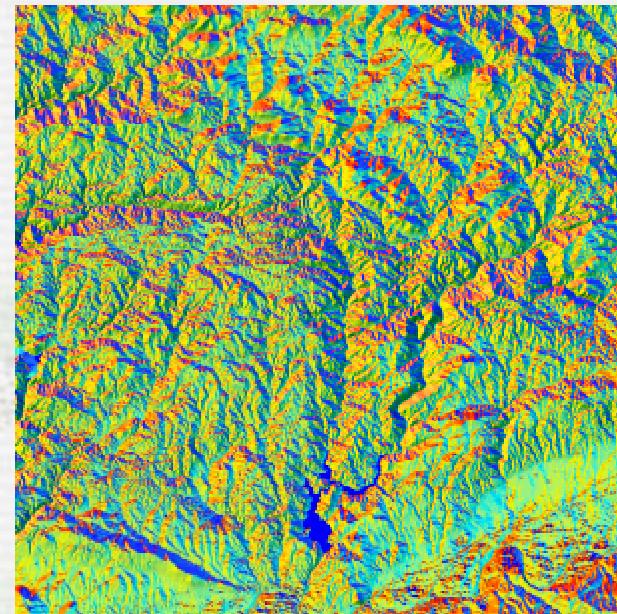
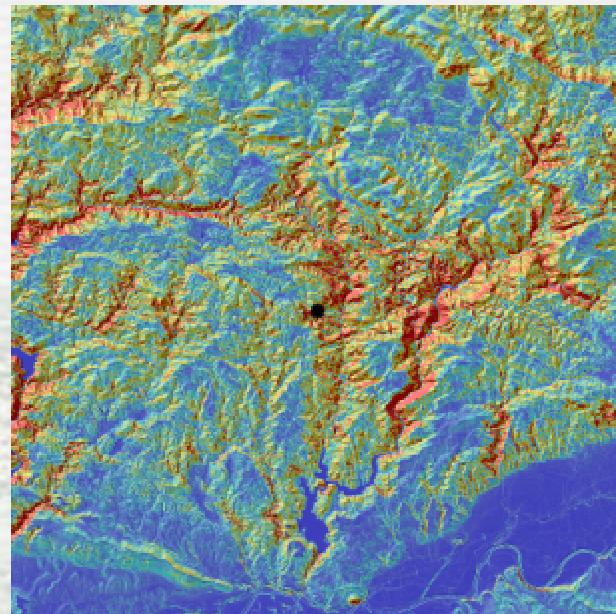
Rediam...



Concepts – Parameters definition.

2.- Slope & aspect

Height



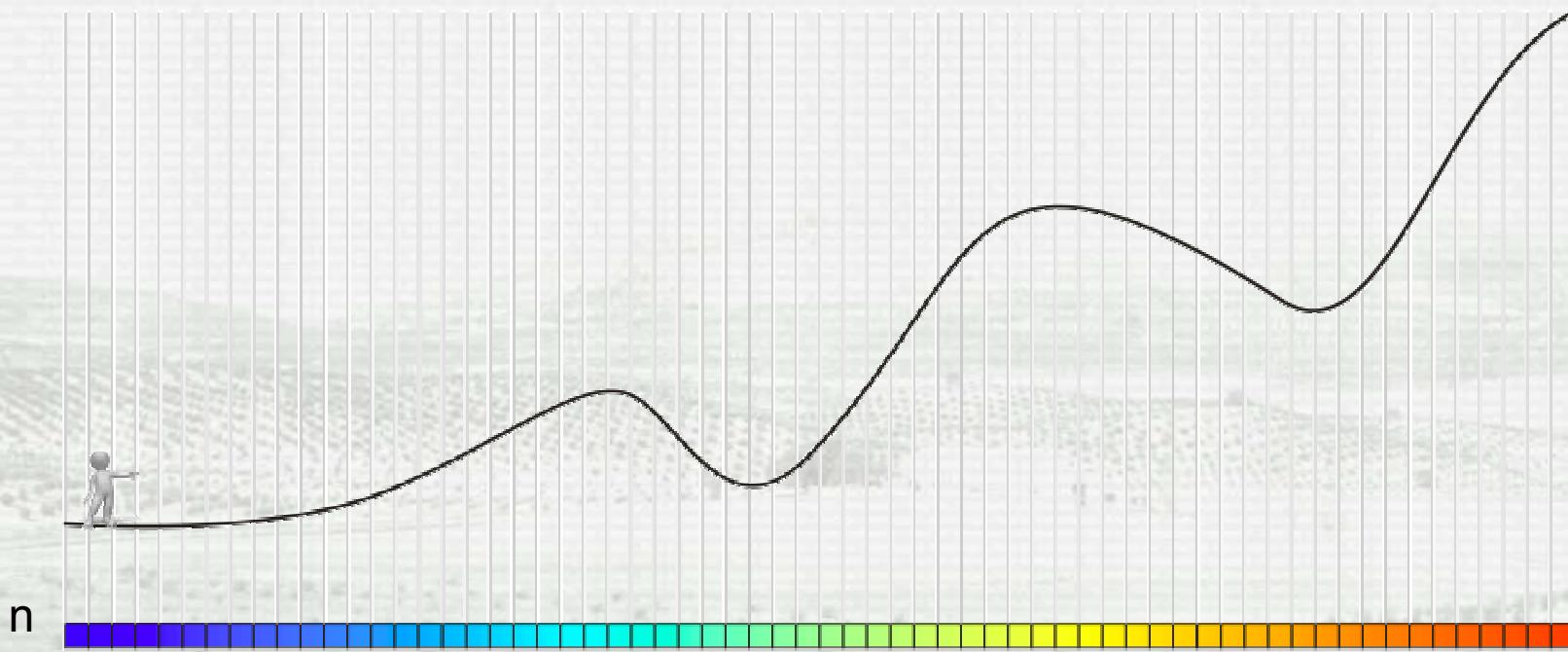
W
S
E
N
flat

Concepts – Parameters definition.

3.- Distance

Height

S&A





Unión Europea

Fondo Europeo
de Desarrollo Regional



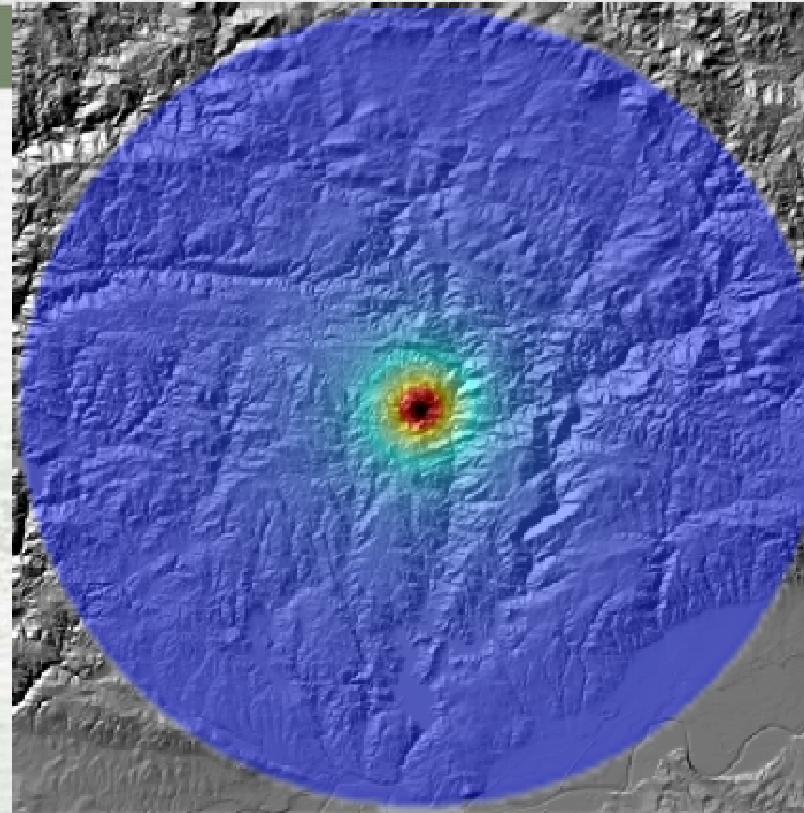
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Parameters definition.

3.- Distance



Height

S&A



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...



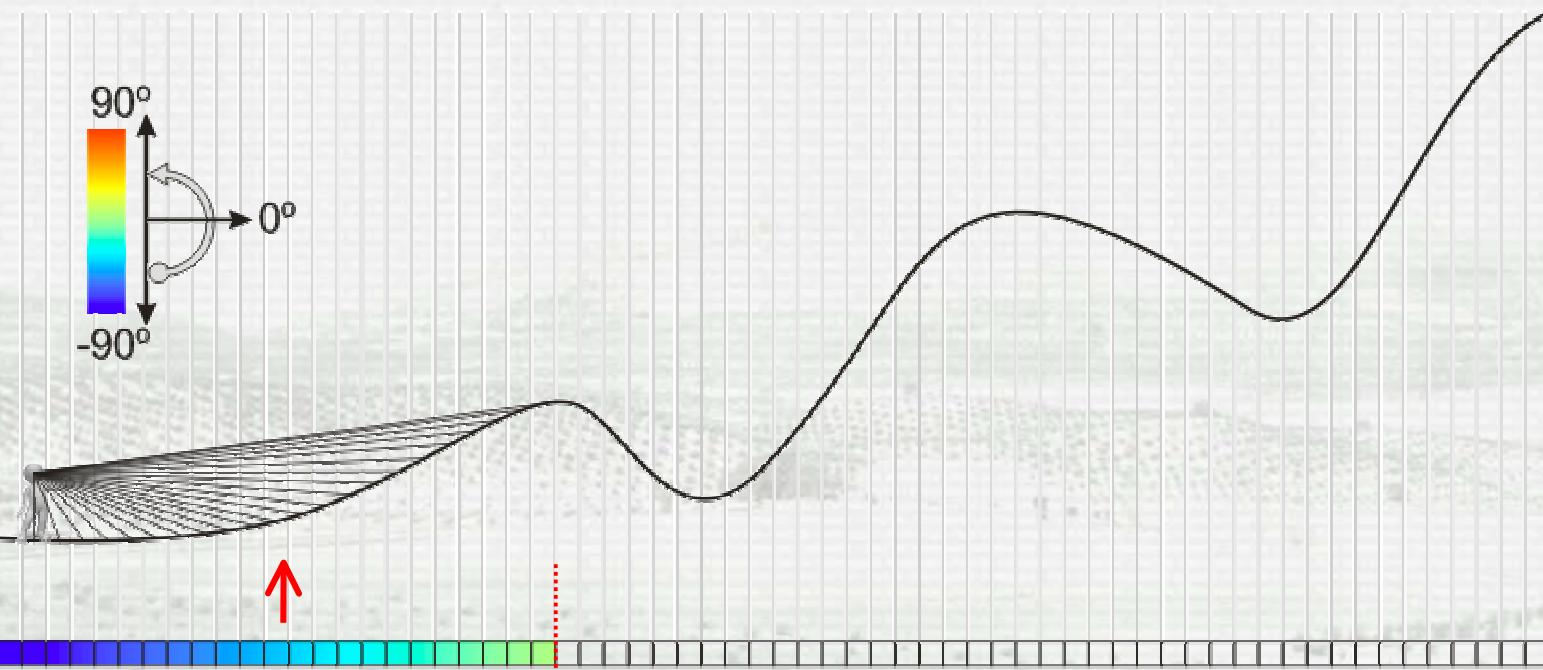
Concepts – Parameters definition.

4.- Altitude (as an angle)

Height

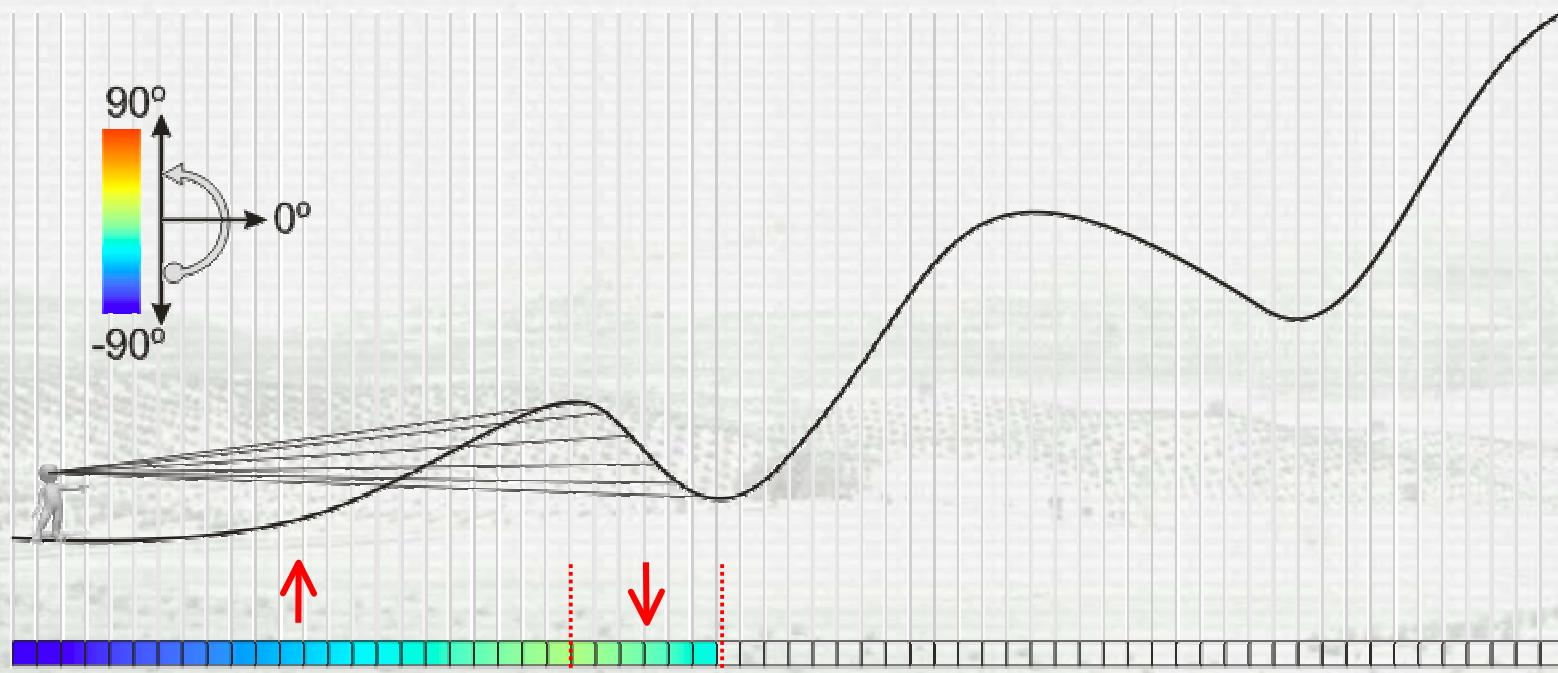
S&A

Dist



Concepts – Parameters definition.

4.- Altitude (as an angle)





Unión Europea

Fondo Europeo
de Desarrollo Regional



JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

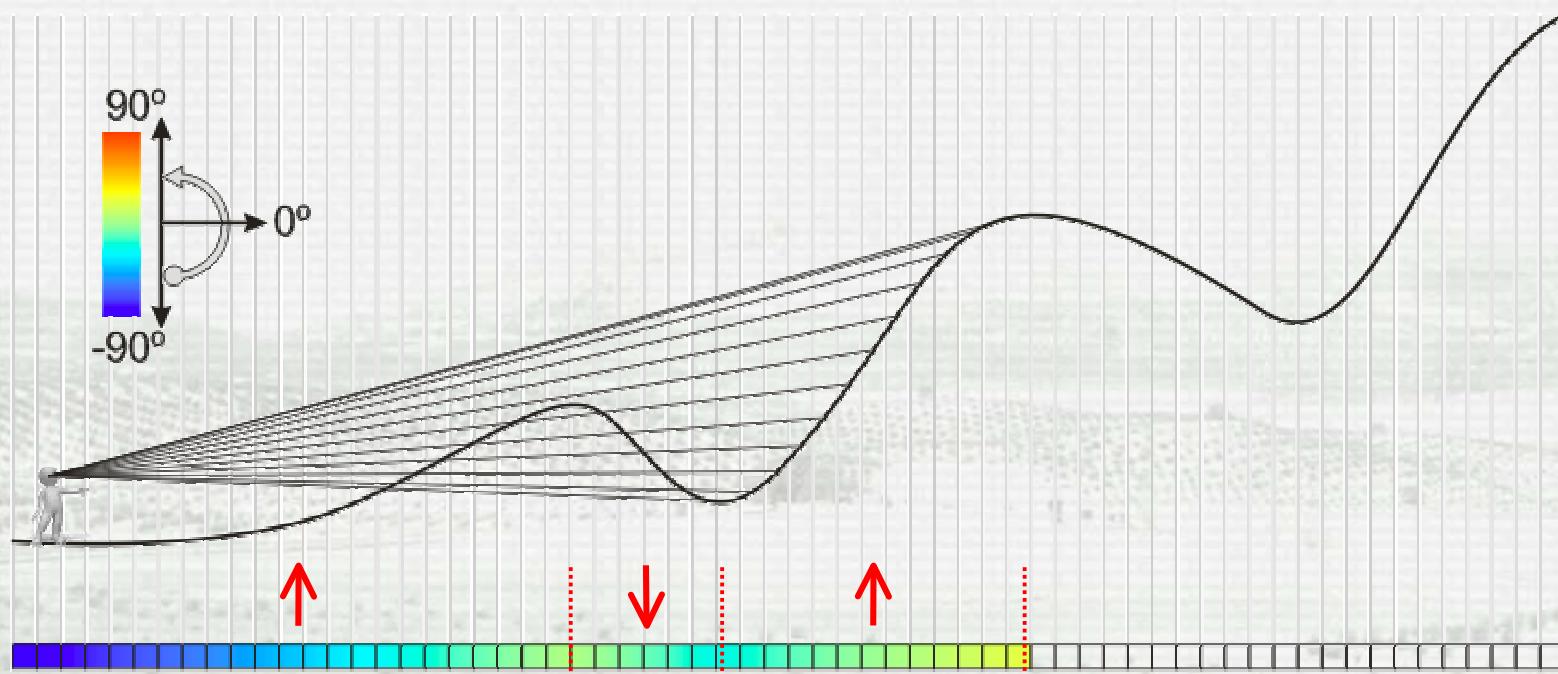
Concepts – Parameters definition.

4.- Altitude (as an angle)

Height

S&A

Dist





Unión Europea

Fondo Europeo
de Desarrollo Regional



JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

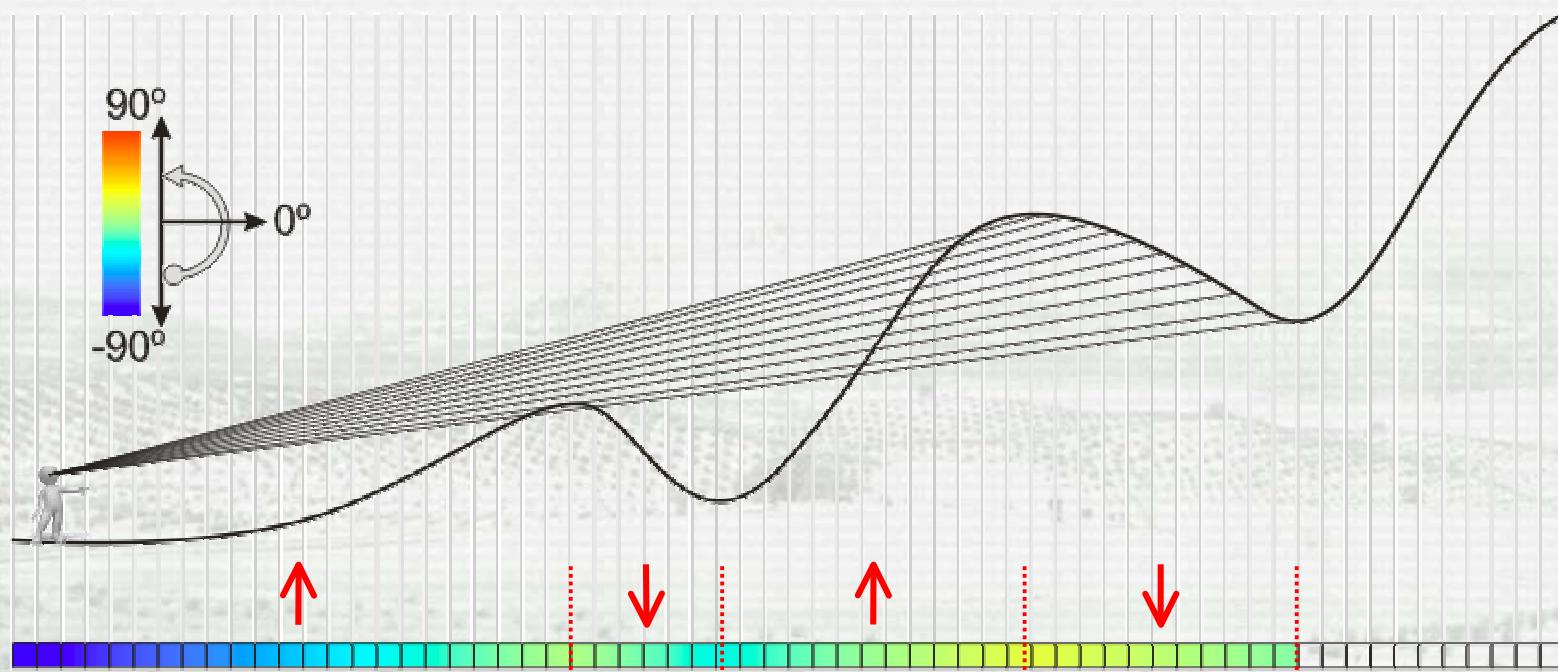
Concepts – Parameters definition.

4.- Altitude (as an angle)

Height

S&A

Dist



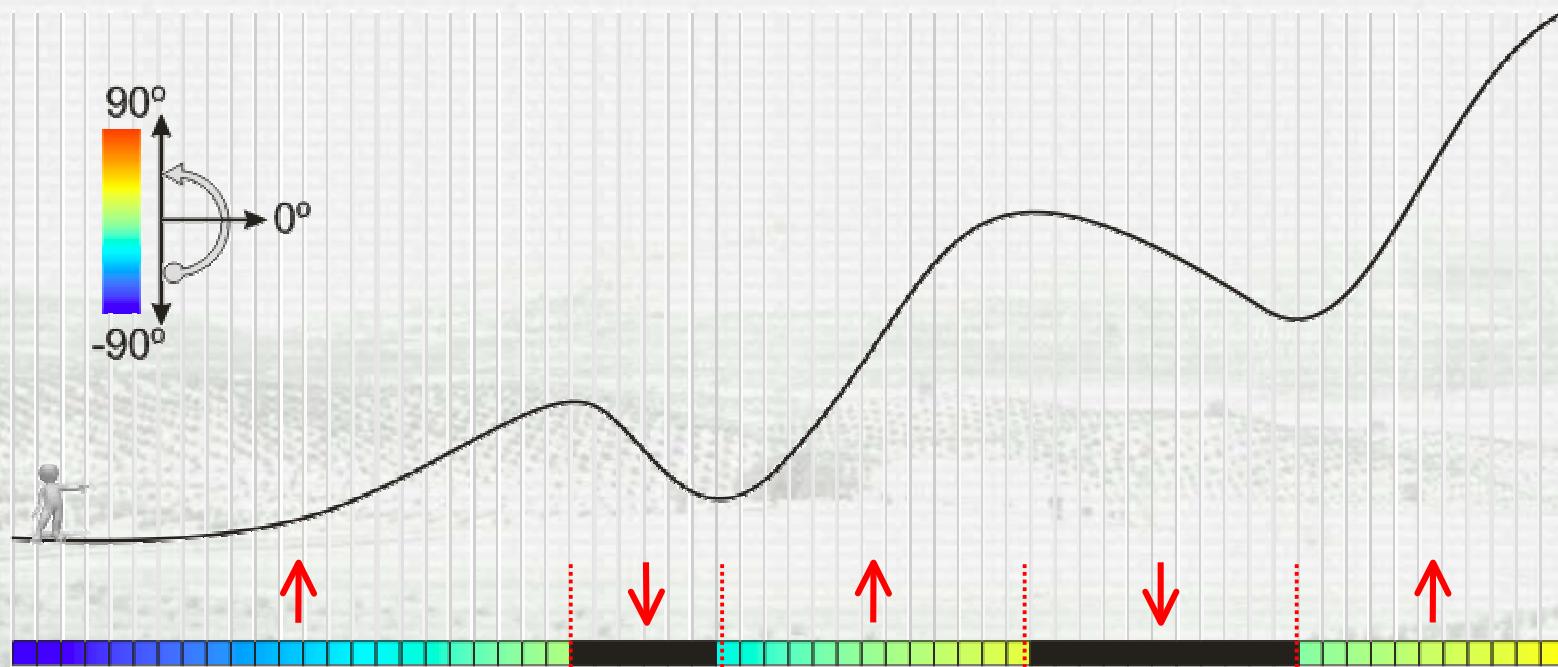
Concepts – Parameters definition.

4.- Altitude (as an angle)



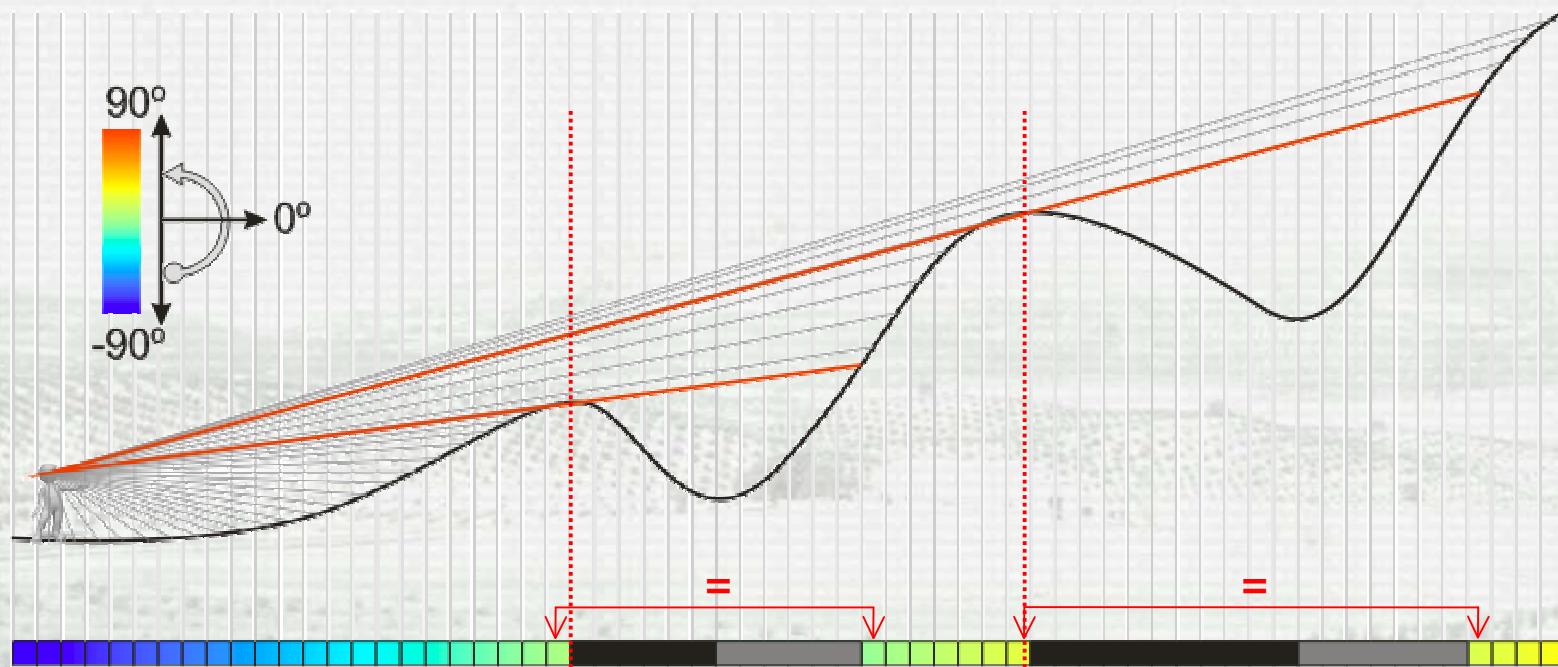
Concepts – Parameters definition.

5.- Visibility



Concepts – Parameters definition.

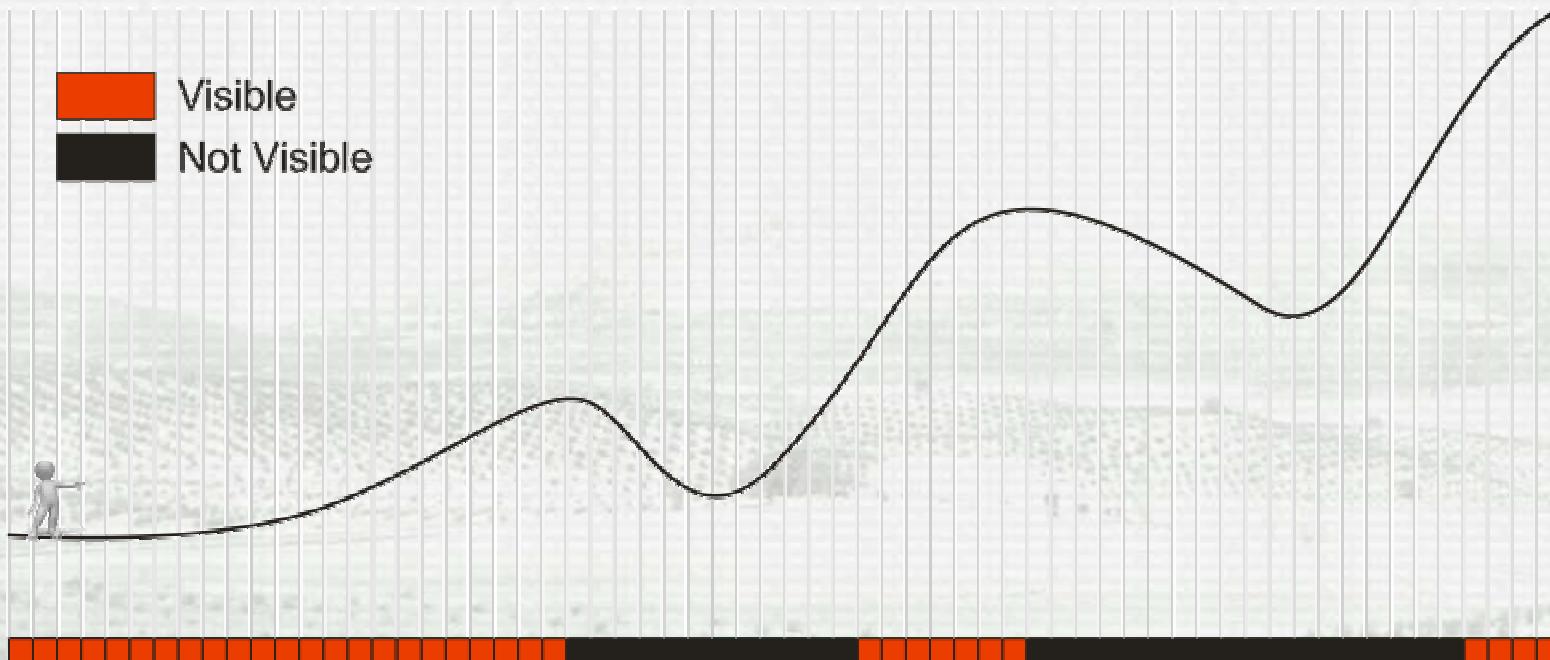
5.- Visibility



Concepts – Parameters definition.

5.- Visibility

Visible
Not Visible





Unión Europea

Fondo Europeo
de Desarrollo Regional



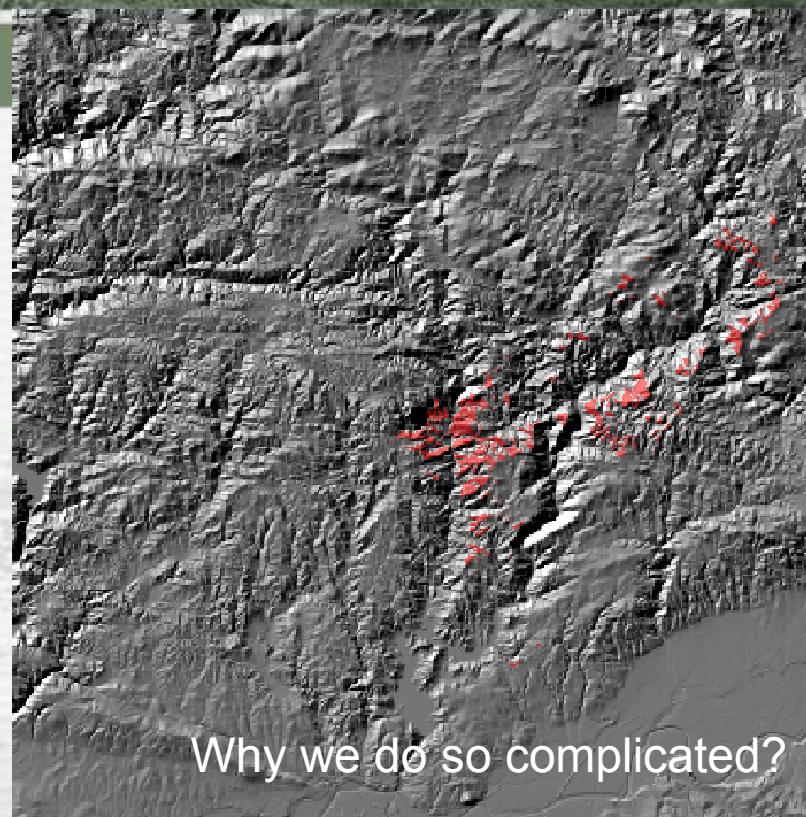
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Parameters definition.

5.- Visibility



Height

S&A

Dist

AI&Az

Why we do so complicated?

Concepts – Parameters definition.

6.- Horizon points

- Horizon
- Not Horizon

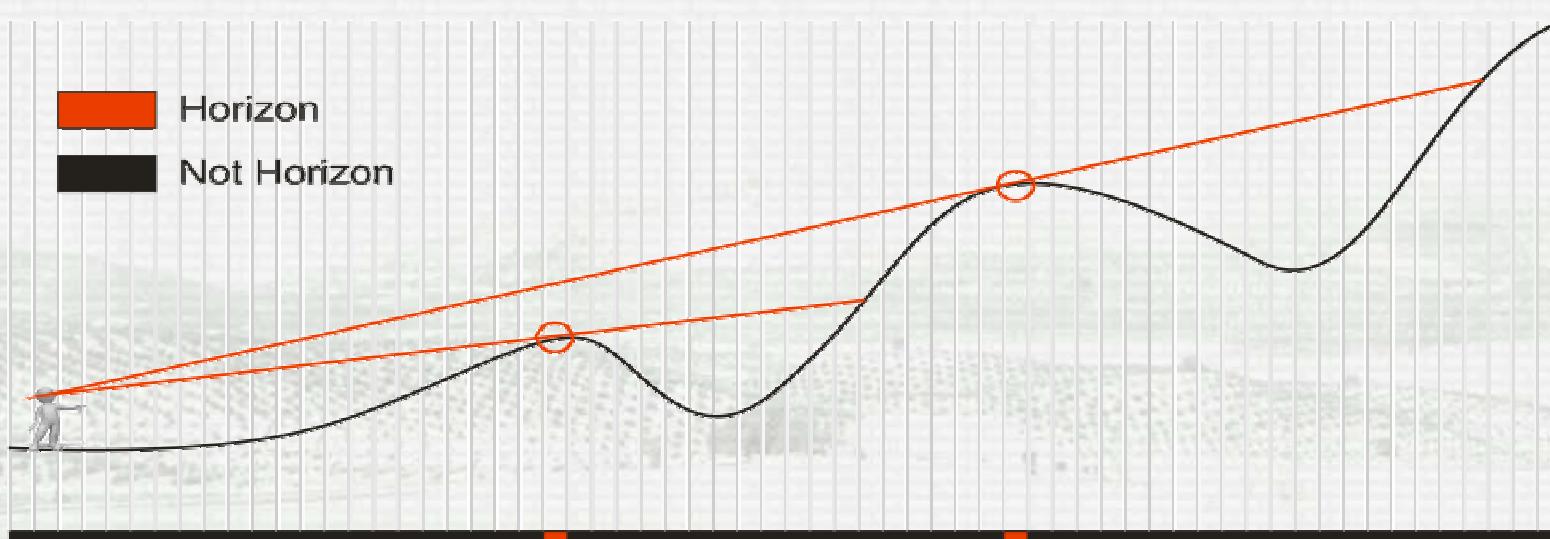
Height

S&A

Dist

Al&Az

Vis



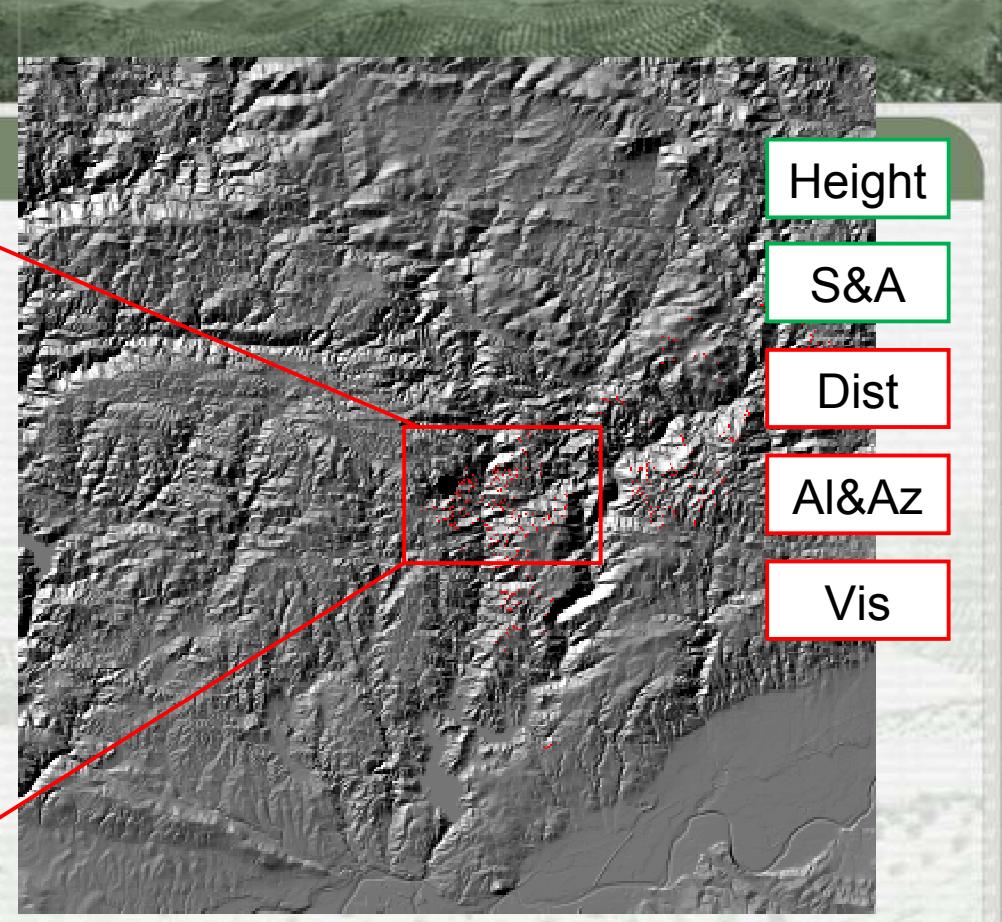
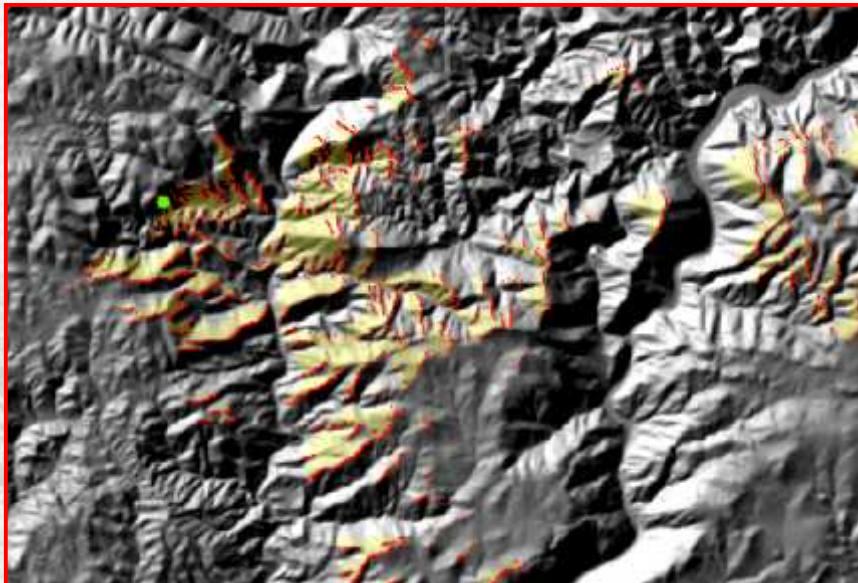


Unión Europea
Fondo Europeo
de Desarrollo Regional



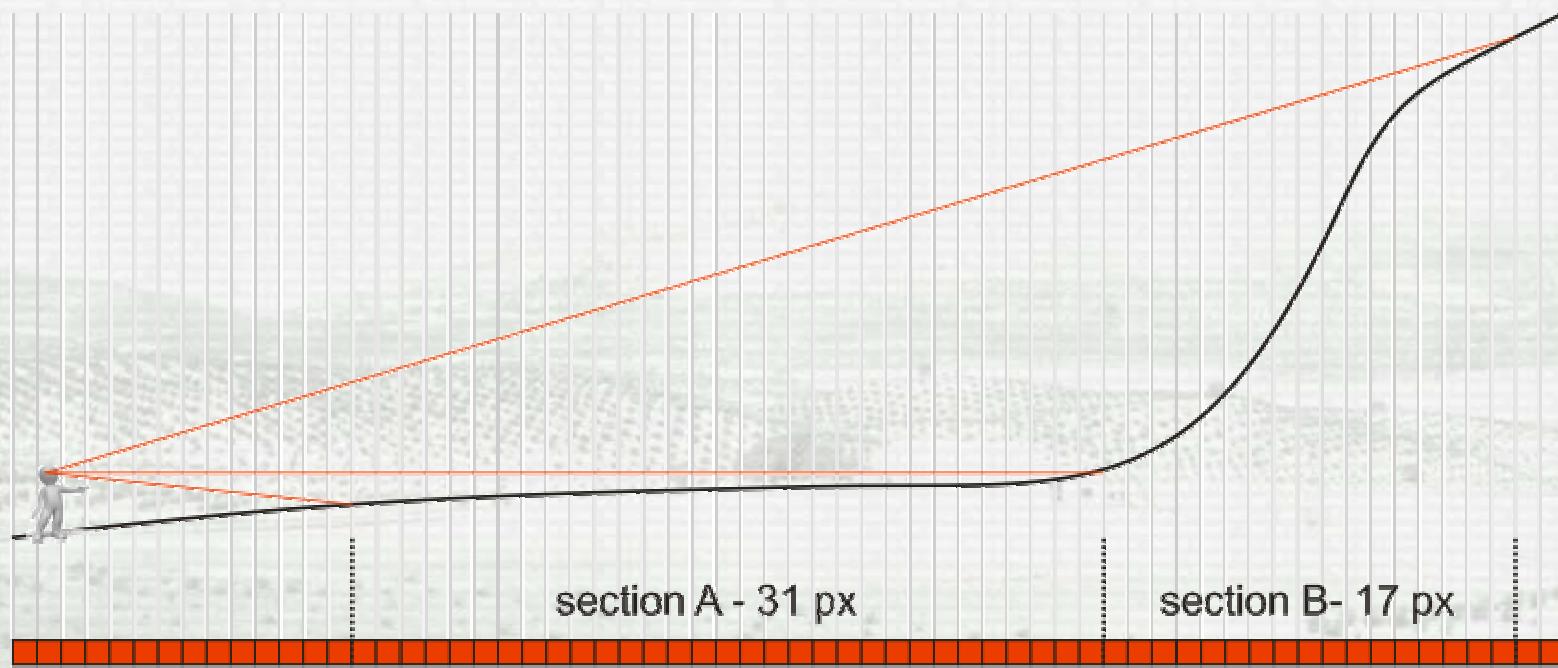
Concepts – Parameters definition.

6.- Horizon points



Concepts – Parameters definition.

7.- Visual Projection (over visible points)





Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...



Concepts – Parameters definition.

7.- Visual Projection (over visible points)



Height



S&A

Dist

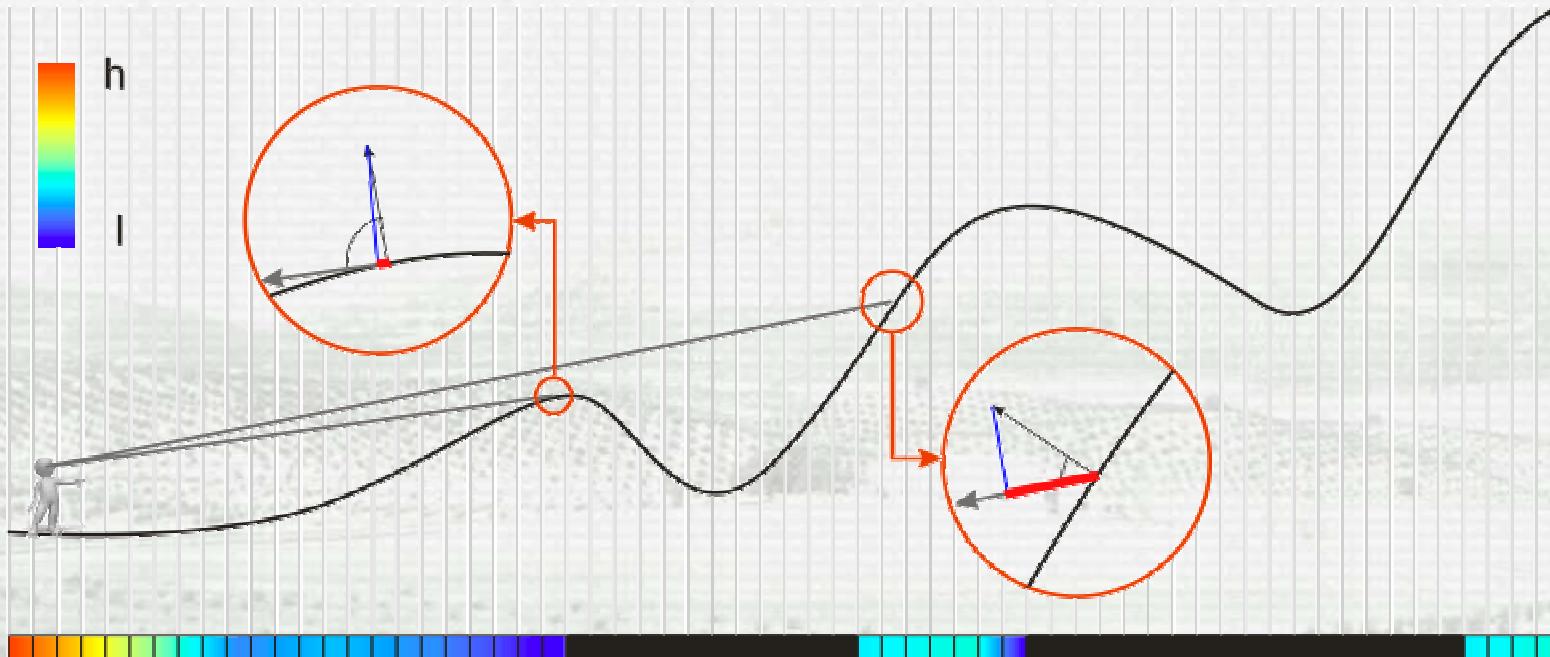
AI&Az

Vis

Hrz

Concepts – Parameters definition.

7.- Visual Projection (over visible points)





Unión Europea

Fondo Europeo
de Desarrollo Regional



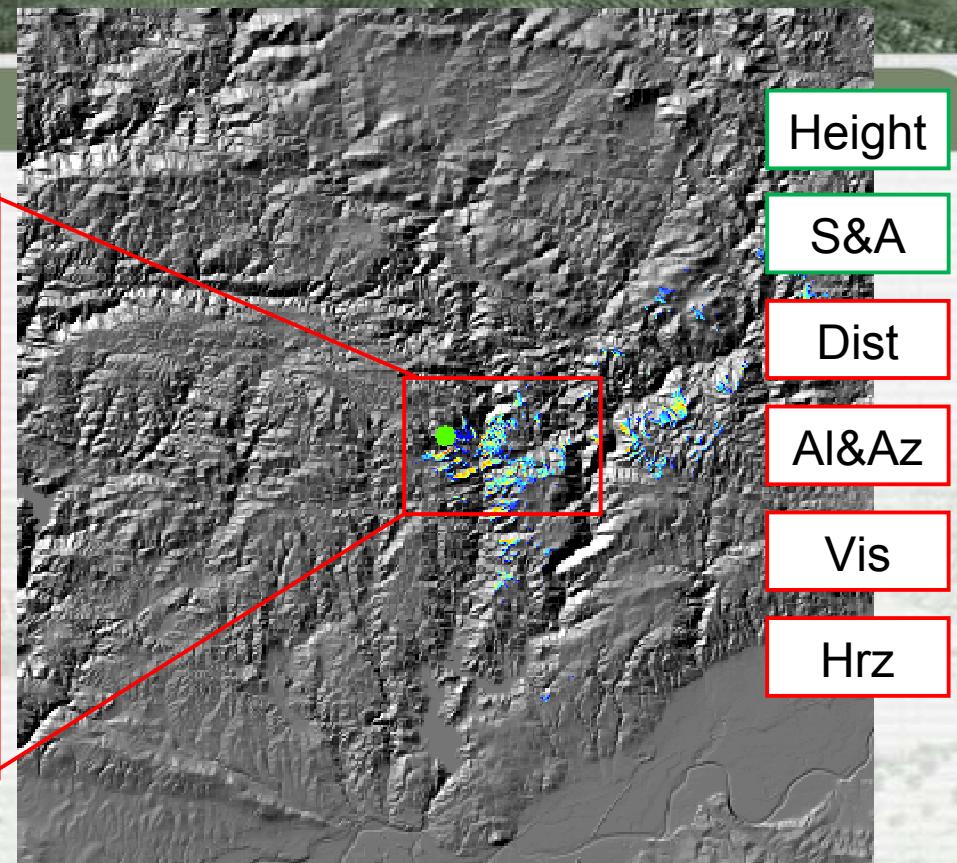
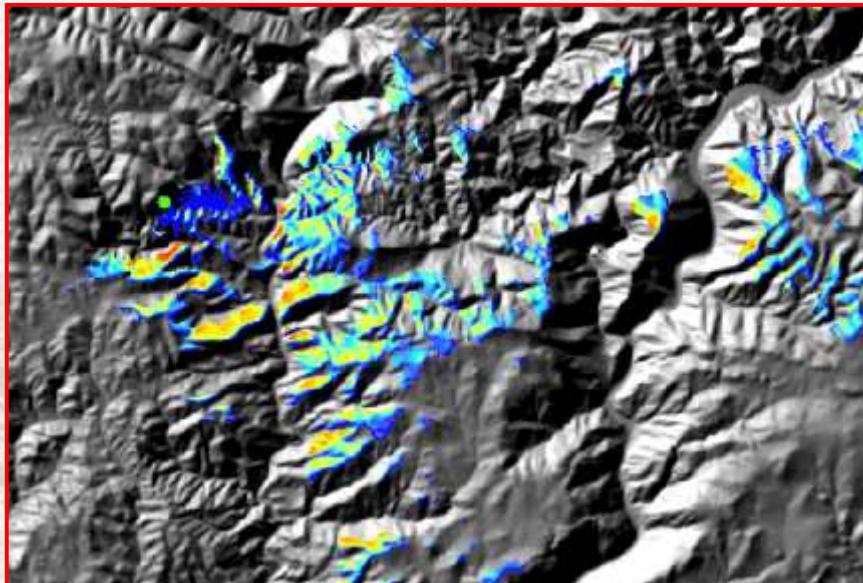
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

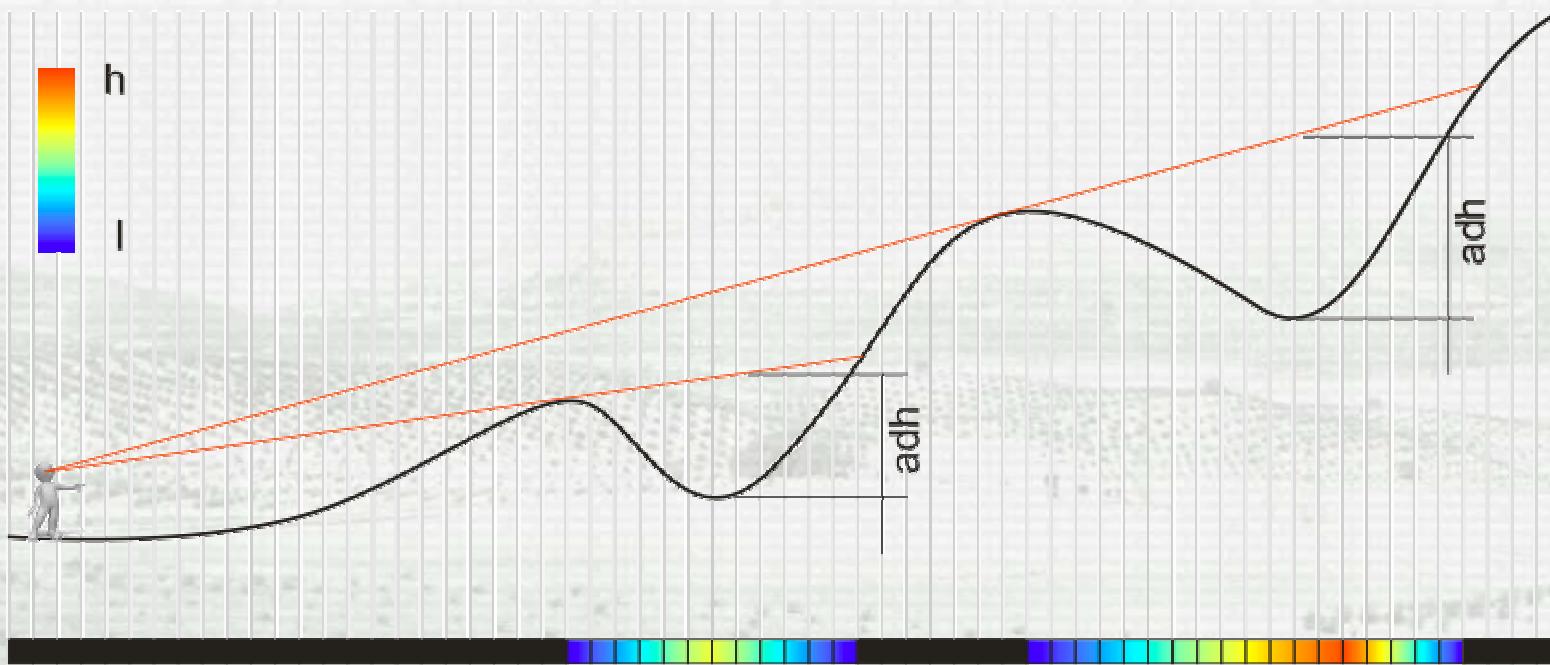
Concepts – Parameters definition.

7.- Visual Projection



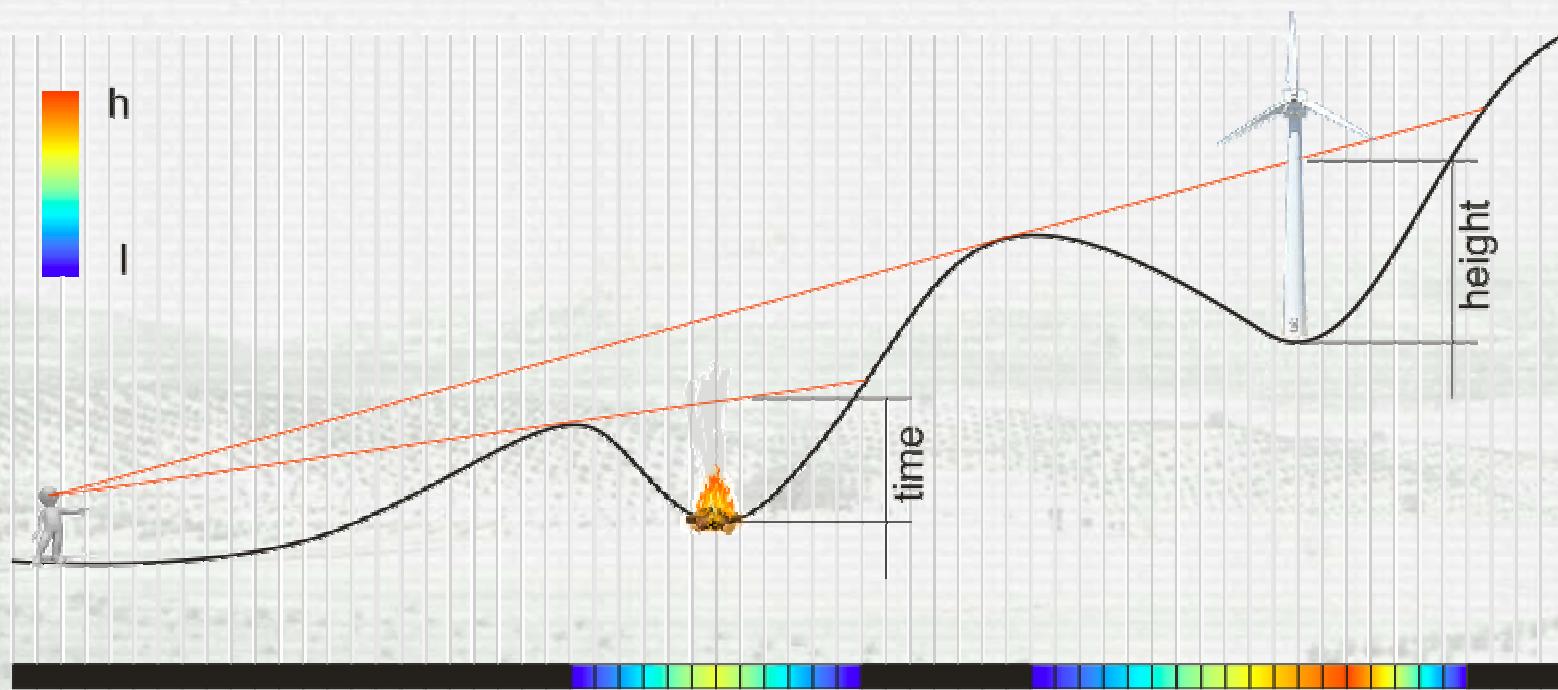
Concepts – Parameters definition.

8.- Additional height (over non-visible points)



Concepts – Parameters definition.

8.- Additional height (over non-visible points)





Unión Europea

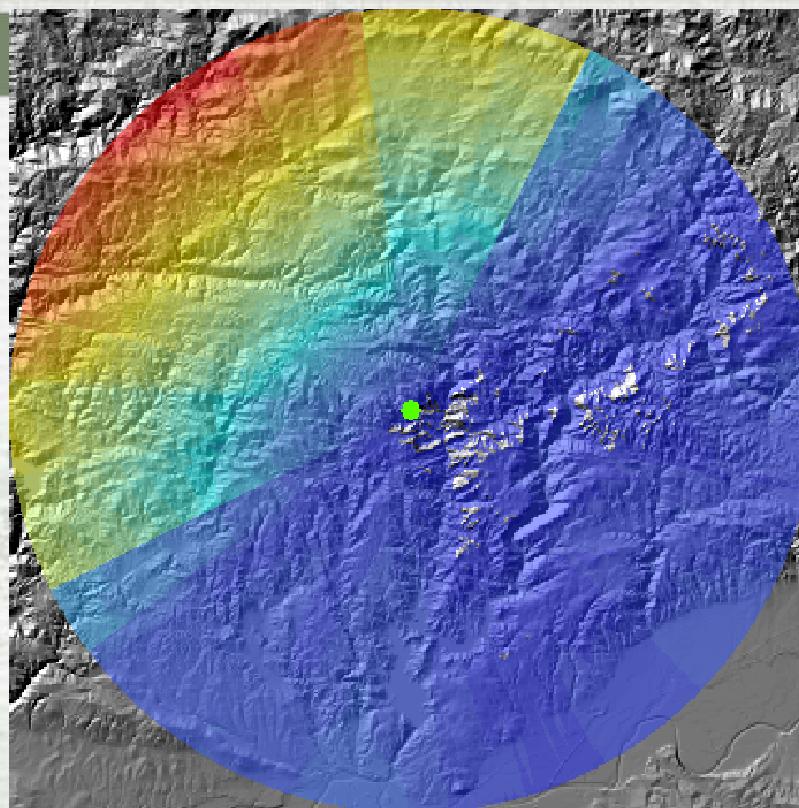
Fondo Europeo
de Desarrollo Regional



Rediam...

Concepts – Parameters definition.

8.- Additional height



Height

S&A

Dist

AI&Az

Vis

Hz

VP



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...



Concepts – Parameters definition.

9.- Tower height (over non-visible points)

Height

S&A

Dist

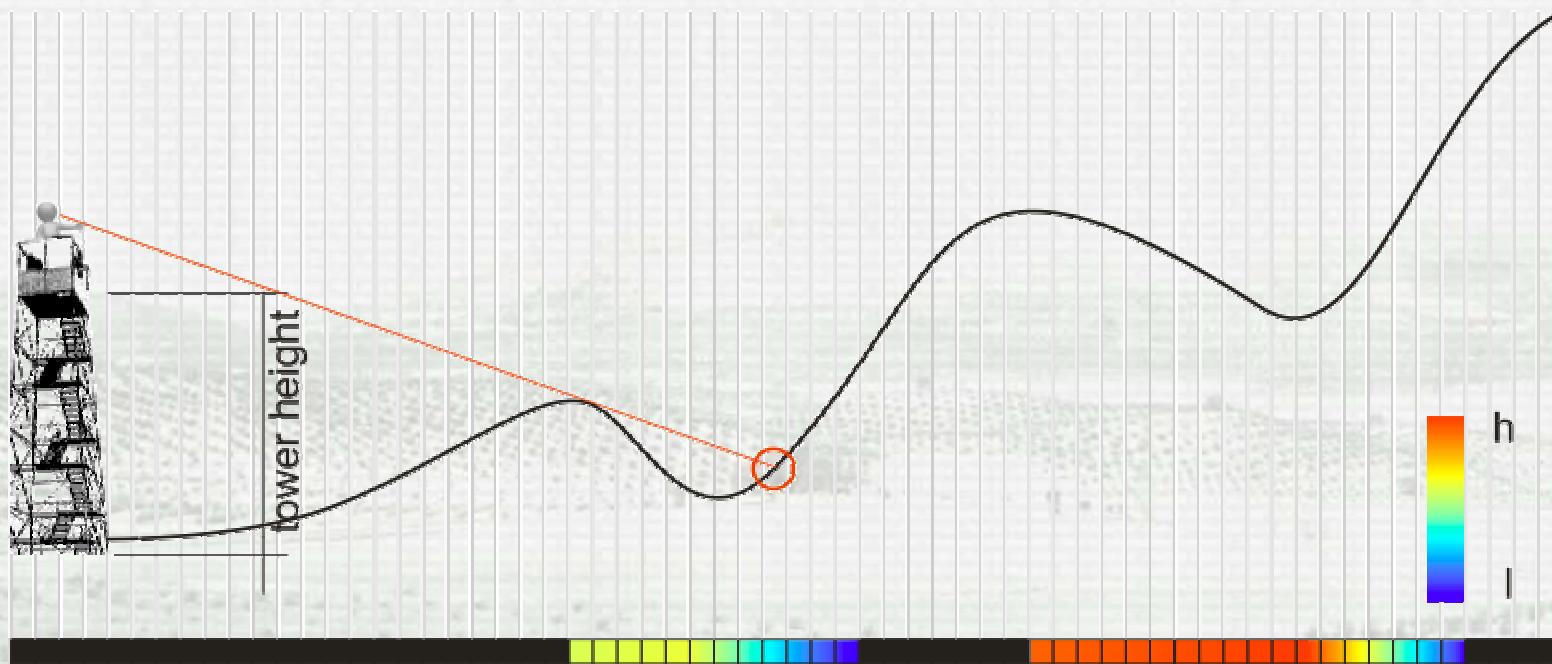
AI&Az

Vis

Hz

VP

AH





Unión Europea

Fondo Europeo
de Desarrollo Regional



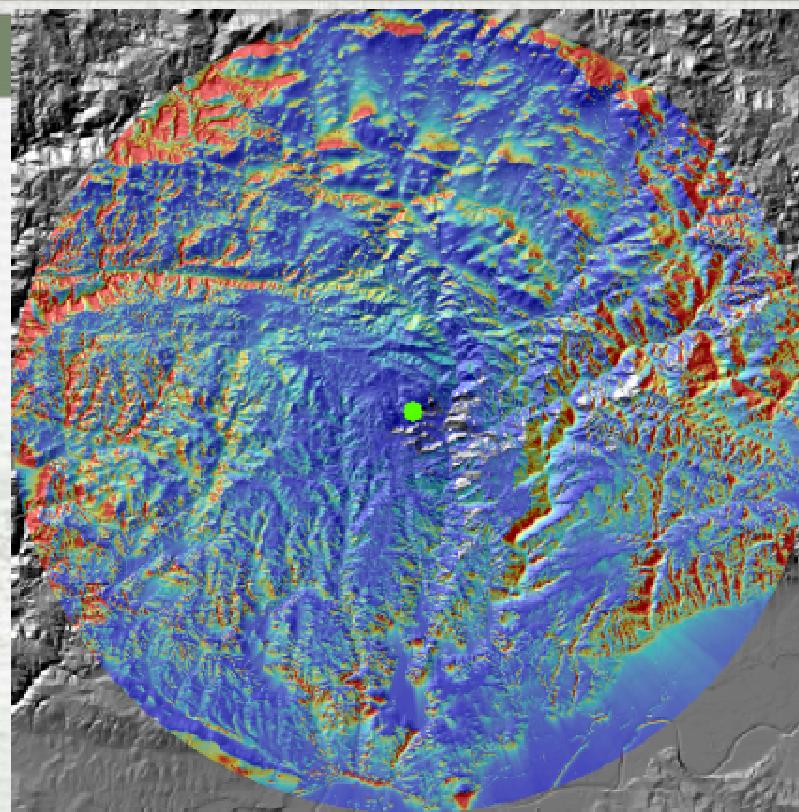
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Parameters definition.

9.- Tower height



Height

S&A

Dist

AI&Az

Vis

Hz

VP

AH

TH



Unión Europea

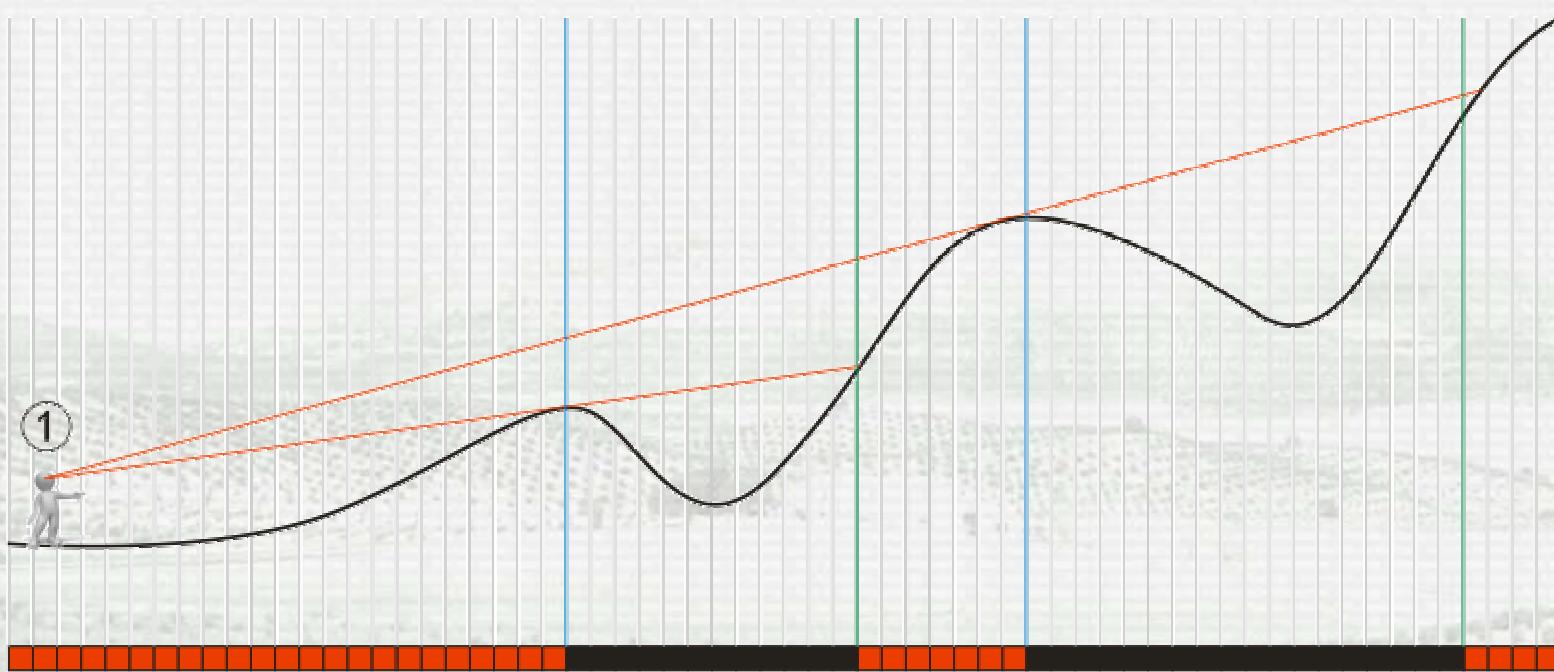
Fondo Europeo
de Desarrollo Regional



Rediam...



Concepts – Ubiquity





Unión Europea

Fondo Europeo
de Desarrollo Regional

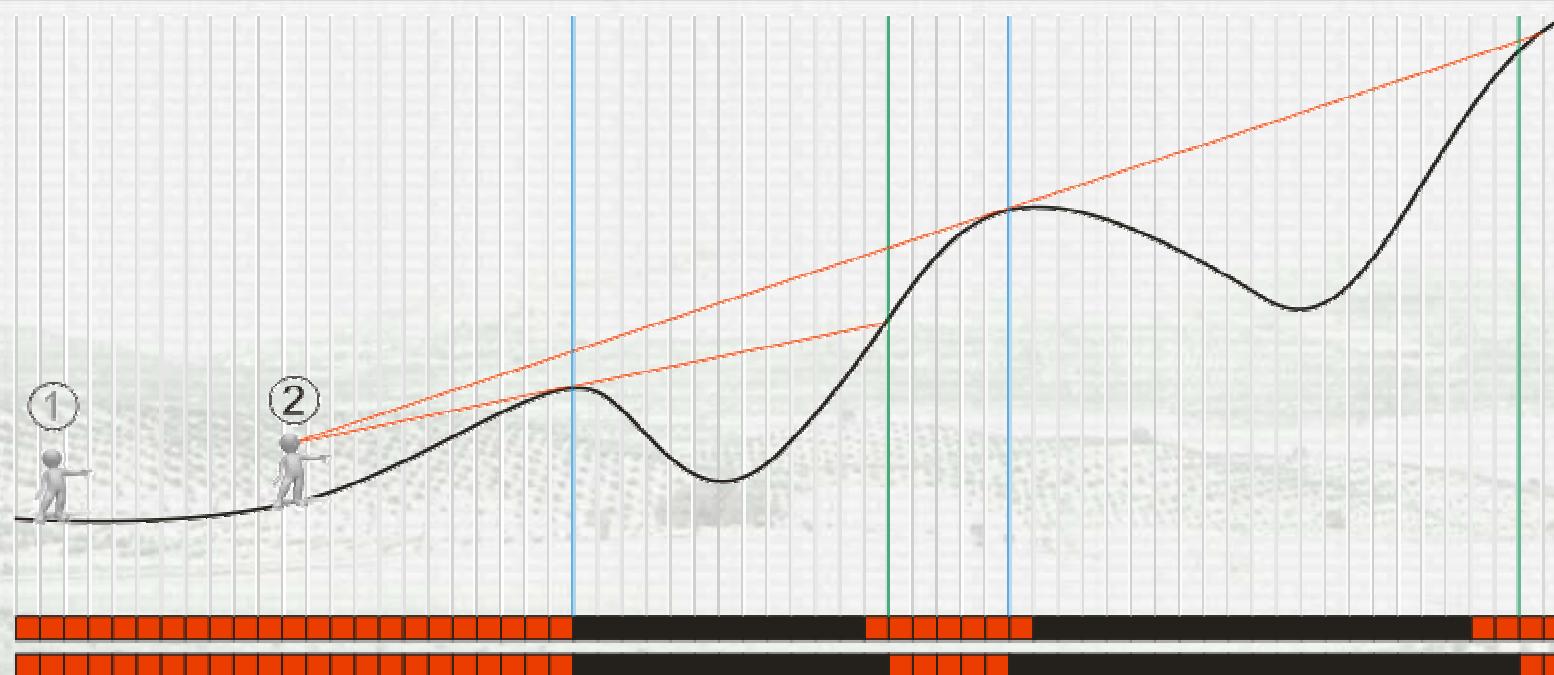


JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity





Unión Europea

Fondo Europeo
de Desarrollo Regional

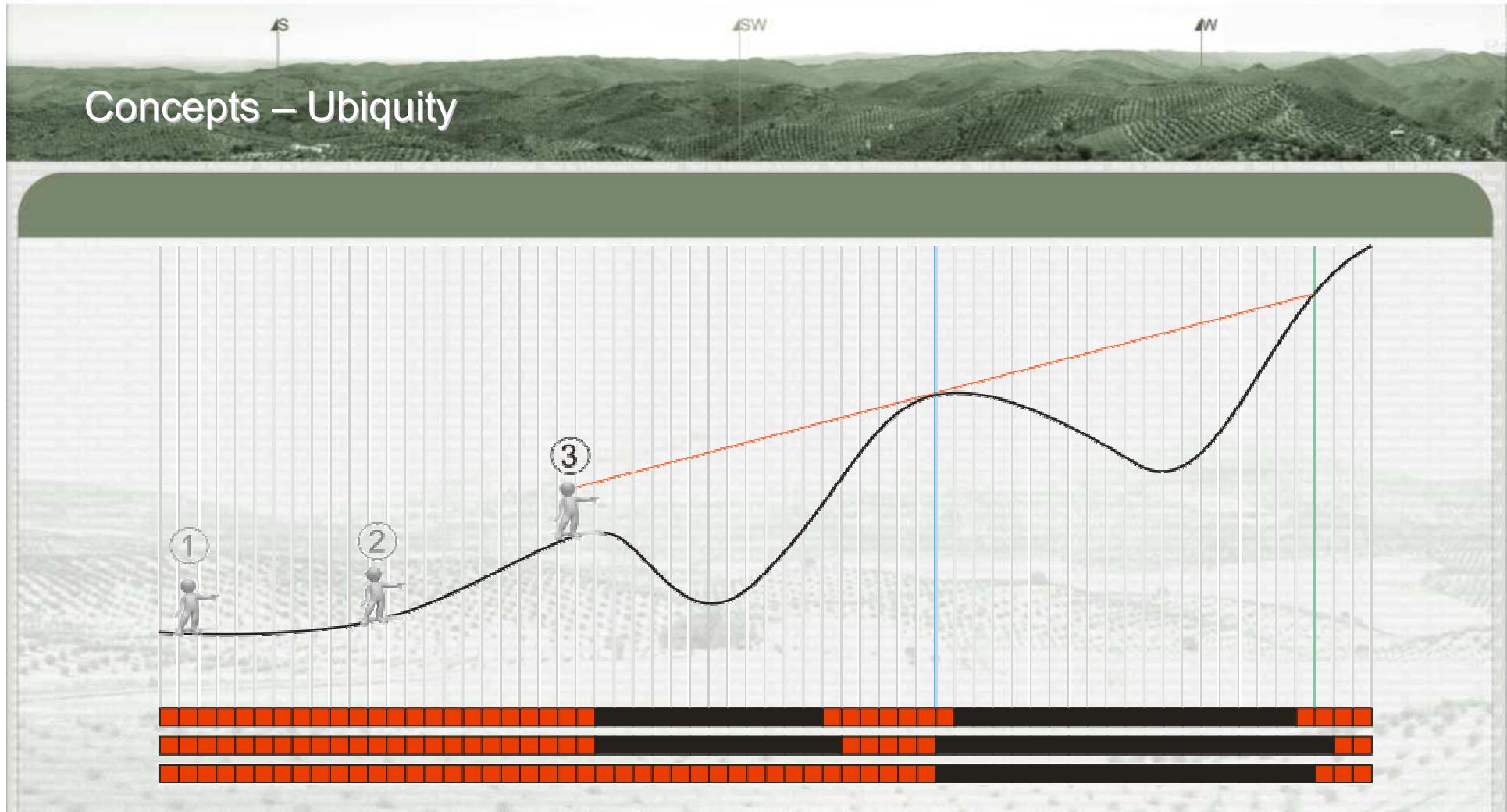


JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity





Unión Europea

Fondo Europeo
de Desarrollo Regional

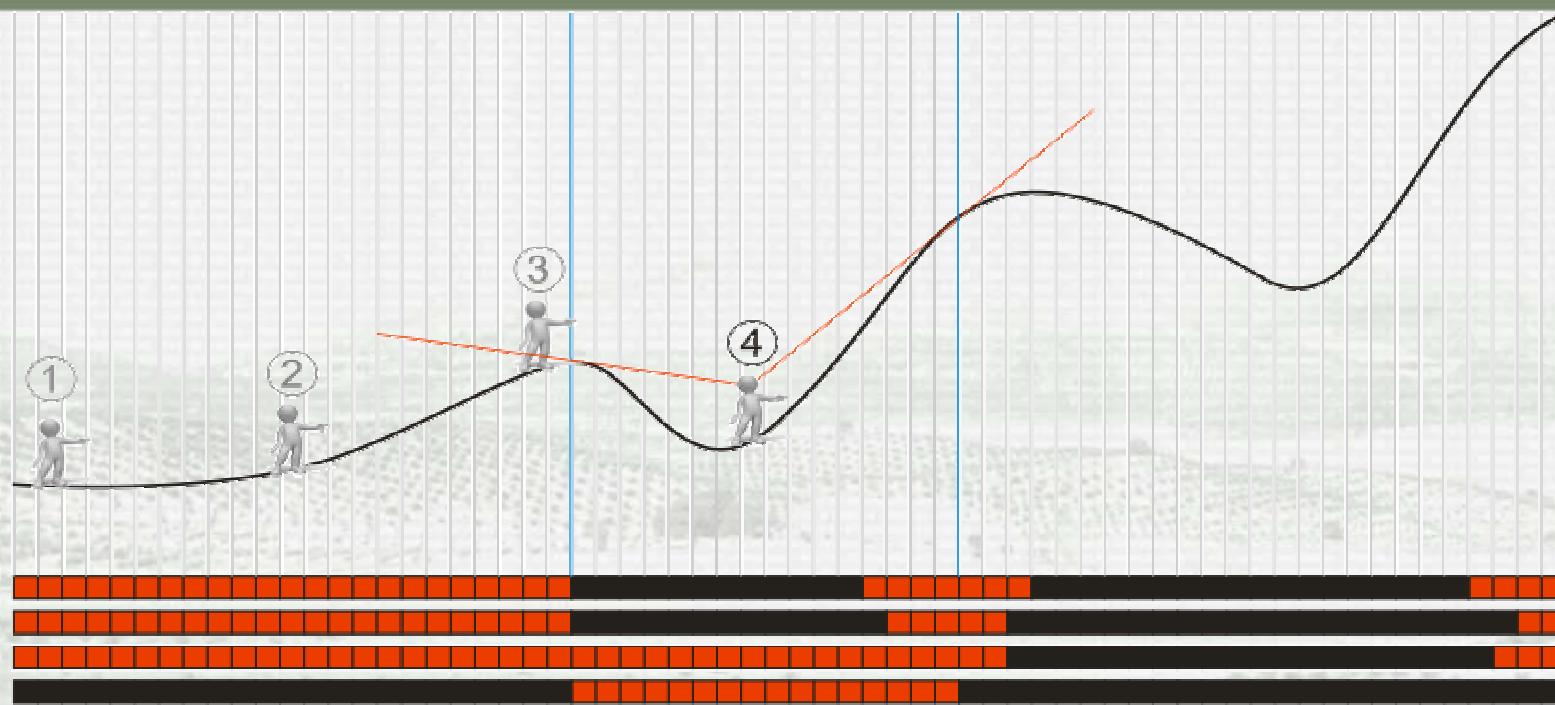


JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity





Unión Europea

Fondo Europeo
de Desarrollo Regional

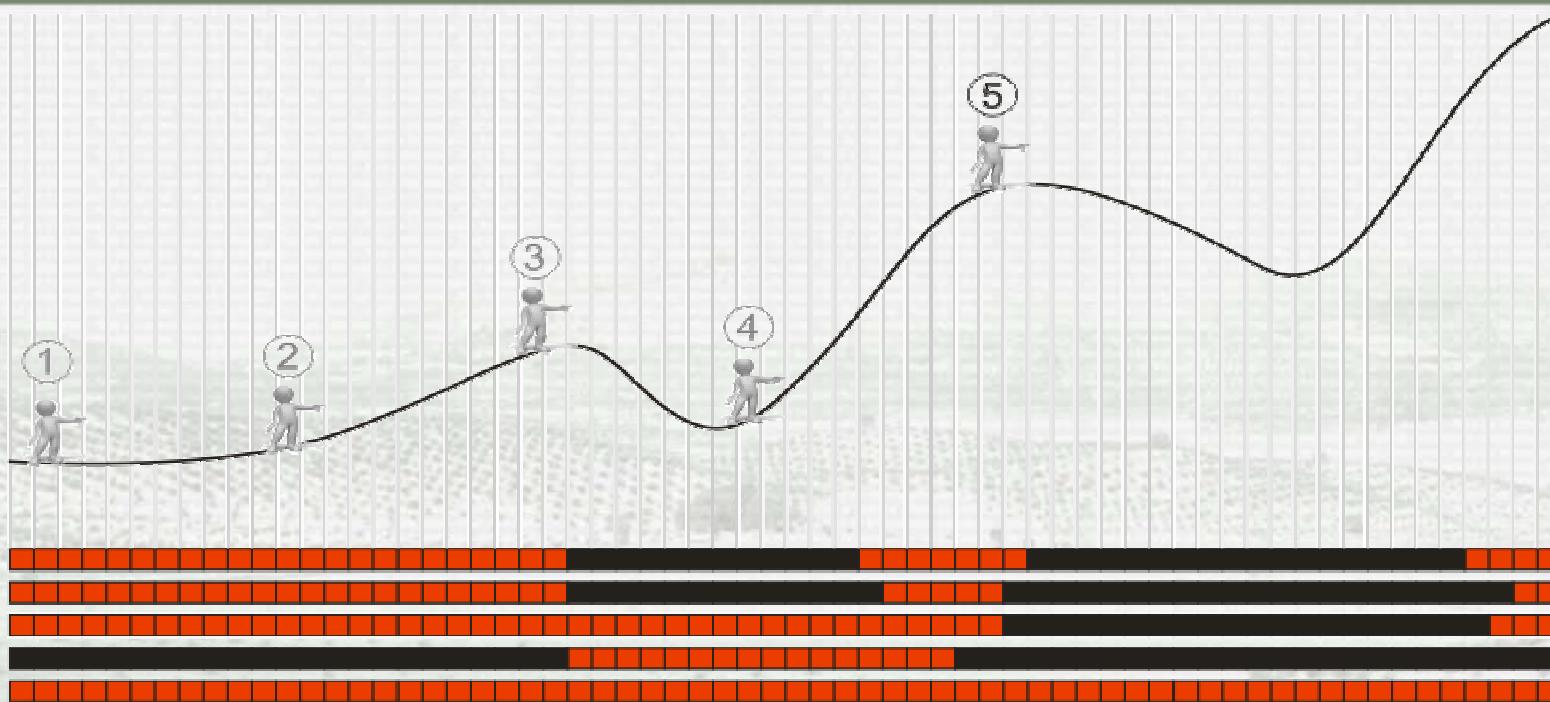


JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity





Unión Europea

Fondo Europeo
de Desarrollo Regional

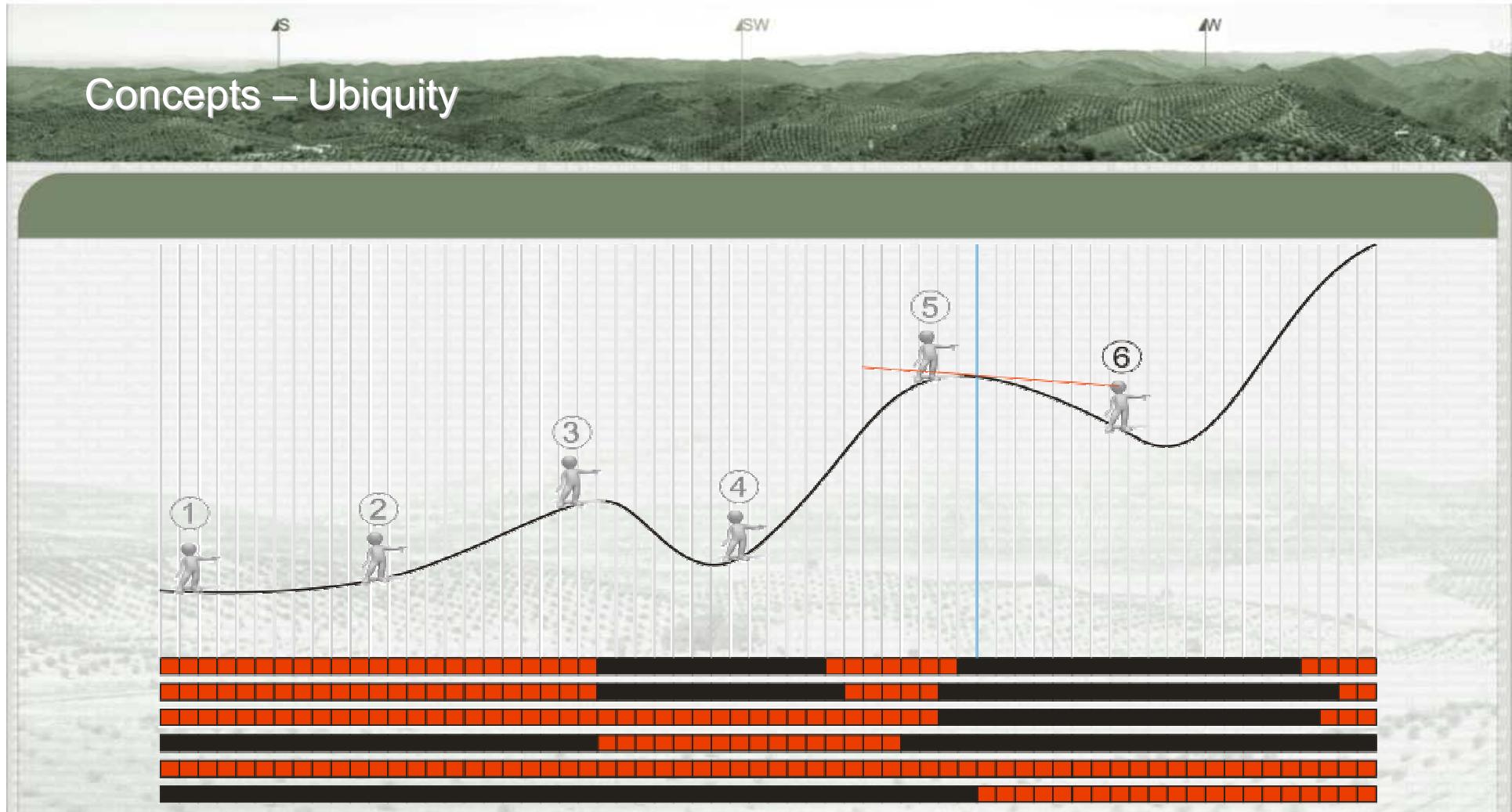


JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

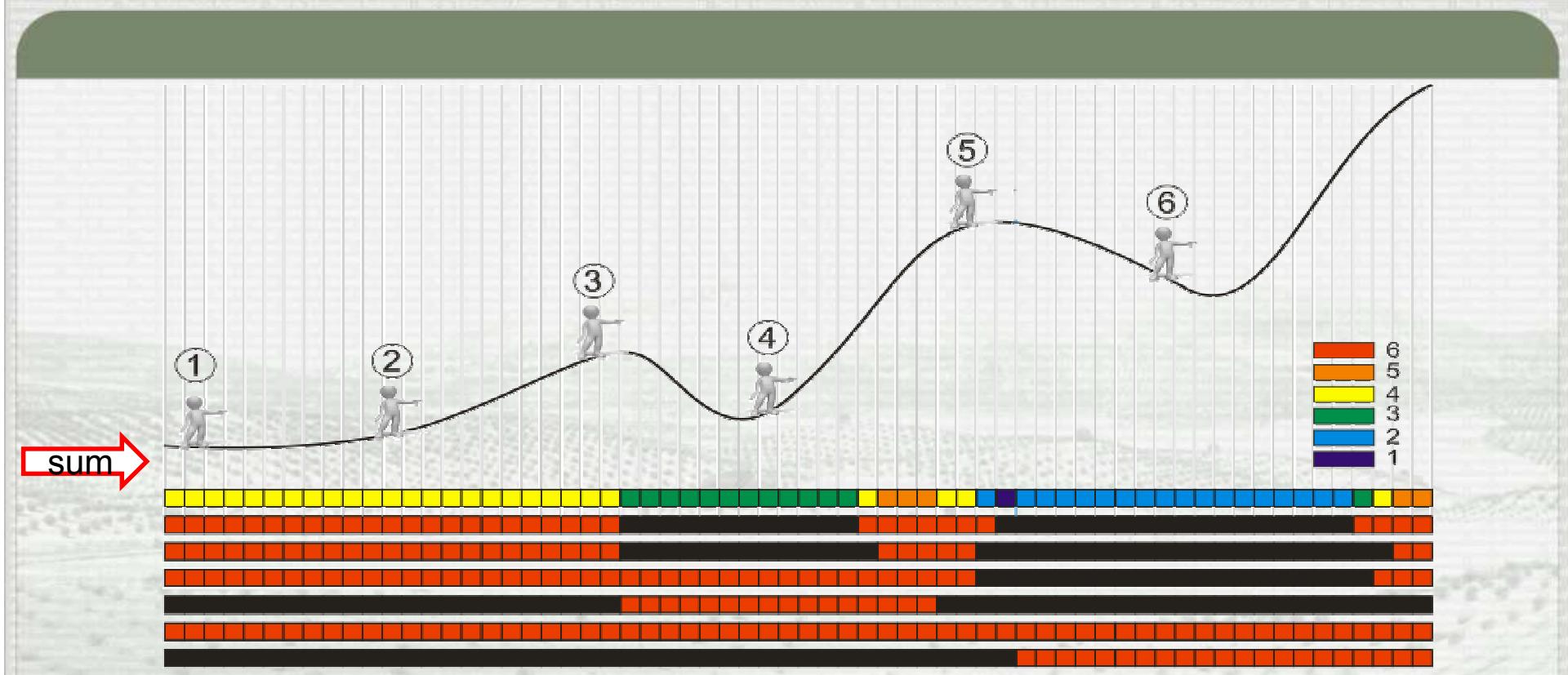
Concepts – Ubiquity





Rediam...

Concepts – Ubiquity





Unión Europea

Fondo Europeo
de Desarrollo Regional



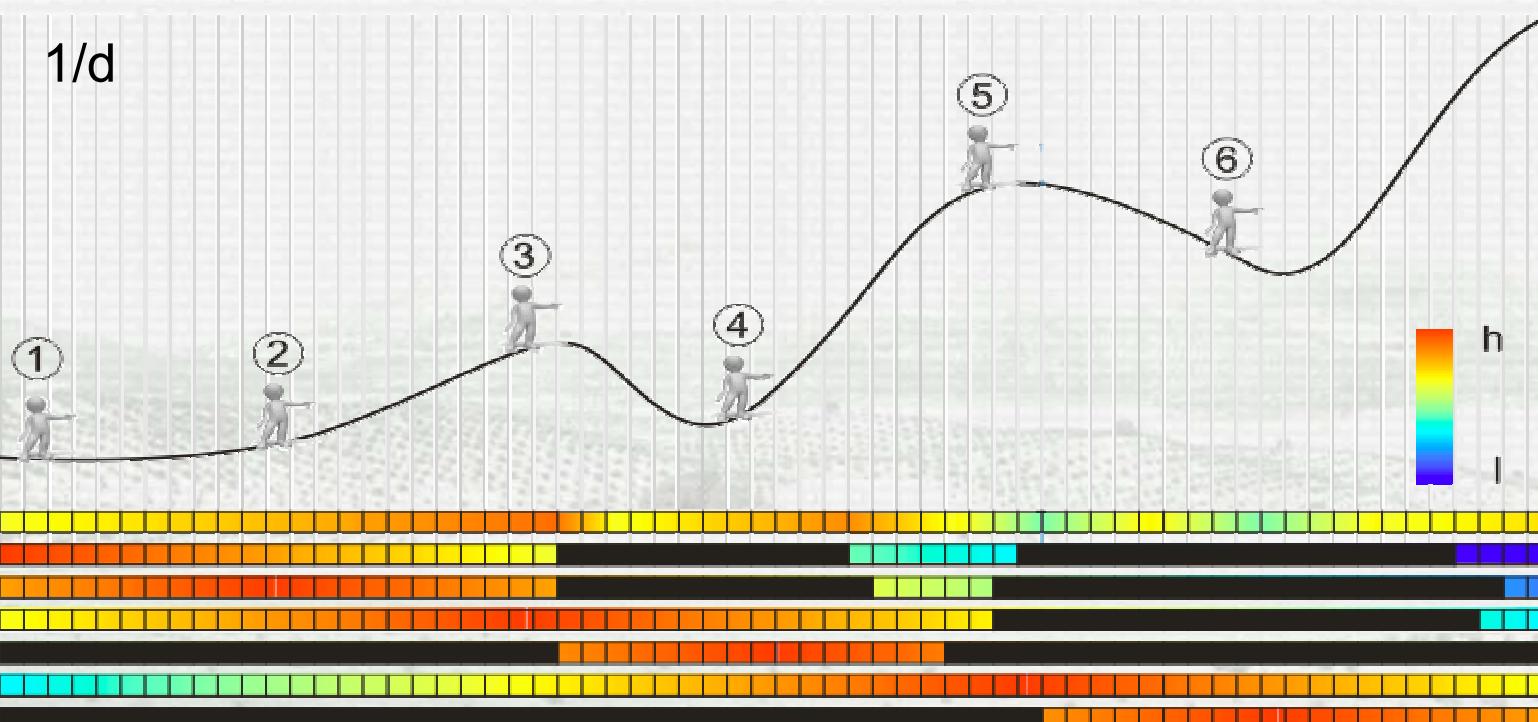
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity & distance

1/d





Unión Europea

Fondo Europeo
de Desarrollo Regional



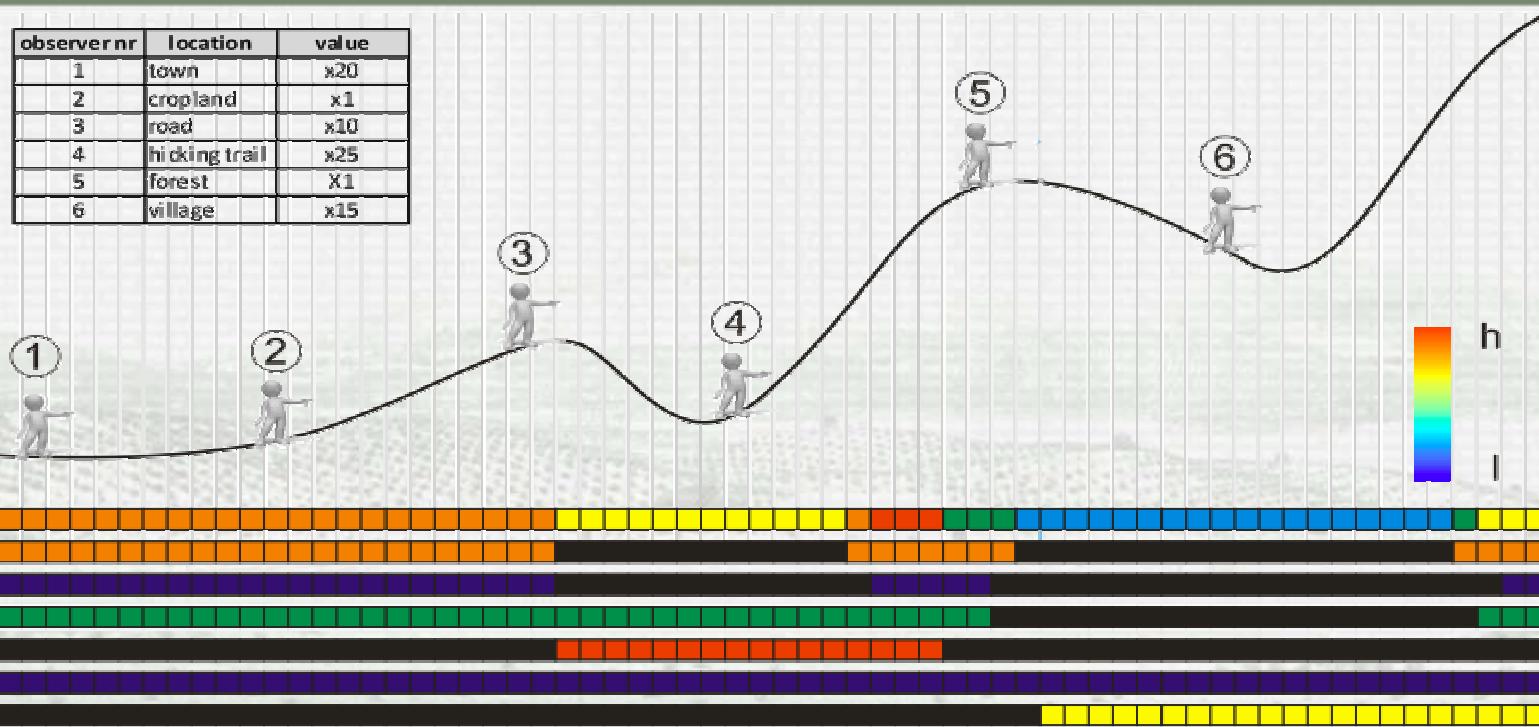
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity & accessibility

observernr	location	value
1	town	x20
2	cropland	x1
3	road	x10
4	hiking trail	x25
5	forest	x1
6	village	x15





Unión Europea

Fondo Europeo
de Desarrollo Regional



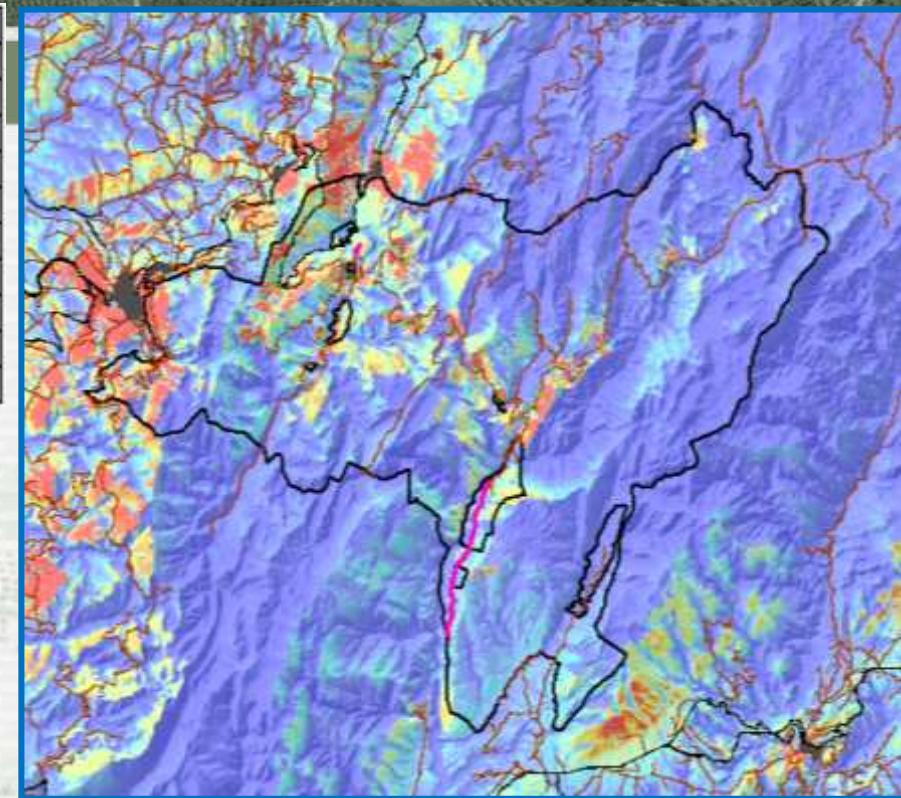
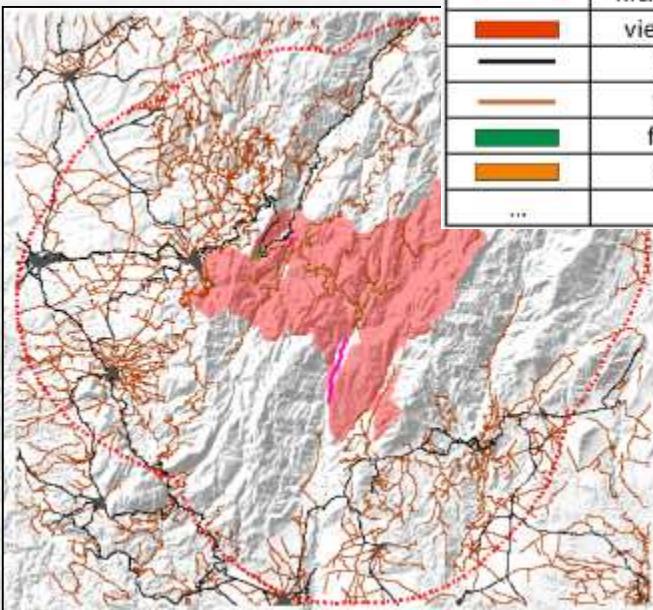
JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity & accessibility

symbol	land use	value
dark grey	towns	x20
grey	villages	x10
yellow	leisure points	x15
green	hiking trails	x25
red	viewpoints	x50
black	roads	x8
brown	tracks	x5
dark green	forests	x1
orange	crops	x2
...



Concepts – Ubiquity & horizon points.





Unión Europea

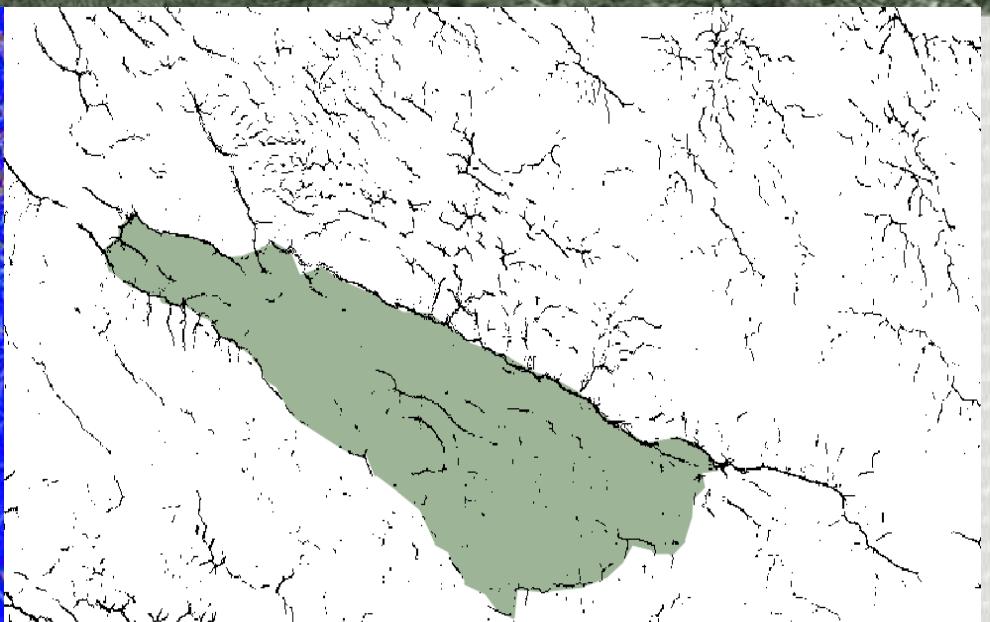
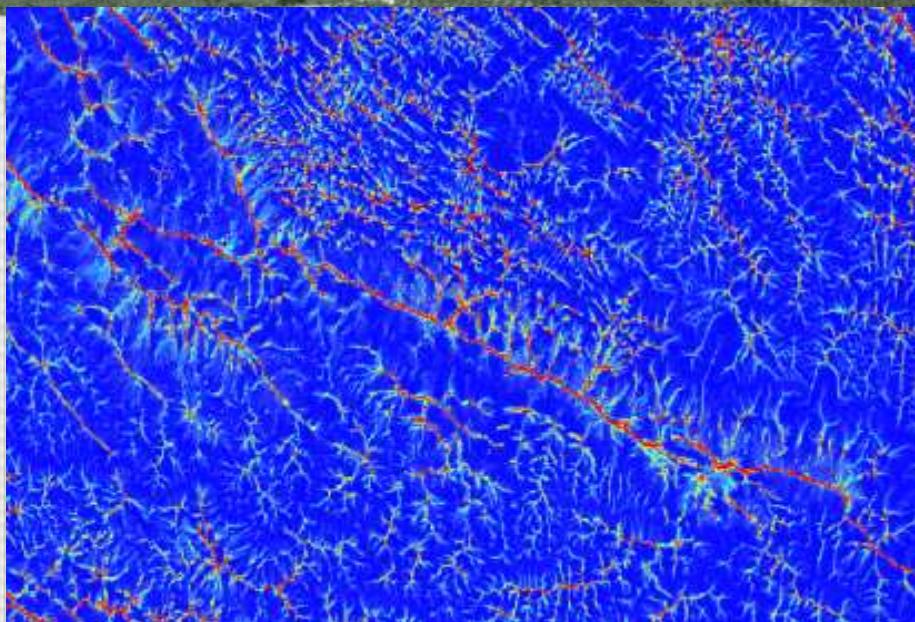
Fondo Europeo
de Desarrollo Regional



Concepts – Ubiquity & horizon points.



Rediam...



We can obtain non-observer location dependent (objective) viewsheds



Unión Europea

Fondo Europeo
de Desarrollo Regional



JUNTA DE ANDALUCÍA
CONSEJERÍA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE



Rediam...

Concepts – Ubiquity and accessibility

Summarizing:

- We can approach values for remote accessibility basing on local.
- We can do the same with additional height instead visibility.
- We can take into account visual projection or vp/d.
- We can obtain some kind of objective viewsheds.



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

INDEX

1.- Landscape Treatment in the Environmental Information Network of Andalusia (REDIAM)

2.- Multi-parametric Visibility Model – Concepts

3.- Multi-parametric Visibility Model – Practice



Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...



Practice – Andalusian visibility model basic parameters

1.- Digital Elevation Model properties:

20x20 m pixel
updated 2008
<2 m error

2.- Calculation properties:

1 observer per hectare
1.7 m observation height
15.000 m maximum distance

e/o

Altitude
Visual projection
Additional height
Tower height
Horizon points
~~Distance~~
~~Azimuth~~

Always the same!!!



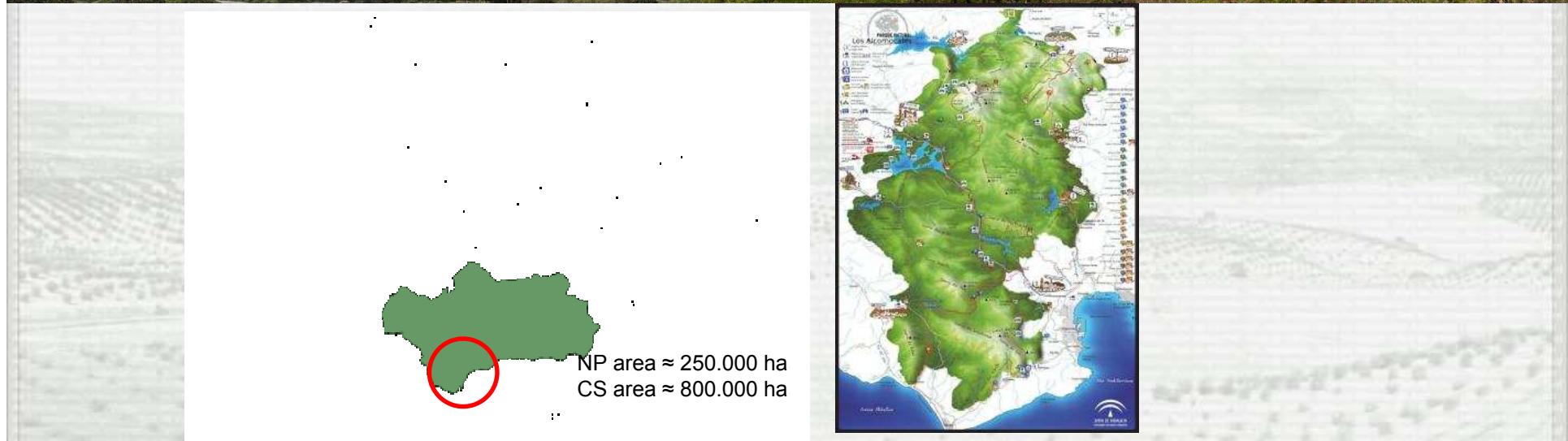
Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

Practice – Case study





Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

Practice – Case study

AIMS:

1. Build a visual impact assessment system that helps locating new aerogenerators, in a saturated area.
2. Promote the substitution of old aerogenerators by new powerful ones, minimizing visual impact.





Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

Practice – Case study

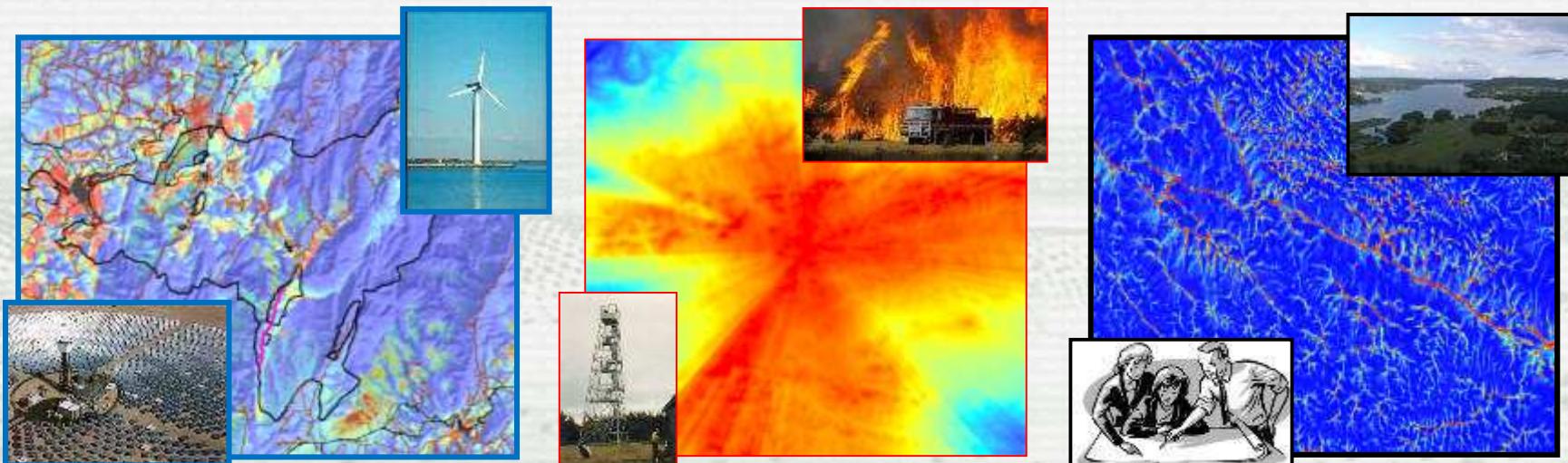
PROCEDURE:

- 1.- Generate a realistic local accessibility model, taking into account:
 - Transport infrastructures, as roads or railroads, categorized.
 - Human settlements, as towns, villages... categorized
 - Other interesting locations, as leisure zones, viewpoints...
 - The way people enjoy landscape, on every class.
- 2.- Make the necessary calculations, as seen above.
- 3.- Identify some scenarios, and evaluate them through the system
- 4.- Compare the results with the experts' approach, and subject them to public trial – broadcasting.

Practice – Case study

WHAT CAN WE EXPECT FROM THE SYSTEM?

- 1.- Relative values for visual impact of desired RES plants, depending on location
- 2.- Some preferable characteristics of them.
- 3.- Lots of by-products, useful for decision making in land management.





Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam...

Practice – Case study

WHAT CAN'T WE EXPECT FROM THE SYSTEM?

- 1.- Reference values for visual impact.
 - 2.- Sinergies are hardly detected.
 - 3.- Exact values, fine tuning.
 - 4.- Landscape characterisation.
- ...





Unión Europea

Fondo Europeo
de Desarrollo Regional



Rediam•••

Thanks a lot!

<http://www.juntadeandalucia.es/medioambiente/site/web/rediam>