<table>
<thead>
<tr>
<th>Content</th>
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<tbody>
<tr>
<td>A</td>
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<td>B</td>
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<td>C</td>
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<td>D</td>
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A- OBJECTIVES

A decision-making tool:

1) To reveal services provided by an area’s ecosystem to its population

2) To assess impacts on Ecosystem Services due to a project

3) To help optimize project design
**B- METHODOLOGY:**

**Definition:** Ecosystem Services are the benefits people obtain from Ecosystems

15 Ecosystem Services are taken into account by the toolkit *(Aulnes ©)*:

<table>
<thead>
<tr>
<th>Provision services:</th>
<th>Regulation services:</th>
<th>Cultural / Recreation services:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Raw material (wood…)</td>
<td>• Erosion prevention (forests…)</td>
<td>• Hunting</td>
</tr>
<tr>
<td>• Food (hazelnuts…)</td>
<td>• Pollination (agriculture output)</td>
<td>• Fishing</td>
</tr>
<tr>
<td>• Fresh water (surface &amp; groundwater)</td>
<td>• Biological control (pests)</td>
<td>• Tourism (eco-tourism)</td>
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<td></td>
<td>• Global Climate regulation (carbon)</td>
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<td></td>
<td>• Air quality regulation (dust abatement)</td>
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<td></td>
<td>• Local climate regulation (wind-break)</td>
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<td></td>
<td>• Drought control (river low flow)</td>
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<td></td>
<td>• Moderation of extreme event (flood)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Waste water treatment (swamp)</td>
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</tr>
</tbody>
</table>
Many parameters are taken into account

- Ecosystem services
- Economic valuation of each ecosystem service
- Geographic parameters
- Beneficiary parameters
- Project parameters

Ecosystem services Database → AULNES’ G.I.S. Calculations → Results
A methodology in 4 steps:

1. **Definition and pricing of the Ecosystem Services**
2. **Mapping of each natural habitat composing the Ecosystem**
3. **Calculation of loss & gain of services depending on the project impact**
4. **GIS Red flag highlighting and alternatives balance**
C- RESULTS:

Objective N° 1:
To reveal Ecosystem Services

Result N° 1:
Mapping ecosystem services
Objective N° 2: To assess impacts on Ecosystem Services due to a project

Result N° 2: Direct/indirect loss of ecosystem services due to a project

Direct loss: Service of regulation of global climate (tons of carbon/ha)

Indirect loss: Modification of the ecological network

Summary overview: losses and gains of ecosystem services
Objective N° 3: To help optimize project design

Result N° 3: Example of the comparison of 3 alternatives of a project

Choose the one that would have the least impact on Ecosystem Services

3 alternatives of a project:

- North alternative
- Center alternative
- South alternative

Ecosystems impacted (ha)

- Green urban areas
- Wet grasslands
- Screens trees and hedges
- Broad-leaved forest
- Fruit trees, vineyards
- Annual & permanent crops
- Pastures

Surface (ha) within the 100 m buffer

Ecosystem services loss (€)

- Recreation
- Hunting
- Fishing
- Drought control
- Flood protection
- Air quality
- Local climate
- Biological control
- Pollination
- Erosion prevention
- Fodder
- Fire wood

Example of the comparison of 3 alternatives of a project

Choose the one that would have the least impact on Ecosystem Services
D- CONCLUSION

This approach contributes to improving the AMC (Avoid-Mitigate-Compensate) evaluation process.

The knowledge of the “ecosystem services footprint” allows to conceive complementary and/or targeted measures:
- Mitigation measures,
- Compensation measures.

The toolkit can help project designers, promoters, managers of natural areas, to make decisions that take into account biodiversity and associated ecological functions.

It becomes possible to integrate ecosystem services loss into cost-benefit analysis of a project.
AKNOWLEDGMENTS

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Research work realized under the scientific responsibility of:

- **Jean-Michel SALLES** (LAMETA)
- **Sébastien ROUSSEL** (LAMETA)
- **John D. Thompson**, CEFE-CNRS, Montpellier
- **Dorothée LABARRAQUE** (EGIS)

Egis is also presenting 5 posters!
Come and meet us!

(Ecosystem services: Poster n° 12)
THANK YOU FOR YOUR ATTENTION!

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17 OVERSEAS SUBSIDIARIES

25 OPERATING COMPANIES
More than 40 OFFICES IN FRANCE

51% FRANCE (incl. overseas dependencies)
18% EUROPE
9% ASIA
4% MIDDLE EAST
14% AFRICA
1% AUSTRALIA / OCEANA

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