RLE case study: French lagoons

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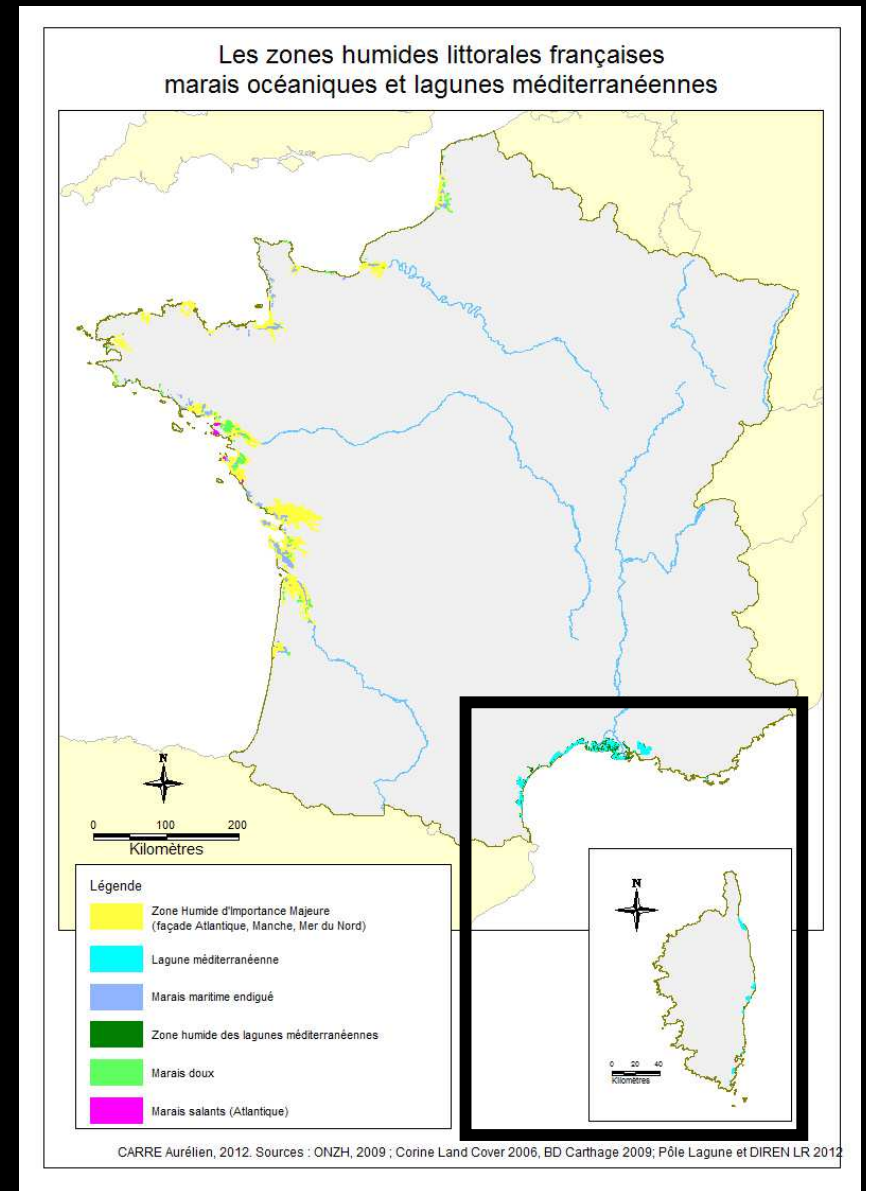World Conservation Congress, Jeju, 11 September 2012

French Lagoons

Spatial scale: Metropolitan France, but lagoons restricted to the Mediterranean coast

Description: Brackish, shallow water bodies (from 40 cm to a few meters deep) separated from the sea by a sand ribbon, which has one or several permanent or temporary breaches (inlets) permitting exchanges between the catchment area and the sea. Lagoons are productive, nutrient-rich habitats, generally surrounded by wetlands (ponds, marshes, salt steppes).

They are considered as being different ecosystems from Atlantic/North Sea coastal marshes, due to their peculiar functioning and biota.

Les zones humides littorales françaises
marais océaniques et lagunes méditerranéennes

Légende
- Zone Humide d'Importance Majeure (façade Atlantique, Manche, Mer du Nord)
- Lagune méditerranéenne
- Marais maritime endigué
- Zone humide des lagunes méditerranéennes
- Marais doux
- Marais salants (Atlantique)

CARRE Aurélien, 2012. Sources : ONZH, 2009 ; Corine Land Cover 2006, BD Carthage 2009; Pôle Lagune et DIREN LR 2012

Assessment of 27 lagoon complexes (with adjacent wetlands) grouped into 12 major units, assessed individually
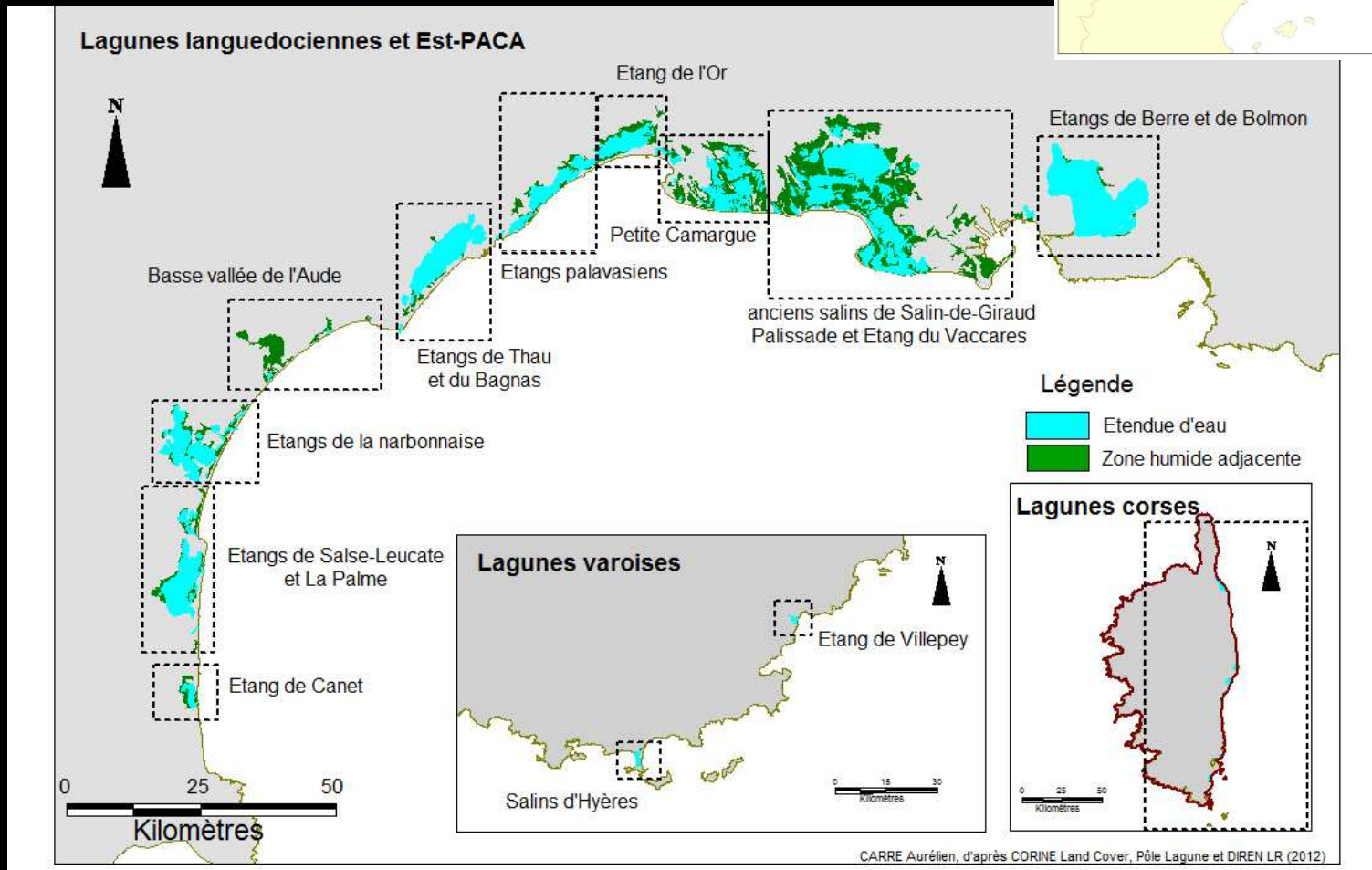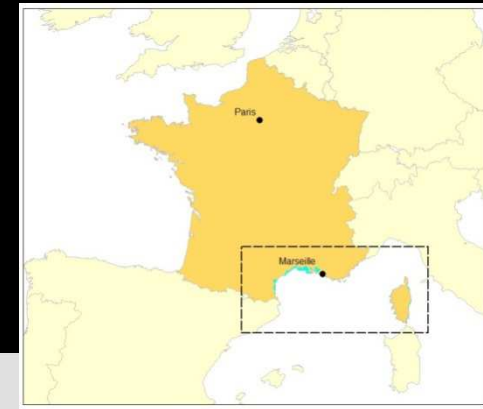
Criterion A: Reduction in geographic distribution

Main factor involved:
Filling (natural or anthropogenic)
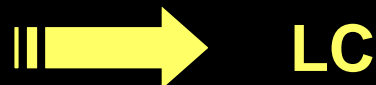
A1 : (last 50 yrs) = LC
Significant regression (in area or volume) only for a few small lagoons representing 5% of the total ecosystem area

A2: (next 50 yrs) = LC
Projected future reduction in spatial extent of large units in 500 to 3000 yrs

A3: (since 1750) = LC
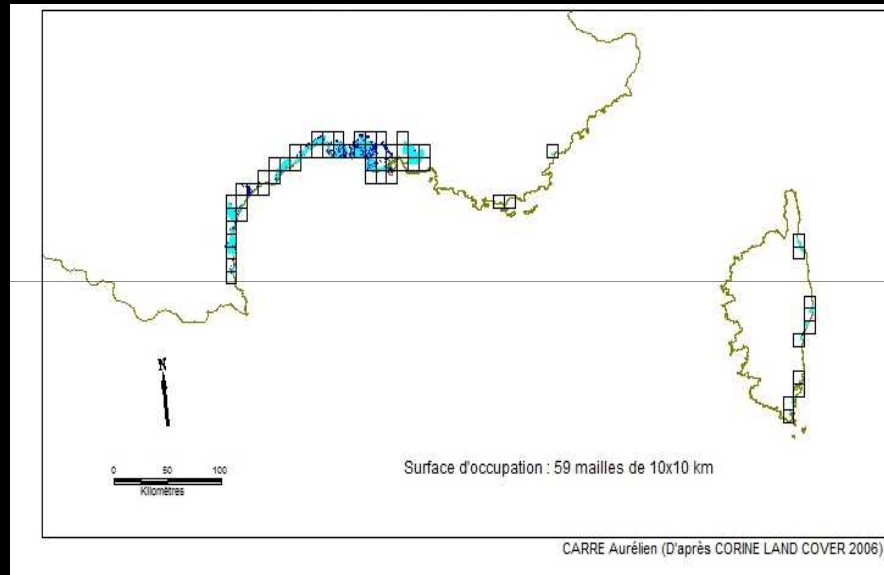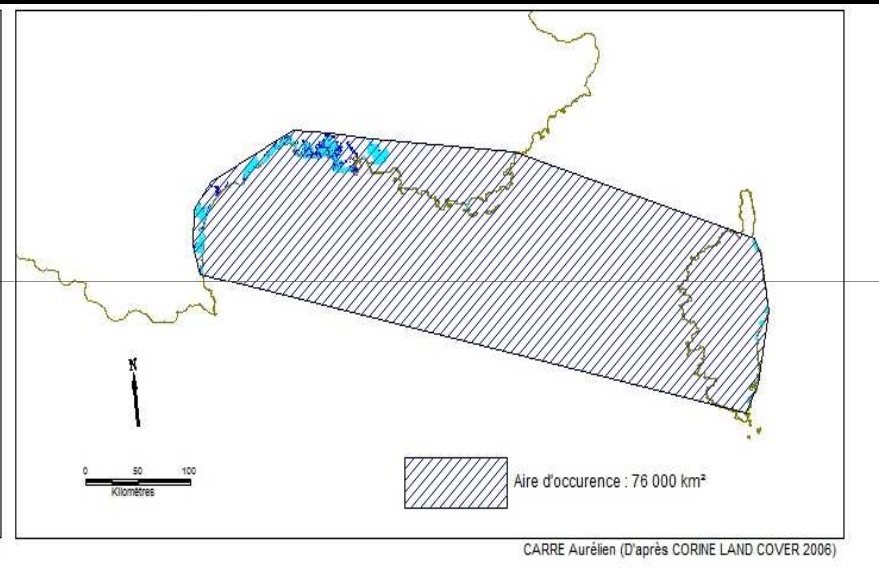*According to the historic data available*

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LC

Criterion B : Restricted geographic distribution

B1. Extent of occurrence (EOO)

B2. Area of occupancy (AOO)

59 grid cells of 10x10 km

76 000 km²

LC
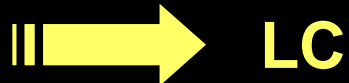
Criterion C : Degradation of the abiotic environment

Main factor involved:

Contamination of water and sediment by chemical and organic compounds (wastewaters, pesticides, fertilizers)

Proxy: **Eutrophication**

Spatial extent: all water bodies, 80% of the ecosystem area

Relative severity: assessed using a grid of indicators defined and measured by IFREMER (French Research Institute for Water and Sea)

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Eutrophication assessment by IFREMER

Compartments	Parameters measured	Frequency
Water	T°C, salinity, turbidity, dissolved O_2 [NO3], [NO4], [NH4], [PO4], [Chla], [Chla + pheopigments], [Ptotal], [Ntotal]	3 X / yr
Phytoplankton	[cells < 2μm], [cells > 2μm],	3 X / yr
Benthic macro flora	Specific composition and richness Specific biomass	1 X / 4 yrs
Macro fauna	Specific composition and richness Population density, Total biomass	1 X / 4 yrs
Sediments	[organic matter], [Ptotal], [Ntotal]	1 X / 4 yrs

	Very good		Good		Moderate		Poor		Very poor

30%   **50%**   **80%**

Relative severity

Very poor state = disappearance of submerged macrophyte beds, proliferation of green algae, anoxia crises frequent

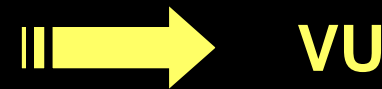# Criterion C : Degradation of the abiotic environment

C1 : (last 50 yrs) = VU
Average value of the eutrophic conditions of each lagoon unit

C2: (next 50 yrs) = VU
Average value of the sites for which no measure has been taken to reduce eutrophication

⇒ VU

C3: (since 1750) = LC
Degradation observed mostly since the 1960's with agriculture intensification and urban development

Criterion D : Disruption of biotic interactions

Main factor selected:

Proliferation of non-native species

Up to 60 introduced species of algae are found in some lagoons, many of which are invasive (red algae). Another example comes from the reef building tubeworm *Ficopomatus enigmaticus*, that contributes to the filling of lagoons and modifies their currents. Its proliferation is favoured by an excess of phytoplankton.

© Pôle Lagunes

Extent: all lagoons, and especially those used for shell farming

Relative severity : Few quantitative data available on the impact of these species on the characteristic biota, but their recent and generalized proliferation calls for a *Near threatened* status for the next 50 years.

⏸➡ *D1 : DD,   D2 : NT,   D3 : LC*

Global assessment of French lagoons — VU

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Lagune	Superficie totale (ha)	Plan d'eau (ha)	Zone Humide (ha)	A1	A2	A3	B1 (EOO)	B2 (AOO)	B3 (<5 loc)	C1	C2	C3	D1	D2	D3
Canet	1200	590	610	VU	**CR**	VU				DD	DD	LC	LC	LC	LC
Salse-Leucate	6400	5400	1000	LC	LC	LC				LC	**NT**	LC	DD	**VU**	LC
Lapalme	1300	700	600	LC	LC	**VU**				LC	**NT**	LC	DD	LC	LC
Narbonnais	7300	5300	2000	LC	LC	LC				**NT**	LC	LC	LC	LC	LC
Vendres et plaine de l'Aude	3200	1700	1500	VU	**CR**	EN				**CR**	**CR**	LC	DD	**NT**	LC
Thau et Bagnas	9800	9300	500	LC	LC	LC				**NT**	LC	LC	**NT**	**VU**	LC
Palavasiens	6000	5000	1000	LC	LC	LC				**CR**	EN	LC	**NT**	**NT**	LC
De l'Or	5000	3000	2000	LC	LC	LC				**CR**	**CR**	LC	**NT**	**NT**	LC
Petite Carmargue	13800	5400	8400	LC	LC	LC				**EN**	**EN**	LC	LC	LC	LC
Camargue + Palissade	40 000	16000	24000	LC	LC	LC				NT	**VU**	LC	DD	**NT**	LC
Berre et Bolmon	16700	16000	700	LC	LC	LC				**CR**	EN	LC	DD	**NT**	LC
Salins d'Hyères	900	700	200	LC	LC	LC				LC	LC	LC	LC	LC	LC
Villepey	127	100	27	LC	LC	LC				LC	LC	LC	LC	LC	
Biguglia	1800	1400	400												
Terrenzana et Diana	600	550	50												
Urbino	800	750	50												
Palu	350	110	240												DD
Santa Giulia	100	26	74												
Balistra	400	100	300												
TOTAL	115777	72126	43651	**LC**	**LC**	**LC**	**LC**	**LC**	**LC**	**VU**	**VU**	**LC**	**DD**	**NT**	**LC**

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Thank you!

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