

Supplementary Table S1. Study sites selected for the estimation and validation of the hydrological and morphological pressures.

Waterbody code	Waterbody Name	River Basin Authority	Type	Type	MGRS	Nature	Date of Google Earth Pro images (for morphological pressures assessment)
EB00007549	Estany Gran de Basturs	Ebro	L-T10	Karstic, limestone, feed by groundwater	31TCG3637267573	Natural	16/06/2019
ES030MSPF0148040	Laguna Grande de El Tobar	Tajo	L-T10	Karstic, limestone, feed by groundwater	30TWK8043588661	Natural	27/09/2019
ES030MSPF0149040	Laguna de Taravilla o de La Parra	Tajo	L-T10	Karstic, limestone, feed by groundwater	30TWL8670900541	Natural	09/09/2019
ES091MSPF1046	Cañizar de Villarquemado	Ebro	L-T11	Karstic, limestone, feed by groundwater, spring type	30TXK4521685799	Heavily modified	22/08/2019
ES091MSPF1757	Ullals de Baltasar	Ebro	L-T11	Karstic, limestone, feed by groundwater, spring type	31TBF9652705222	Natural	14/06/2017
ES030MSPF0331040	Laguna de Somolinos	Tajo	L-T12	Karstic, limestone, mixed feeding	30TVL9453266764	Natural	28/07/2018
ES080MSPFL07	Laguna de Uña	Júcar	L-T12	Karstic, limestone, mixed feeding	30TWK8718253373	Heavily modified	
ES080MSPFL14	Laguna del Marquesado	Júcar	L-T12	Karstic, limestone, mixed feeding	30TXK1339249437	Natural	
ES091MSPF1014	Estanque Grande de Estanya	Ebro	L-T15	Karstic, evaporative rocks, small	31TBG9544455882	Natural	29/05/2019
ES091MSPF1019	Lago de Arreo	Ebro	L-T15	Karstic, evaporative rocks, small	30TWN0072736199	Natural	03/08/2018
ES091MSPF1029	Estany de Montcortés	Ebro	L-T15	Karstic, evaporative rocks, small	31TCG3477988488	Natural	16/06/2019
EBL7673	Laguna de Guialguerrero	Ebro	L-T16	Continental, oligosaline, permanent	30TXL1662248505	Natural	12/07/2019

ES091MSPF1042	Laguna Honda	Ebro	L-T16	Continental, oligosaline, permanent	30TXL1351723939	Natural	12/07/2019
ES080MSPFL05	Laguna de Talayuelas	Júcar	L-T17	Continental, oligosaline, temporary	30S XK5065708882	Natural	
ES017MSPFES053MAL000070	Complejo lagunar de Altube-Charca de Monreal	Cantábrico Oriental	L-T18	Continental, subsaline, permanent	30TWN1048757584	Natural	03/08/2018
ES050MSPFES0512000032	Laguna del Taraje	Guadalquivir	L-T18	Continental, subsaline, permanent	30STF4275289698	Natural	
ES091MSPF1007	Embalse de las Cañas	Ebro	L-T18	Continental, subsaline, permanent	30TWN4896403634	Heavily modified	27/09/2017
ES091MSPF1035	Laguna de Lor	Ebro	L-T18	Continental, subsaline, permanent	30TXM1158149085	Heavily modified	13/08/2019
ES091MSPF1677	Balsa de la Morea	Ebro	L-T18	Continental, subsaline, permanent	30TXN1151131952	Heavily modified	03/07/2016
ES091MSPF1678	Balsa del Pulguer	Ebro	L-T18	Continental, subsaline, permanent	30TXM0683556753	Heavily modified	27/06/2017
ES020MSPF000101108	Laguna de Boada de Campos	Duero	L-T19	Continental, subsaline, temporary	30TUM4556749454	Natural	
ES063MSPF005200280	Laguna de Montellano	Guadalete y Barbate	L-T19	Continental, subsaline, temporary	29SQA6242738915	Natural	
ES080MSPFL10	Laguna de Ontalafia	Júcar	L-T19	Continental, subsaline, temporary	30SXH0685886597	Natural	
NAV-H	Navaridas (Zona central del humedal)	Ebro	L-T19	Continental, subsaline, temporary	30TWN2944110934	N/A	
ES091MSPF1016	Laguna de Pitillas	Ebro	L-T20	Continental, hyposaline or mesosaline, permanent	30TXM1670696725	Natural	25/07/2019
ES091MSPF968	Laguna de Sariñena	Ebro	L-T20	Continental, hyposaline or mesosaline, permanent	30TYM3354631493	Heavily modified	05/05/2019
ES091MSPF985	Laguna de La Estanca	Ebro	L-T20	Continental, hyposaline or mesosaline, permanent	30TYL3952968780	Heavily modified	03/08/2018

ES020MSPF000101107	Laguna de las Salinas (Lagunas de Villafáfila)	Duero	L-T21	Continental, hyposaline or mesosaline, temporary	30TTM8235432148	Natural	
ES020MSPF000101114	Complejo lagunar de Villafáfila de mineralización alta	Duero	L-T21	Continental, hyposaline or mesosaline, temporary	30TTM8077531447	Natural	
ES091MSPF1037	Laguna del Musco	Ebro	L-T21	Continental, hyposaline or mesosaline, temporary	30TWN3587009528	Natural	27/09/2017
ES091MSPF974	Laguna de Carralagroño	Ebro	L-T21	Continental, hyposaline or mesosaline, temporary	30TWN3560010300	Natural	27/09/2017
ES091MSPF984	Laguna de Gallocanta	Ebro	L-T21	Continental, hyposaline or mesosaline, temporary	30TXL2650036500	Natural	28/07/2018
ES091MSPF992	Laguna de Carravalseca	Ebro	L-T21	Continental, hyposaline or mesosaline, temporary	30TWN3560009400	Natural	27/09/2017
BOL-H	Bolue (Zona central del humedal)		L-T24	Continental, fluvial origin, flood plain, oligosaline or subsaline	30TWN0019299248	N/A	
ES020MSPF000101110	Laguna de La Nava de Fuentes	Duero	L-T24	Continental, fluvial origin, flood plain, oligosaline or subsaline	30TUM5480959055	Natural	
ES091MSPF1025	Encharcamiento de Salburúa y Balsa de Arkaute	Ebro	L-T24	Continental, fluvial origin, flood plain, oligosaline or subsaline	30TWN3004745239	Natural	
ES091MSPF1045	Encharcamientos de Salburúa y Balsa de Betoño	Ebro	L-T24	Continental, fluvial origin, flood plain, oligosaline or subsaline	30TWN2866745291	Natural	01/06/2019
ES091MSPF973	Galacho de Juslibol	Ebro	L-T26	Continental, fluvial origin, ox-bow lakes	30TXM7217318903	Heavily modified	19/06/2018
ES091MSPF976	Galacho de La Alfranca	Ebro	L-T26	Continental, fluvial origin, ox-bow lakes	30TXM8629208314	Heavily modified	19/06/2018

ES080MSPFL02	Marjal y Estanys d'Almenara	Júcar	L-T28	Coastal lakes without seawater influence	30SYK4102803679	Heavily modified
ES080MSPFL04	Marjal de Rafalell y Vistabella	Júcar	L-T28	Coastal lakes without seawater influence	30SYJ3240282098	Natural
ES080MSPFL06	L'Albufera de Valencia	Júcar	L-T28	Coastal lakes without seawater influence	30SYJ2810557351	Heavily modified
ES064MSPF000203730	Laguna del Portil	Tinto, Odiel y Piedras	L-T29	Coastal lakes on dune slacks, permanent	29SPB7342220371	Natural

Supplementary Table S2. Data sources for the benthic invertebrates and macrophyte EQR, and emerged and submerged macrophyte metrics.

EU Member State	Source type	Report/Portal	Link
France	Report	Ifremer, Laboratoire environnement ressources Provence Azur Corse. District "Rhône et Cotiers Méditerranéens". Contrôle de surveillance/opérationnel – Campagne DCE 2009. 2010. 129 pp.	https://archimer.ifremer.fr/doc/00038/14923/12248.pdf (accessed on September 2020)
France	Report	Ifremer, Laboratoire environnement ressources Provence Azur Corse. District "Corse". Contrôle de surveillance/opérationnel – Campagne DCE 2009. 2010. 97 pp.	https://archimer.ifremer.fr/doc/00028/13918/11086.pdf (accessed on September 2020)
France	Report	Ifremer, Laboratoire environnement ressources Provence Azur Corse. Diagnostic de la qualité du compartiment macrophytes des lagunes profondes dans le contexte de la Directive Cadre sur l'Eau (bassin Rhône Méditerranée & Corse). Propositions d'évolution de la stratégie d'échantillonnage. 2012. 23 pp.	https://archimer.ifremer.fr/doc/00114/22528/20205.pdf (accessed on September 2020)
France	Report	Ifremer, Laboratoire environnement ressources Provence Azur Corse. Réseaux de surveillance DCE - Campagne 2012 – District « Rhône et	https://wwwz.ifremer.fr/mediterranee/content/download/86267/file/dce_2012_rhone.pdf (accessed on September 2020)

		côtiers méditerranéens ». 2013. 132 pp.	
France	Report	Ifremer, Laboratoire environnement ressources Provence Azur Corse. Réseaux de surveillance DCE – Campagne 2012 – District « Corse ». 2013. 109 pp.	https://wwwz.ifremer.fr/mediterranee/content/download/86268/file/dce_2012_corse.pdf (accessed on September 2020)
France	Report	Ifremer, Laboratoire environnement ressources Provence Azur Corse. Directive Cadre sur l'Eau. Bassin Rhône Méditerranée Corse - Année 2018. 2019. 83 pp.	https://archimer.ifremer.fr/doc/00620/73224/72436.pdf (accessed on September 2020)
Spain	Portal	Confederación Hidrográfica del Júcar. Programa de Control de las Aguas Superficiales.	https://www.chj.es/es-es/medioambiente/redescontrol/Paginas/RedesdeControl.aspx (accessed on October 2019)
Spain	Portal	Confederación Hidrográfica del Ebro. Informes de Seguimiento.	http://www.chebro.es/contenido.visualizar.do?idContenido=28045 (accessed on October 2019)
Spain	Portal	Confederación Hidrográfica del Tajo. Resultados/informes.	http://www.chtajo.es/LaCuenca/CalidadAgua/Resultados_Informes/Paginas/RISupEstadoLagunas.aspx (accessed on October 2019)
Spain	Portal	Confederación Hidrográfica del Duero. Informes.	http://www.mirame.chduero.es/DMA Duero_09/webMasaLago/masaLagoBusqueda.faces (accessed on October 2019)

Supplementary Table S3. Availability of these different parameters in the studied lagoons. Sources: WATERBASE European database for the physical-chemical and chlorophyll-*a* parameters, and River Basin Authorities from Spain and France for the EQR values of benthic invertebrates and macrophytes

SITE	Ammonium ($\mu\text{mol N-NH}_4^+ \text{ L}^{-1}$)	Dissolved Oxygen ($\mu\text{mol O}_2 \text{ L}^{-1}$)	Electrical conductivity	Nitrite ($\mu\text{mol N-NO}_2^- \text{ L}^{-1}$)	Orthophosphate ($\mu\text{mol P-PO}_4^{3-} \text{ L}^{-1}$)	Silica ($\mu\text{mol Si} \text{ L}^{-1}$)	Total Nitrogen ($\mu\text{mol N} \text{ L}^{-1}$)	Total Phosphorus ($\mu\text{mol P} \text{ L}^{-1}$)	Chl- <i>a</i> ($\mu\text{g} \text{ L}^{-1}$)	Benth. Invertebrates (EQR)	Macrophytes (EQR)
ALBU					x	x		x	x	x	x
BIGU	x	x			x	x		x	x	x	x
CABR	x	x	x	x	x	x					
CANE	x	x		x	x			x	x	x	x
COMA	x	x	x	x	x	x	x	x	x		
GELA				x	x			x	x		
ITTI	x	x	x	x	x	x	x	x	x		
KOTY	x	x	x	x	x	x	x	x	x		
NARB	x	x		x	x	x		x	x	x	x
THAU	x	x		x	x	x		x	x	x	x
URBI	x	x			x	x		x	x	x	x