

Centri urbani tra alluvioni e siccità

ripensare la città in funzione del cambiamento climatico



venerdì
4 aprile
2025
Ancona

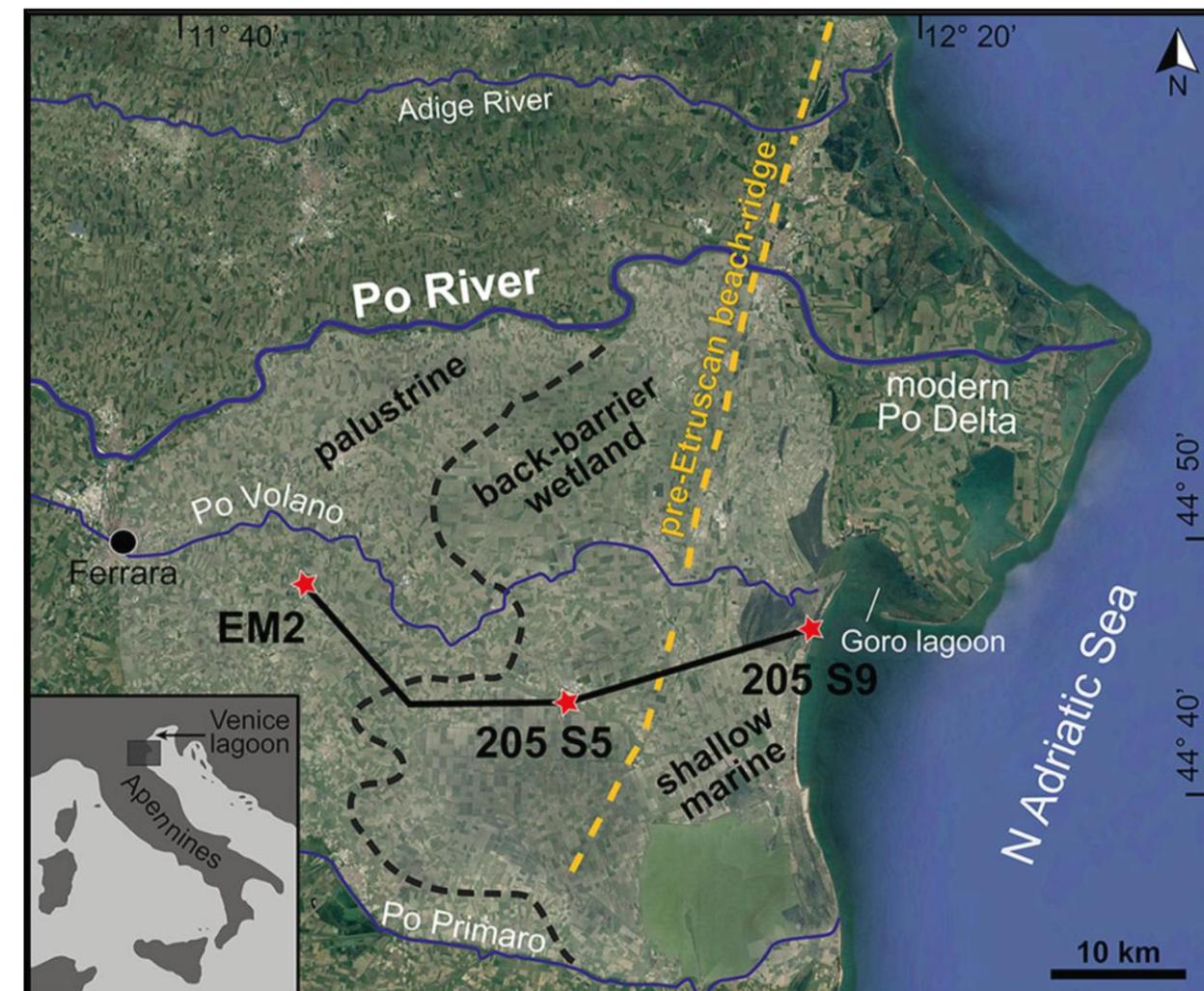
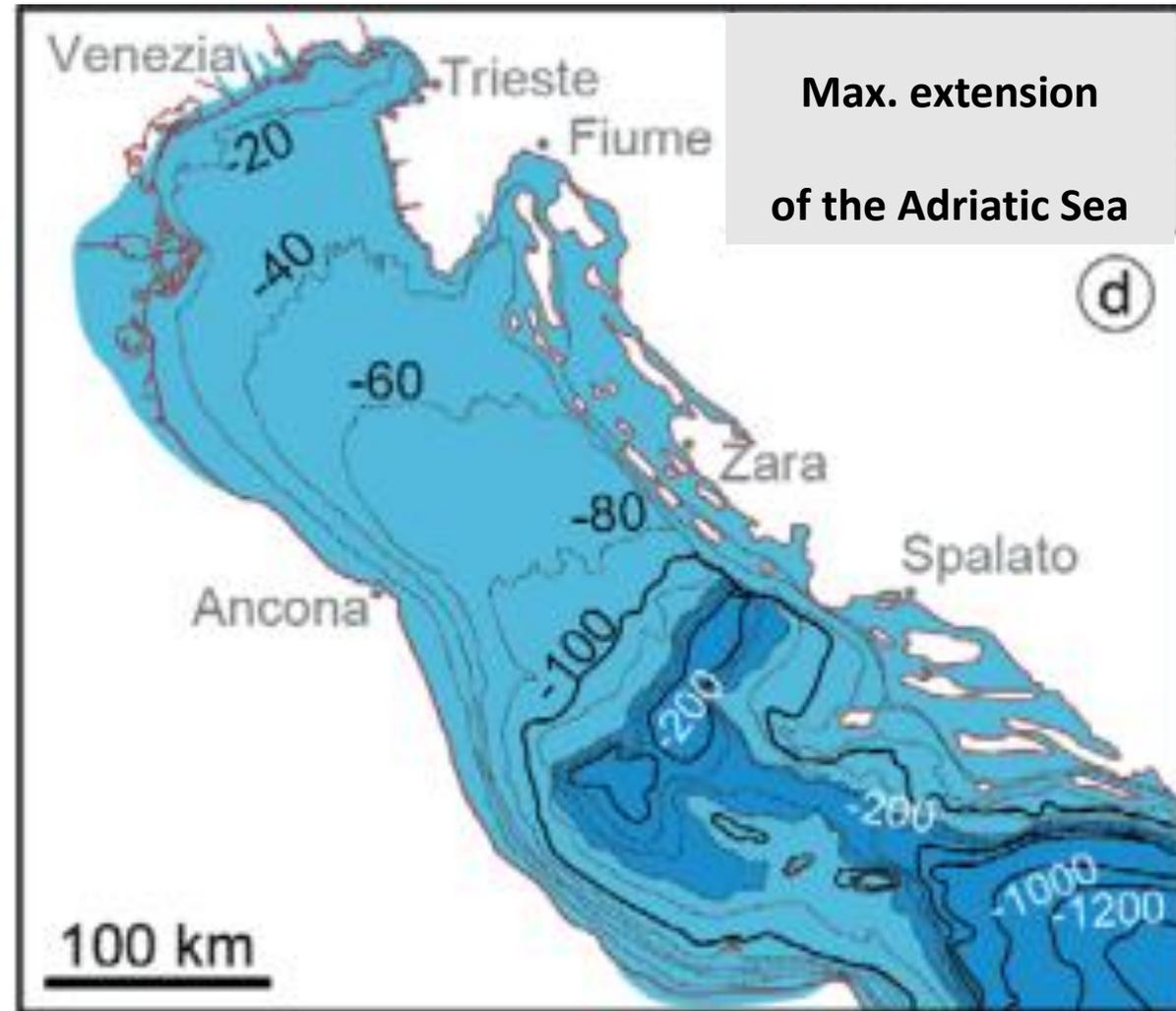
Salinizzazione e cambiamento climatico nell'acquifero costiero della Pianura Padana

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- Affiliazione: Dip. SIMAU - Università Politecnica delle Marche
- E-mail: n.colombani@univpm.it



HOLOCENE (5200 y B.P.)

TODAY



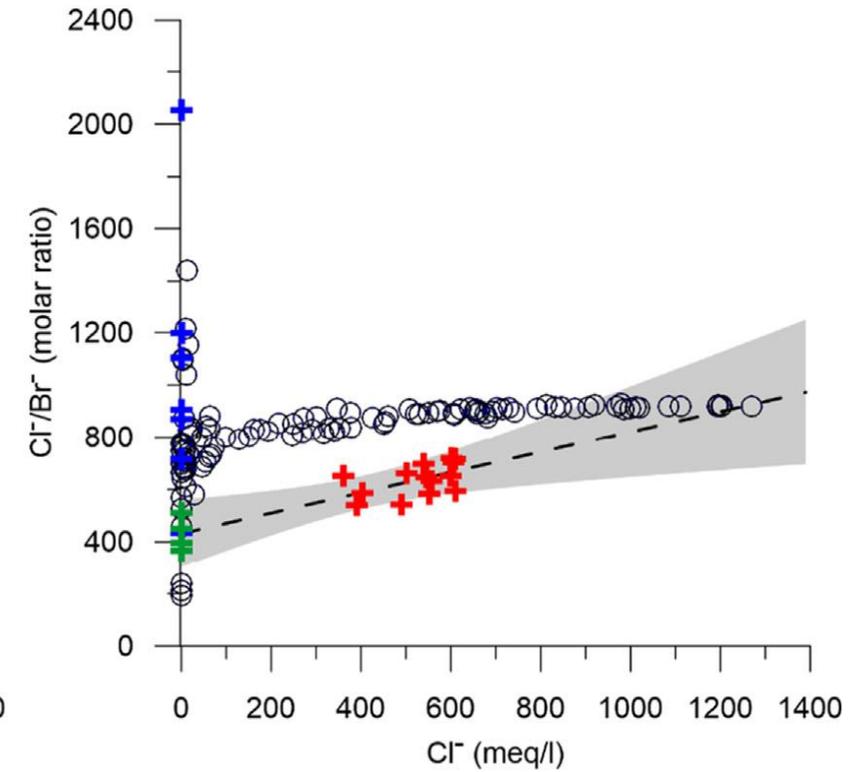
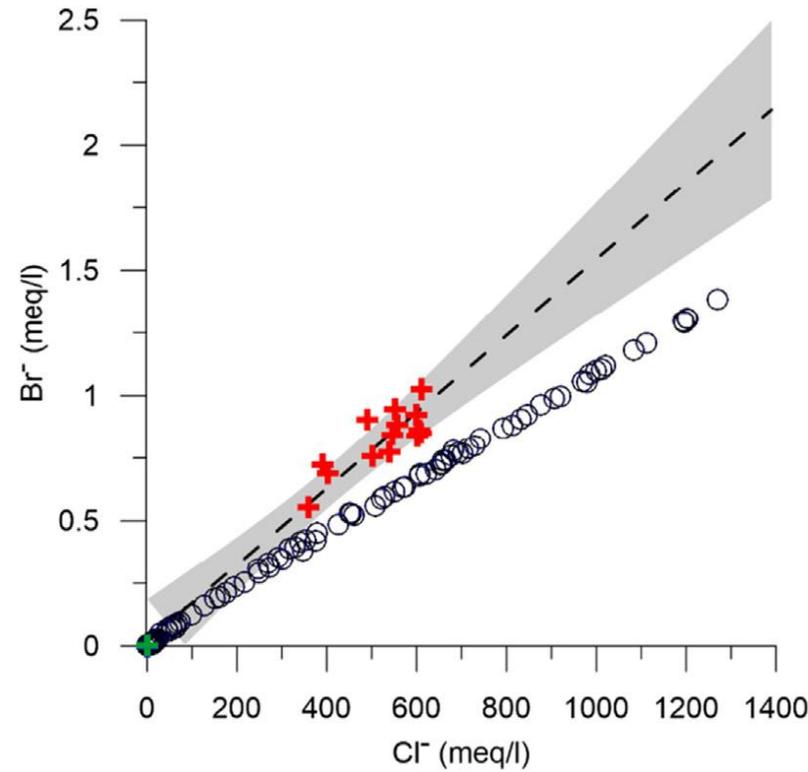
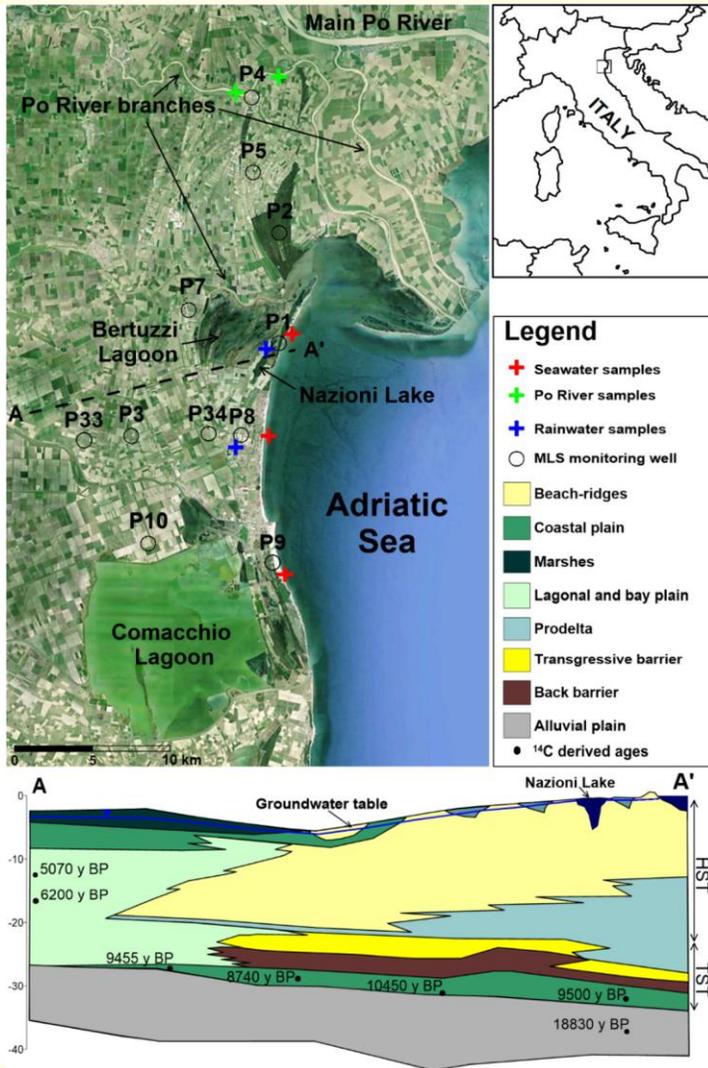
Sourced from: Fontana A., Ronchi L. (2021) DOI:10.30687/978-88-6969-480-6/001

Sourced from: Rossi et al. (2021) DOI: 10.1002/jqs.3322

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Phreatic coastal aquifer salinity characterization



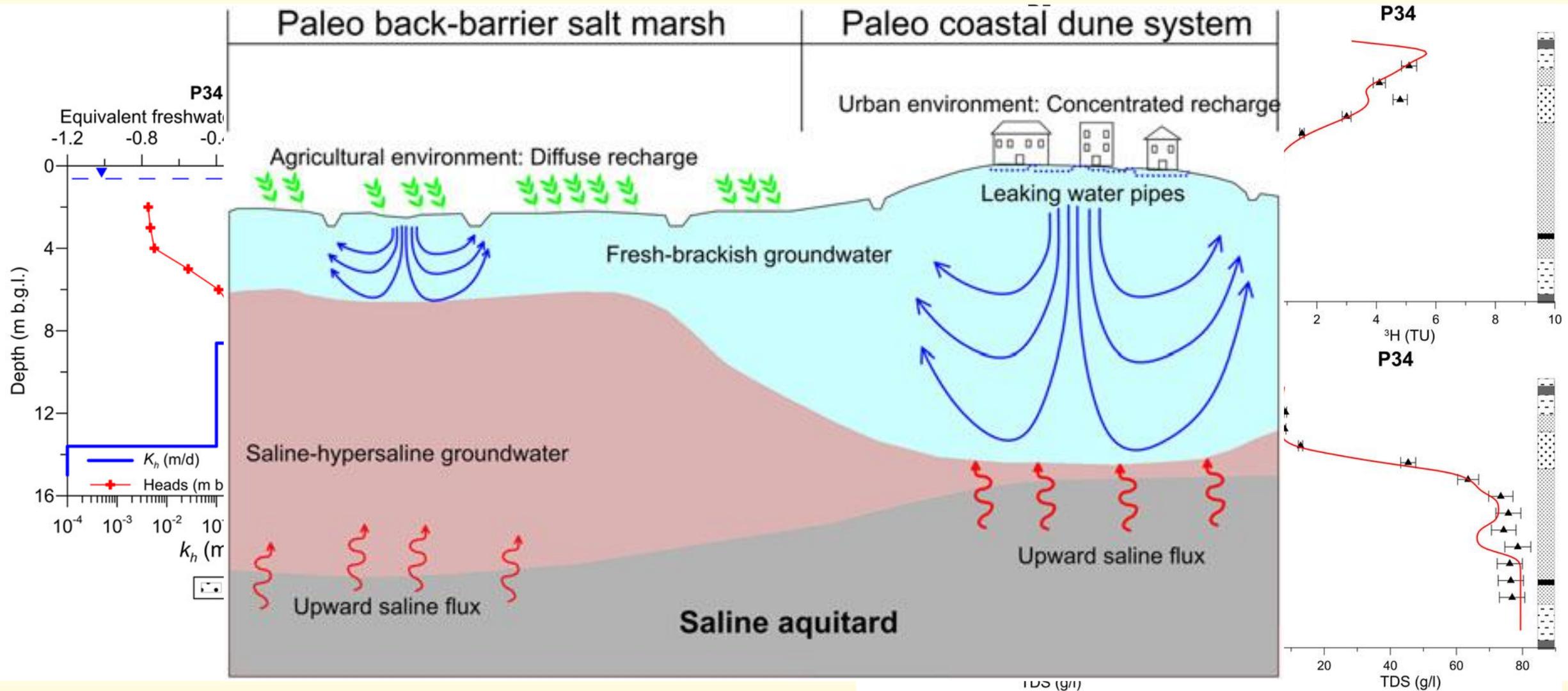
○ GW + Sea + Po River + Rain - - Po-Sea mixing line 99.99% Conf. interval

Colombani et al. (2016) DOI: 10.1016/j.gexplo.2017.01.011

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Groundwater residence times and flow patterns

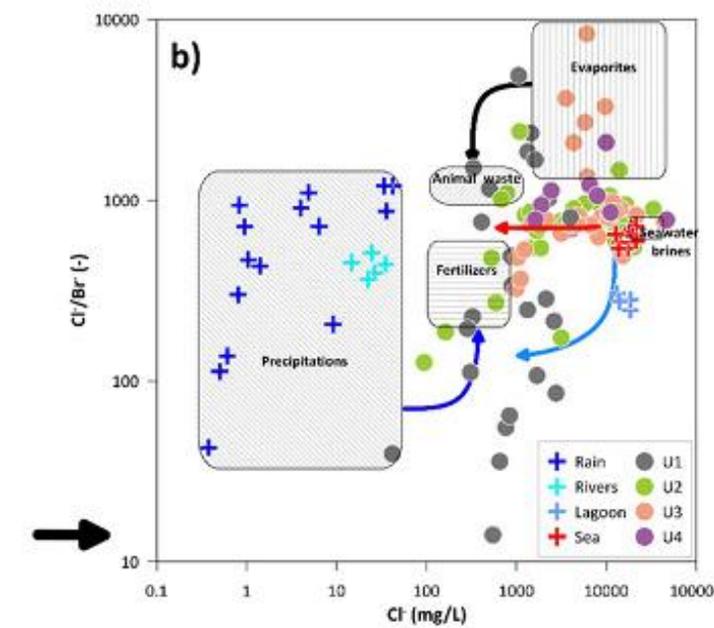
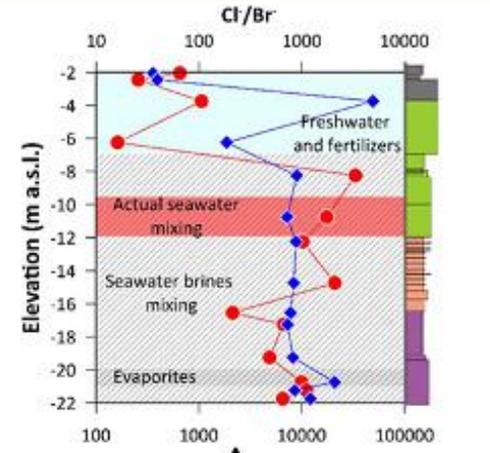


Caschetto et al. (2013) DOI: 10.1002/hyp.10942

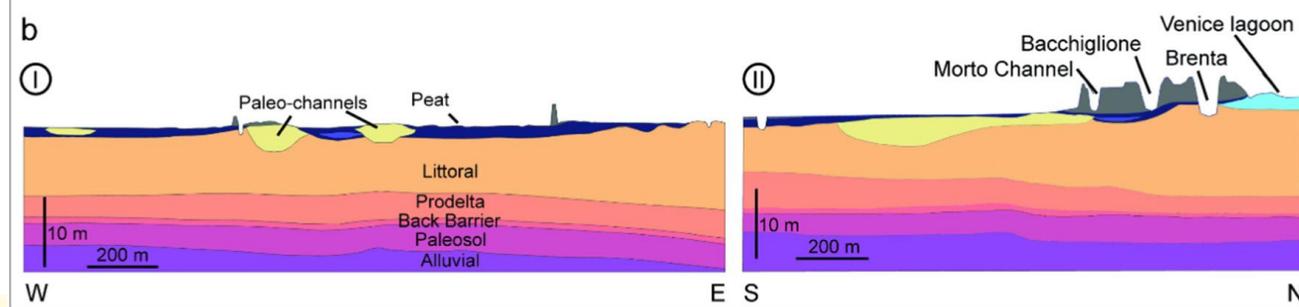
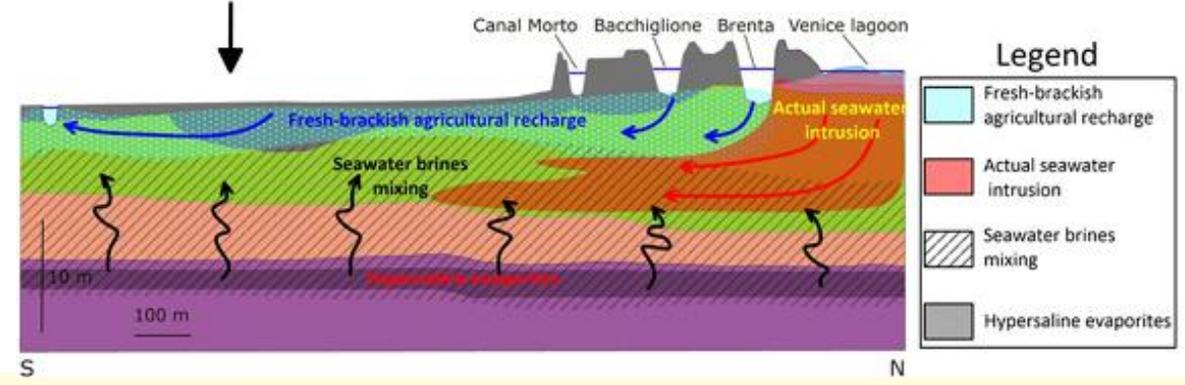
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Groundwater residence times and flow patterns II

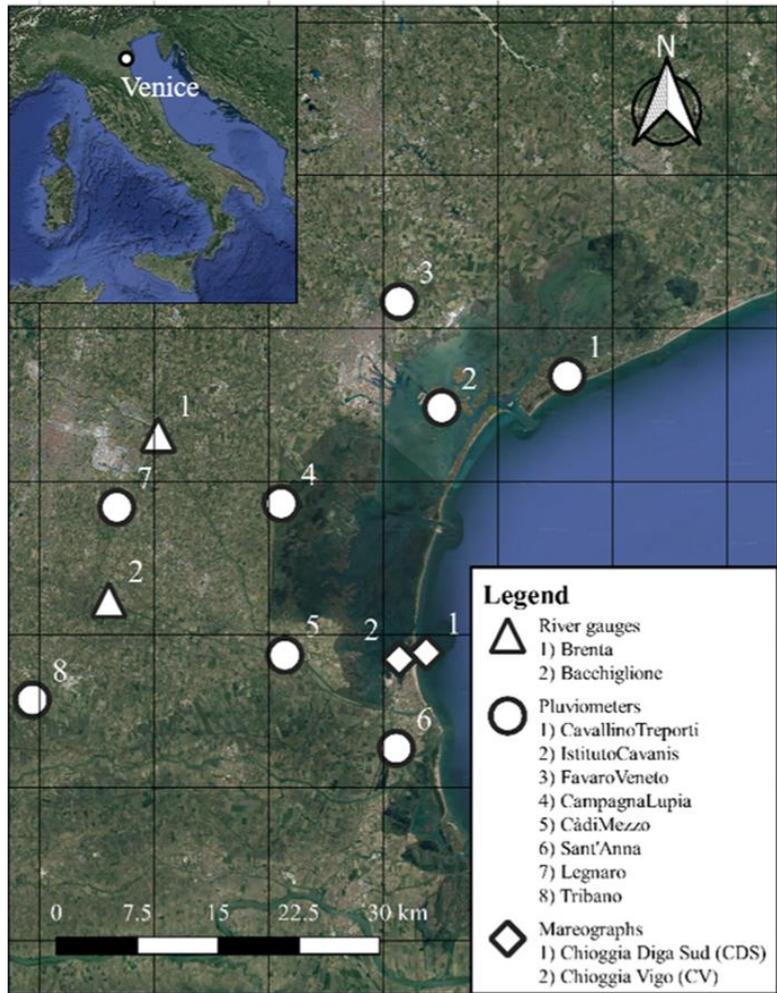


High resolution vertical Cl/Br and depositional environments revealed different origins of groundwater salinity

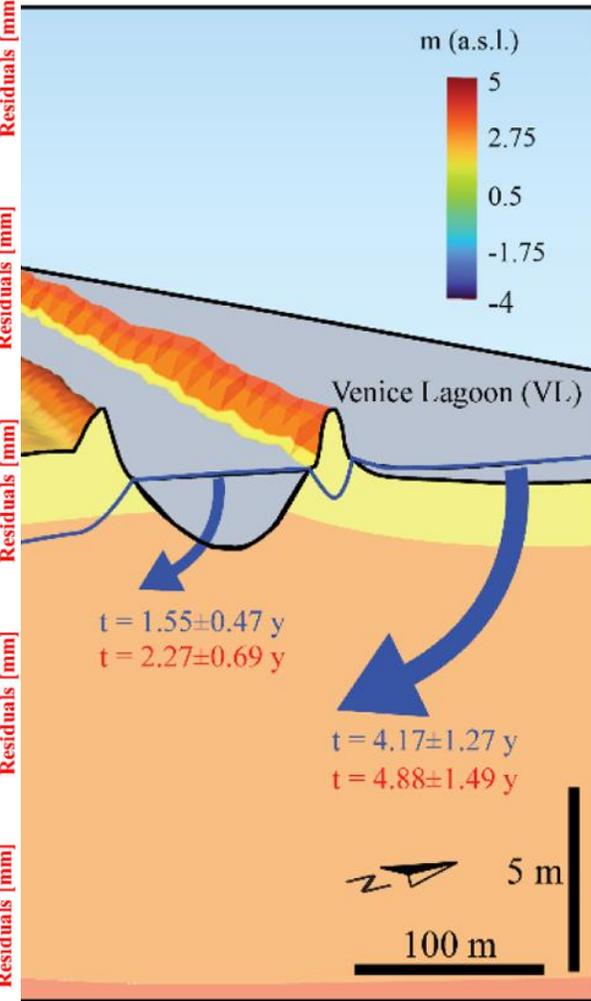
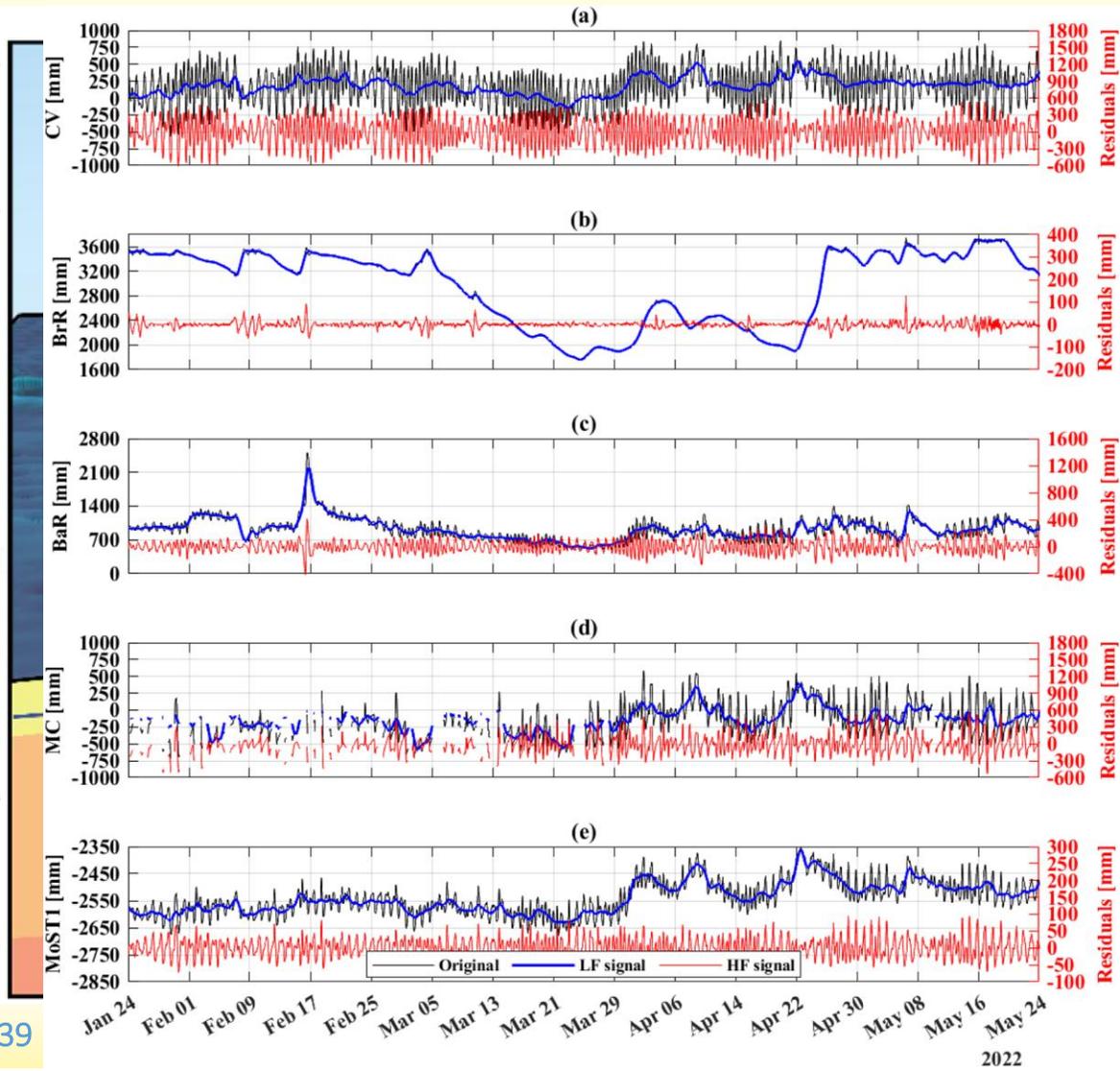


Alessandrino et al. (2023) DOI: 10.1016/j.scitotenv.2023.167058

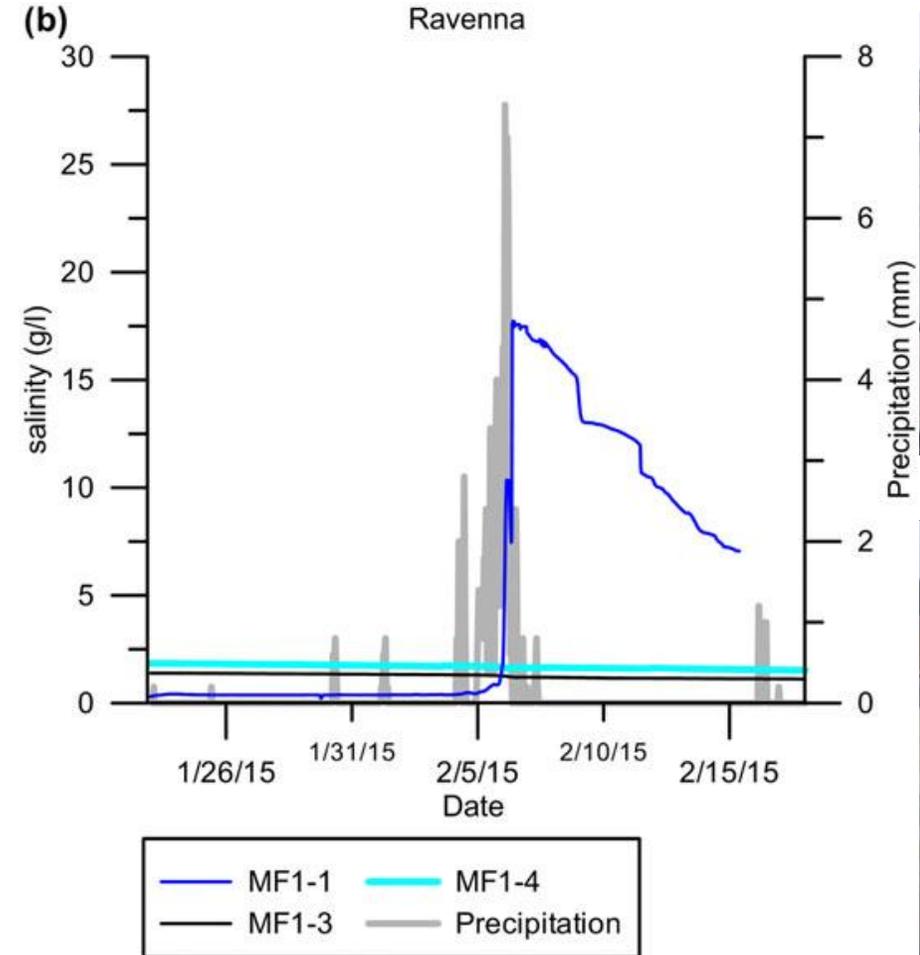
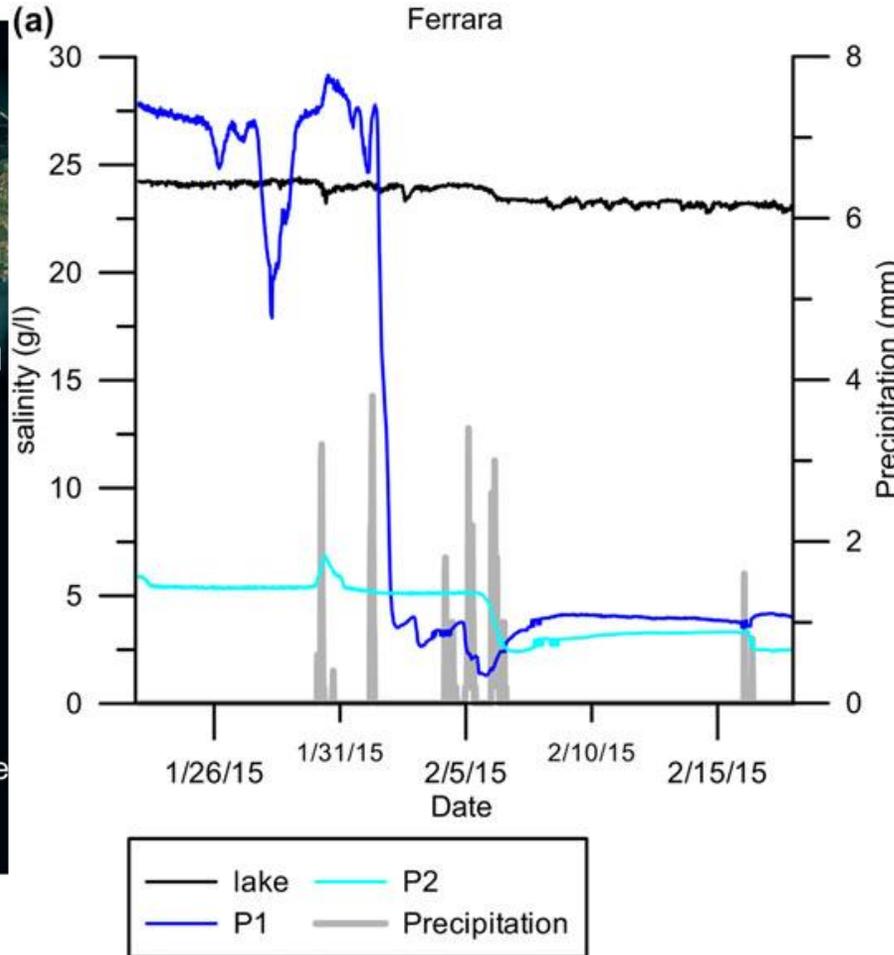
Groundwater residence times and flow patterns II



Gaiolini et al. (2024) DOI: 10.1016/j.ejrh.2024.102039

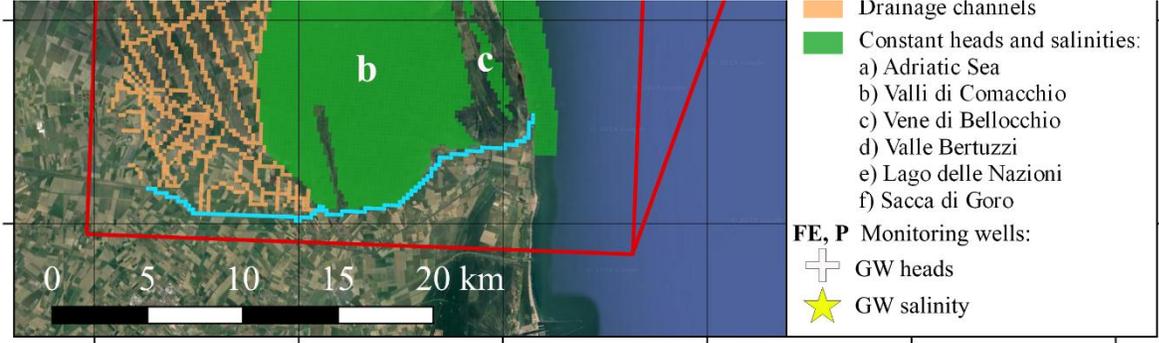
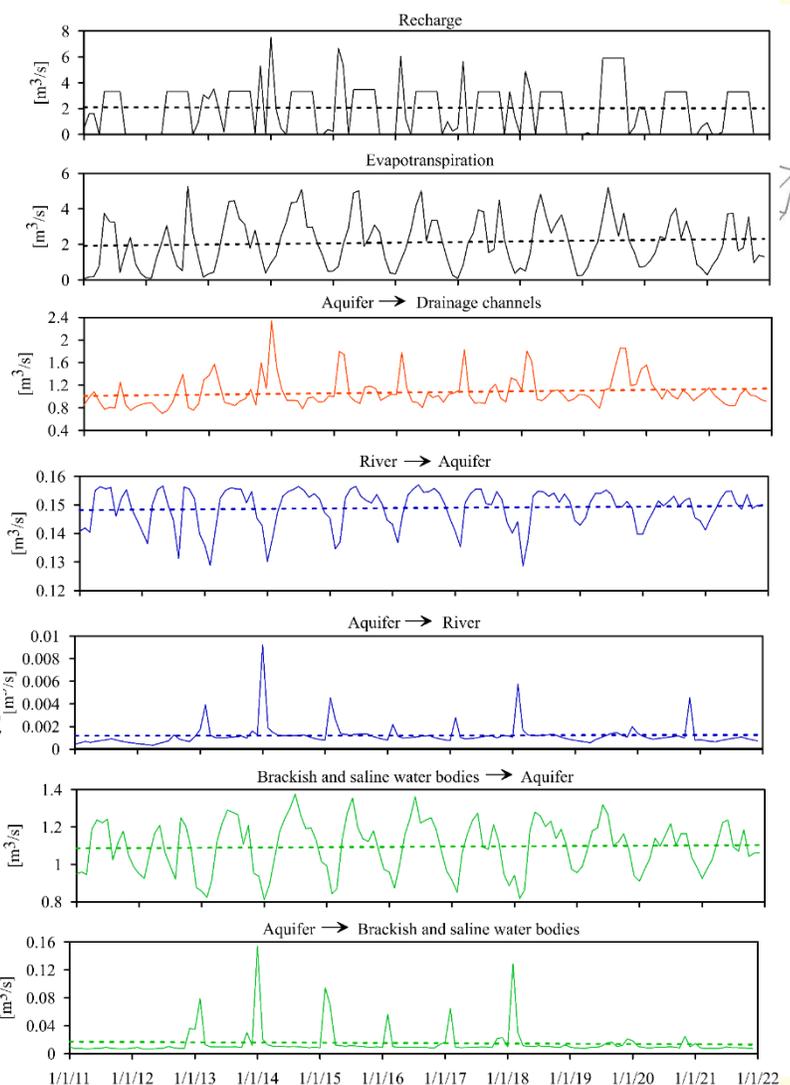
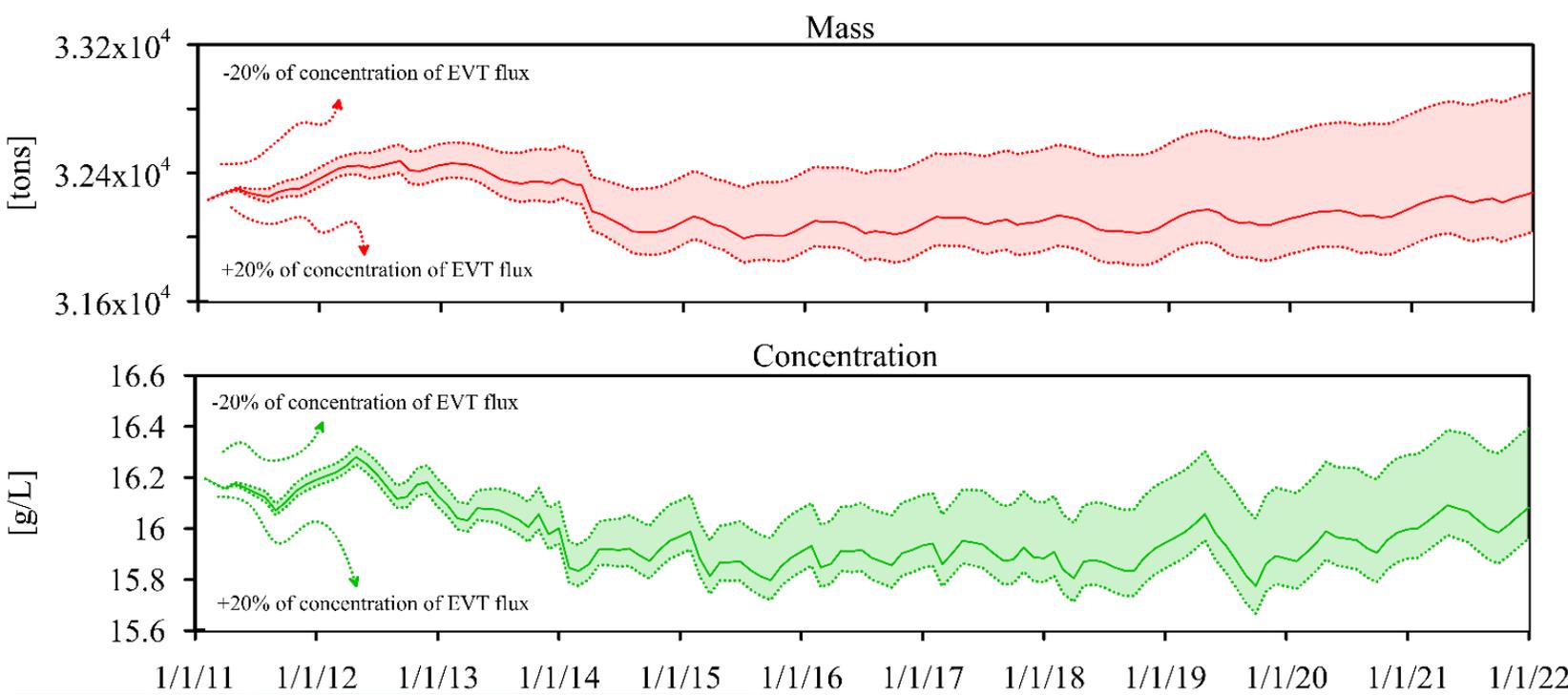


Extreme events Feb 2015



Giambastiani et al. (2016) DOI: 10.1002/hyp.11130

SEAWAT model of the Southern Po coastal aquifer



Gaiolini et al. (2024) DOI:10.1007/s11269-024-04044-y

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TAKE HOME MESSAGE



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- Hypersaline groundwater associated with back barrier environments, while fresh groundwater related to relict dune-beach systems.
- Depth-dependent physical aquifer parameterization indispensable in coastal aquifers.
- Upward vertical gradient due to the reclamation system controls the hydrodynamics of this coastal area.
- Numerical modelling, is useful to manage the salinization and to confirm the hypothesis on the paleo-salinization origin.
- Seawater intrusion limited in the first 1-2 km inland.