

Sampling sites during the Venice cruises periode (2015 – 2017)

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1. Study site description: the Venice lagoon

The Venice lagoon is a shallow water body, covering an area of approximately 432 km² (Sfriso et al., 2019). The average depth of the lagoon is approximately 1 m, with only 5% of its surface deeper than 5 m (some navigable channels are deeper than 15 m). The lagoon is connected to the Northern Adriatic Sea through three inlets, with a flux which can reach 20000 m³ s⁻¹ at peak flow during spring tides, through the three inlets (Umgiesser, 2020). Water residence time is on the order of a few days for the area closest to the inlets and up to 30 d for the inner part and close to the river tributaries (Cucco and Umgiesser, 2006), but is highly variable depending on climatic forcing, and the inputs from rivers (Melaku Canu et al., 2012). Notwithstanding the high anthropogenic impact, the Venice lagoon ecosystem still shows a good resilience, providing a broad range of ecosystem services (Rova et al., 2015, 2019). The lagoon is subjected to the Water Framework Directive 2000/60/EC (WFD; European Community, 2000), which aims at improving the quality of European waters by managing at the river basin scale. The management plan “Hydrographic district of Oriental Alps”, HDOA, (Autorità di bacino dell’Adige et al., 2010), adopted in compliance to the WFD, divides the Venice lagoon into 11 water bodies, based on a combination of hydrological descriptors, existing pressures and chemical and ecological state.

The 5 sampling stations considered in this work are shown in Figure 1. With respect to the subdivision adopted by the management plan HDOA (see figure 2), stations ALG1, ALG2 and TRES fall in PNC1 (ALG2 located close to the border with PNC2), VIG in ENC2, and GIU in ENC4. All these stations are characterized by a similar depth, of about 1 m. Stations ALG2, GIU and TRES are characterized by a more exposed condition, with respect to ALG1 and VIG, which are respectively protected by an island and a saltmarsh from the action of the main winds. Stations ALG1, and TRES are representative of a confined area, characterized by a limited residence time, and, in particular station ALG1, is located under the influence of a freshwater canal.

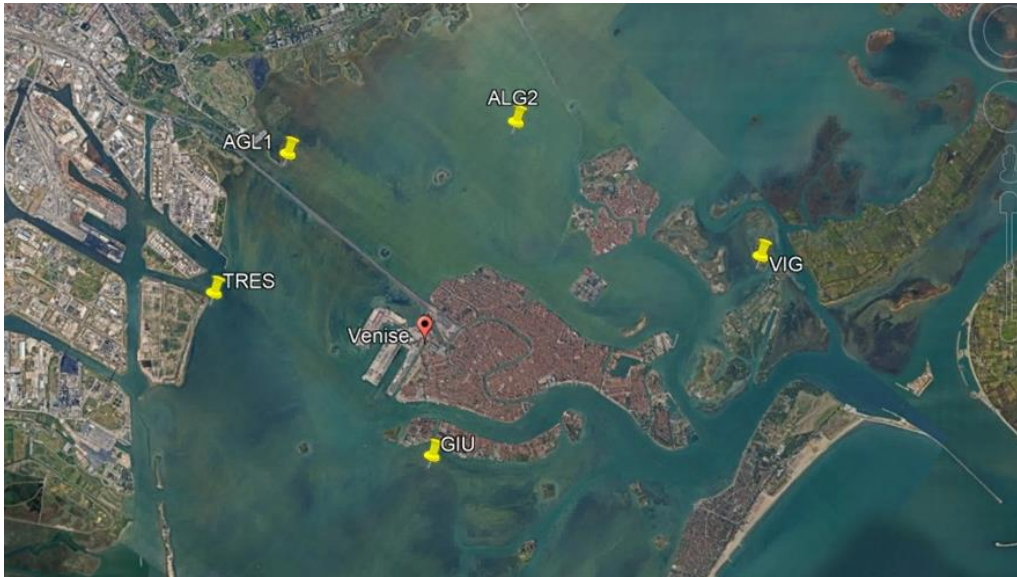


Figure 1 : The 5 sampling stations considered in this work

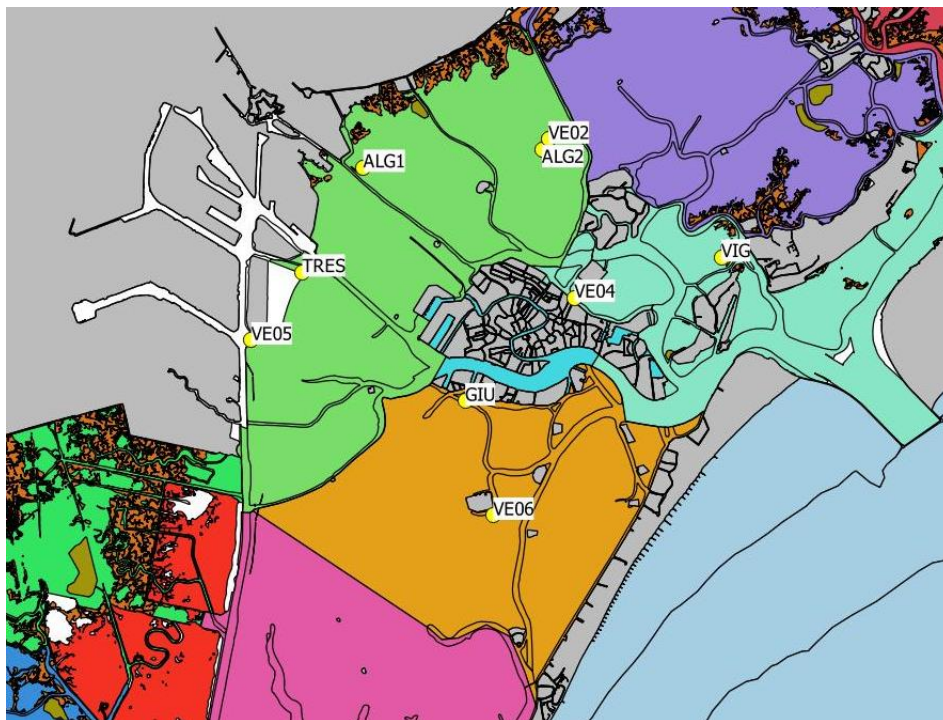


Figure 2 : Sampled stations, and their location with respect to the subdivision adopted by the management plan HDOA. PNC1=green; PNC2=violet; ENC2=light blue; ENC4=light orange.

2. Field campaigns

5 stations in the central part of the lagoon were visited during three different campaigns in 2015 to 2017: Venezia 1 (25-26 June 2015), Venezia 2 (10-13 May 2016), Venezia 3 (22-26 Sep 2017). Two stations (ALG1 and ALG2) were visited during each expedition over the three years. At each station, water column was sampled with a 5-L Niskin® bottles below the surface at 0.5m depth and 3-5 cores were

collected using a Uwitech single tube corer attached to a coring stick. Cores of 20-40 cm were collected, capped and stored in the shadow before returning in the laboratory.

Table 1: Positions of the five stations visited during this study and visits (X) during the different expeditions.

	Lat (N)	Long (E)	Depth (m)	2015	2016	2017
ALG1	45°27'46"	12°17'17"	1.5	X	X	X
ALG2	45°28'02"	12°20'00"	2	X	X	X
GIU	45°25'19	12°18'58"	1.0		X	X
TRES	45°26'38"	12°16'26"	2			X
VIG	45°26'57"	12°22'47"	0.8		X	

3. References

Autorità di bacino dell'Adige et al., 2010. Autorità di bacino dell'Adige, Autorità di bacino dei fiumi Isonzo Tagliamento Livenza Piave Brenta-Bacchiglione, Ministero dell'Ambiente e Tutela del Territorio e del Mare, Regione Lombardia, Regione Veneto, Regione Autonoma Friuli Venezia Giulia, Provincia Autonoma di Bolzano, Provincia autonoma di Trento, Magistrato alle acque, ISPRA, Ufficio di Piano. Subunità idrografica bacino scolante, laguna di Venezia e mare antistante e Piano di Gestione, Piano di Gestione dei bacini idrografici delle Alpi Orientali.

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