
CAPO FETO WETLAND - ITALY

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Capo Feto is a typical Mediterranean wetland (margi) located along the south-western coast of Sicily, 5 km west of Mazara del Vallo (37.68° N, 12.48° E).

The study area is included in the inner surface of the Life-Nature project requalification financing to the UE. The marshland has a total extension of 1.4 Km² and an average depth of 1.75 m. (Fig. 1).

The catchment's area of Capo Feto coastal zone shows the typical feature of wetland habitat. As for the surface hydrology of the wetland area, it's dry in the summer season except the net of reclamation channels and a few ponds; in the winter season Capo Feto manifests entirely the typical landscape of wetlands with ponds and marsh zones and the typical wildlife of migratory and sedentary birds (Fig. 2, 3).

All drainage of the wet land is currently assured to a net of 10 artificial channels; the West-East channel is the principal, all the others channels are perpendiculars compared with the principal channel, this net assuring the drainage of the groundwater and rainwater.

In the seventies the areas near Capo Feto were of interest for their anthropic environment connected to the agriculture, tourism and urbanization.



Figure 1: Location and map of Capo Feto Margi

In the eighties SNAM laid the Italian–Algerian methane pipeline across the Capo Feto area, this underground construction, emerging from the sea, changed a lot of the original features; in addition to this, the global climate change caused modifications to the natural habitat.



Figure 2: View of Capo Feto wetland.

Capo Feto has a typical Mediterranean climate, characterized by high temperatures in summer and mild in the winter. Because of its geographic position and its geomorphology Capo Feto, such as all the western coast of the Sicily, has exposure to strong and persistent winds (annual average is approximately 6,8 m/sec), that has a strong influence on the climate.

In the winter winds blow from west or north-west, while in spring-summer there are continuous changes of wind direction and force.

North winds are most constant, they are cold and persistent in duration, while the sirocco is a typical muggy wind lasting three - five days, its speed is greater in April-June.

The wind from north-west is cold and intense and of such a high salt content, that the local people called it "marascata". It causes much damage to the plants of the coastal landscape. The autumn wind is from the west (ponente) with the sirocco is wind it gains more speed.

The annual average temperature is of approximately 17,14 °C; the highest temperatures are recorded in August, less frequently, in July. These temperatures have highs of 30-32 °C and less often of 37-38 °C. The minimal temperatures very rarely reach zero. In fact on some January and February nights the temperature descends very low.

The annual rainfall average in the last ten years has been 415 millimeters, distributed over a period of 75 days.

This index of rainfall is among the lowest in Sicily. Moreover, it often happens that the greater part of the rain occurs within a few days, and it is not infrequent that in a single day one tenth of the annual rainfall occurs. The precipitation in autumn-winter turns out to be frequently of stormy origin with high intensity. In spring and, in summer, the precipitations are quite modest and less frequent.



Figure 3: Wildlife of migratory and sedentary birds. For Capo Feto we estimated water budgets and seasonal water budget before the beginning of the Life Nature reclamation and environmental remediation works.

On an annual basis, the wetland can be considered a net heterotrophic system, from positive ΔDIP ($0.015 \text{ mmol m}^{-2} \text{ d}^{-1}$) values and ΔDIN ($0.05 \text{ mmol m}^{-2} \text{ d}^{-1}$) values calculated it can be considered as source of DIP and that of DIN as indicated in the LOICZ procedure. The annual average of the net ecosystem metabolism (NEM) taken as the difference between ecosystem production and respiration (p-r), was $-1.6 \text{ mmol C m}^{-2} \text{ d}^{-1}$ in 2001, assuming production of organic matter with a Redfield C:N:P ratio. The negative Nfix-denit values calculated indicate that in the system of the dissimilating dissimulators process of nitrogen in which denitrification is caused prevails.

LaguNet (<http://www.dsa.unipr.it/lagunet/>) is a scientific observational network studying the fluxes of nutrients and other contaminants from lagoon catchments to the near coastal environment. The objectives of LaguNet are to support and encourage co-operation of research groups studying lagoons, wetlands and saltmarsh systems situated along the Italian coast and to evaluate the application of the LOICZ (Land Ocean Interactions in Coastal Zones, a core project of IGBP) biogeochemical flux model and typology classification to such sites.

The methodology has been applied by LOICZ to approximately 170 coastal environments worldwide; it is based on a mass balance approach and provides important information on the flux of nutrients and ecosystem functions; the approach used is applicable to a majority of coastal ecosystems with data that are normally available from conventional monitoring

campaigns. In this way it is possible to compare and to group aquatic systems having different characteristics based on properties related to biogeochemical cycles and to the ecosystem functions that result from these processes.



Figure 4: LaguNet sites around the Italian peninsular.

On the basis of this experience and considering the paucity of LOICZ sites in the Mediterranean and Southern Europe it was decided to apply this methodology to a series of Italian coastal environments where sufficient data are available (Fig. 4).

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