

Point of Geological Interest: Cabo Frio Dunes

HOW DUNES ARE FORMED

Dunes are formed from the action of constant winds that blow in a main direction on the sand of the beaches. The sea brings more sand to the beach than it can take back. Thus, the remaining sand forms the dunes. It is also necessary the existence of a site where sands can accumulate in an environment of little rain.

TYPES OF DUNES

Geologists (professionals who study the evolution of the Earth and of life that develops on it) are studying Cabo Frio searching to identify the behavior of the dune fields, genuine natural laboratories capable to provide information on how the landscape that today we observe has been formed over thousands of years.

The dunes can be of two types: stationary (fixed) and migratory (movable). Stationary dunes become stable for several factors, and the major one is the vegetation development. Migratory dunes (Figure 1) present a larger movement of sand grains. Their migration is caused by the high intensity of winds, forming fields of migratory dunes, which displace even when finding obstacles.

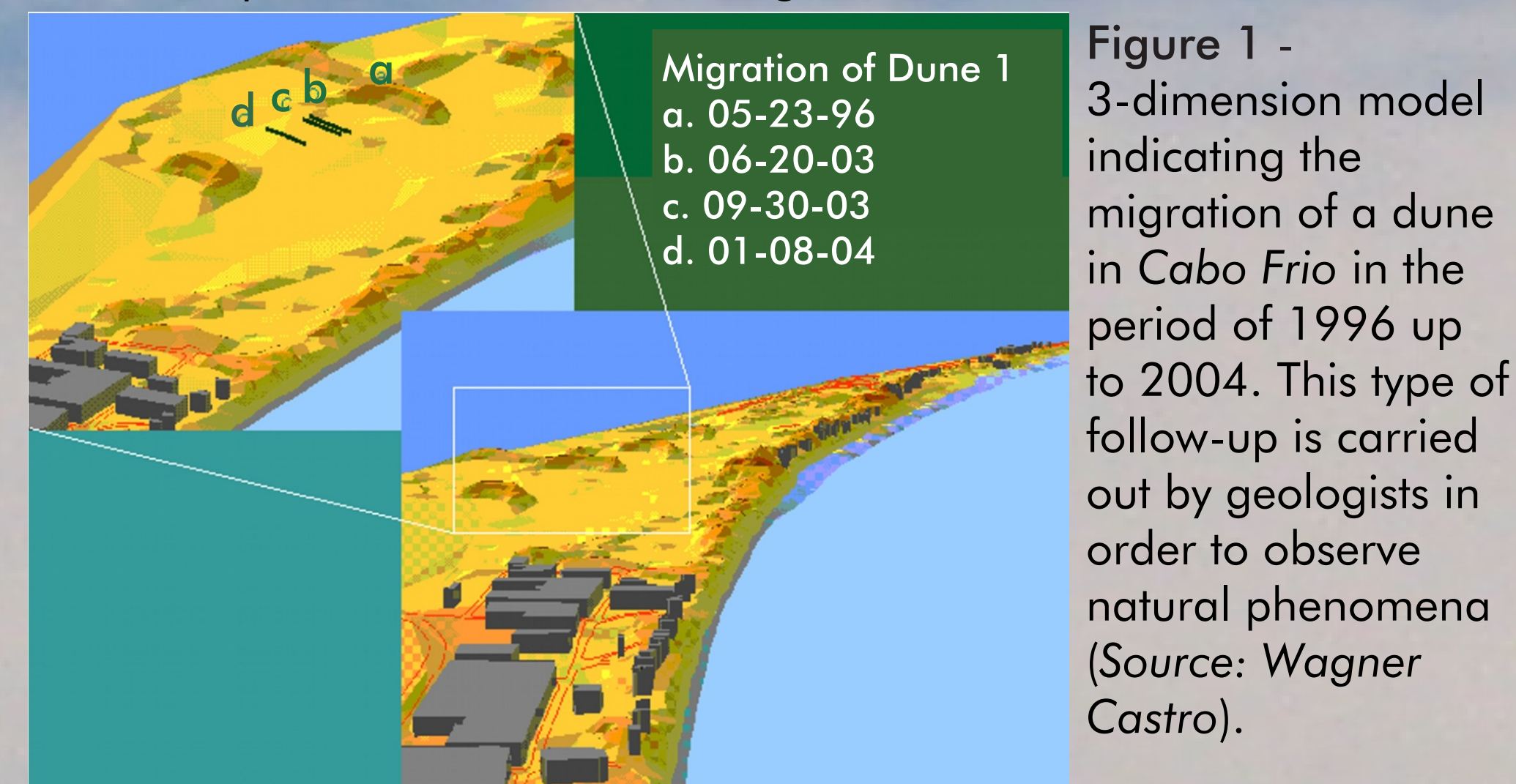


Photo: Carlos Rosa



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CHARACTERIZATION

The city of Cabo Frio has a population of about 150,000 inhabitants, according to data of the City Hall. Its climate is semi-arid with average temperatures from 35°C in January up to 18°C during the month of July. Natural factors as geology, wind regimen and waves and little rain of the region benefit the development of dunes.

The wind regimen capable to transport sediments from the beach to the dunes is mainly directed towards northeast, as it can be observed in the dune fields of Dama Branca and of Però.

The coastal dunes of Cabo Frio constitute the most important active eolian record in the Brazilian Southeast. Sand that forms the dunes has origin in the adjacent sea deposits, from where they are removed and thrown at the beach by the action of waves. The feeding zone of migratory dunes of Cabo Frio is located in the area of the Forte, Dunas and Foguete beaches.

Dama Branca Dune has 33 meters high. Its movement is slow and gradual, burying the coastal plain covered by sandbar vegetation. In addition to the exceptional geological and landscape beauty, Dama Branca Dune is the largest isolated dune in the Brazilian Southeast.



The coastal dunes migrate according to the predominant wind orientation from northeast. In the last years, human action on the natural environment by means of the disordered occupation is further accelerating the processes of eolian movement.

The photo above displays part of the dune field of Cabo Frio. When the contour of a dune has the shape of crescent moon it is named barchan dune by specialists (Photo: Wagner Castro).



Satellite image with the location of the dune field of Cabo Frio.



Above: View of dunes (Photos: INEPAC)



NATURAL HERITAGE

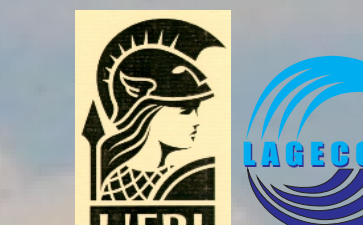
Due to its importance and singularity, the Dama Branca dune was listed as heritage by INEPAC - Instituto Estadual do Patrimônio Cultural [State Institute of Cultural Heritage] in 03.11.1985. The inclusion of Dama Branca dune in the heritage list was a breakthrough for the preservation of the natural heritage in Região dos Lagos.

About the governmental action of to list the Dama Branca dune as heritage, INEPAC makes the following considerations:

"Daughters of the sea sedimentation and of the northeast wind, these sand formations are unique in the State, as single ecosystem, botanical heritage and landscape, except for the military areas of Marambaia. There are orchids and philodendrons that only bloom there, tied by the vegetation of sand bar or swept away by winds that sculpt and destroy them continuously. Identity symbol of the region and the image of the most famous among them, the Mother Dune, known as Dama Branca by people, is surrounded by true corridors of dunes, parallel to it, movable or already fixed by sand bar vegetation. This protection action was resulted by study carried out together with Fundação Estadual de Engenharia do Meio Ambiente / Feema" [environmental protection agency].

In this place, sand and wind follow their work, sculpting a new landscape each instant. We are

"Earth has taken some billion years to build rocks, minerals, mountains and oceans. Protect this masterpiece!"



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