

Ministry of Infrastructure and Transport
Venice Water Authority
concessionary
Consorzio Venezia Nuova

Measures for the protection of Venice and its lagoon



Lagoon of Venice

(May 2005)



Venice



Island of Torcello



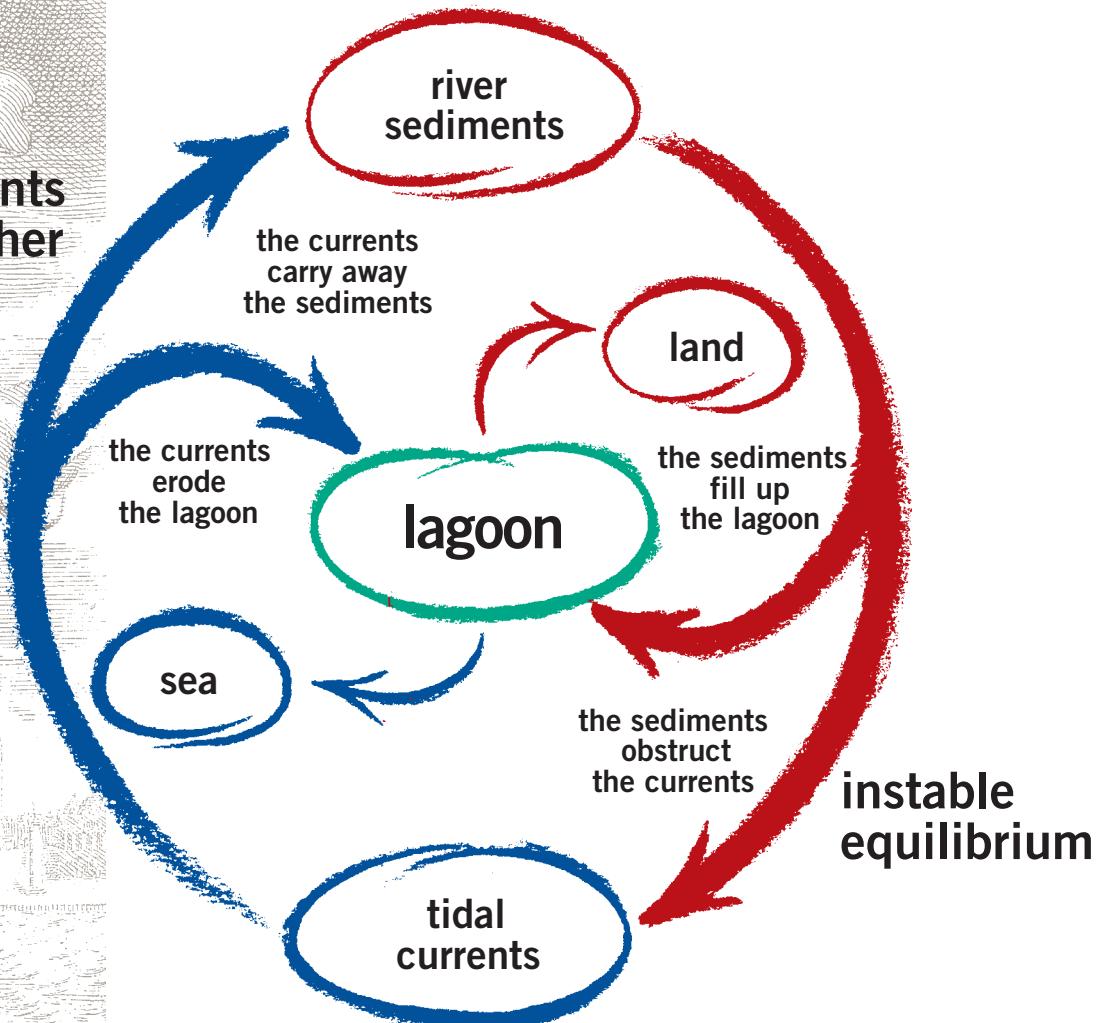
Salt marshes, channels and “tidal creeks”



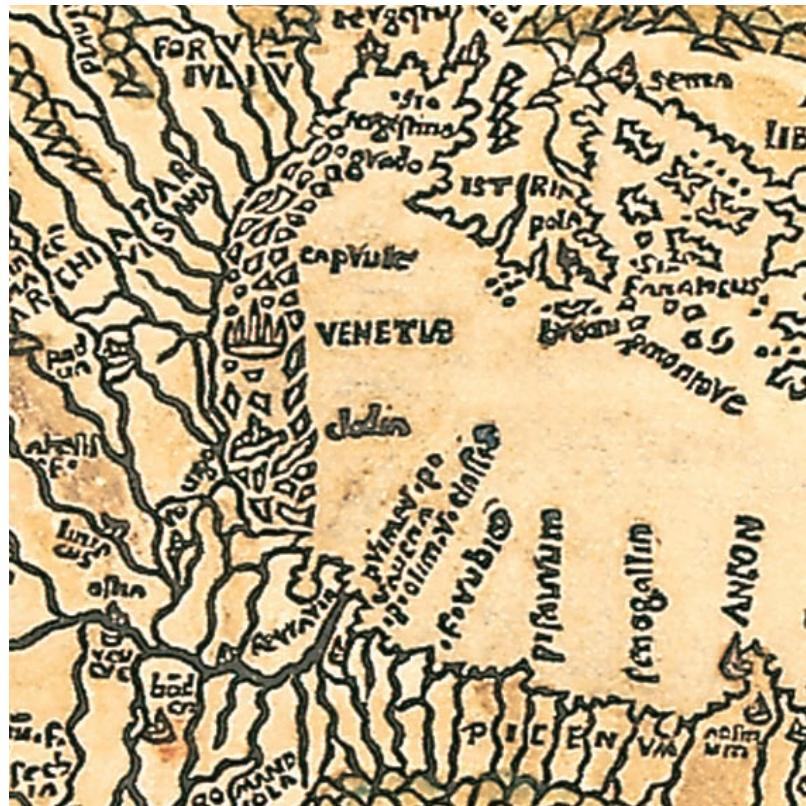
Marghera



The lagoon: a transitional environment in a state of instability



Lagoons of the Upper Adriatic Sea

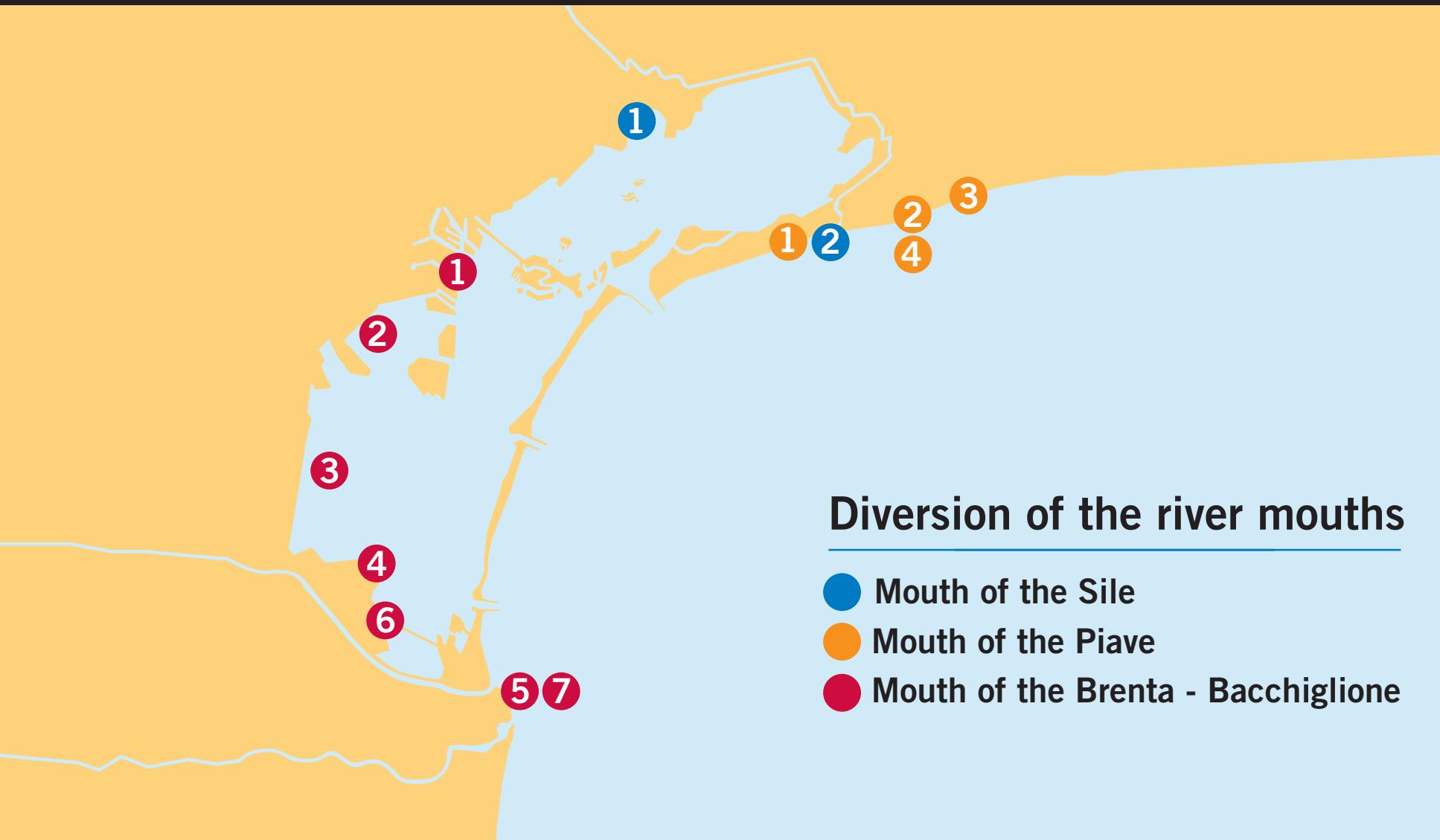


16th century

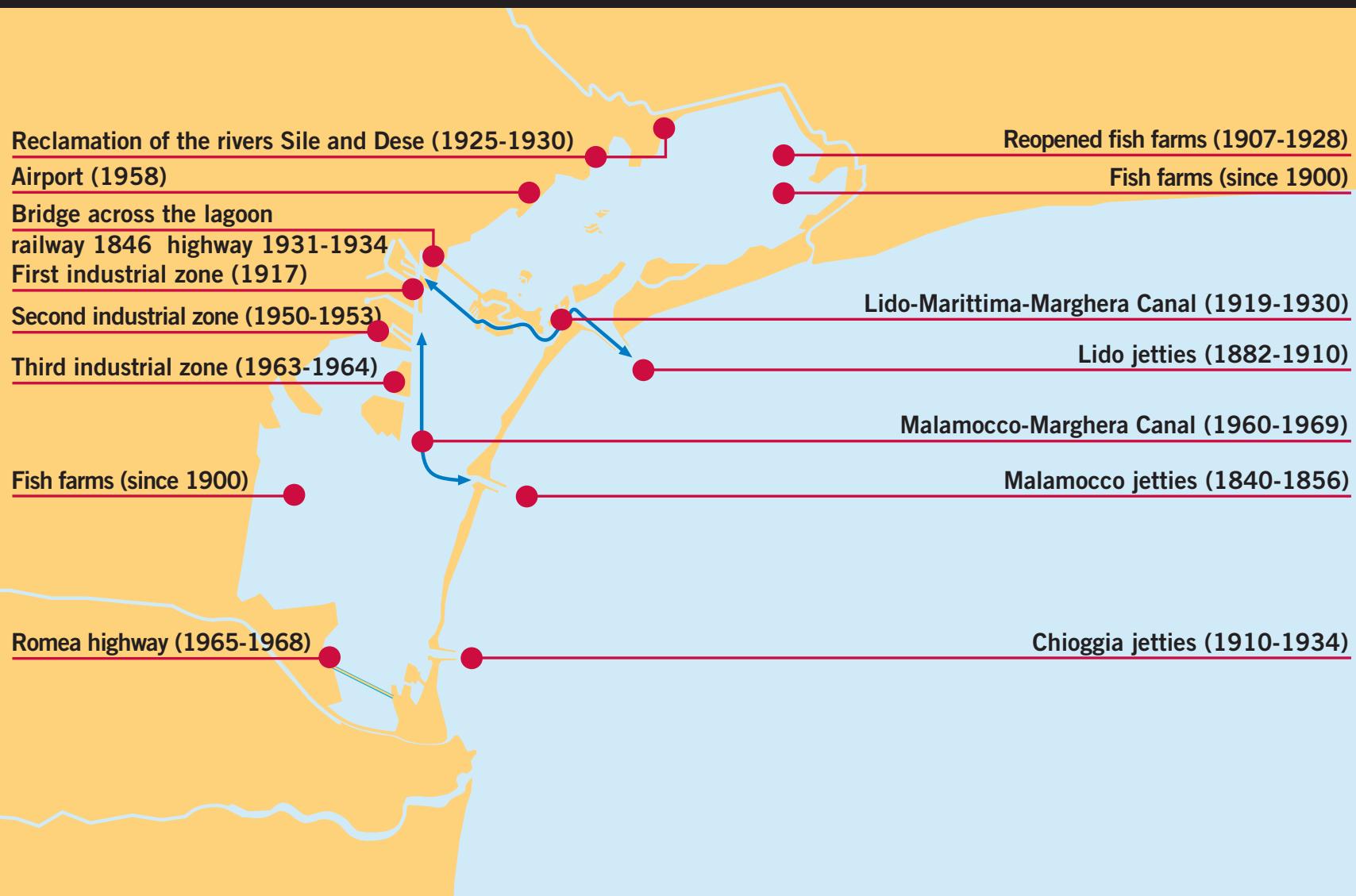


today

Diversion of the rivers



Main interventions (19th - 20th centuries)

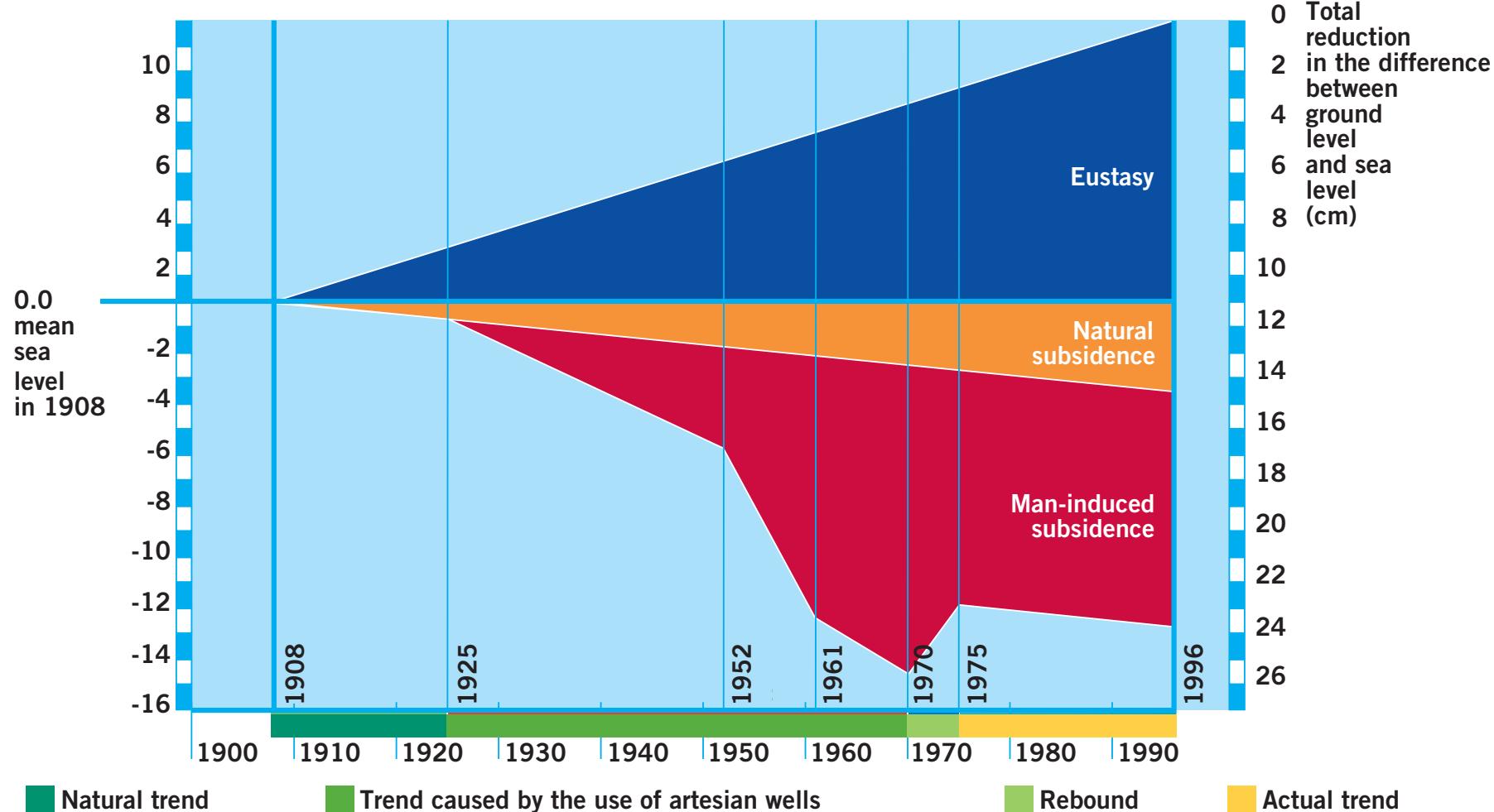


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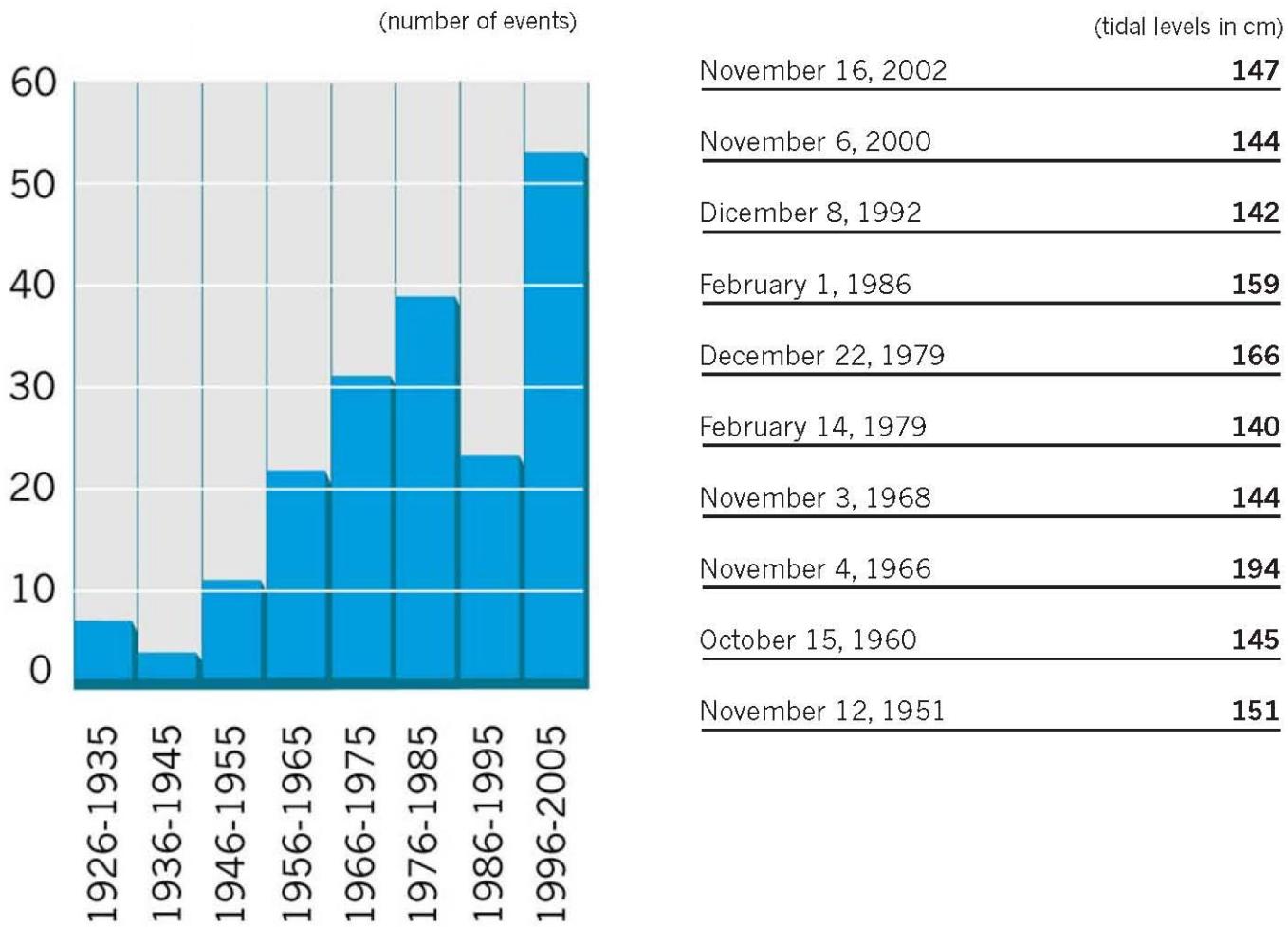
High tide protection



Eustasy and subsidence



Frequency of high tides ≥ 110 cm

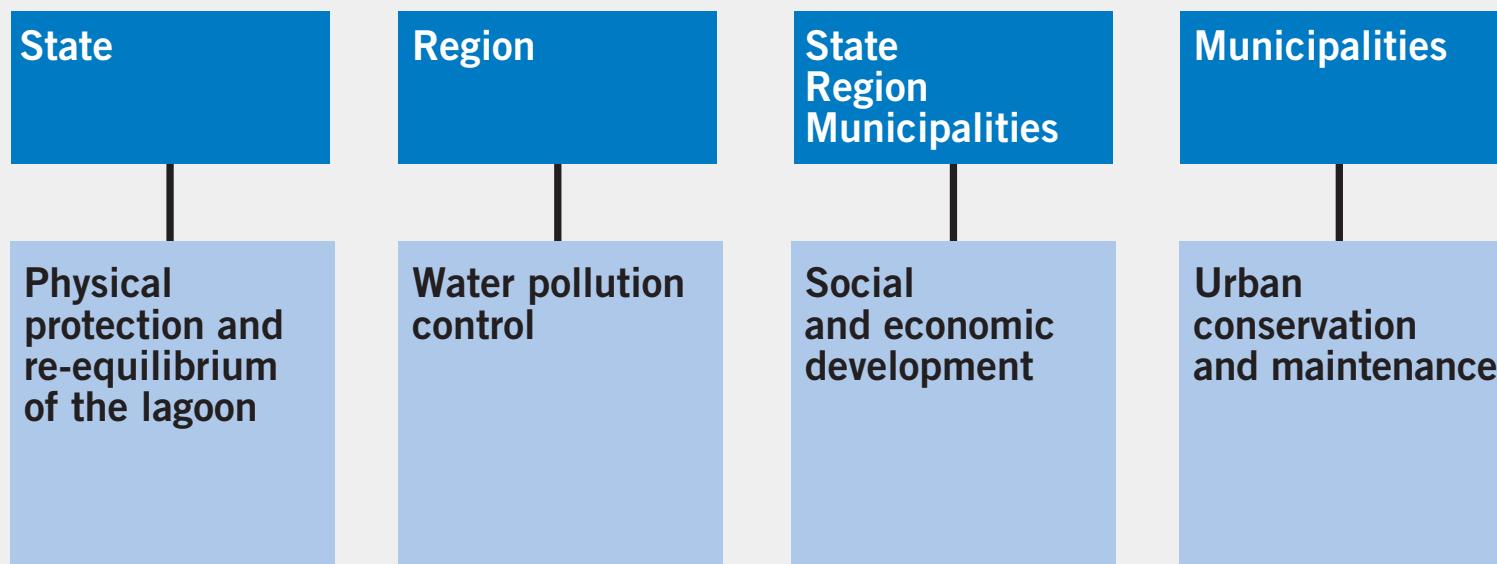




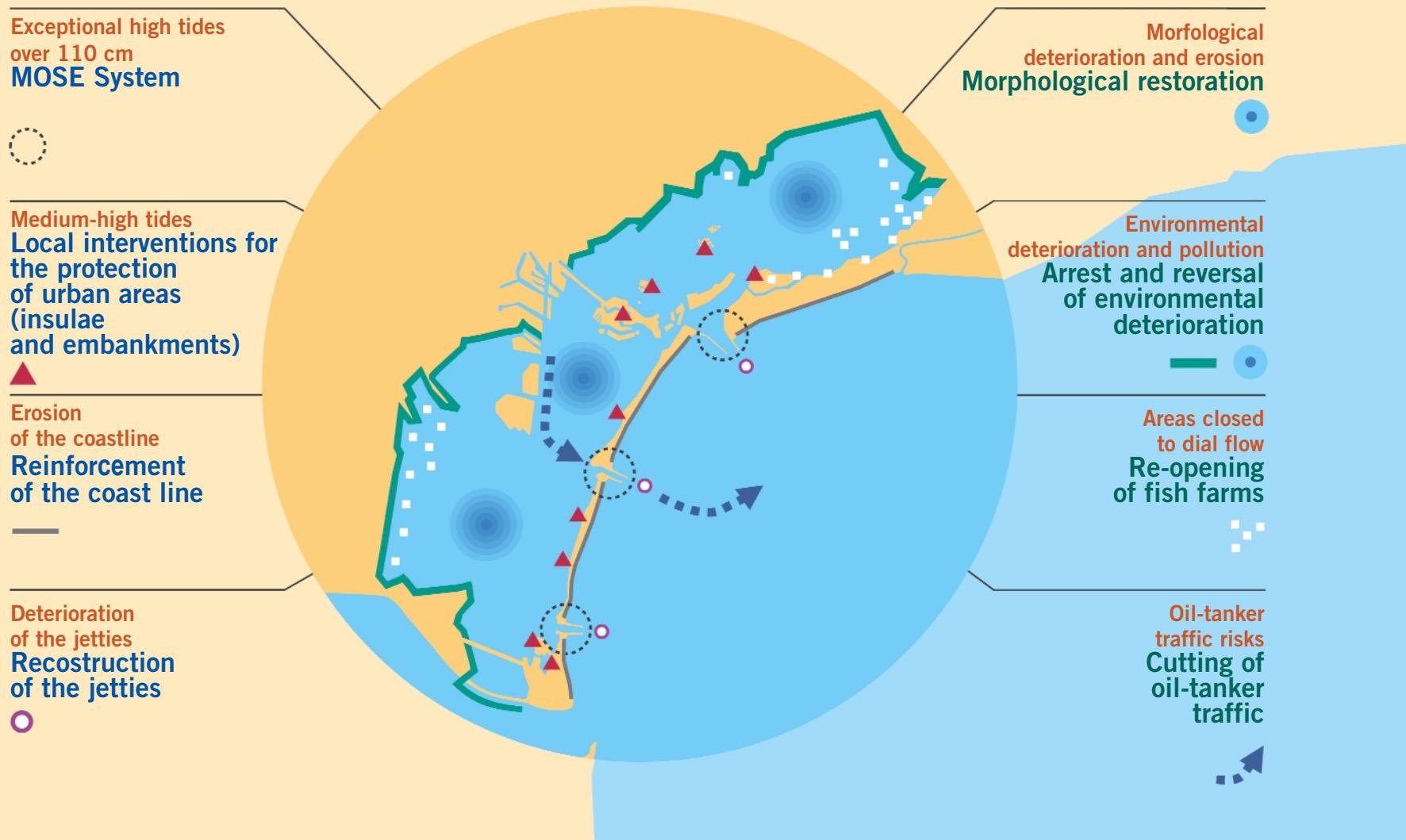
The safeguarding
of Venice and its lagoon

A matter of priority national interest

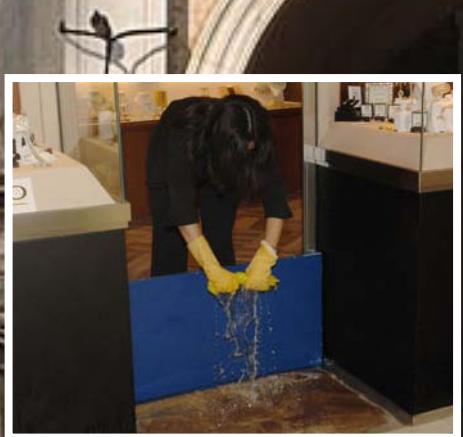
Law nº. 798 of 1984. Responsibilities



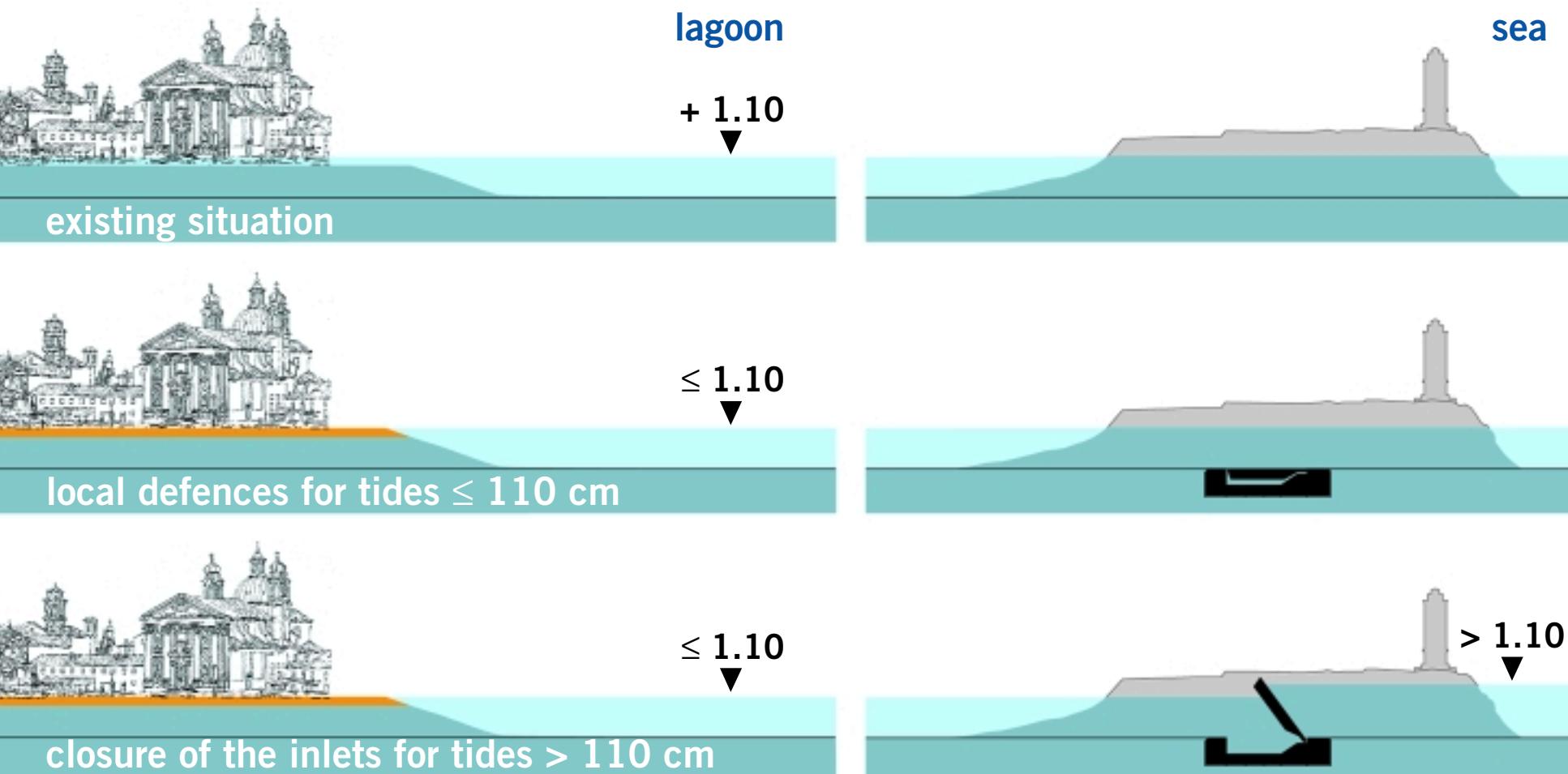
System of interventions



Venice, October 2006. High water (+ 112 cm)

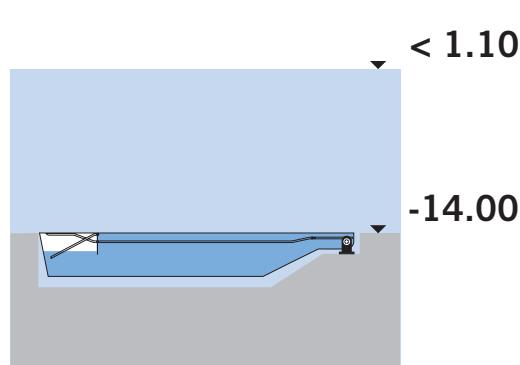


High tide protection system

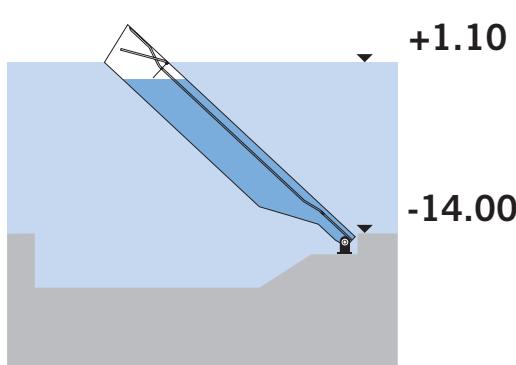


How the floodgates work

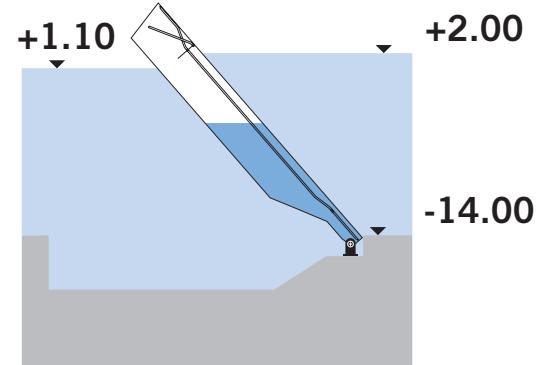
Defence against exceptionally high tide



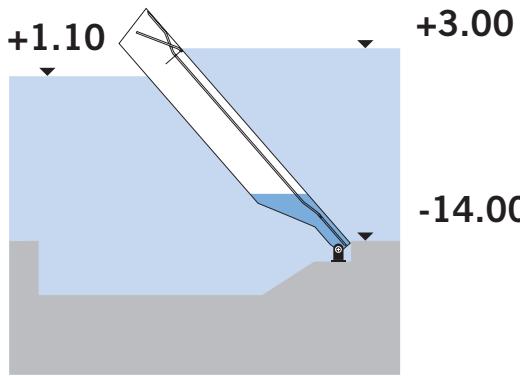
a
< Lagoon



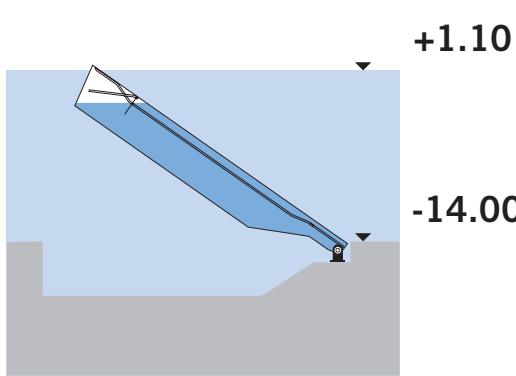
b



c



d



e



MOSE System Work sites

Gates



Lido

The lay-out of the inlet before the realization of the MOSE System for the defence from high tides



Lido

The new lay-out
of the inlet after
the realization
of the MOSE System
for the defence from
high tides

- ① Refuge haven
- ② Row of gates (Lido-Treporti)
- ③ Intermediate island
- ④ Row of gates (Lido-San Nicolò)
- ⑤ Northern jetty (existing)
- ⑥ Southern jetty (existing)



Lido. The inlet before commencement of work ¹²



Lido. The inlet today



Lido. The inlet today



Lido. The lock and the caisson construction area



Lido. The new island



Lido. The new island and the south jetty



Lido. Seabed protection



Malamocco

The lay-out of the inlet
before the realization
of the MOSE System
for the defence from
high tides



Malamocco

The new lay-out
of the inlet after
the realization
of the MOSE System
for the defence from
high tides

- 1 Row of gates
- 2 Northern jetty (existing)
- 3 Navigation lock
- 4 Southern jetty (existing)
- 5 Breakwater



Malamocco.The inlet before commencement of work



Malamocco. The inlet today



Malamocco.The inlet today



Malamocco. The lock and the caisson work site



Malamocco. The lock



Chioggia

The lay-out of the inlet
before the realization
of the MOSE System
for the defence from
high tides



Chioggia

The new lay-out
of the inlet after
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high tides

- 1 Refuge haven
- 2 Northern jetty (existing)
- 3 Row of gates
- 4 Southern jetty (existing)
- 5 Breakwater



Chioggia. The inlet before commencement of work



Chioggia. The inlet today

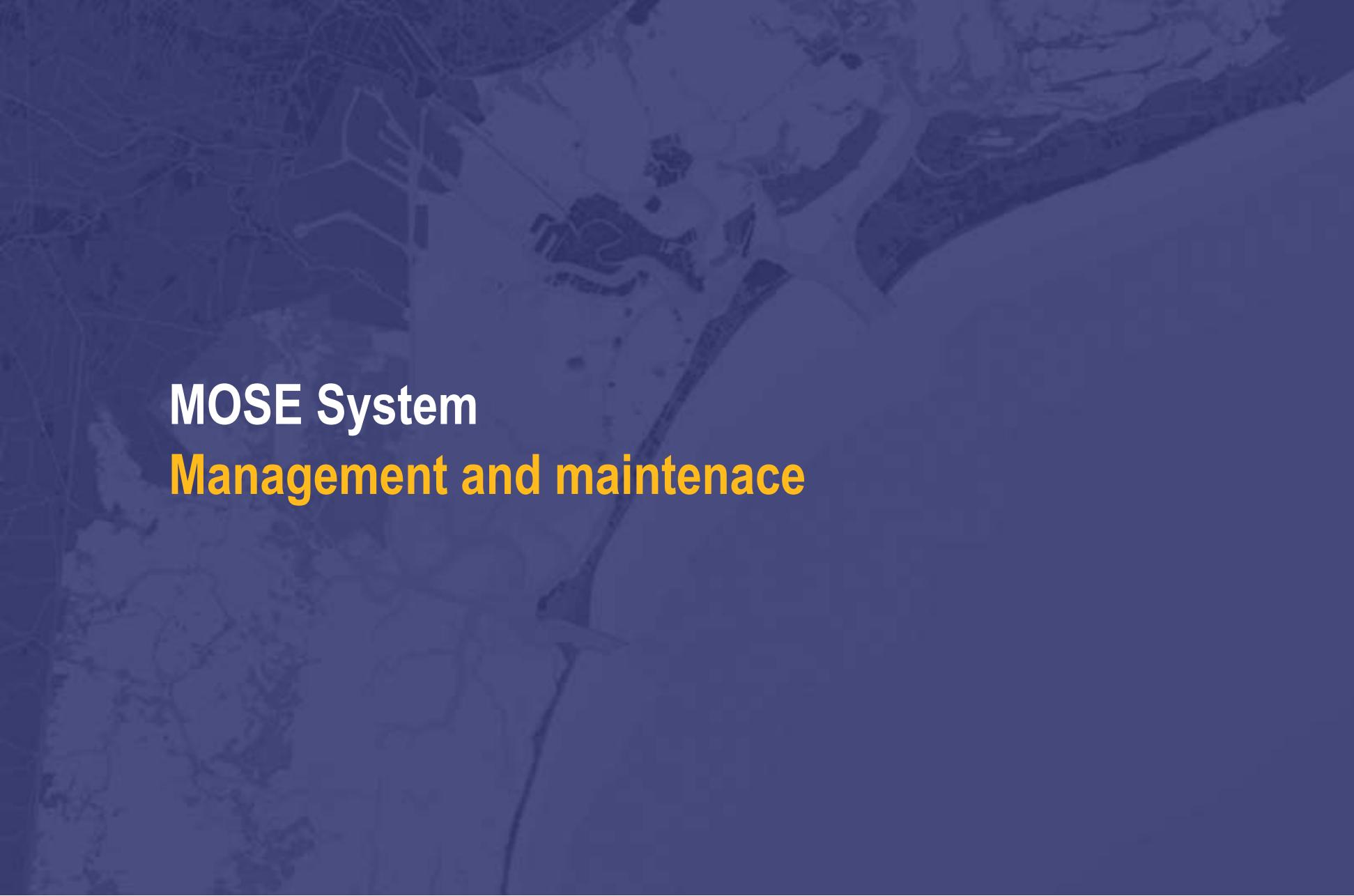


Chioggia. The inlet today



Chioggia. Locks and the row of gates abutment





MOSE System

Management and maintenance

Venice. Arsenale

- 1 Comparto Galeazze
- 2 Comparto Fonderie
- 3 Comparto S.Cristoforo
- 4 Tese della Novissima
- 5 Area Casermette
- 6 Area Lamierini
- 7 Area Sommersibilisti
- 8 Bacini Carenaggio
- 9 Darsena delle Galeazze
- 10 Torre di Porta Nuova
- 11 Darsena Vecchia
- 12 Darsena Grande
- 13 Edifici delle Gaggiandre
- 14 Porta di Terra
- 15 Capannoni della darsena Grande
- 16 Edificio delle Artiglierie
- 17 Edificio delle Corderie



Venice. Arsenale



**Mose System.
Management and
maintenance area**

- ① Maintenance of the gates (area of the large dockyard);
- ② shipyard and maintenance of craft (area of the medium dockyard);
- ③ management and monitoring (area of the Novissima buildings)

Mose System



Start of work	2003
Progress of work	42%
Employers (current day presence in the work sites)	700
Boats	95

Reinforcement of littoral

Intervention areas

● Works underway

● Works completed

Works completed

Beach reconstruction
45 km

Dune restoration
8 km

Reinforcement of jetty
11 km



Venice. Arsenale



Local defences

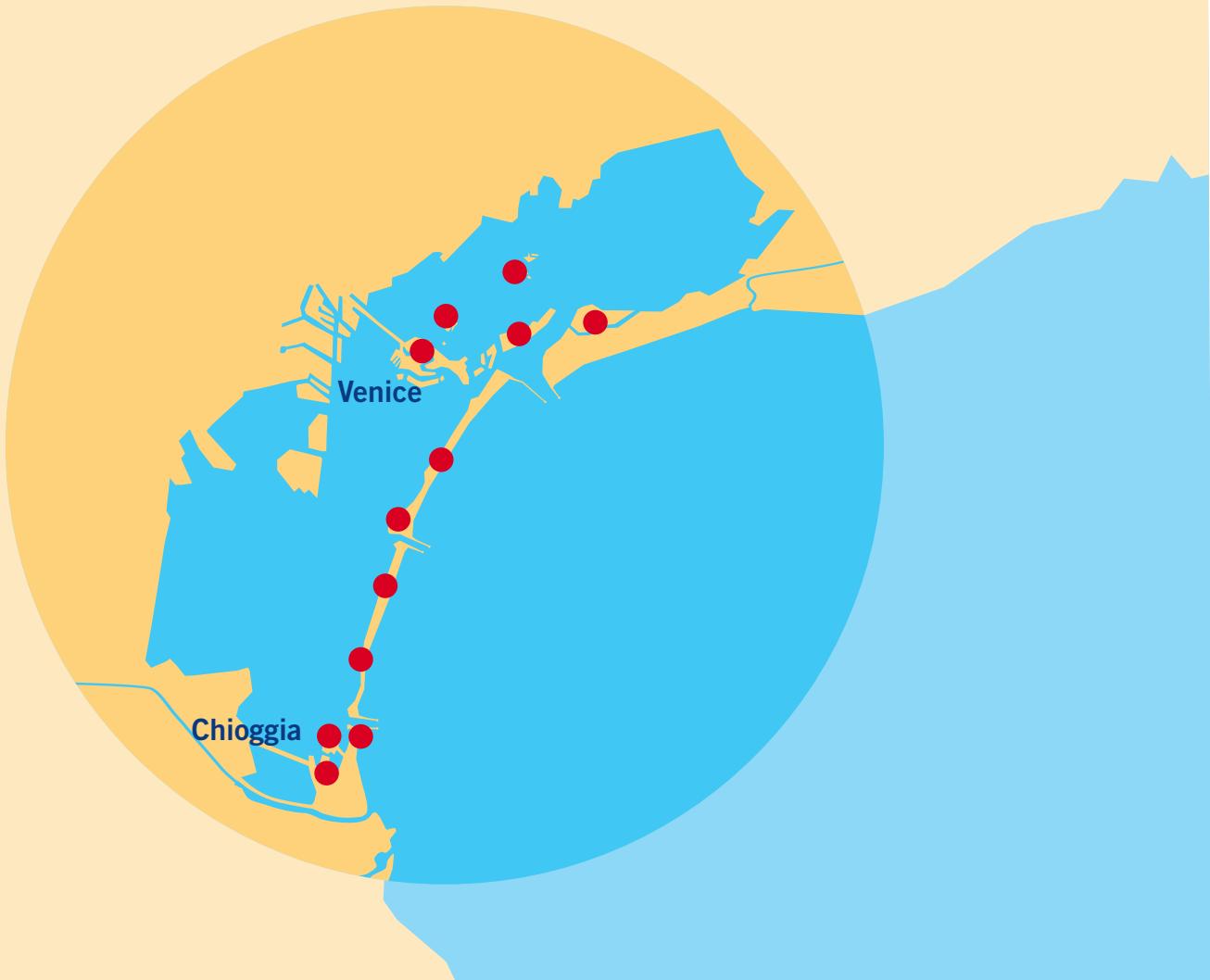


Intervention areas

Works completed

**Works extension
92 km**

**Total surface
areas protected
1,200 hectares**



Piazza San Marco. Localization

The area of intervention
(general project)

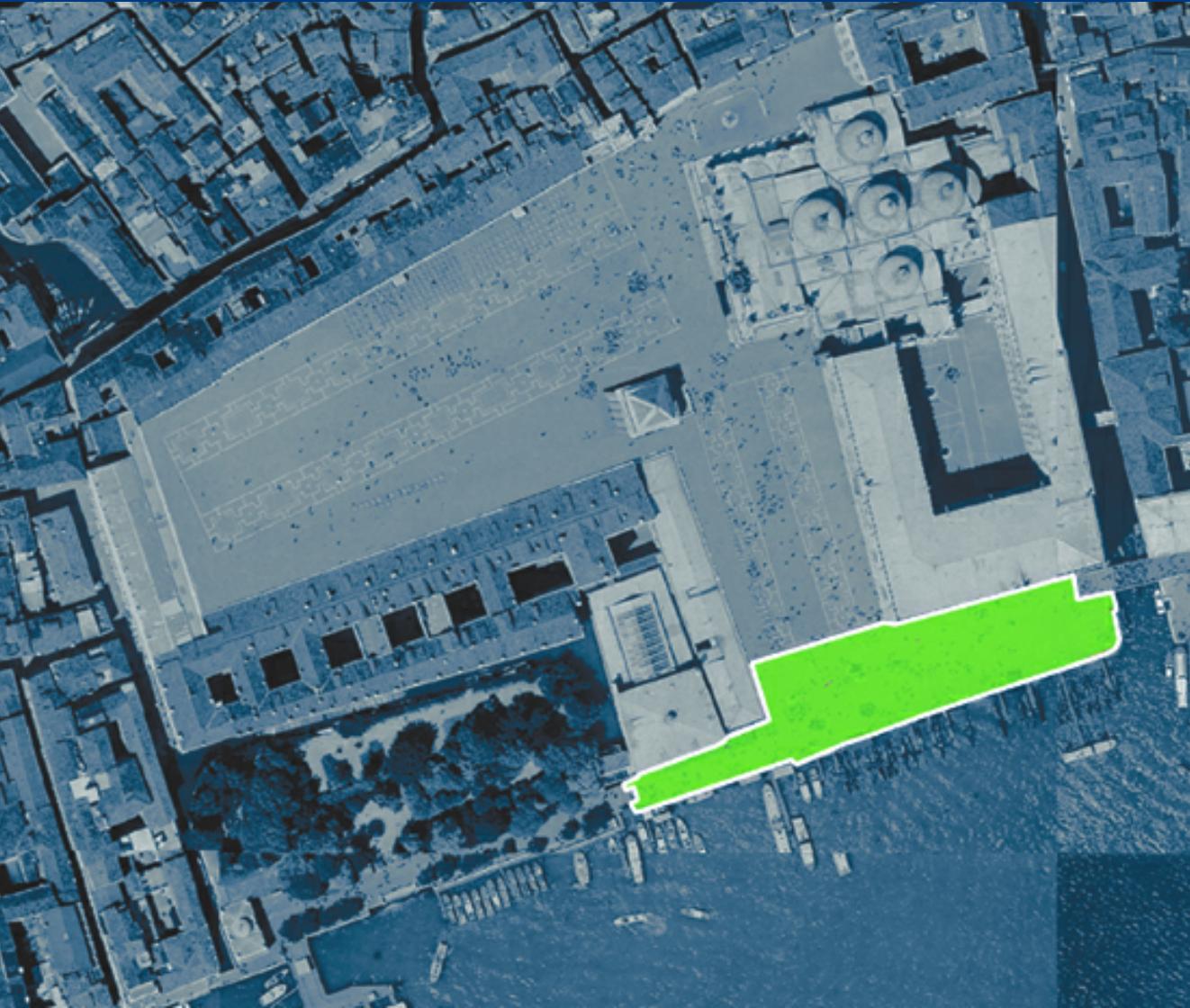
- ① Procuratorie Vecchie
- ② Saint Mark's Square
- ③ Basilica of Saint Mark
- ④ Procuratorie Nuove
- ⑤ Doge's Palace
- ⑥ Marciana Library
- ⑦ bank along

Saint Mark's basin

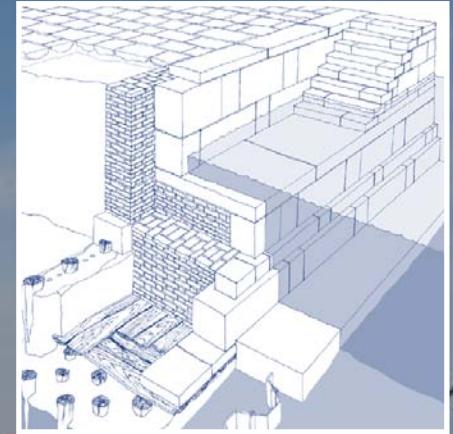


Piazza San Marco

The zone
of intervention
(phase one)



Piazza San Marco. The bank





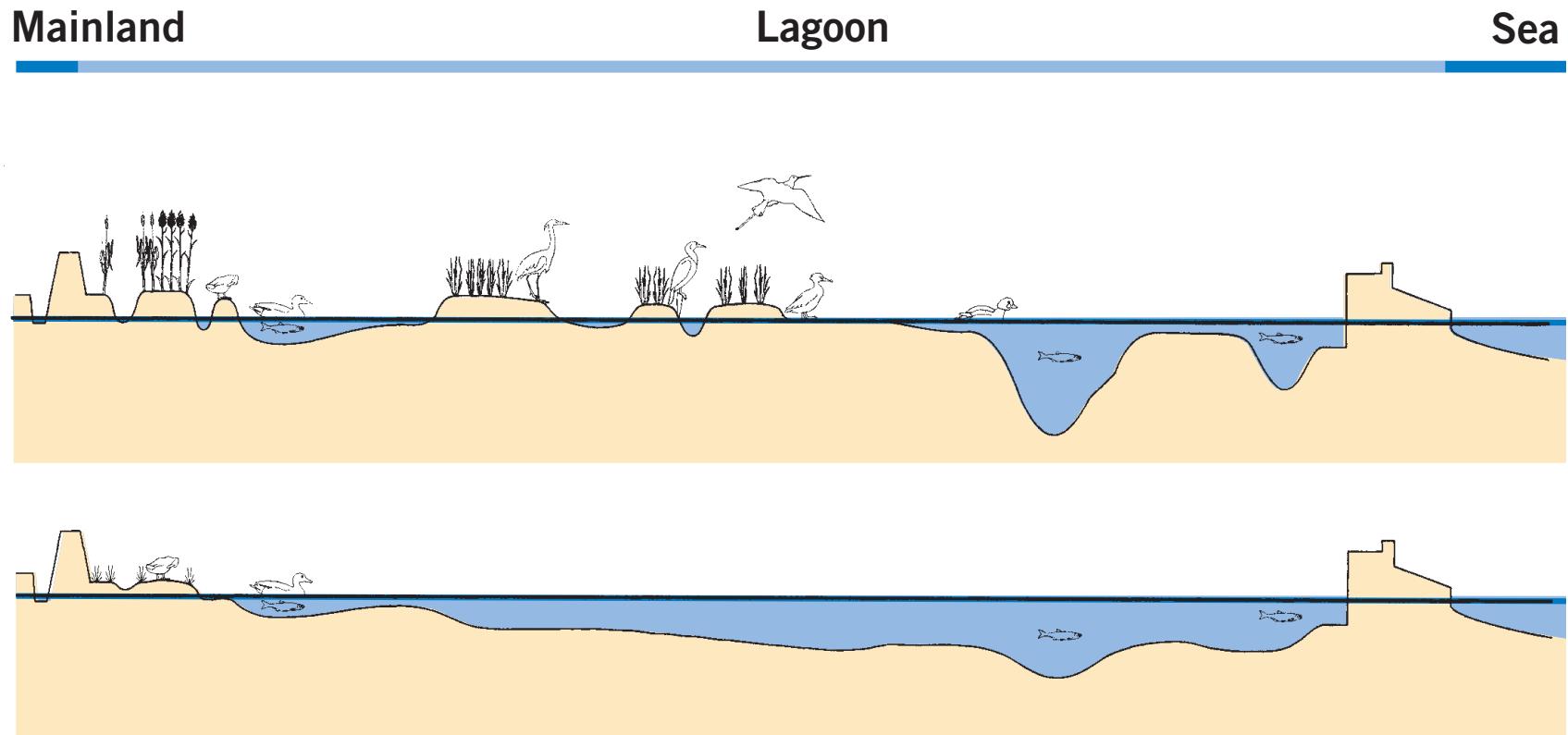
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Environmental defence



The lagoon becomes a bay

Alteration of the morphological structures



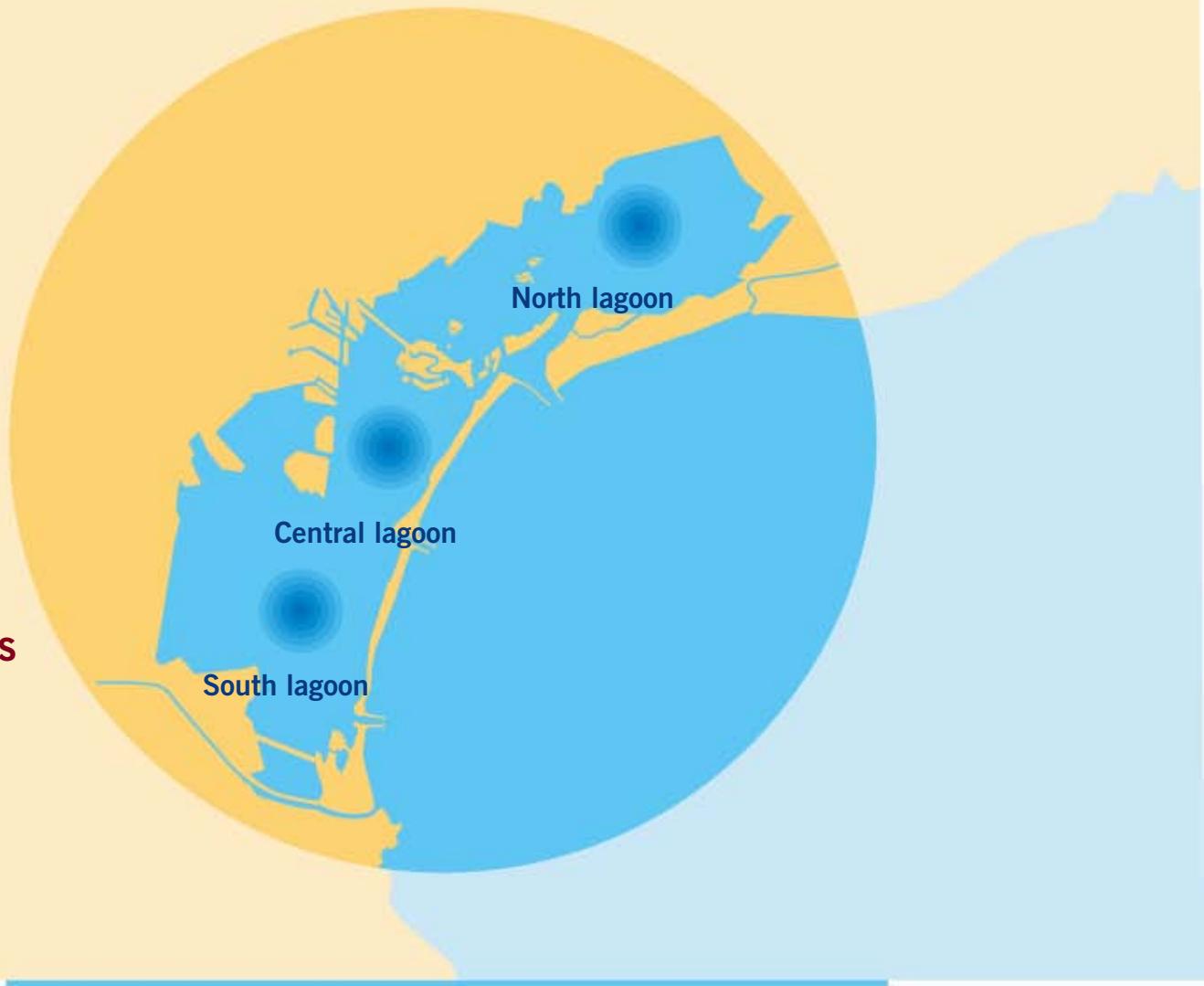
Eroding salt marsh



Recovery of lagoon morphology



Intervention areas



Works completed

Channel dredging
176 km

Reconstruction of mudflats
and salt marshes
1,406 hectares

Environmental restoration
of islands
12 islands

Reconstruction of salt marshes



Reconstruction of salt marshes



Cavallino littoral



Reconstruction of salt marshes



(*Juncus e Limonium*)



Protection of eroding salt marshes



Island of San Lazzaro degli Armeni



Island of San Lazzaro degli Armeni

The banks before
and after
interventions



Arrest and reversal of environmental decay



Intervention areas



Works completed

Securing of former dump
5 sites (182 hectares)

Securing of industrial
canal banks
35.6 km

Removal of polluted
sediments from industrial canal
322.000 m³

Island of Tresse before interventions



Island of Tresse after interventions



Porto Marghera. Industrial canals

Release of pollutants
from the banks of the
South industrial canal

Above,
the Tresse island
after interventions



Porto Marghera. The south industrial canal after interventions



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Sea storm protection



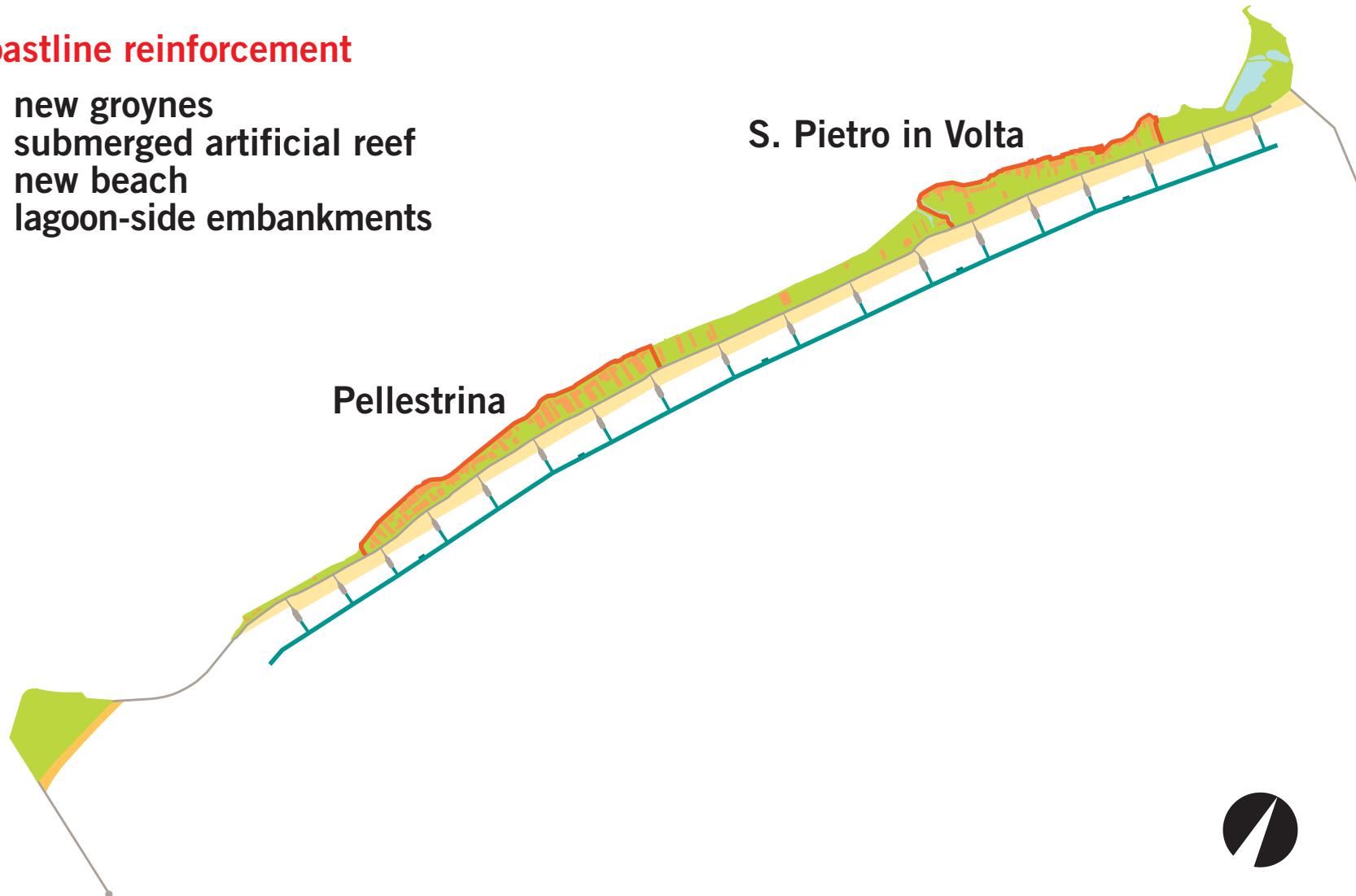
Pellestrina littoral after the flood of November 4th, 1966



Pellestrina littoral. The system of defences

Coastline reinforcement

- new groynes
- submerged artificial reef
- new beach
- lagoon-side embankments



Pellestrina. The littoral before interventions



Pellestrina littoral. The new beach



Pellestrina. The littoral today



Pellestrina littoral

The new
reconstructed beach



Mose System. Financing (March, 2008)

Total cost **4.272** mln euro

Amount financed **2.443** mln euro

Amount committed **1.786** mln euro

(of which **1.569** spent)

Progress of work **42** %

