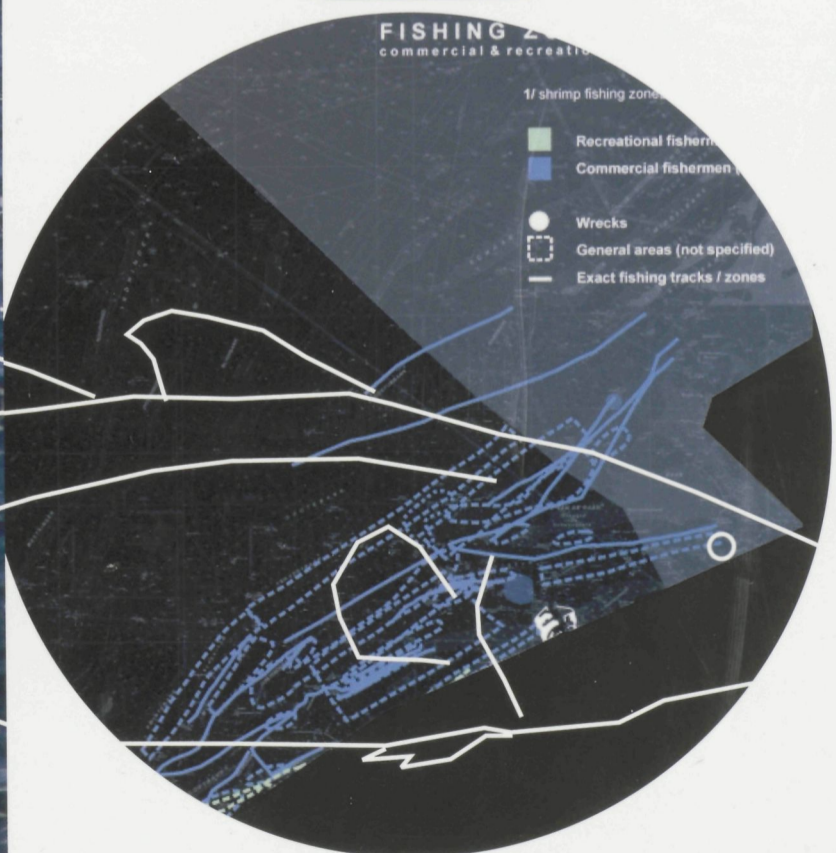
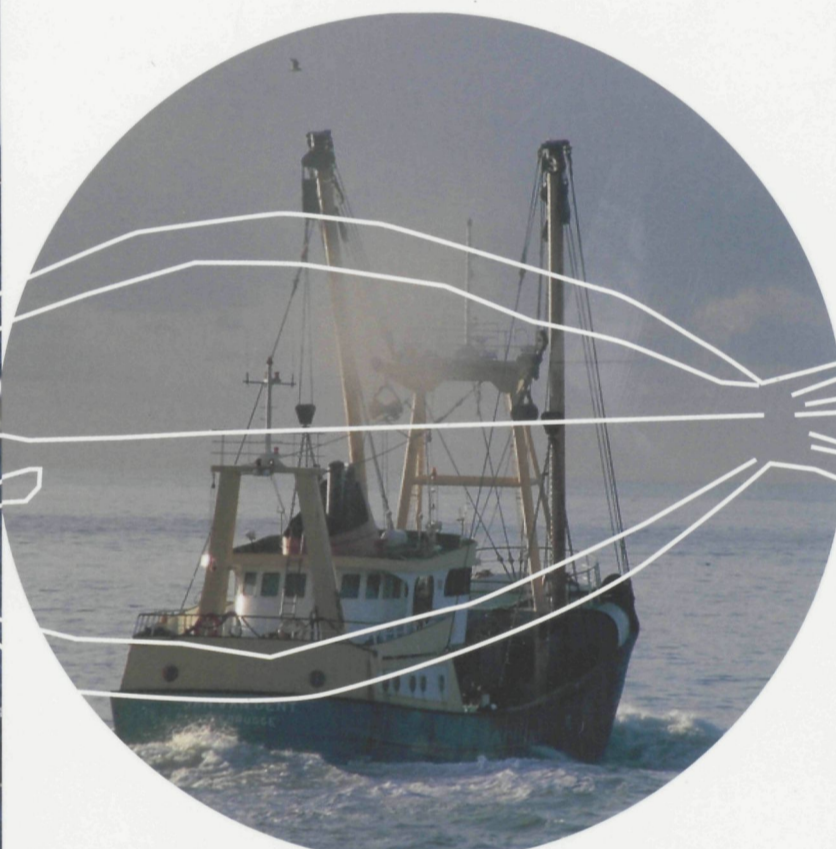


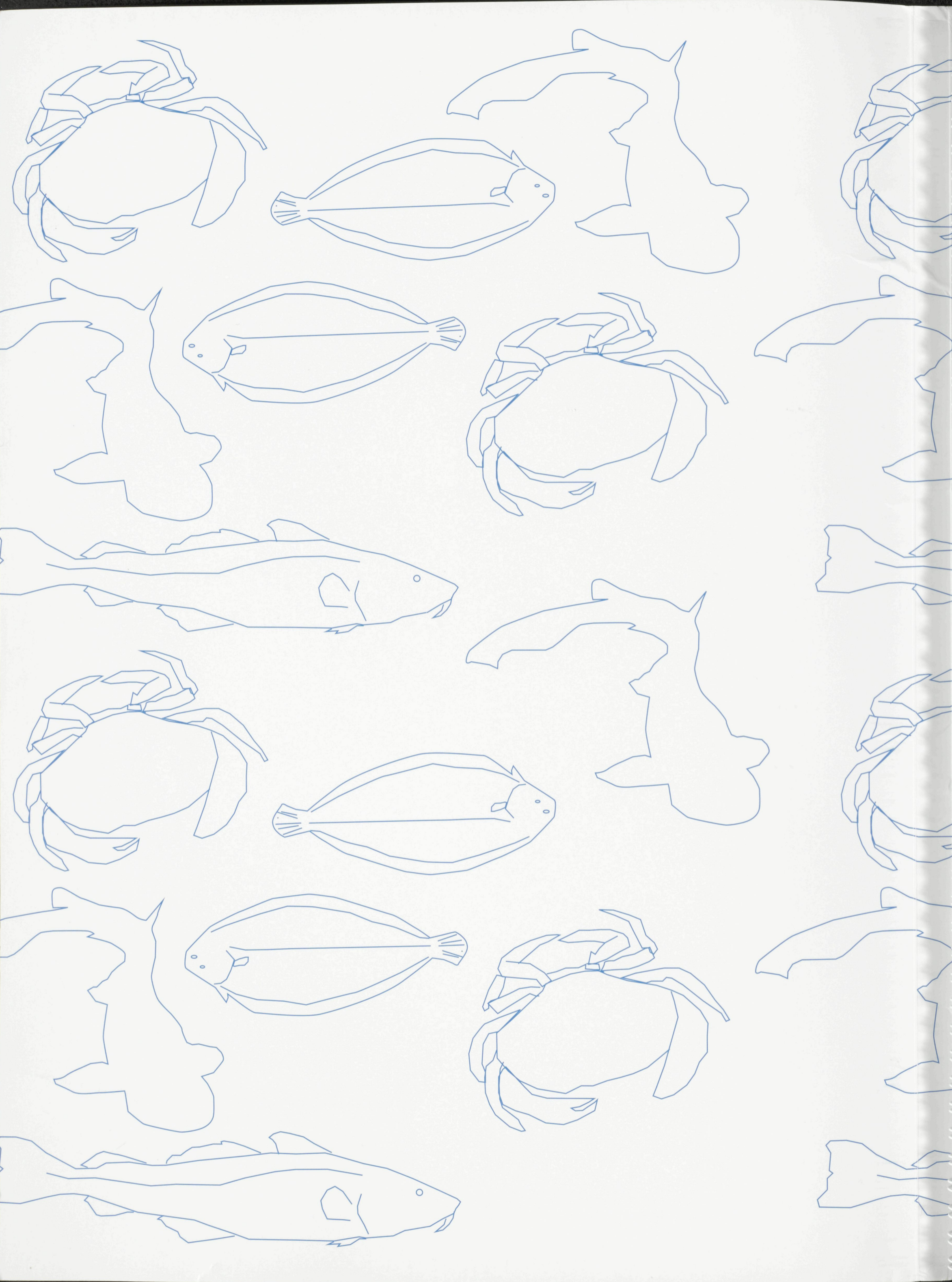


LECOFISH

An ecosystem approach in sustainable fisheries management through local ecological knowledge

Frank Maes
Jessica Coppens
An Vanhulle
 Maritime institute
 Ghent University





COLOFON

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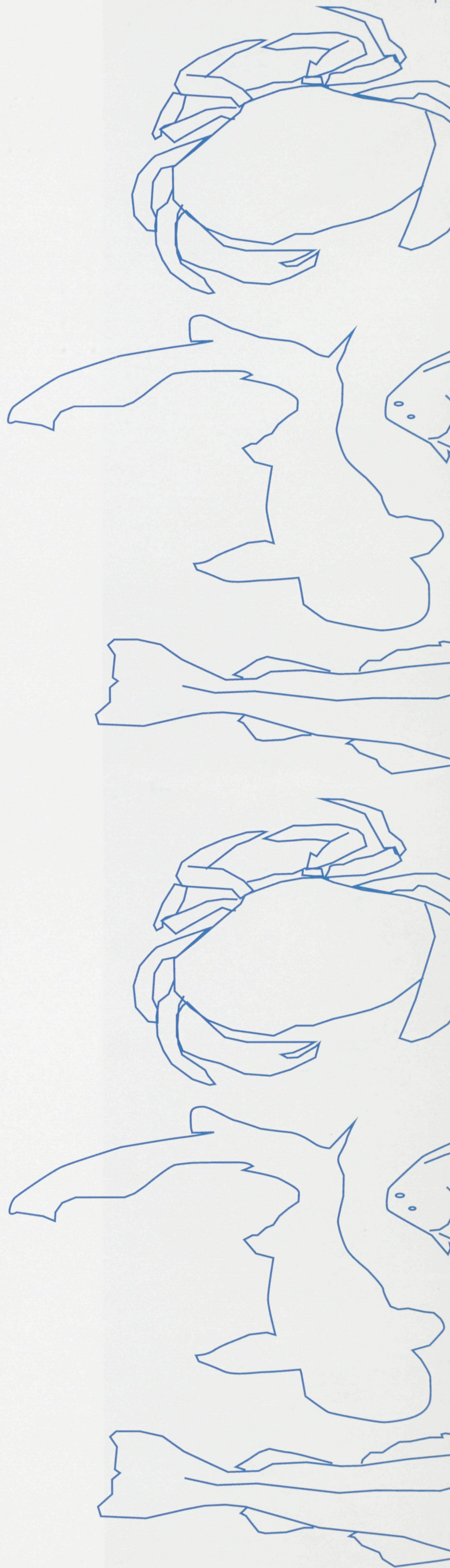
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Maritiem Instituut Gent





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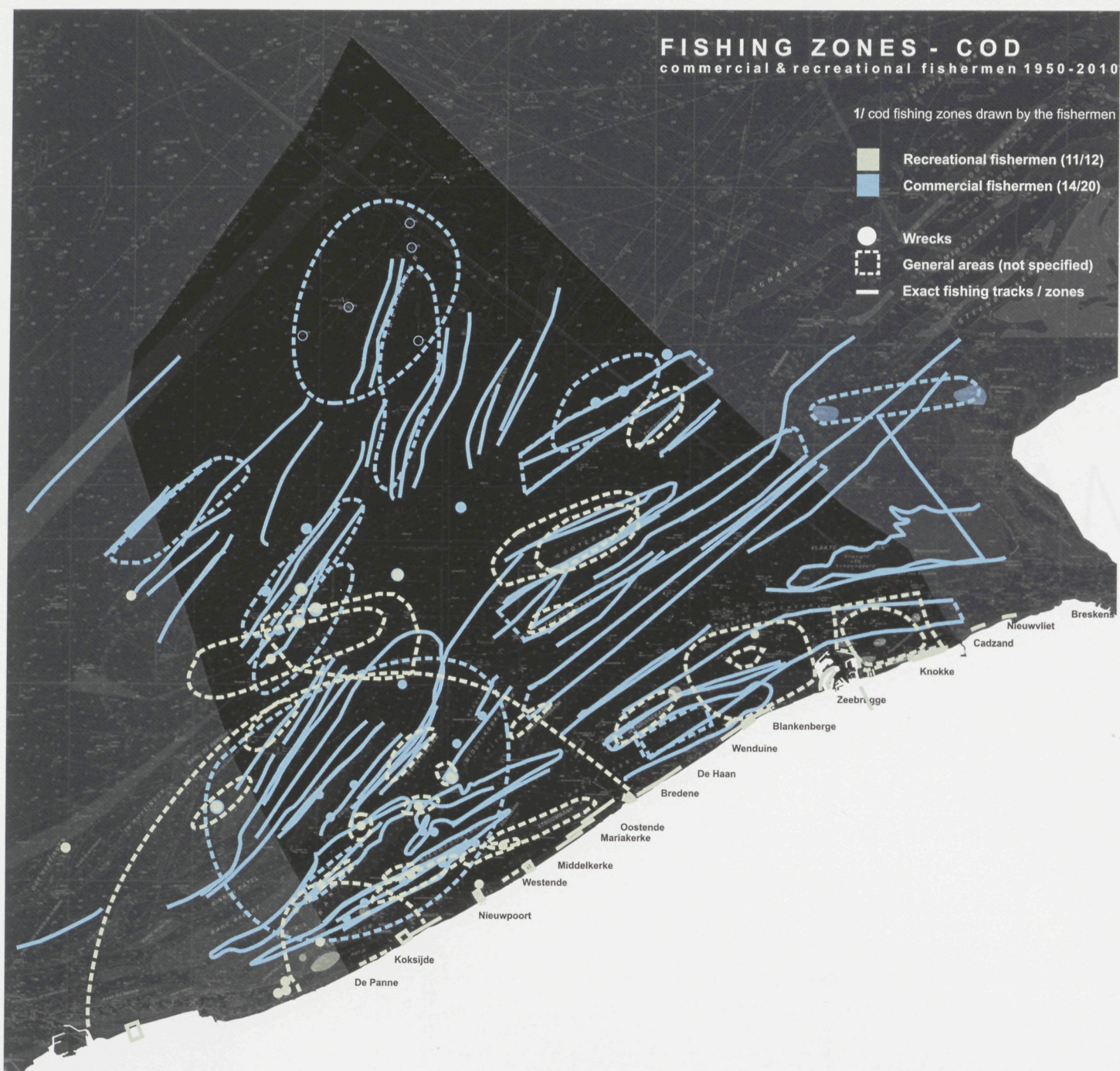




MAPS SERIES I

COD





Nieuwpoort
1965-2010 / 1983-1996



Exact fishing locations for cod specified by 2 recreational fishermen, only winter time (starting in november)

Westende-Middelkerke
1997-2005



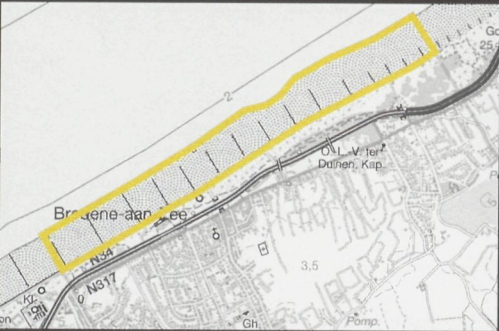
Fishing location for juvenile cod fishing (season not specified)

Oostende
1970-2010



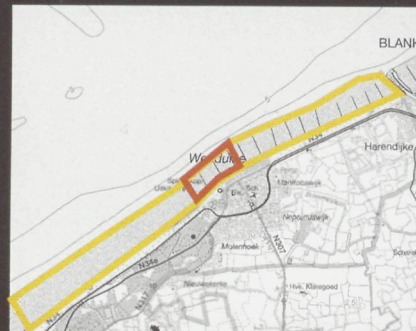
Fishing location for cod and juvenile cod fishing in winter time (november - march)

Bredene
2000-2010



Area specified as a competition zone; cod is caught in winter time

De Haan-Wenduine
1995-2010



Yellow area specified as a competition zone; cod is caught in winter time
Orange area specified as favourite fishing location ("Rotonde Wenduine"); cod and juvenile cod are caught in winter time

Blankenberge
1968



Fishing location for cod fishing in winter 1968

Zeebrugge
1956-1965



Location of juvenile cod in winter time (n.b. only occasional catches of juvenile cod/cod due to basic fishing gear)

Zeebrugge
2000-2010



Location of juvenile cod in winter time

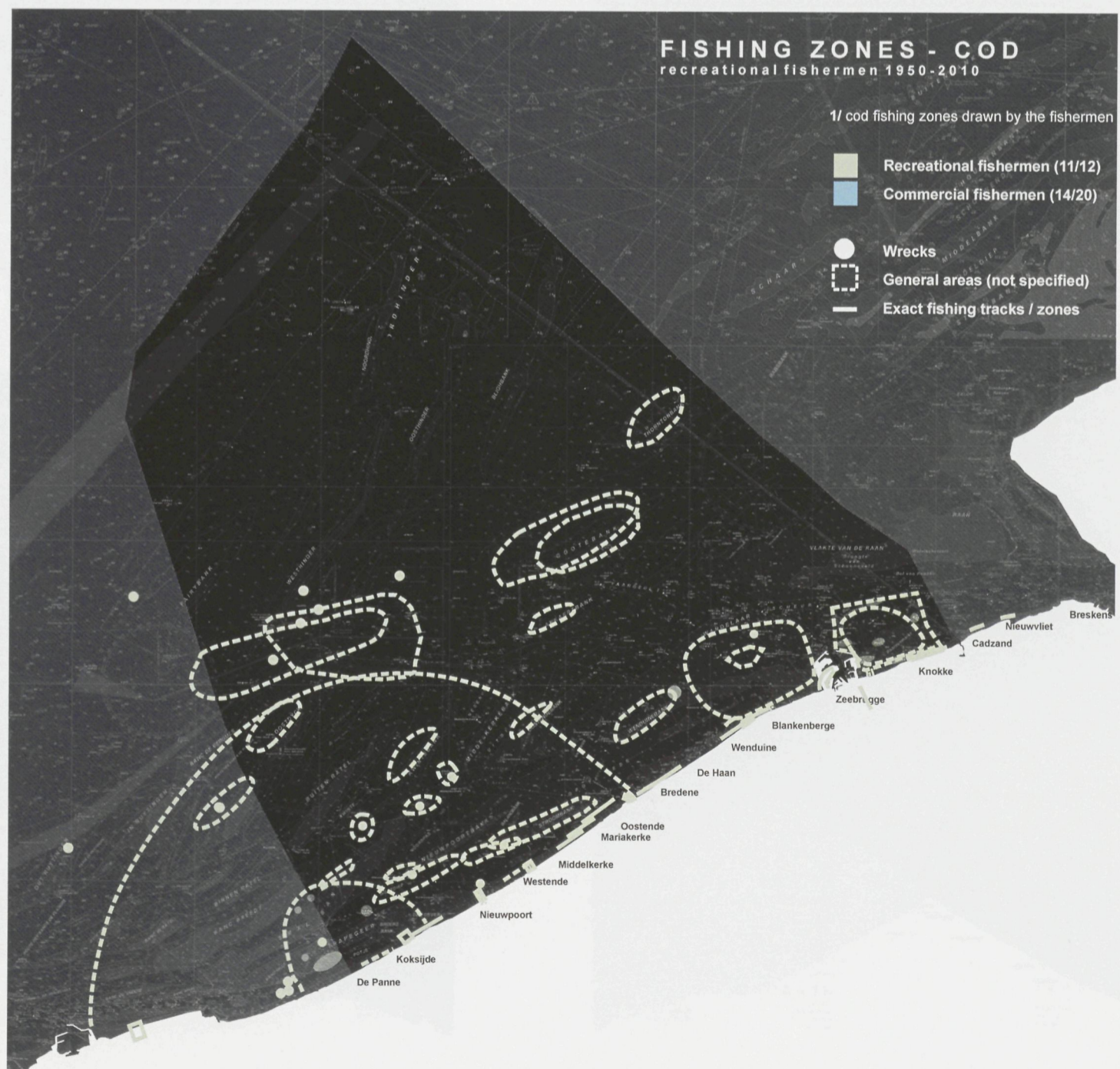
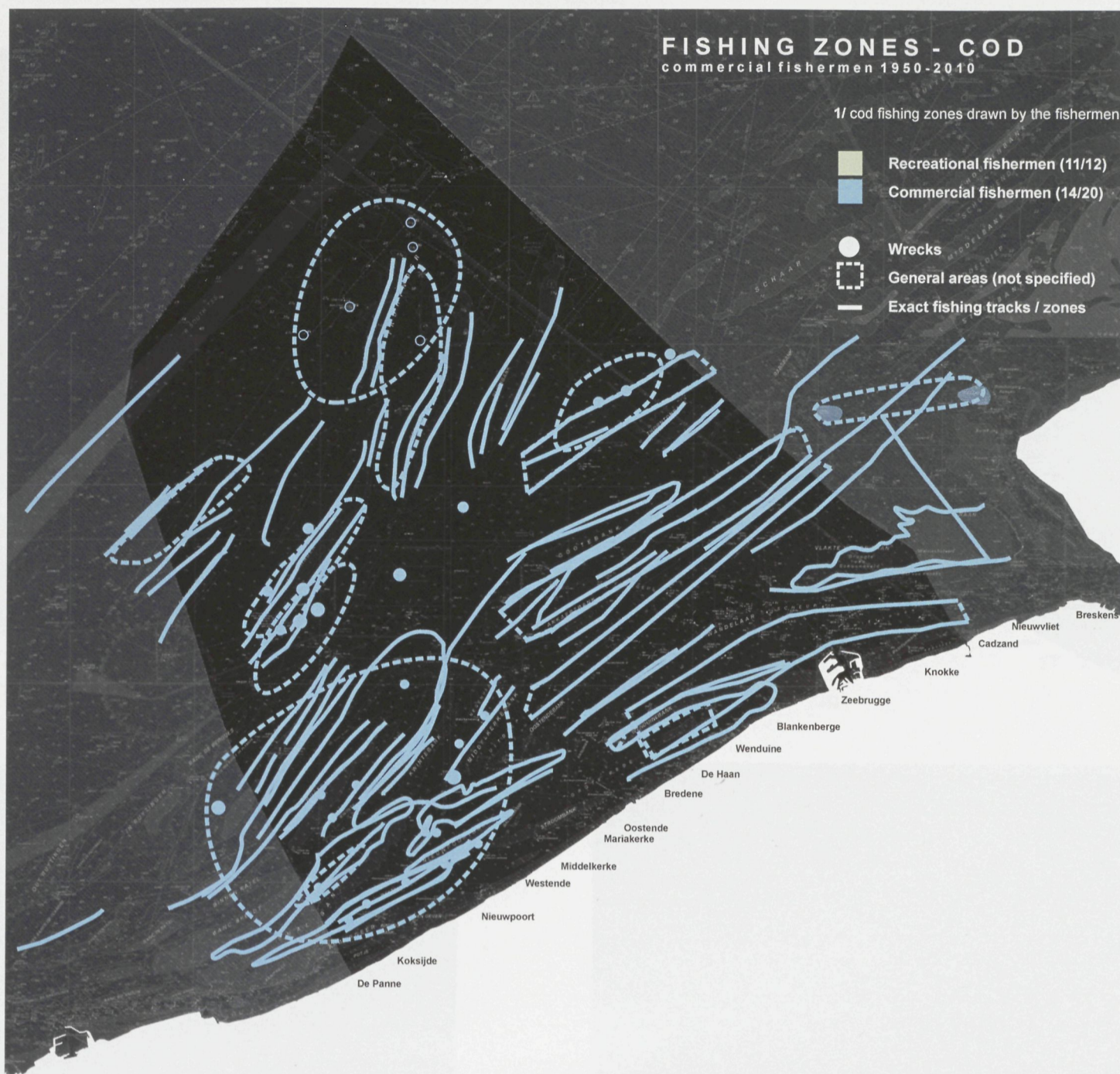
Knokke-Heist
1965-2010



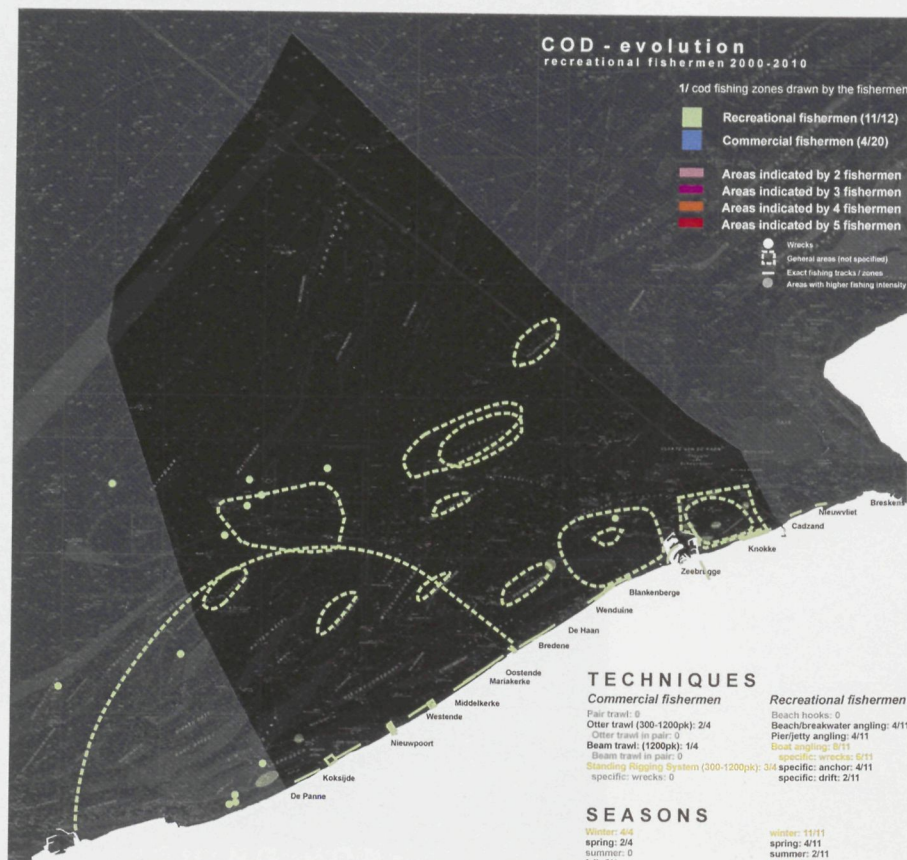
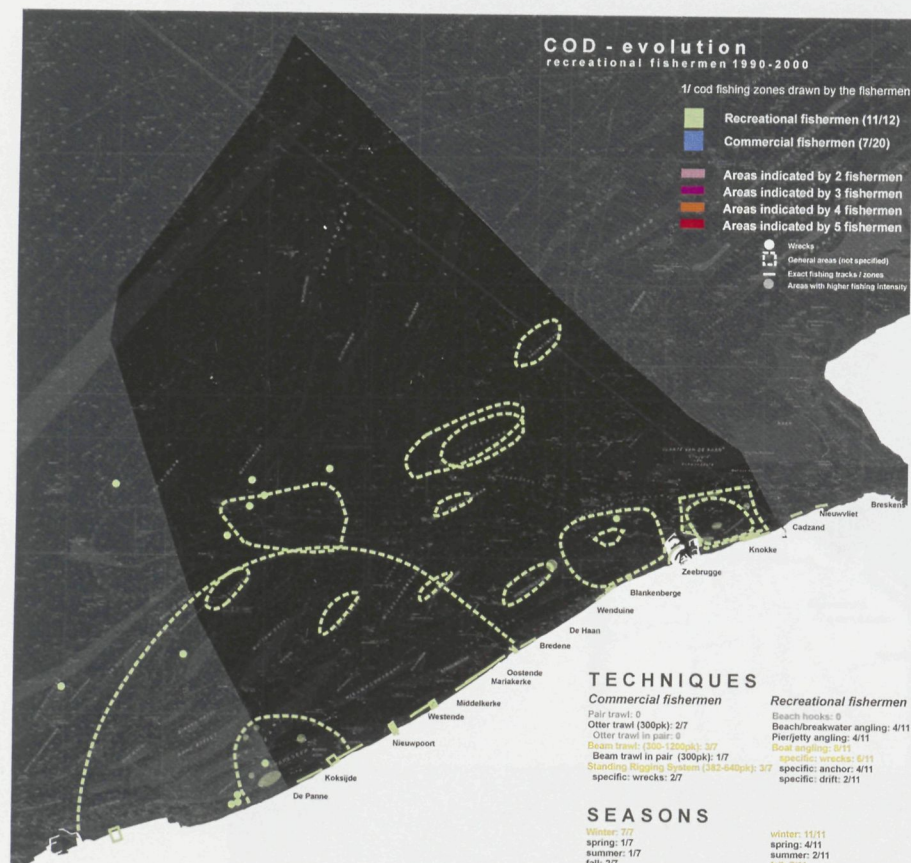
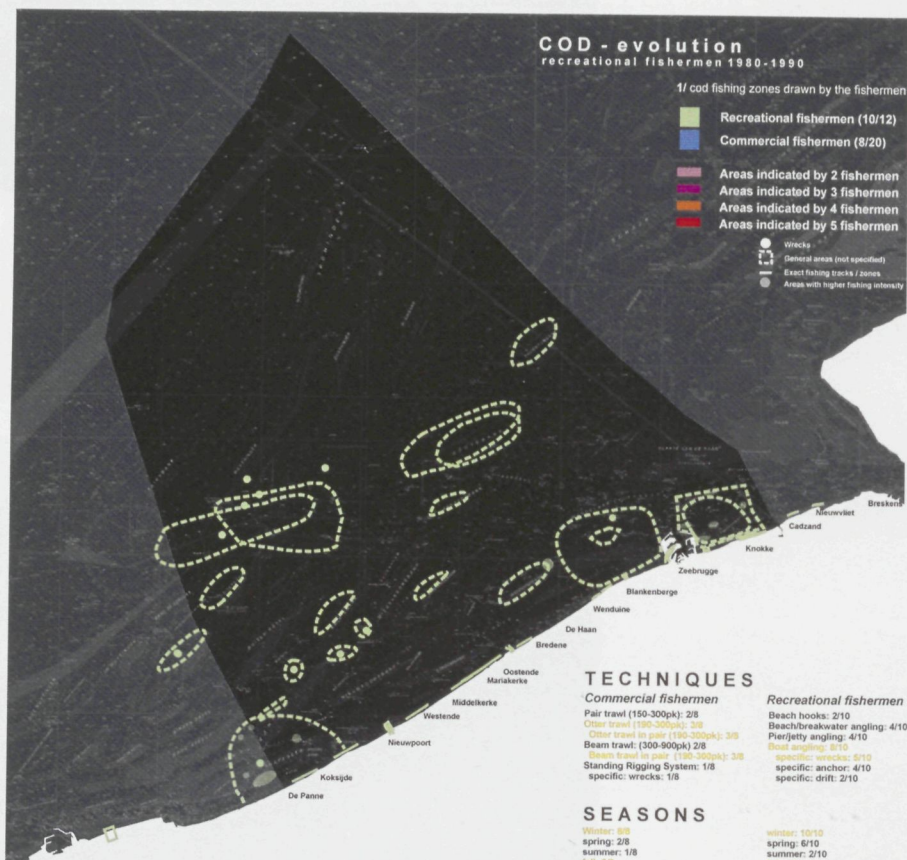
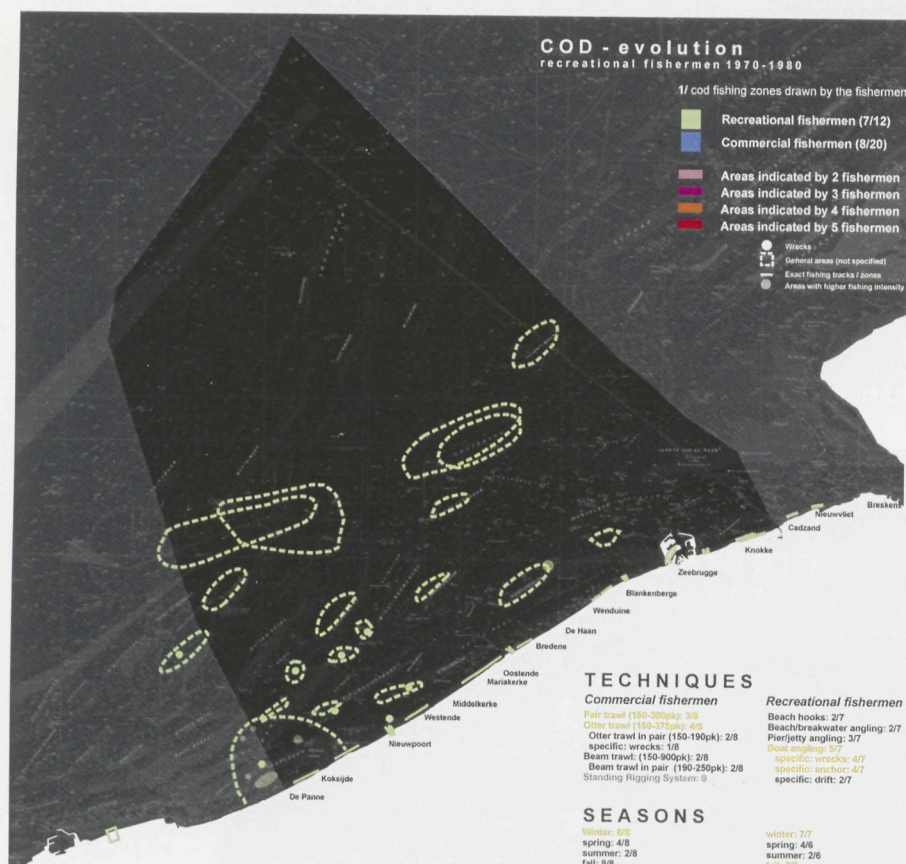
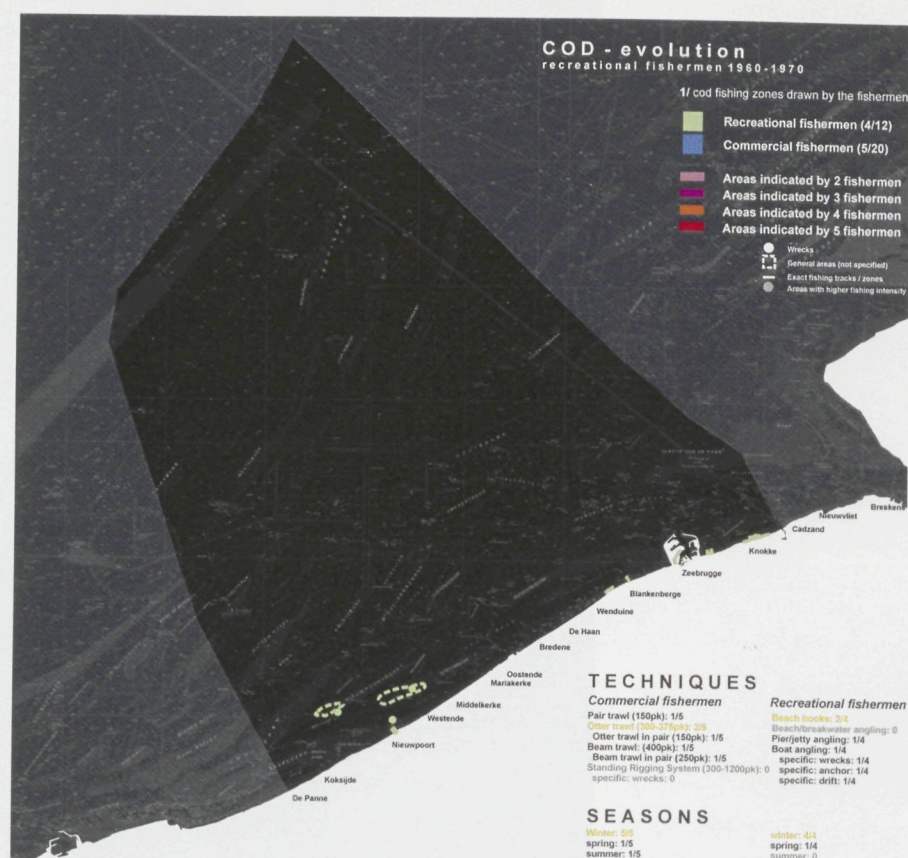
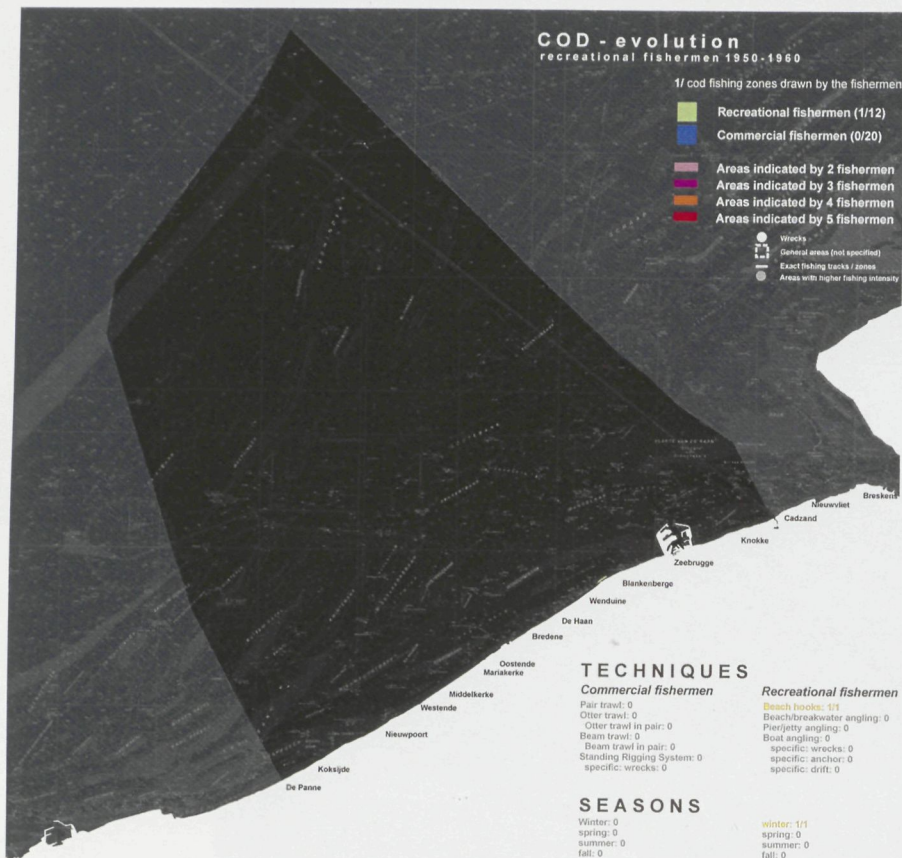
Locations in Knokke specified by 2 recreational fishermen
Fishing location for cod and juvenile cod fishing in winter time (yellow: 1965-1988, orange: 1965-2010, pink: 2000-2010)
cod fishing only from mid october till december and again in march-april

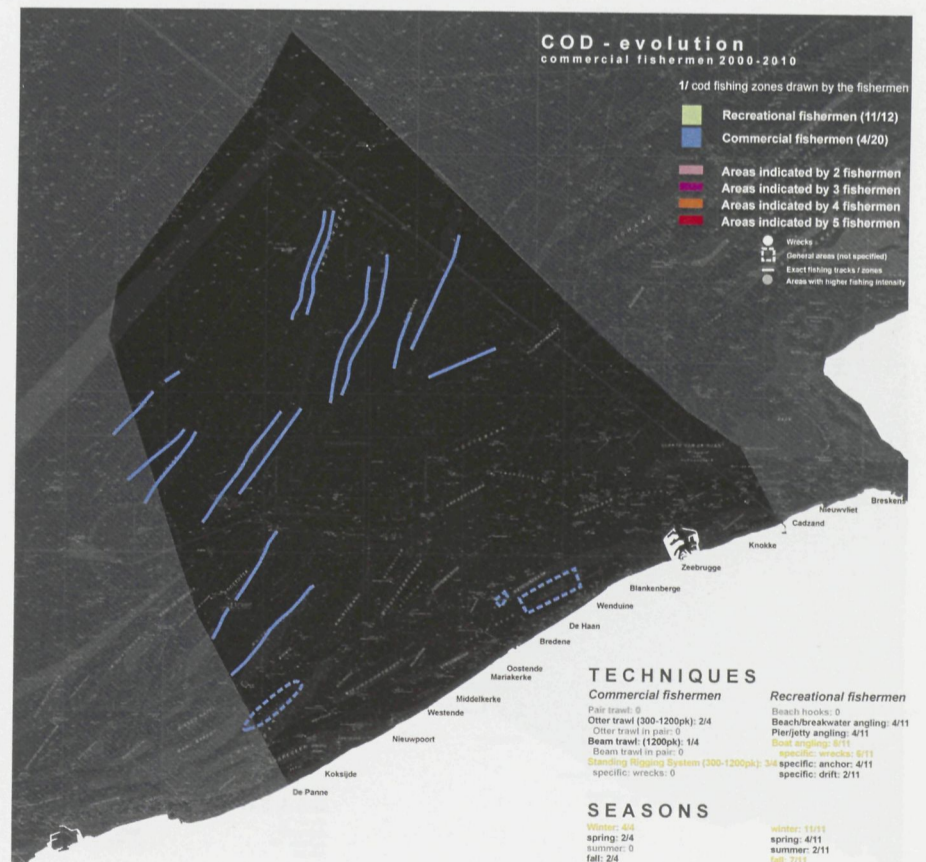
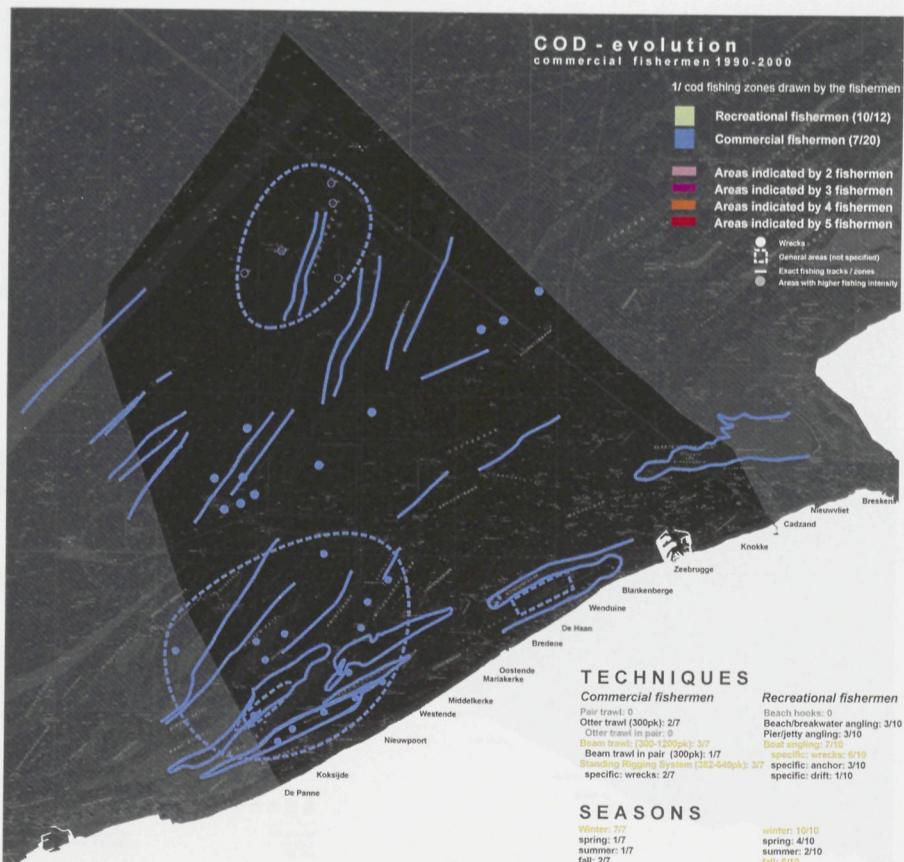
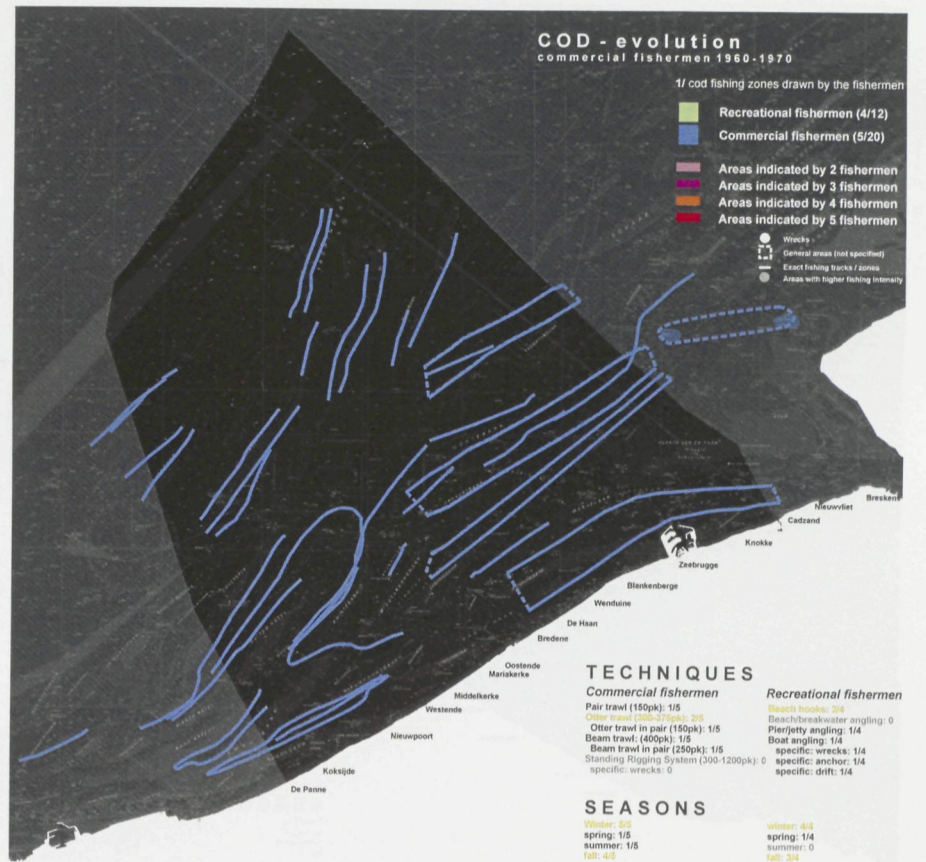
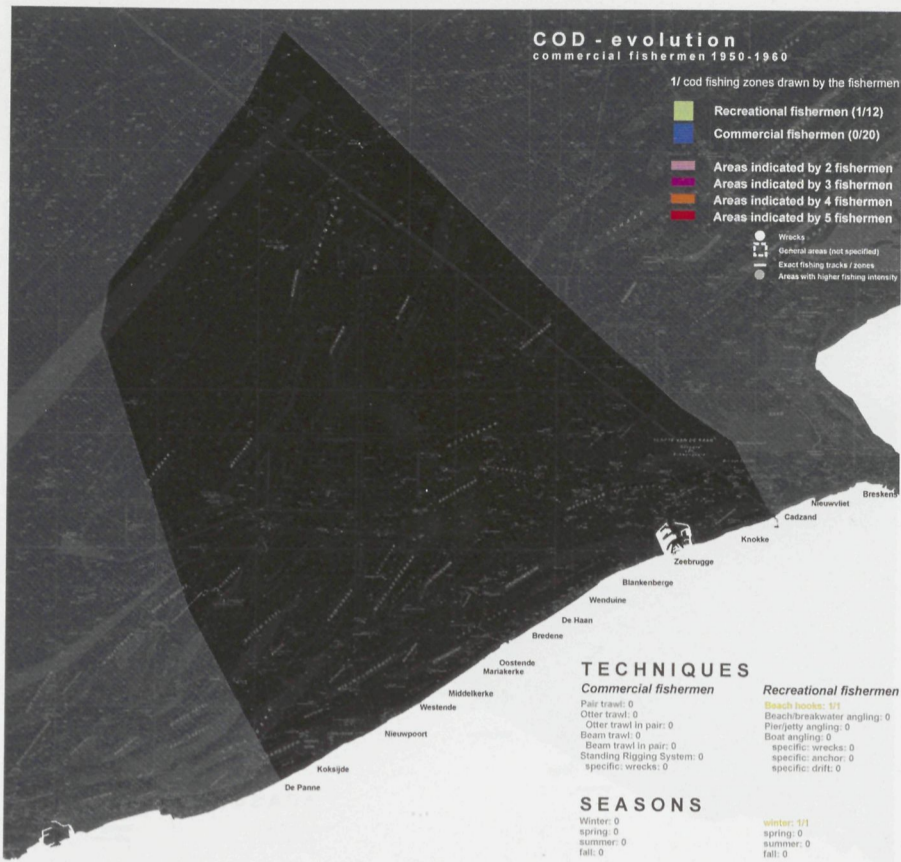
FISHING ZONES - COD
recreational fishermen 1956-2010

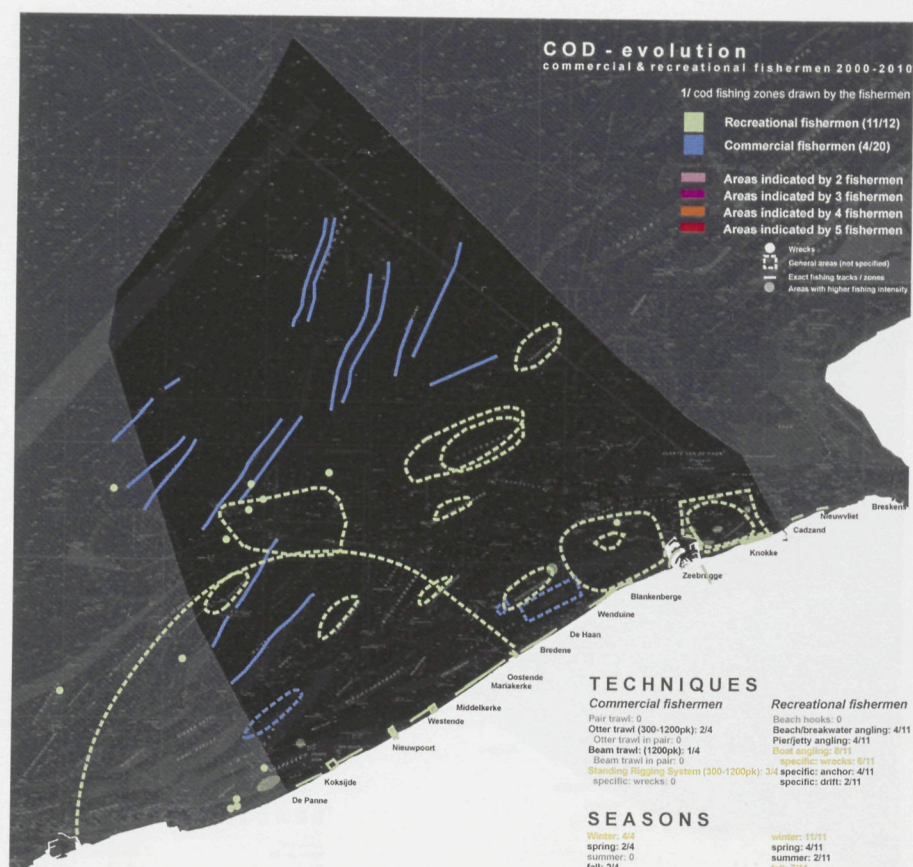
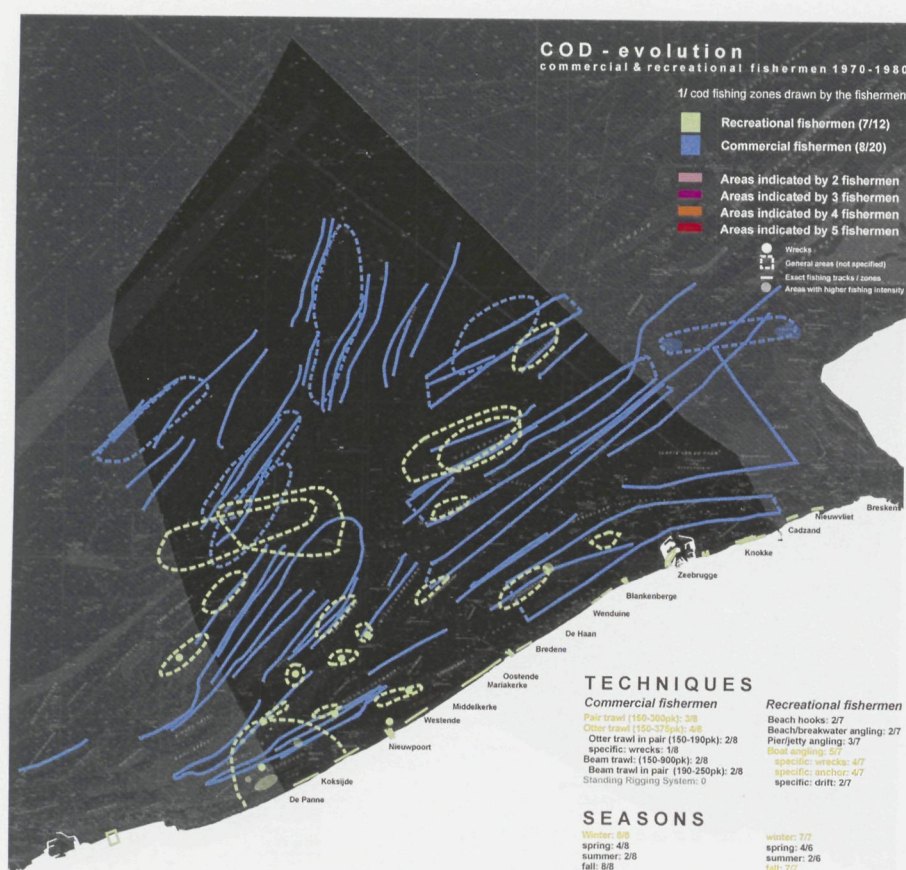
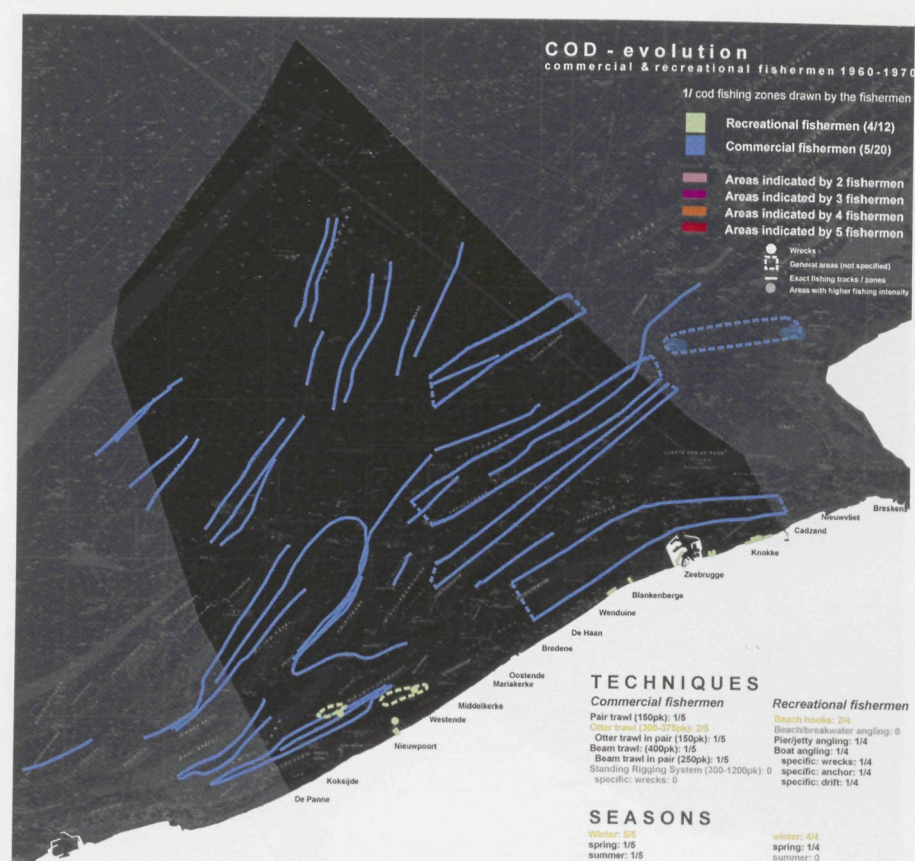
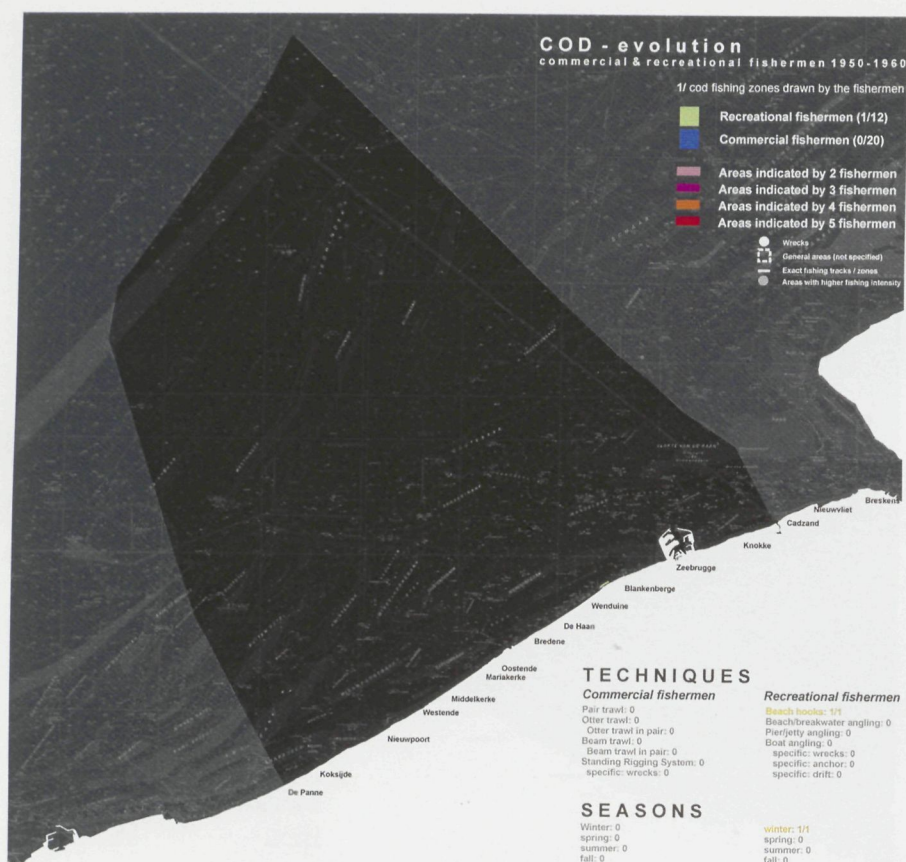
1/ cod fishing zones drawn by the fishermen - detailed maps

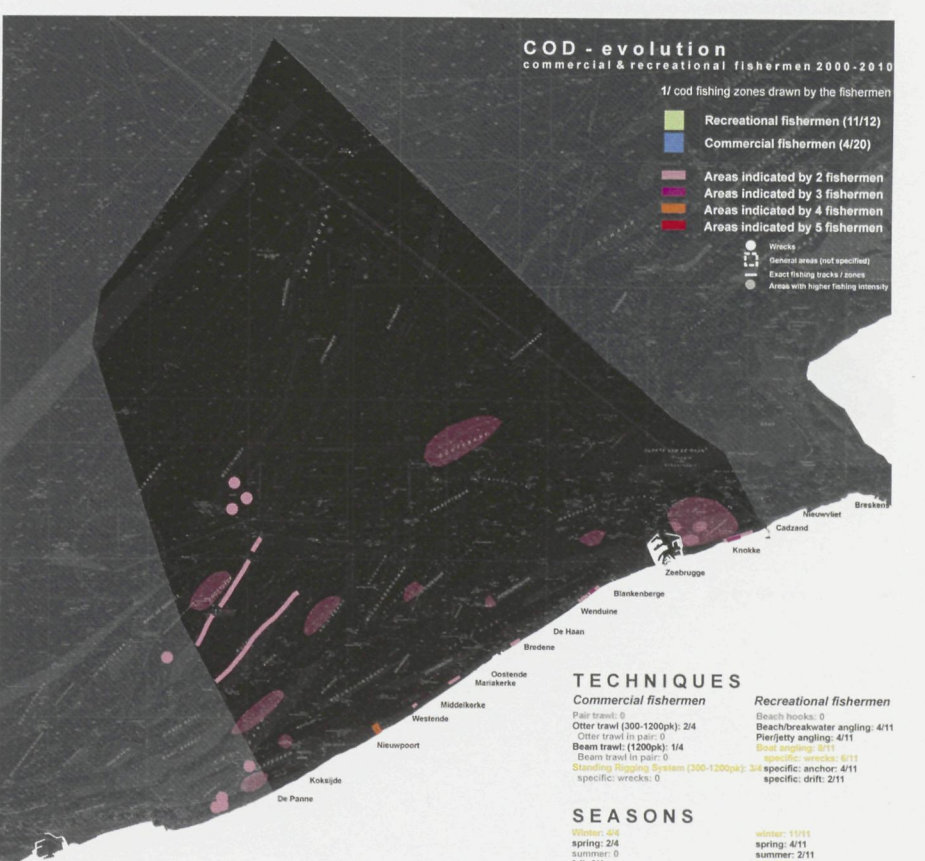
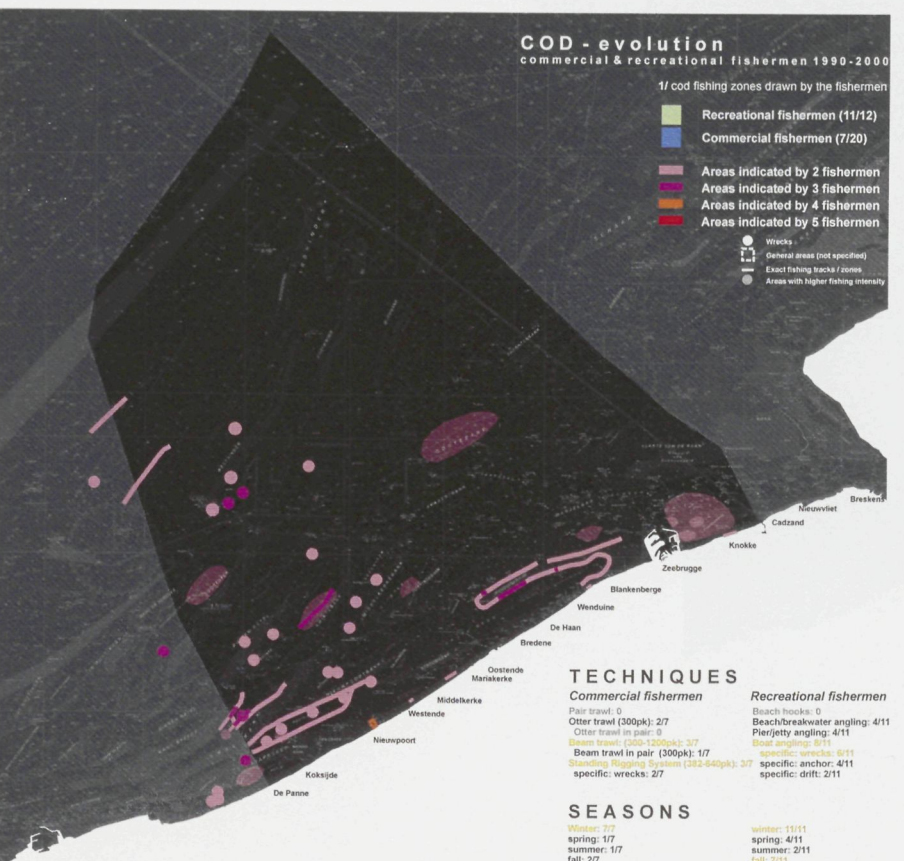
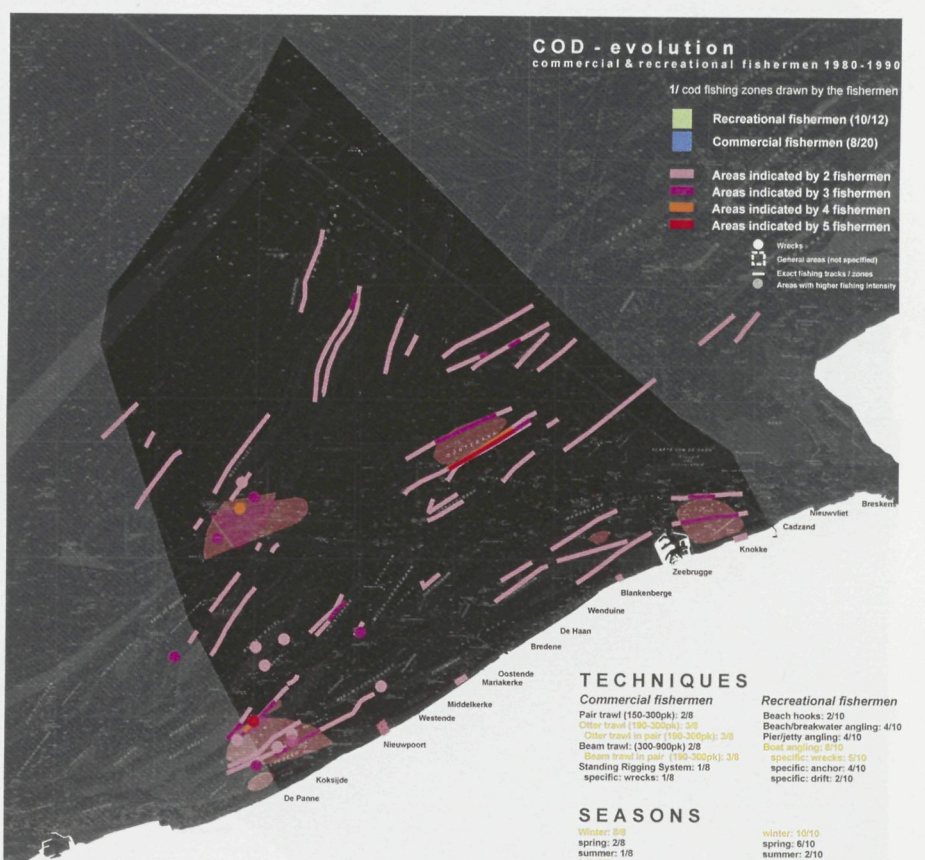
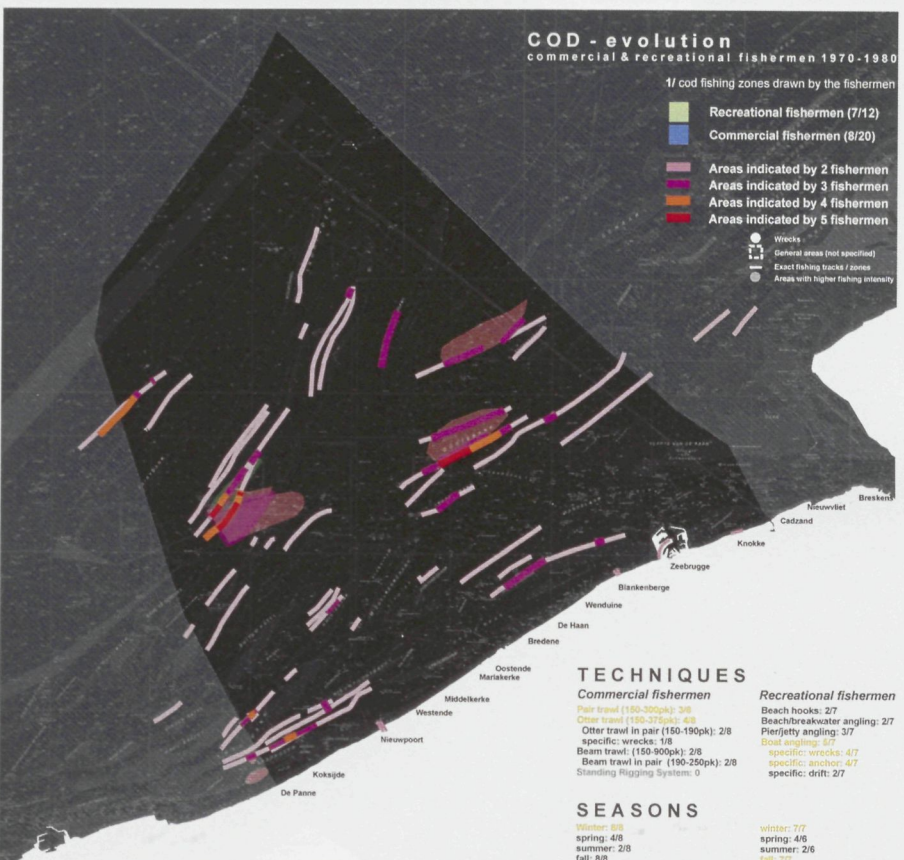
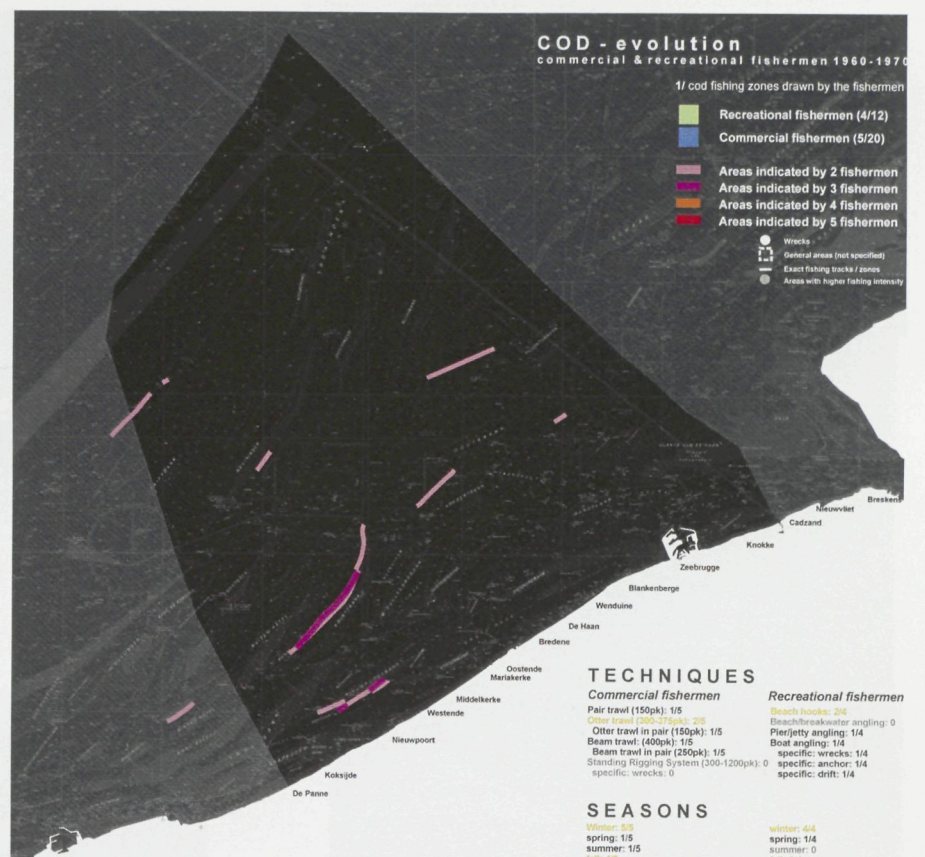
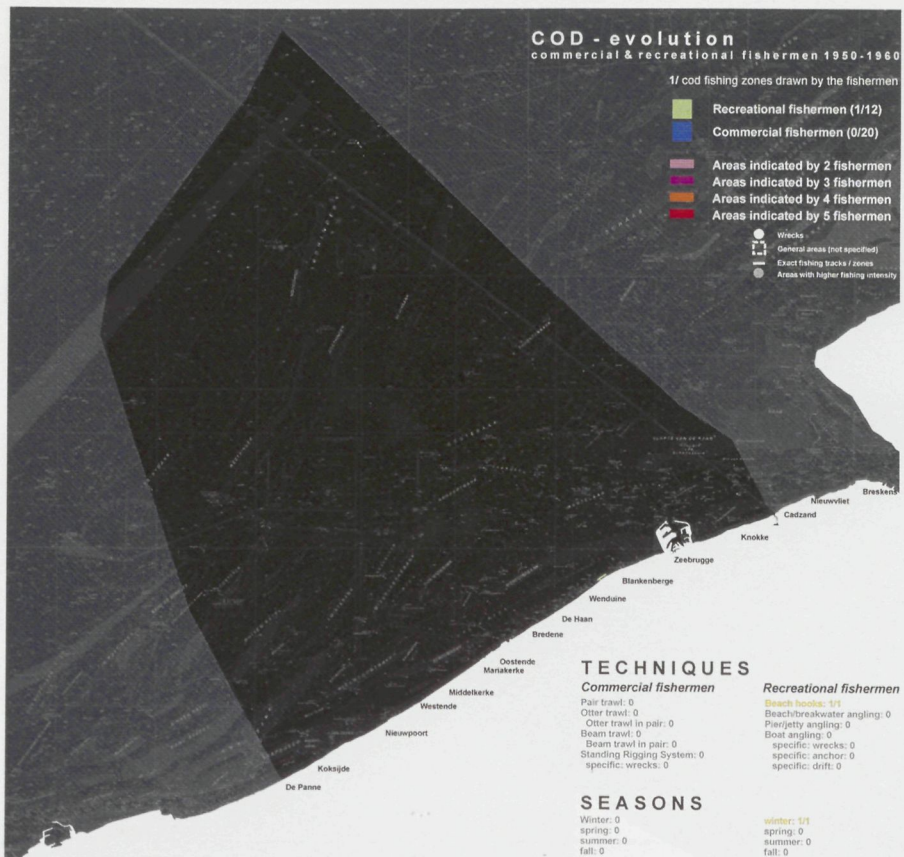


COD - fishing zones
commercial & recreational fishermen 1950 - 2010

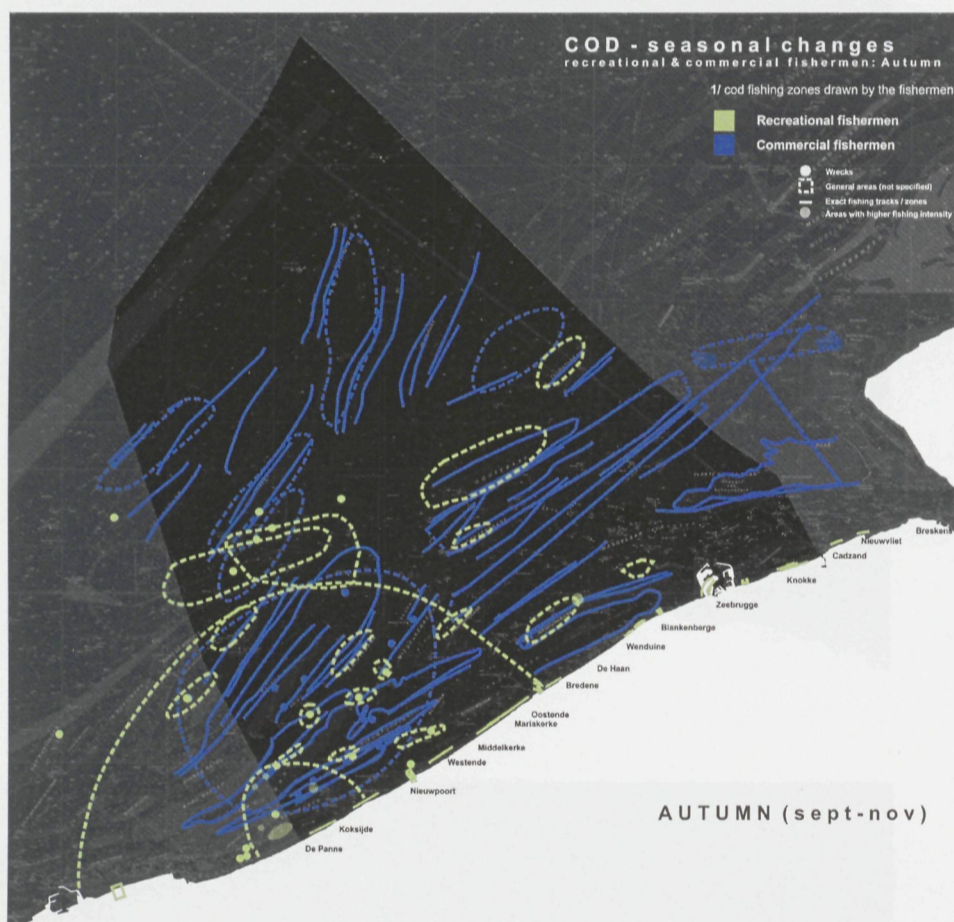
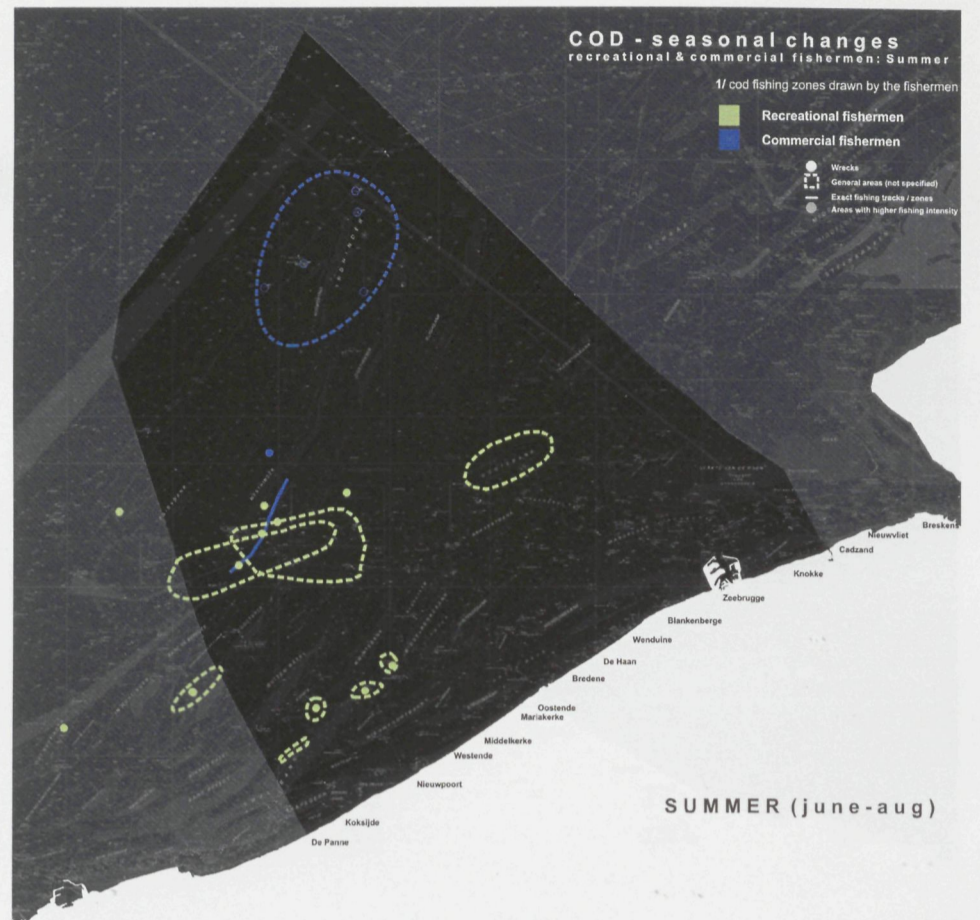
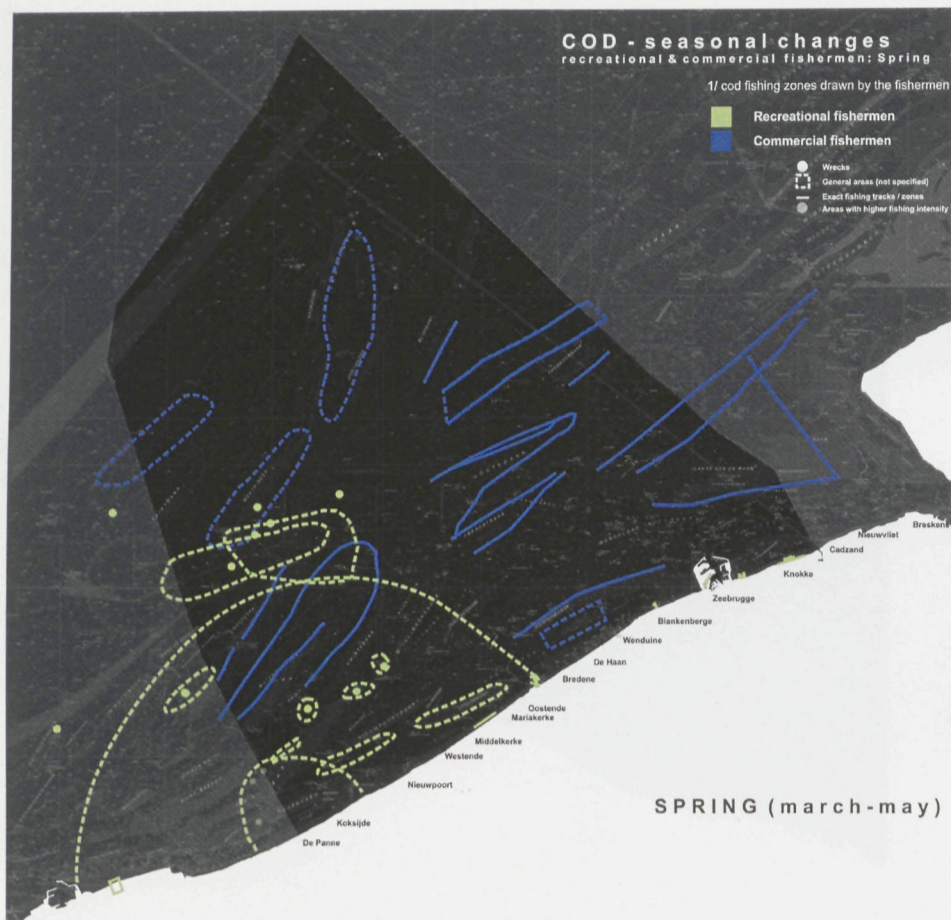


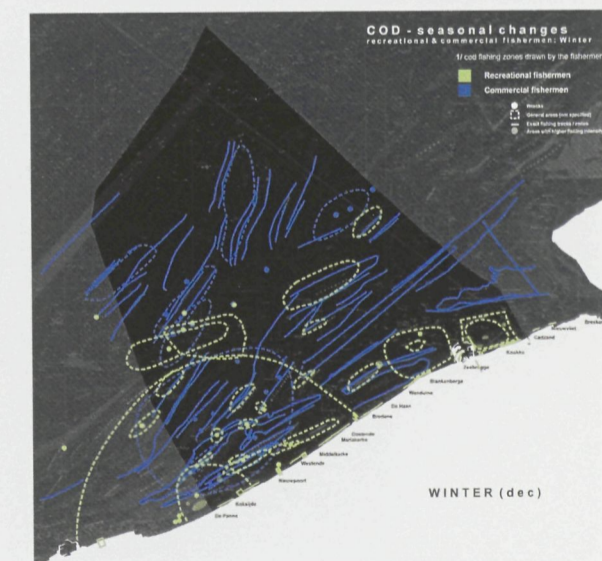
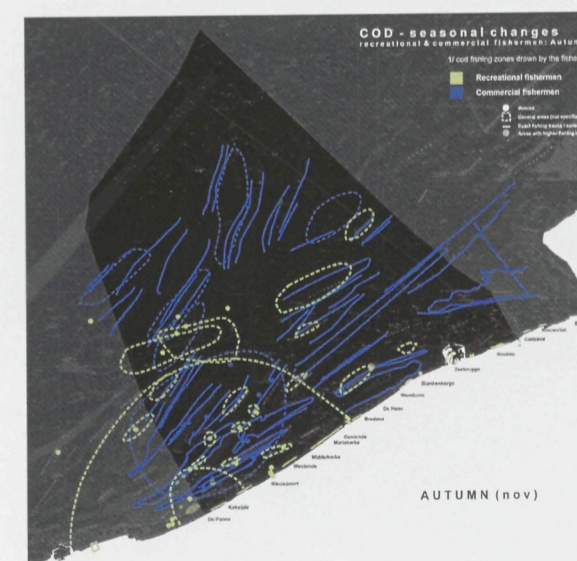
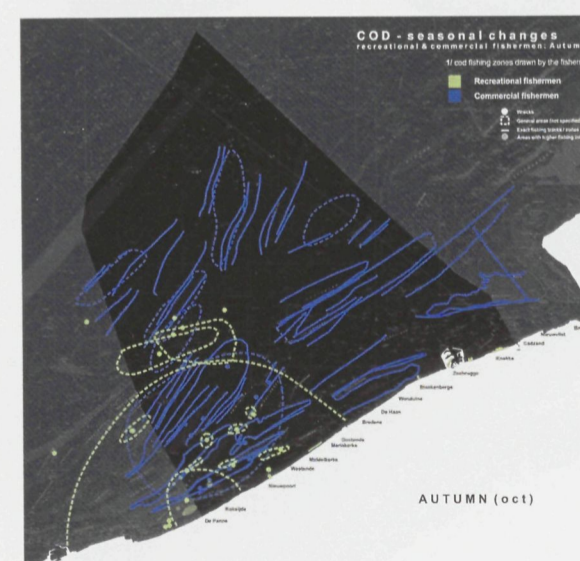
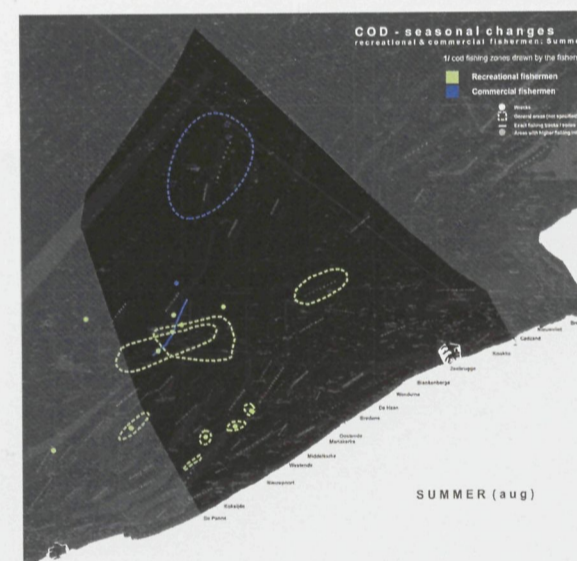
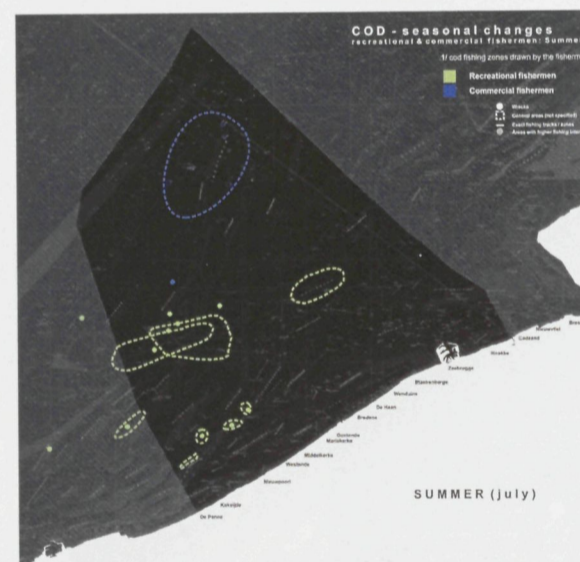
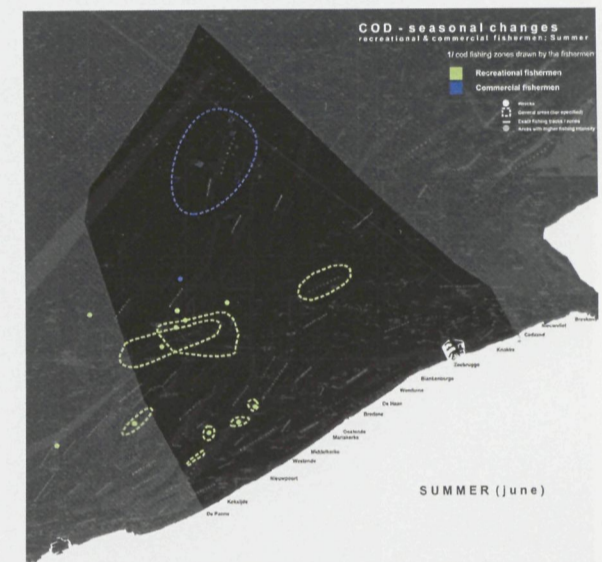
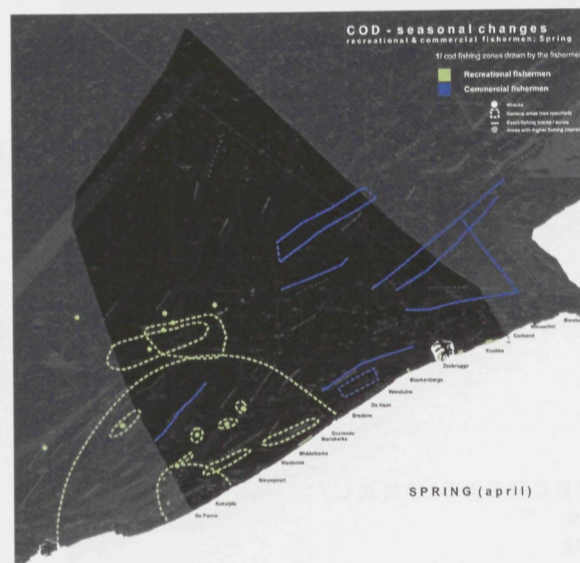
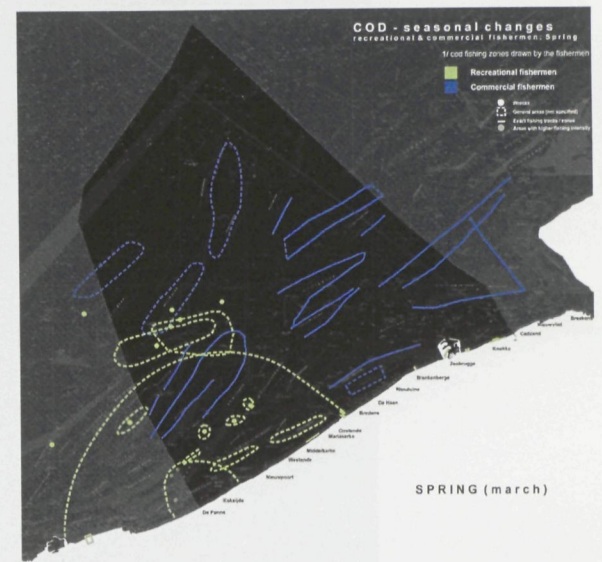




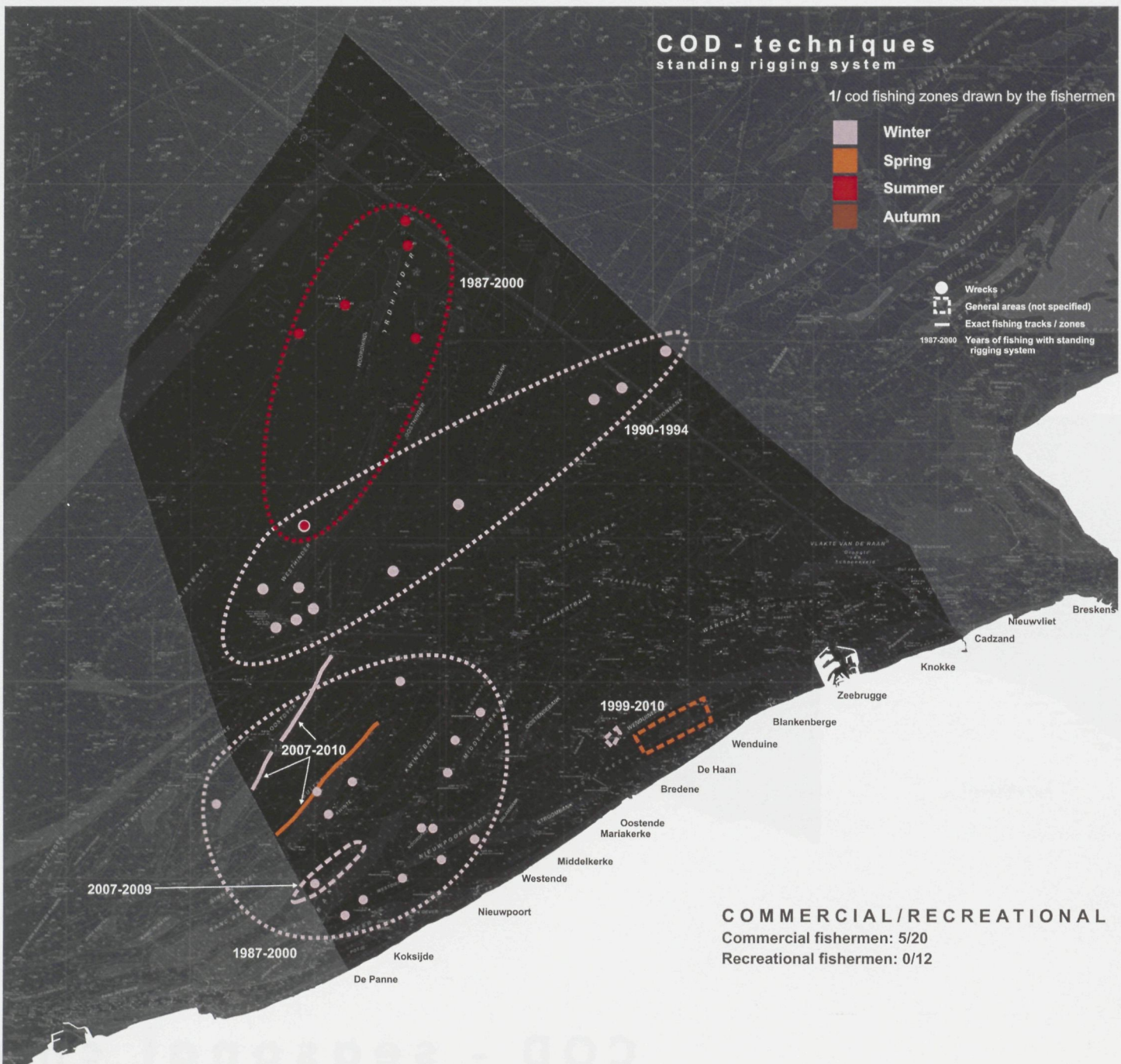
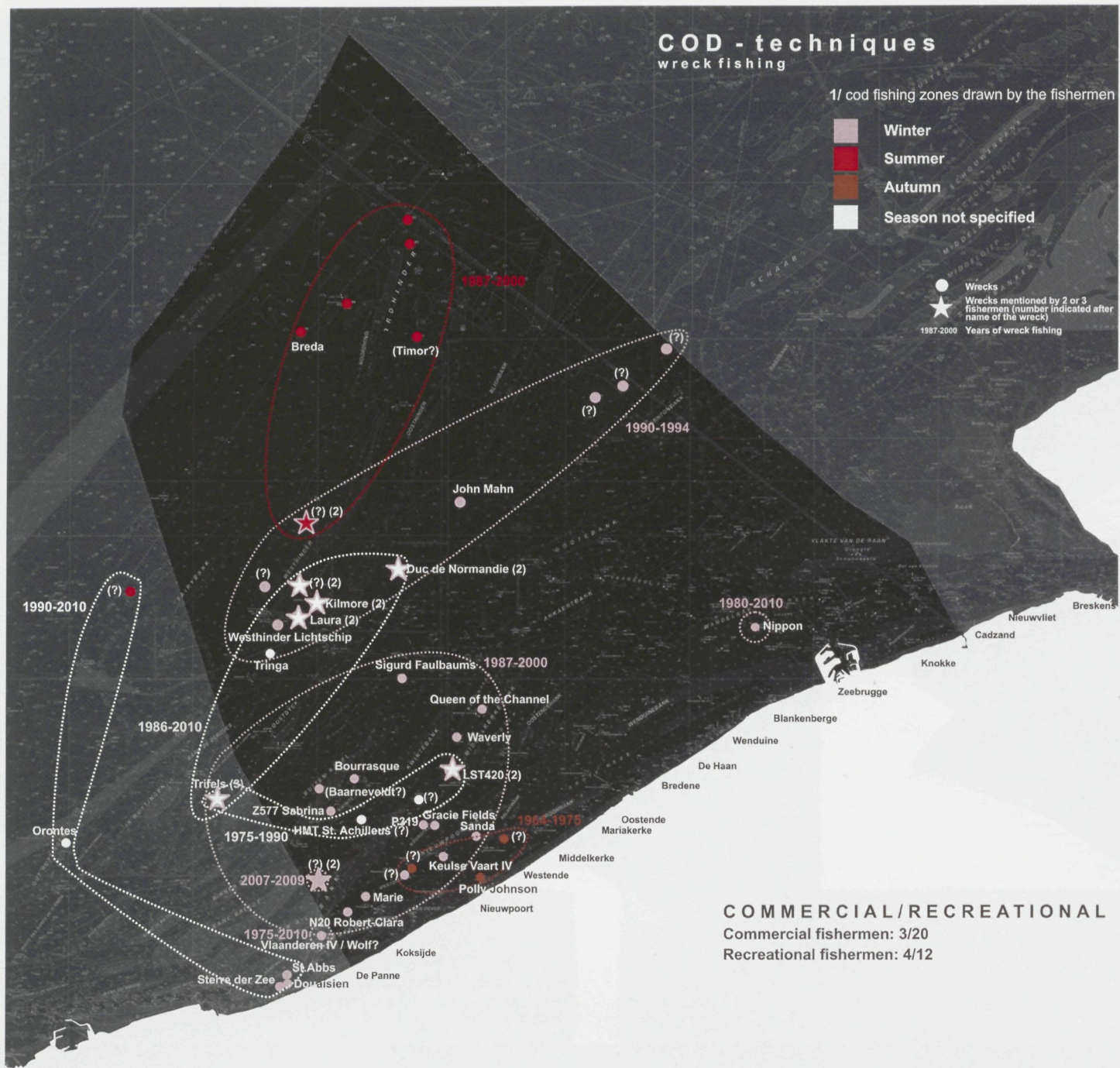


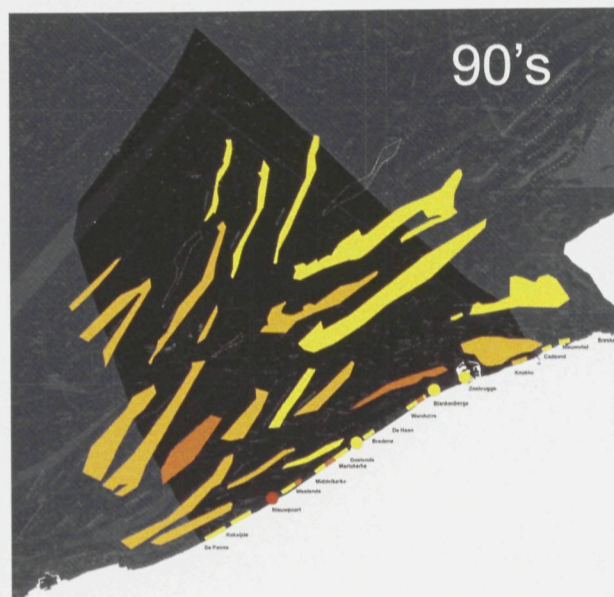
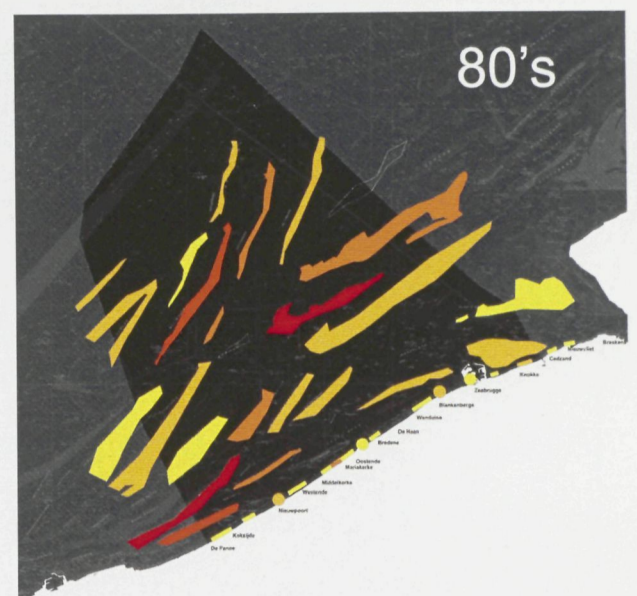
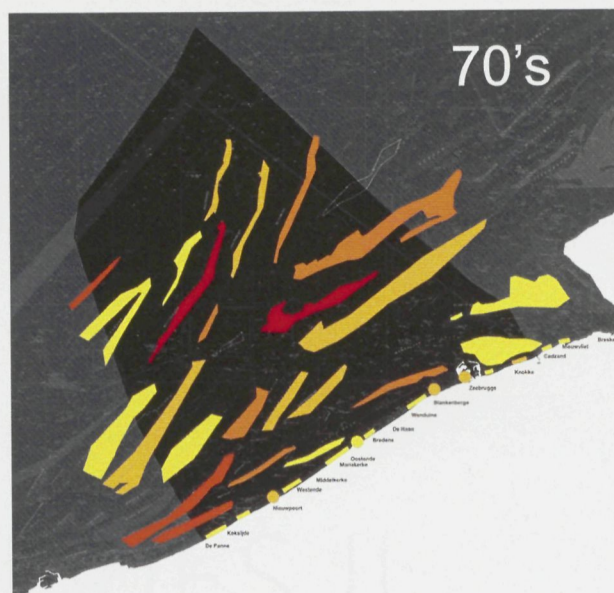
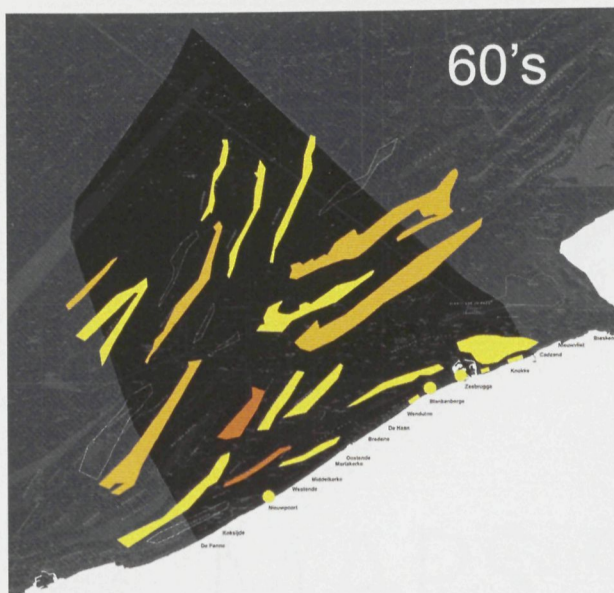
COD - evolution
commercial & recreational fishermen 1950 - 2010
areas fished by 2 or more fishermen





COD - seasonal changes
january-december
commercial & recreational fishermen 1950 - 2010



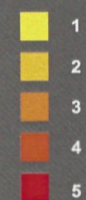


COD - EVOLUTION OF FISHING ZONES

commercial & recreational fishermen 1960-2010

banks / beach / ports indicated by fishermen

number of fishermen on same spot :



LECOFISH SEPTEMBER 2011



COD - SEASONAL CHANGES

commercial & recreational fishermen 1960-2010

banks / beach / ports indicated by fishermen

number of fishermen on same spot :



LECOFISH SEPTEMBER 2011

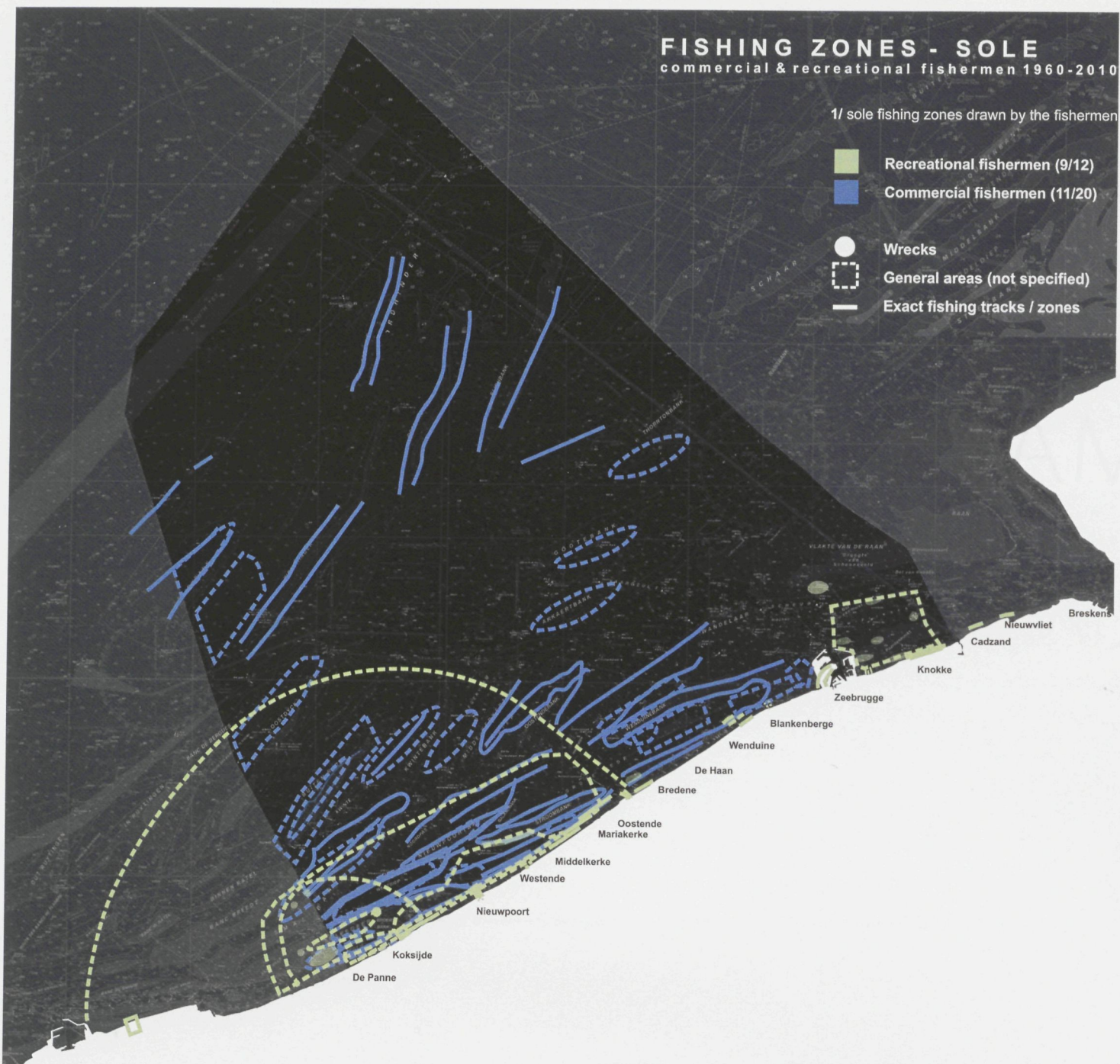
COD - structure maps

commercial & recreational fishermen 1950 - 2010



MAPS SERIES II

SOLE



Nieuwpoort
1965-1975 / 1983-2010



Westende-Middelkerke
1997-2005



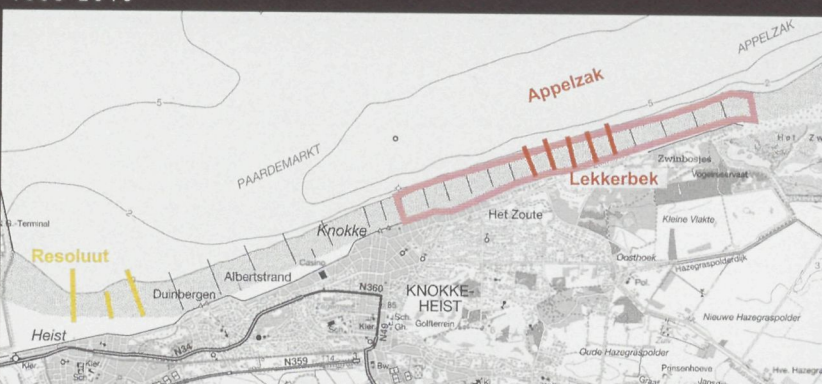
Oostende
1970-2010



De Haan-Wenduine
2000-2010



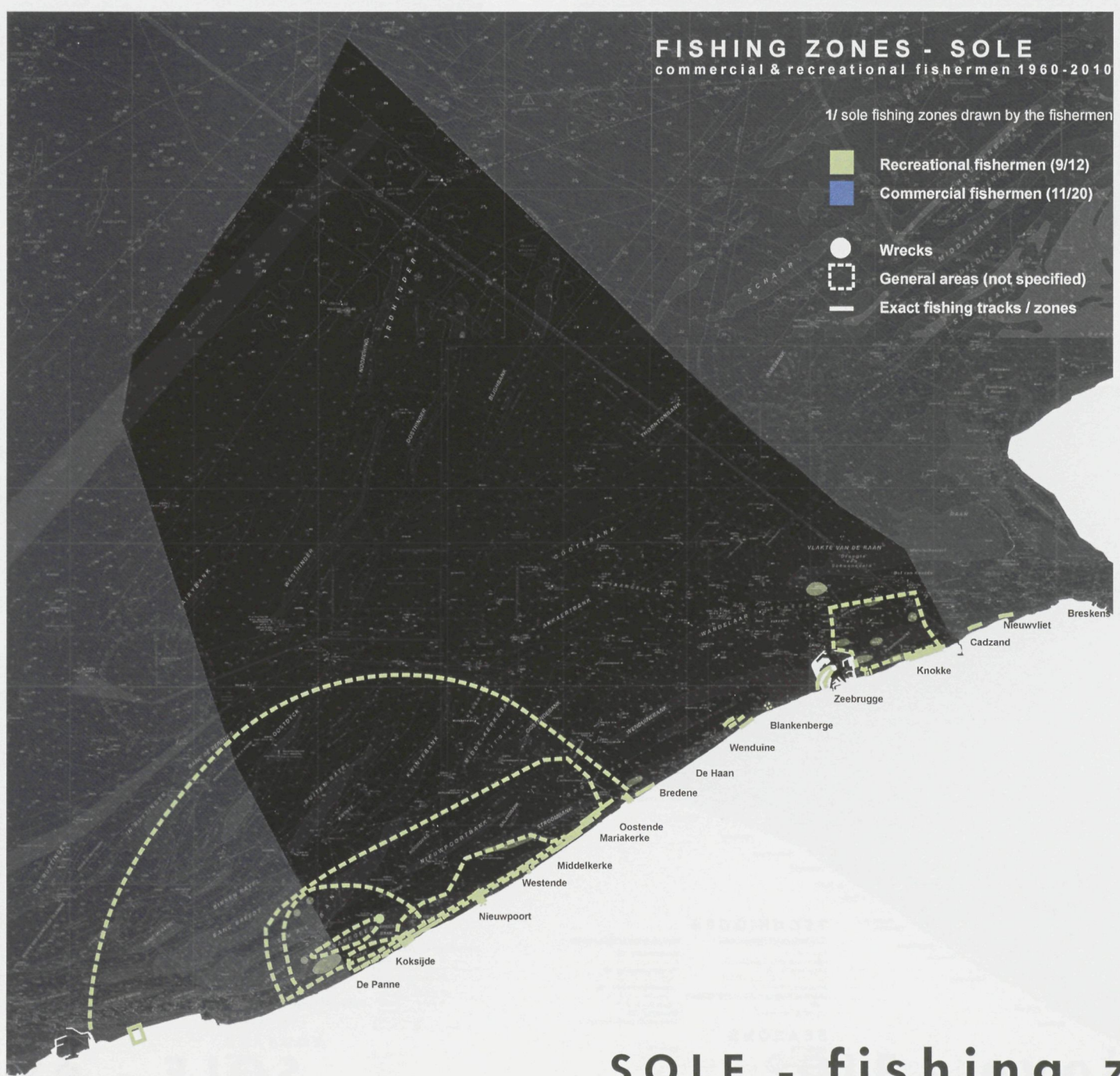
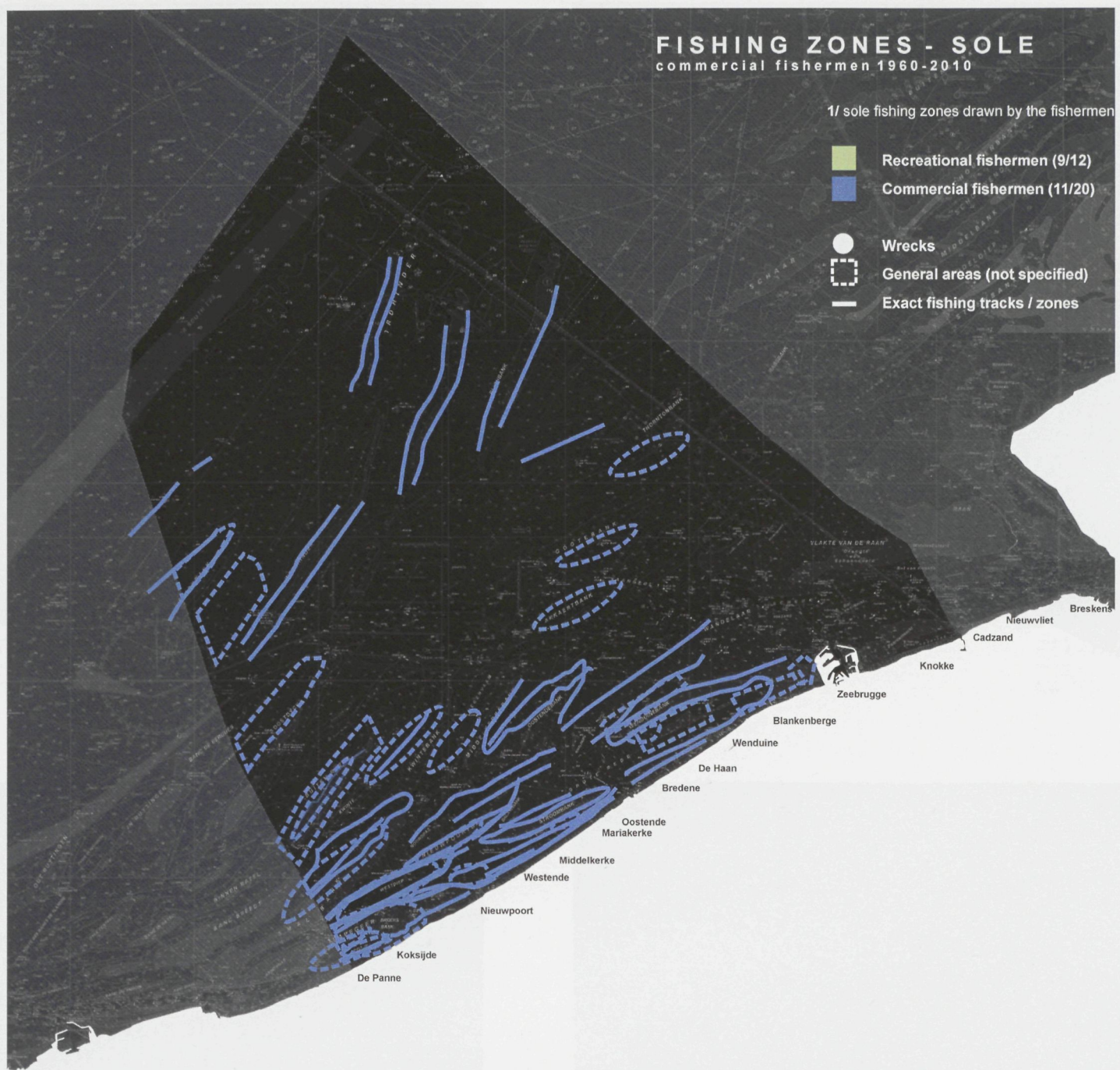
Knokke-Heist
1965-2010



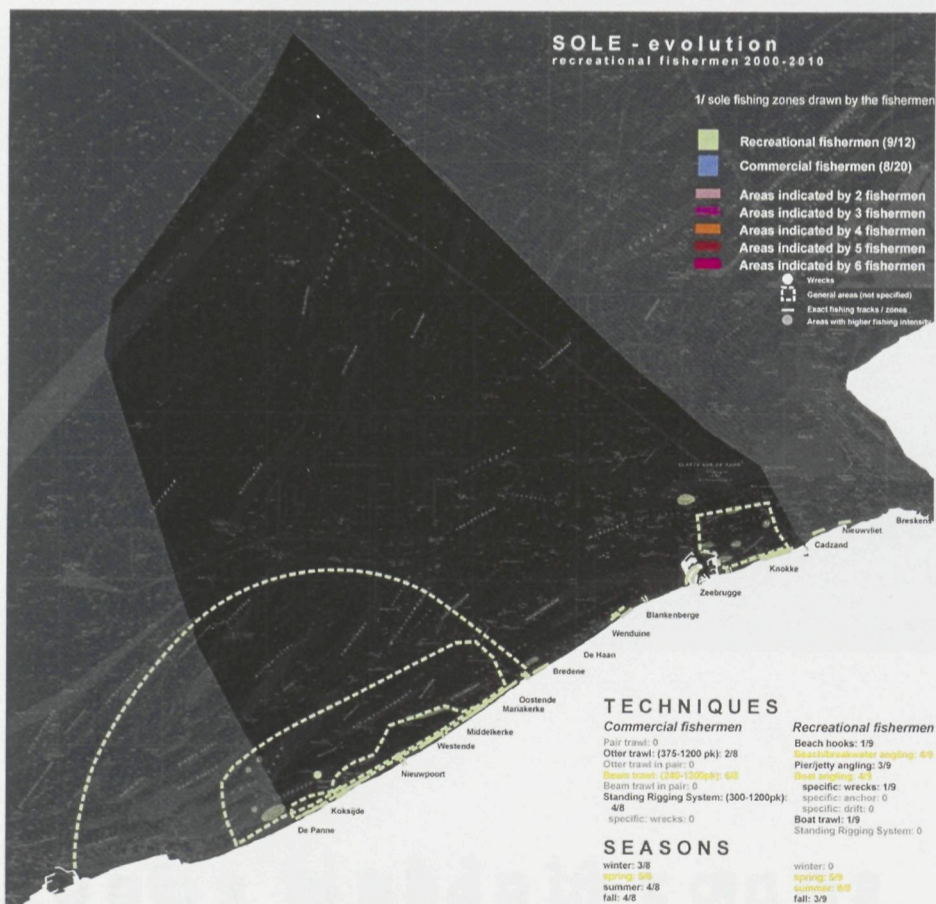
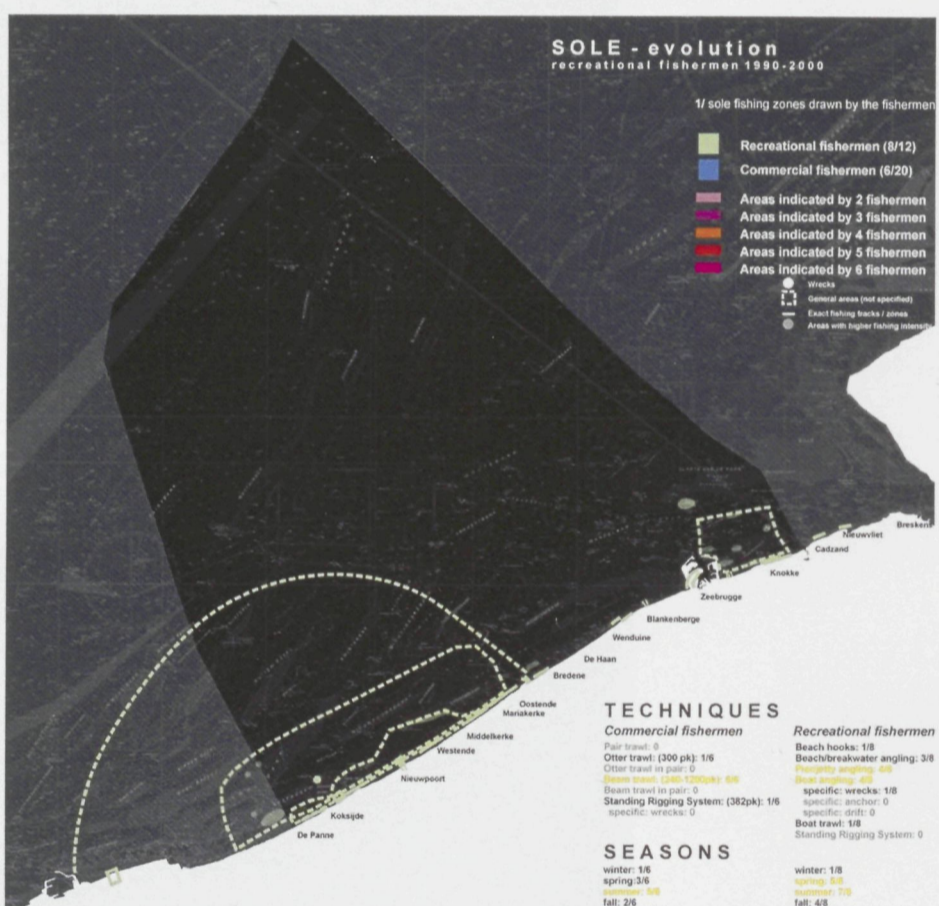
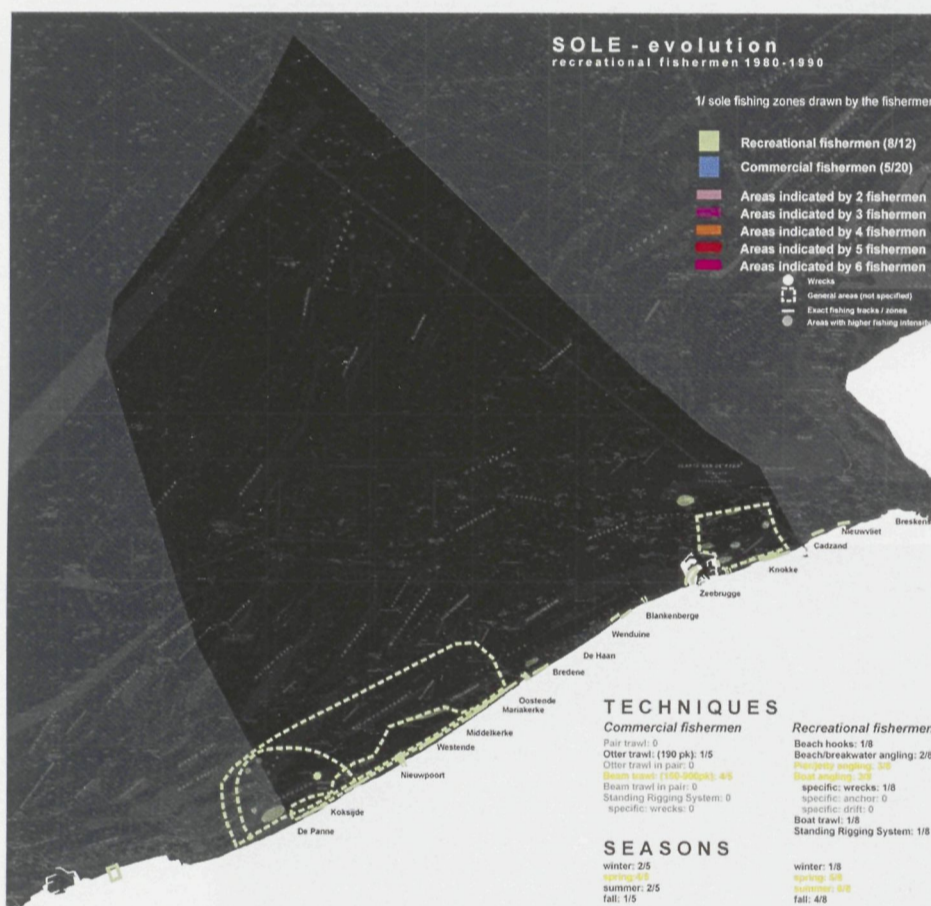
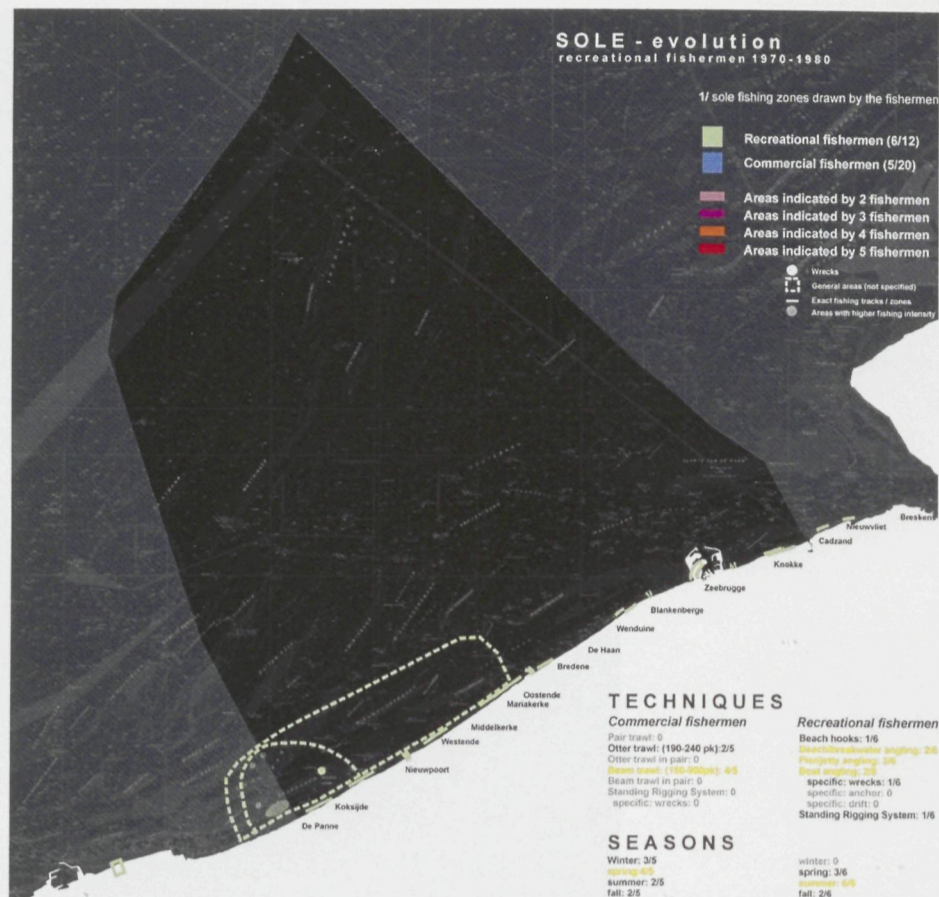
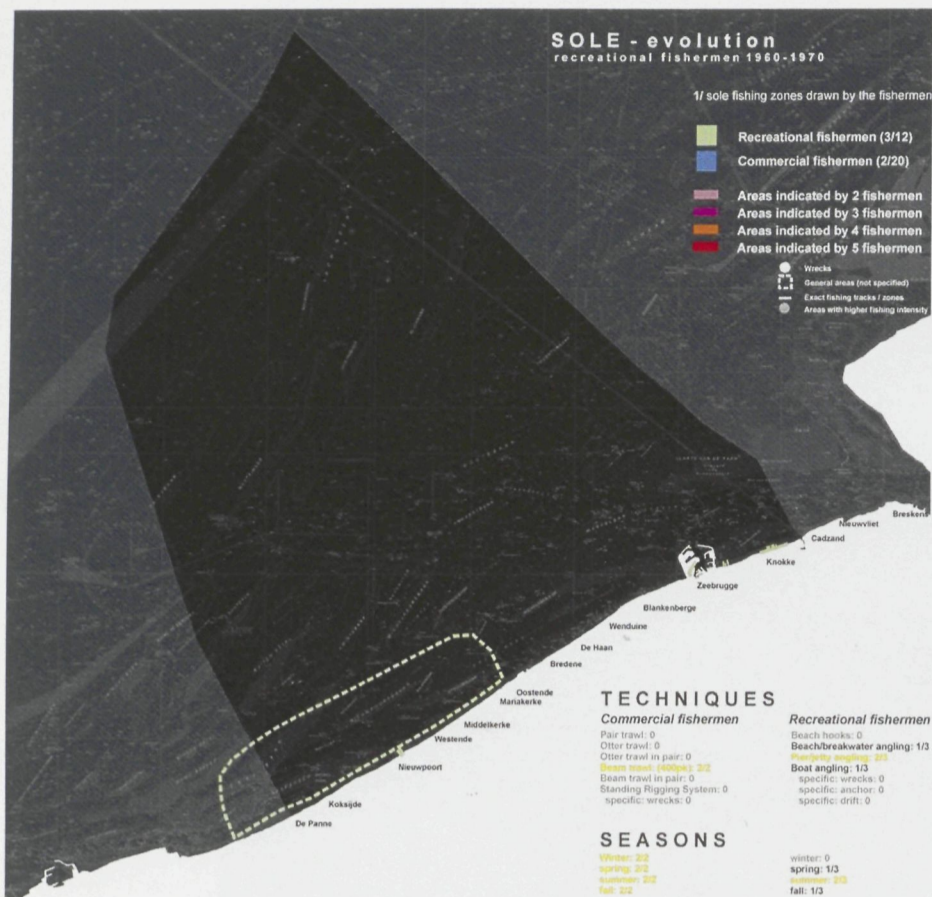
FISHING ZONES - SOLE

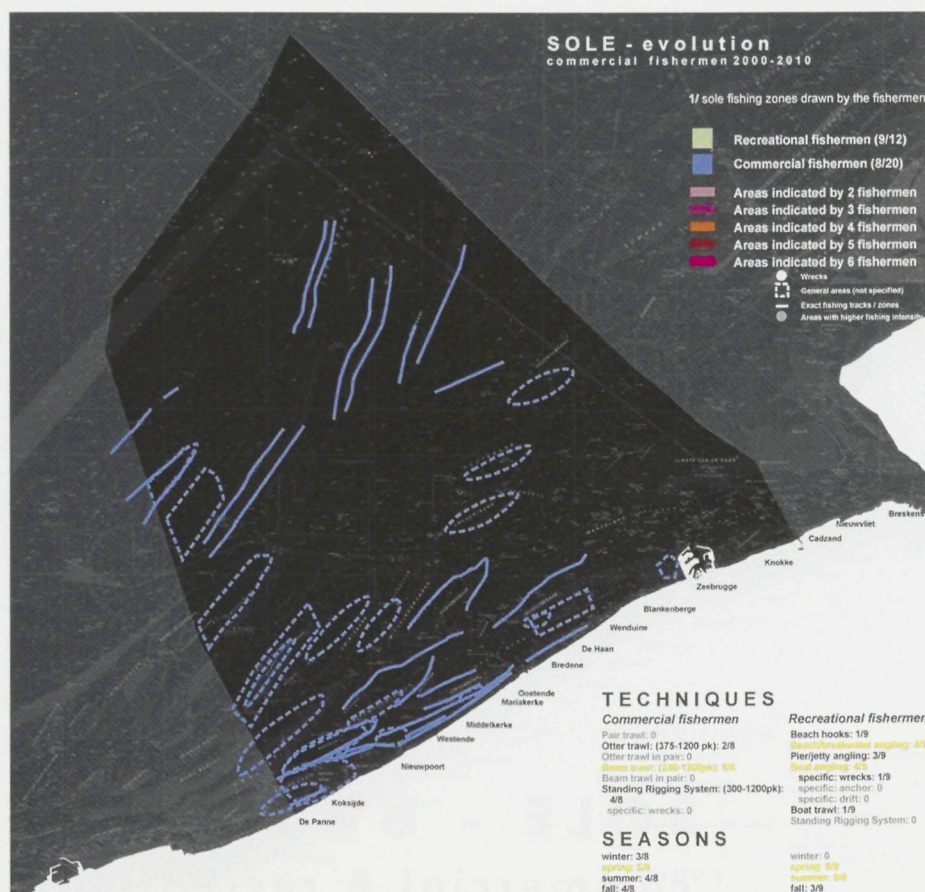
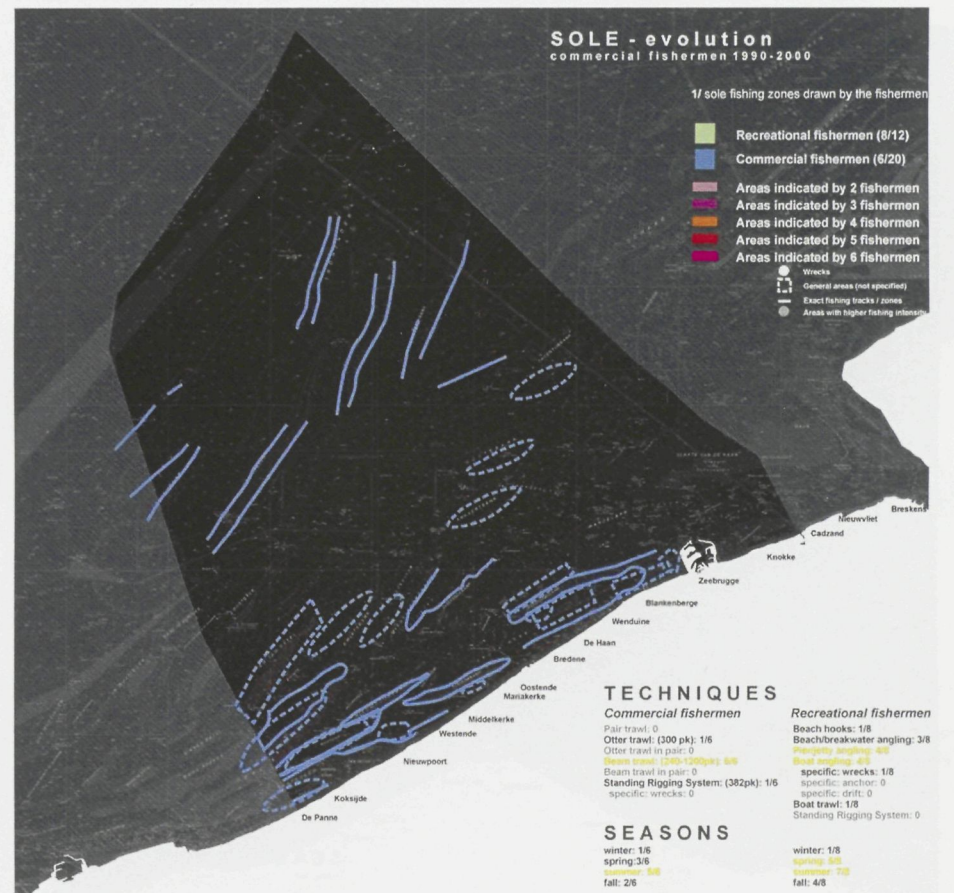
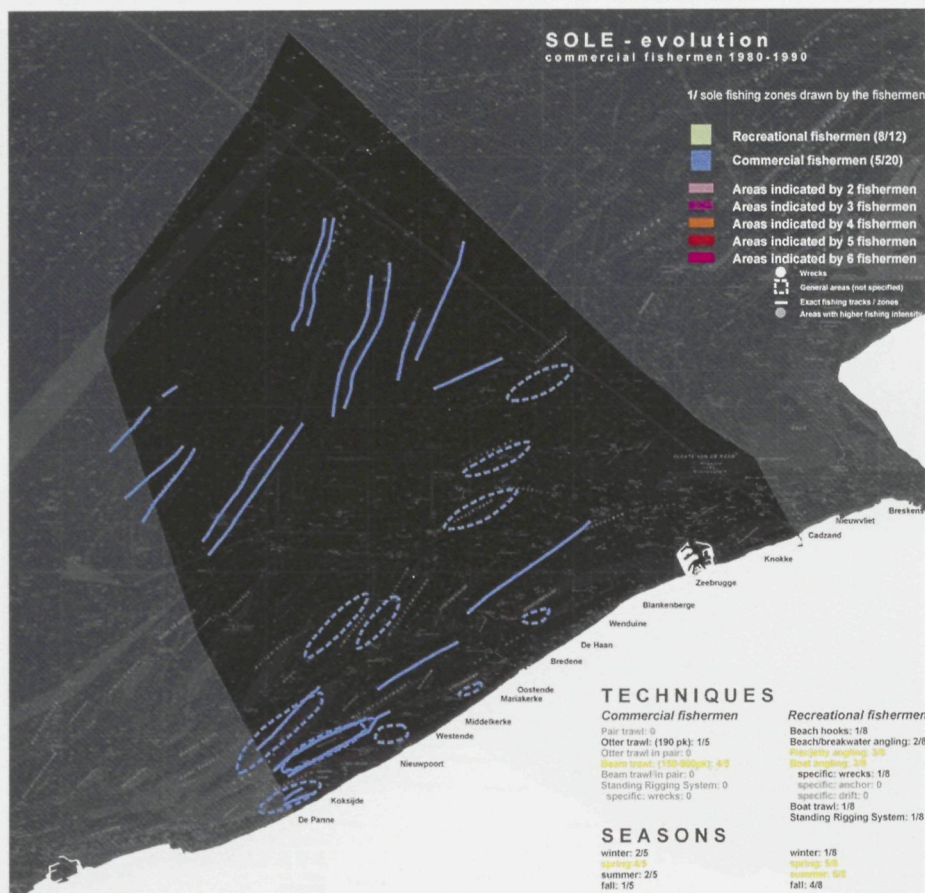
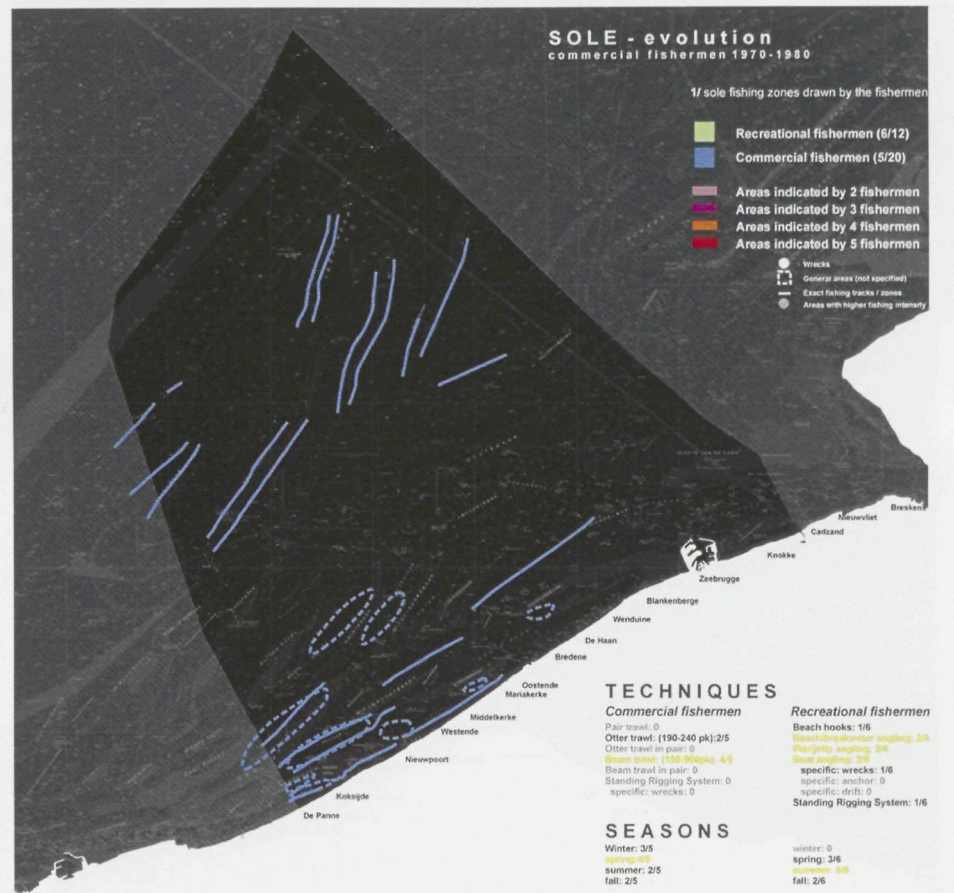
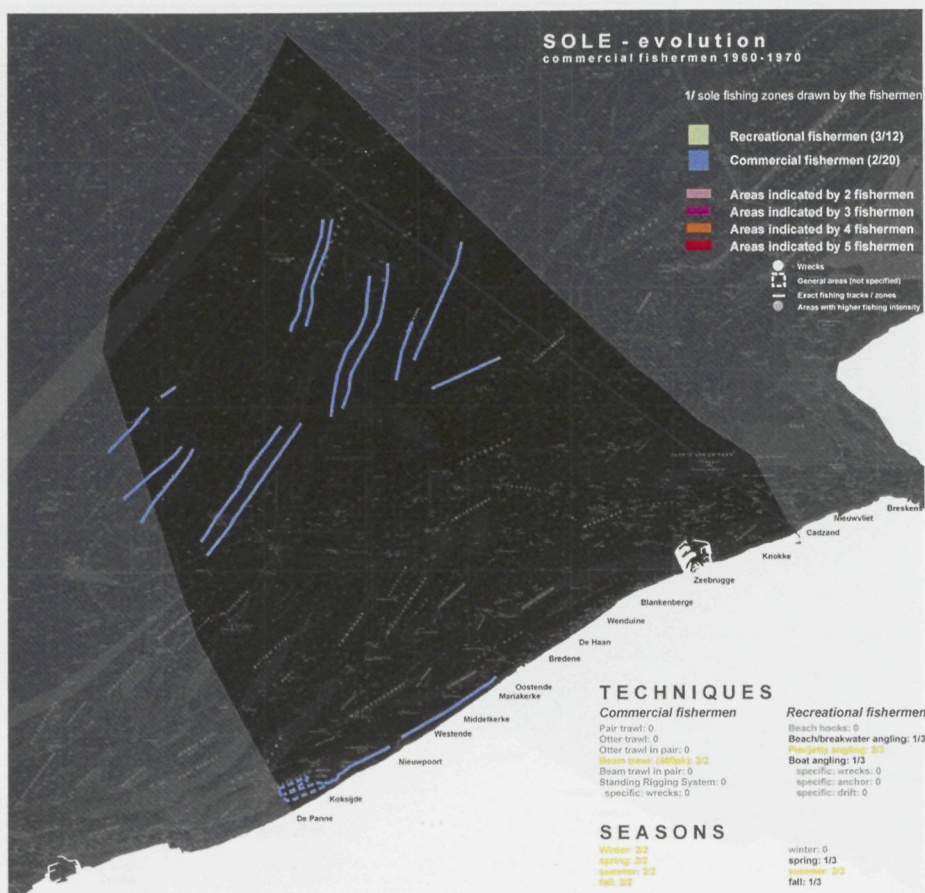
recreational fishermen 1956-2010

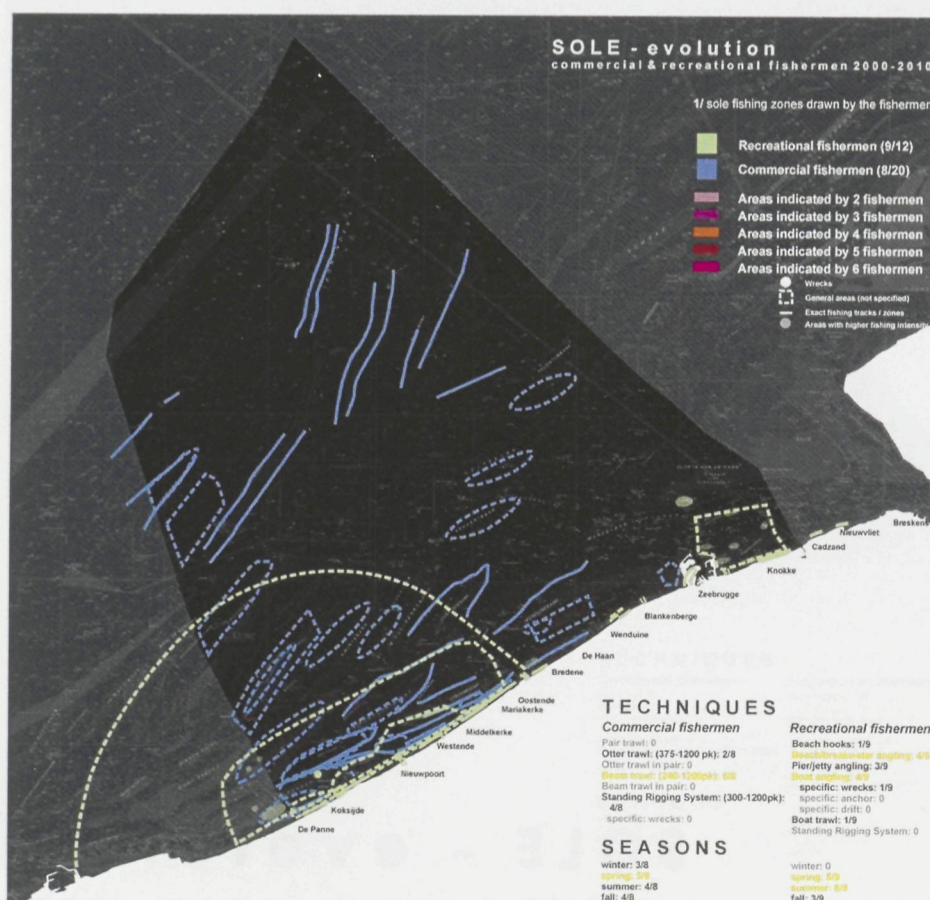
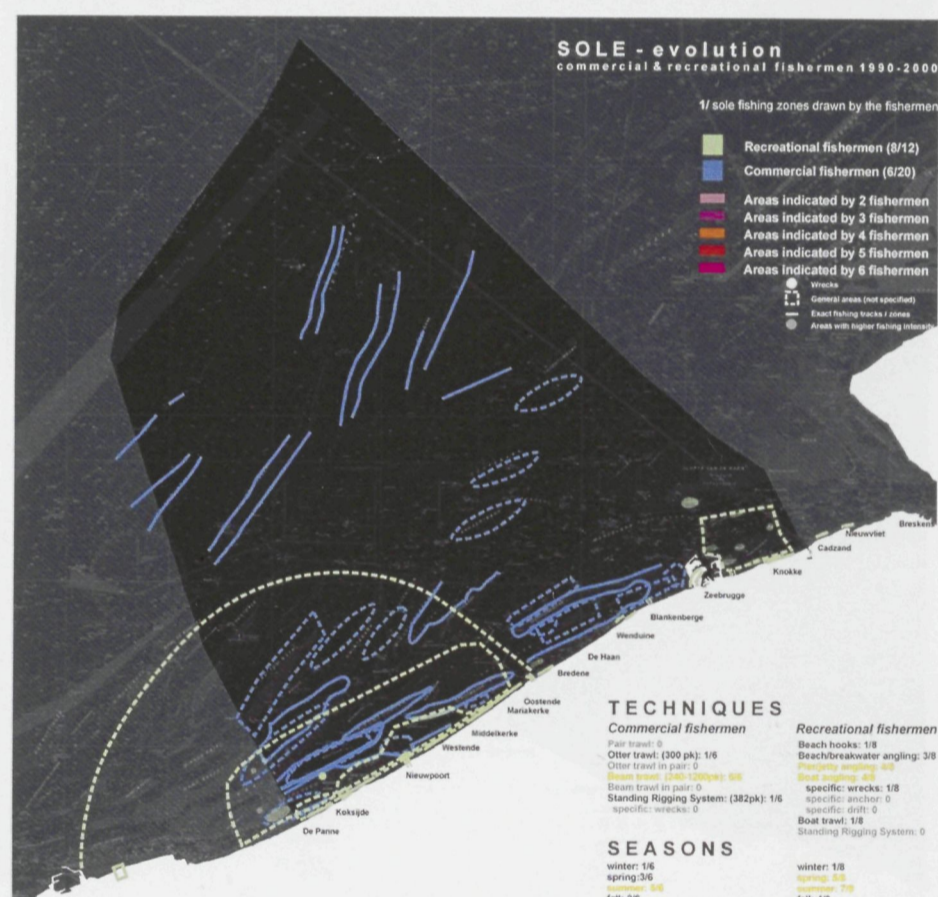
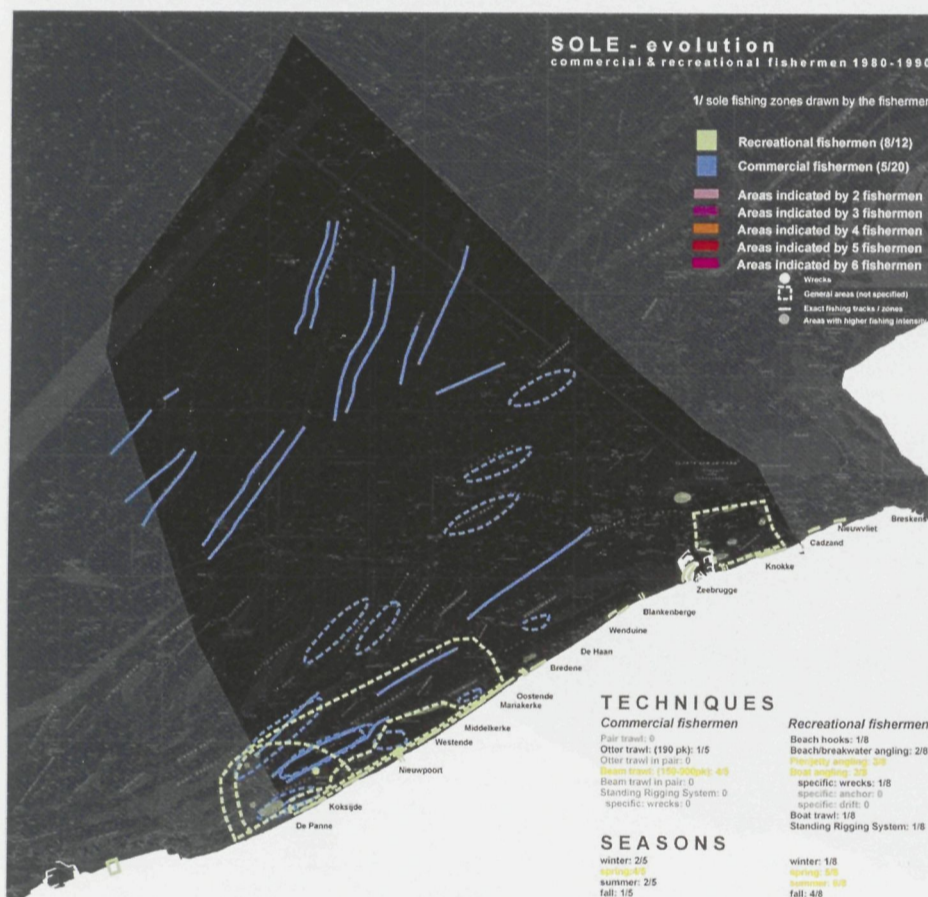
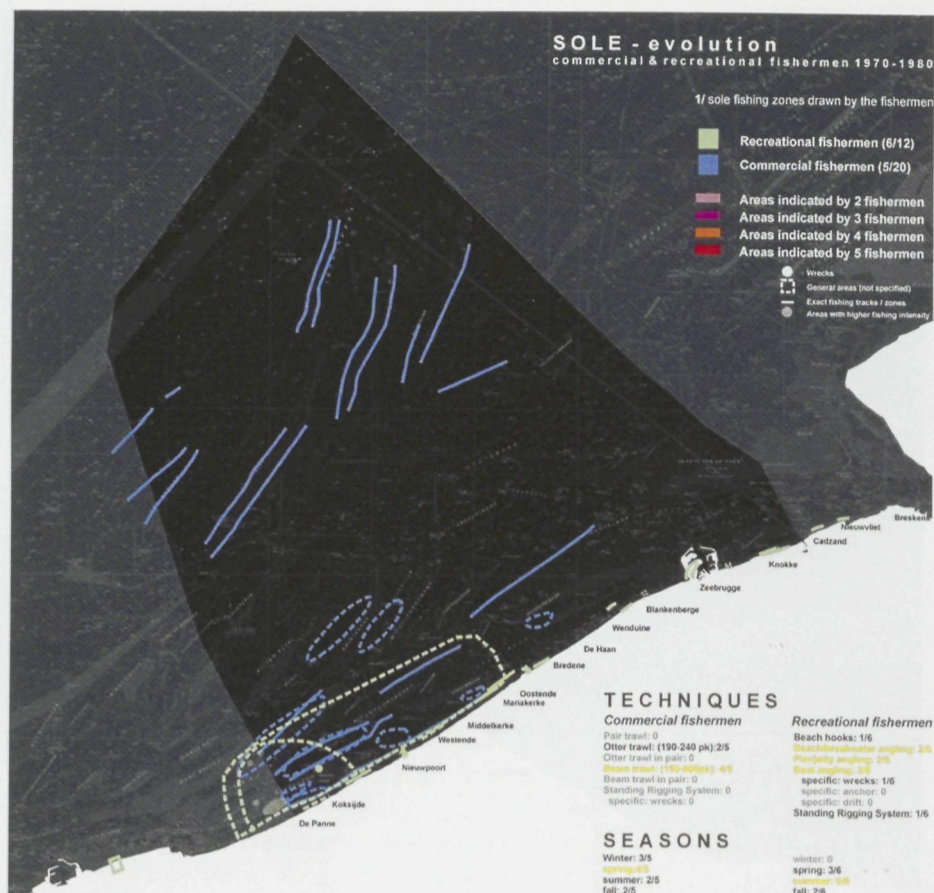
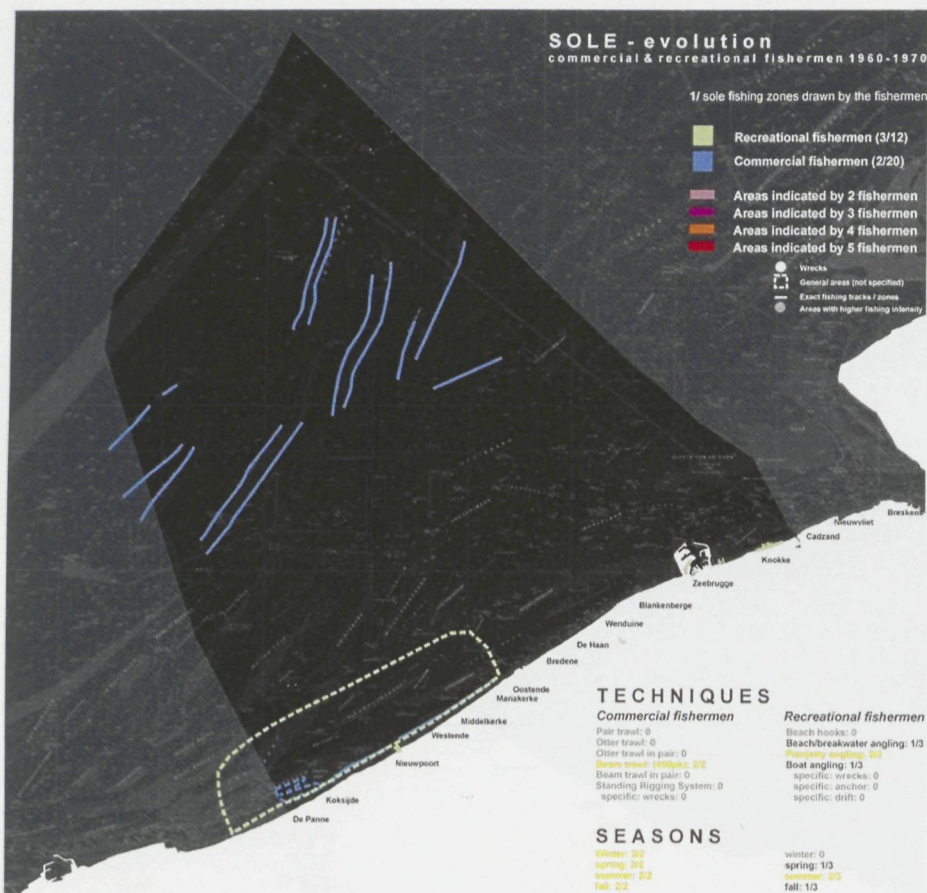
1/ sole fishing zones drawn by the fishermen - detailed maps



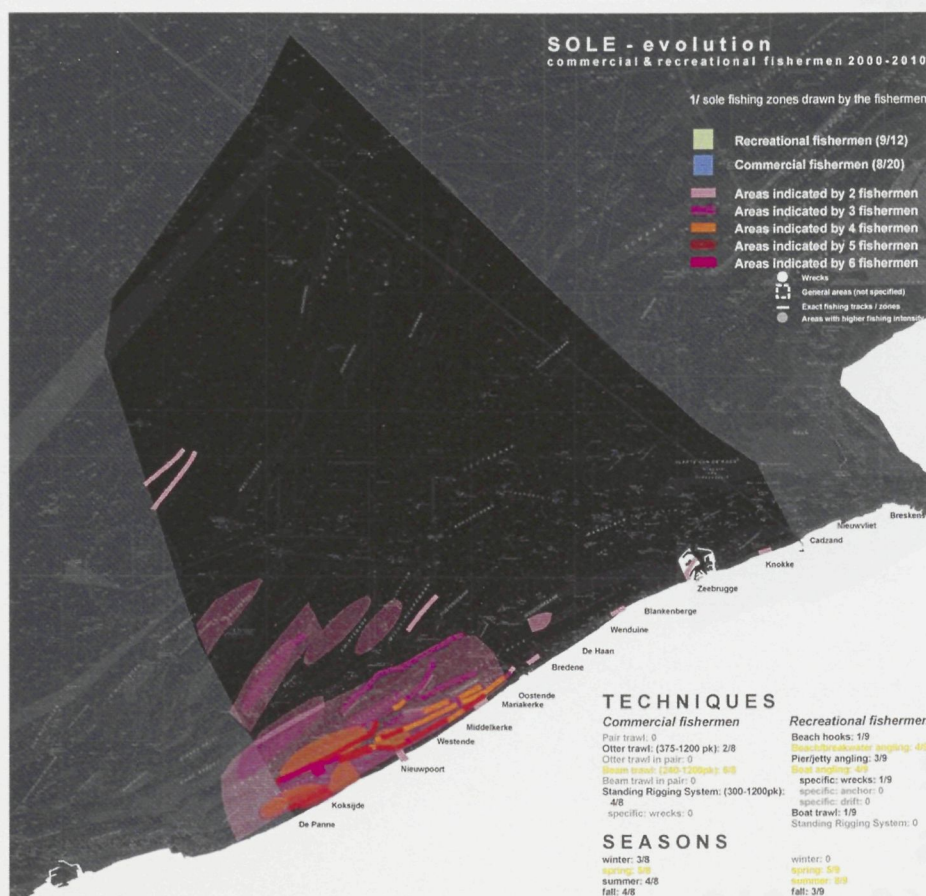
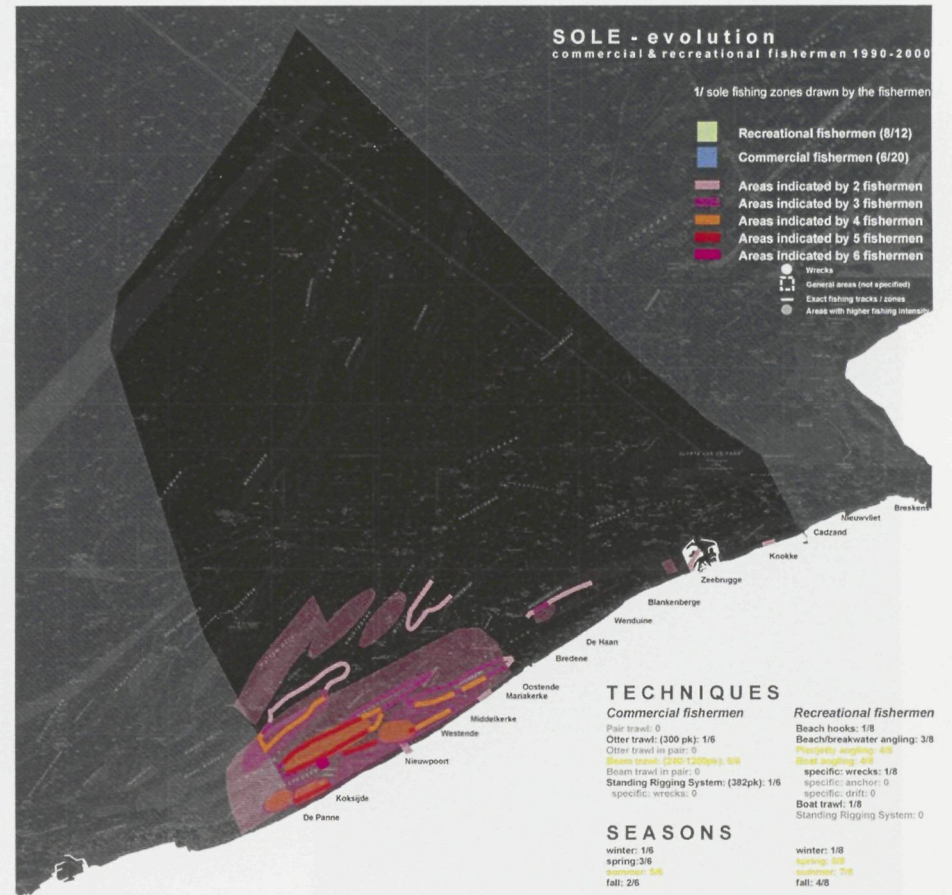
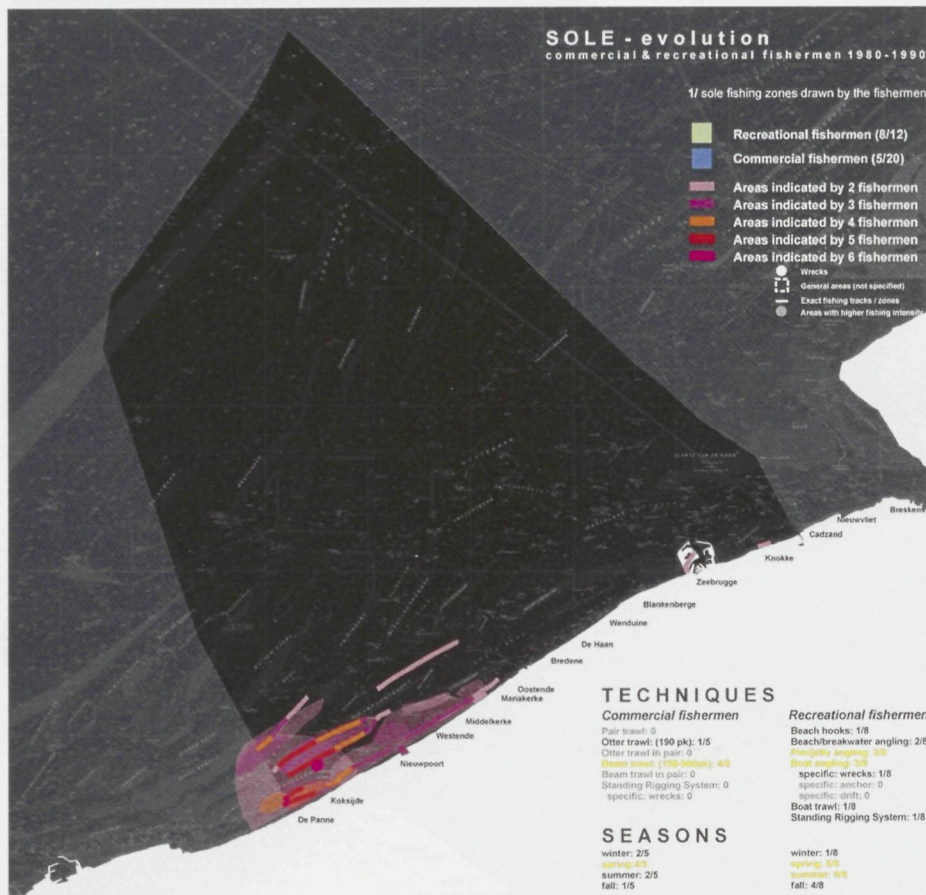
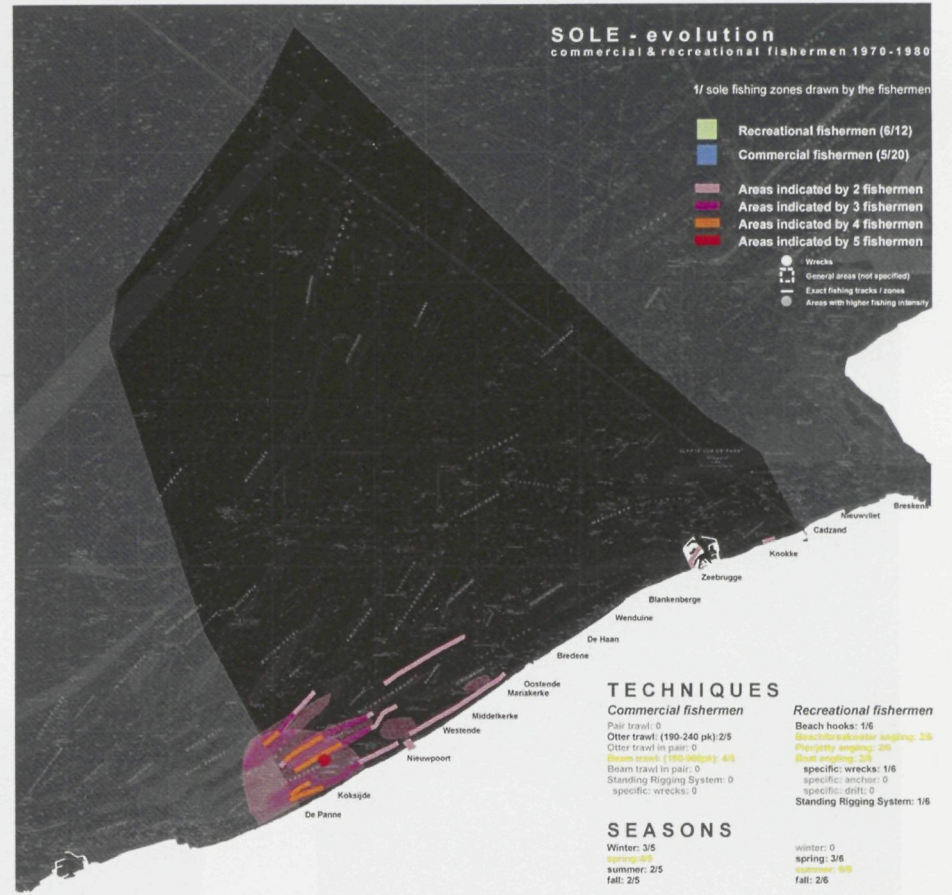
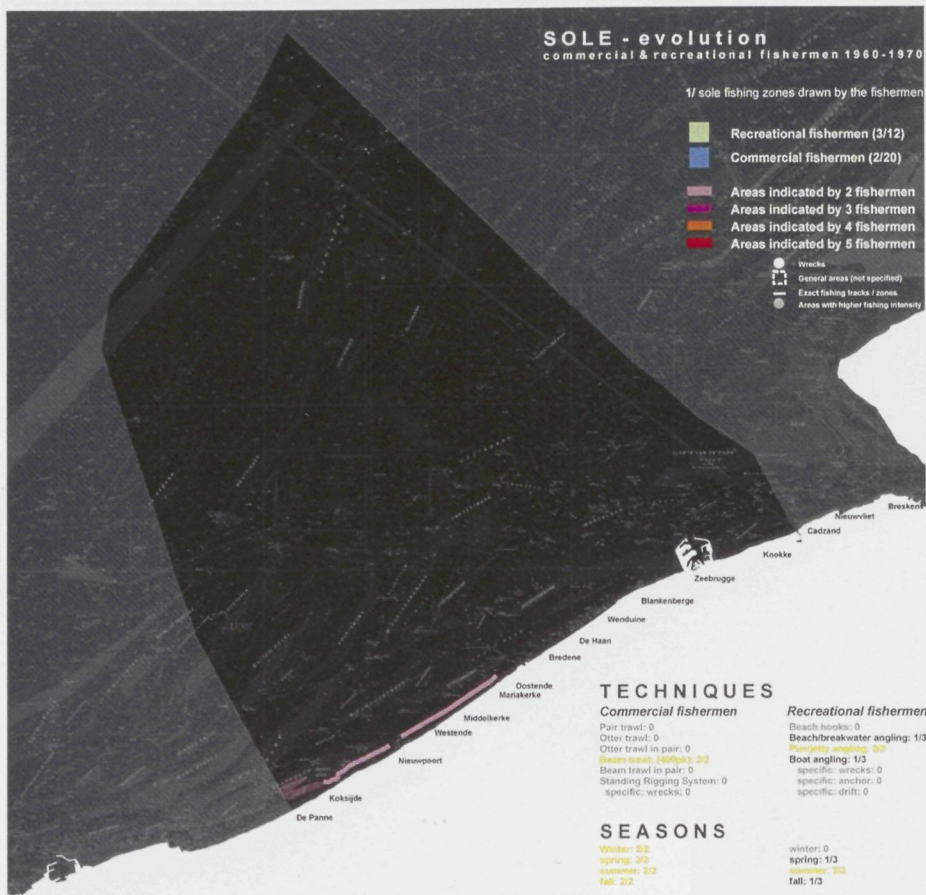
SOLE - fishing zones
commercial & recreational fishermen 1960 - 2010



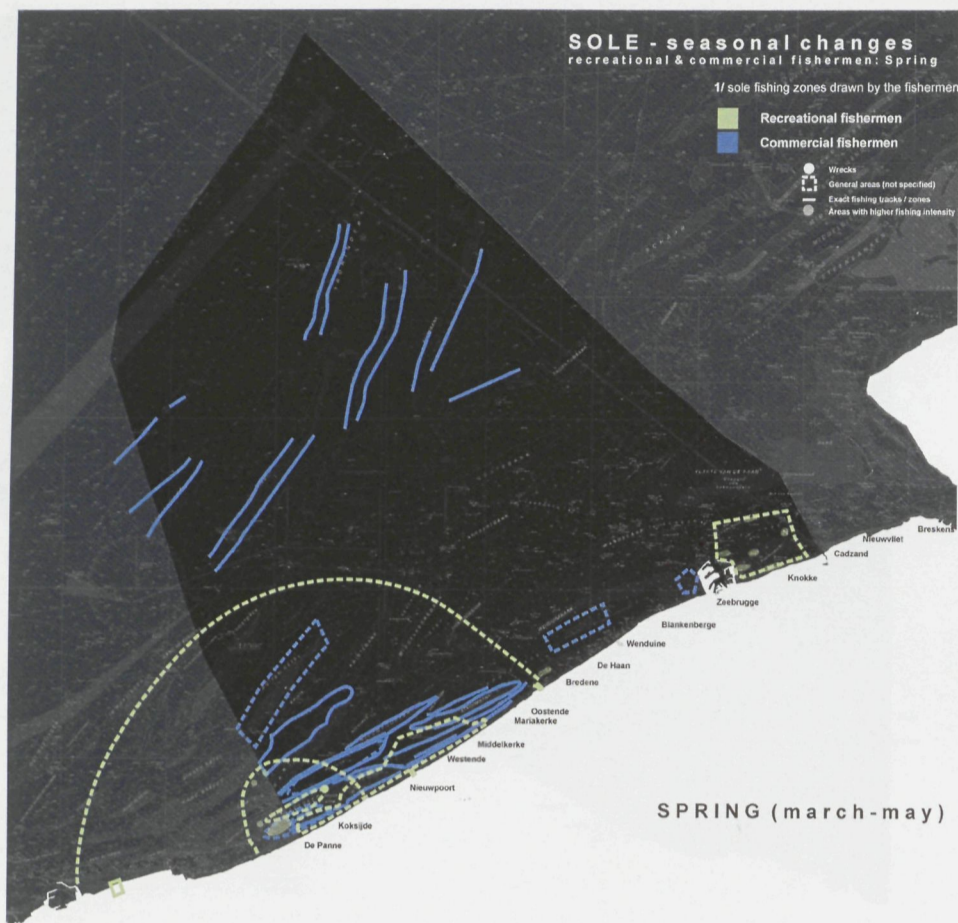


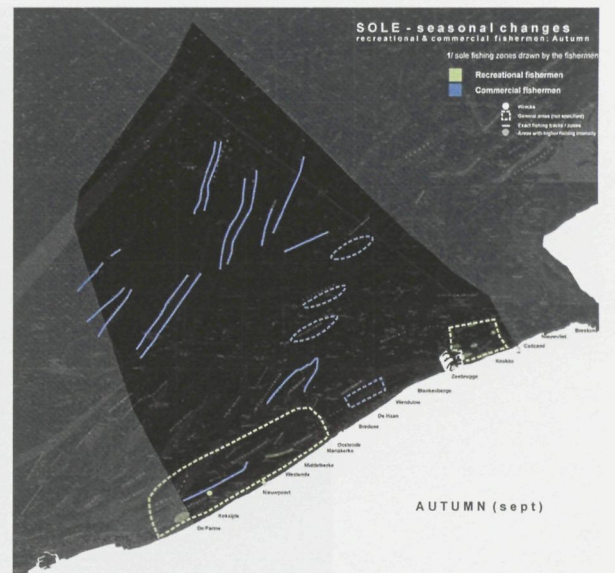
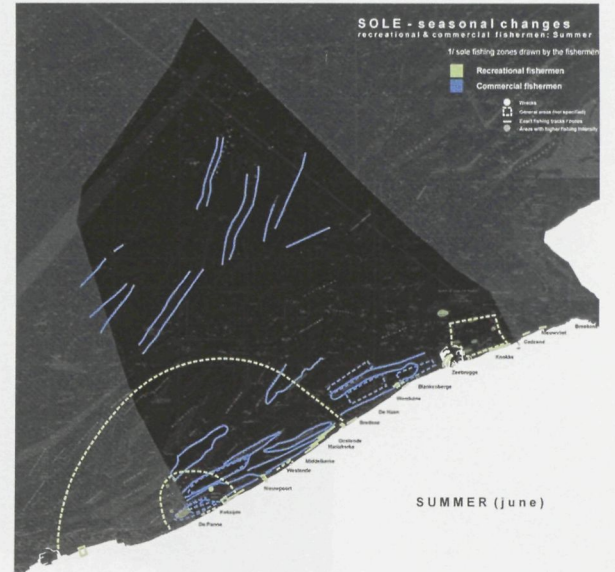
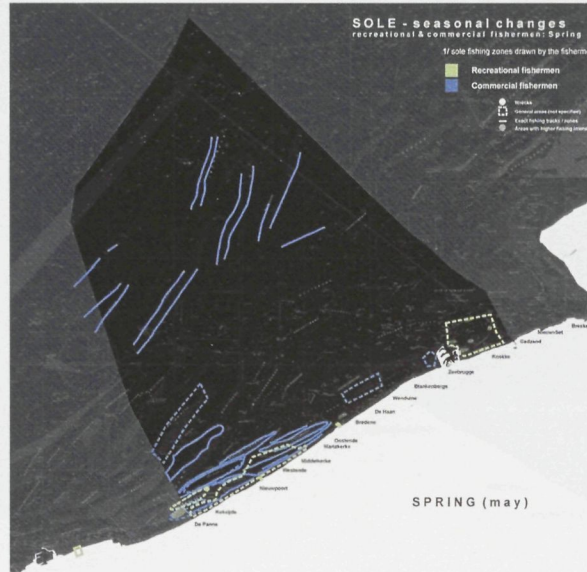


SOLE - evolution
commercial & recreational
fishermen 1960 - 2010

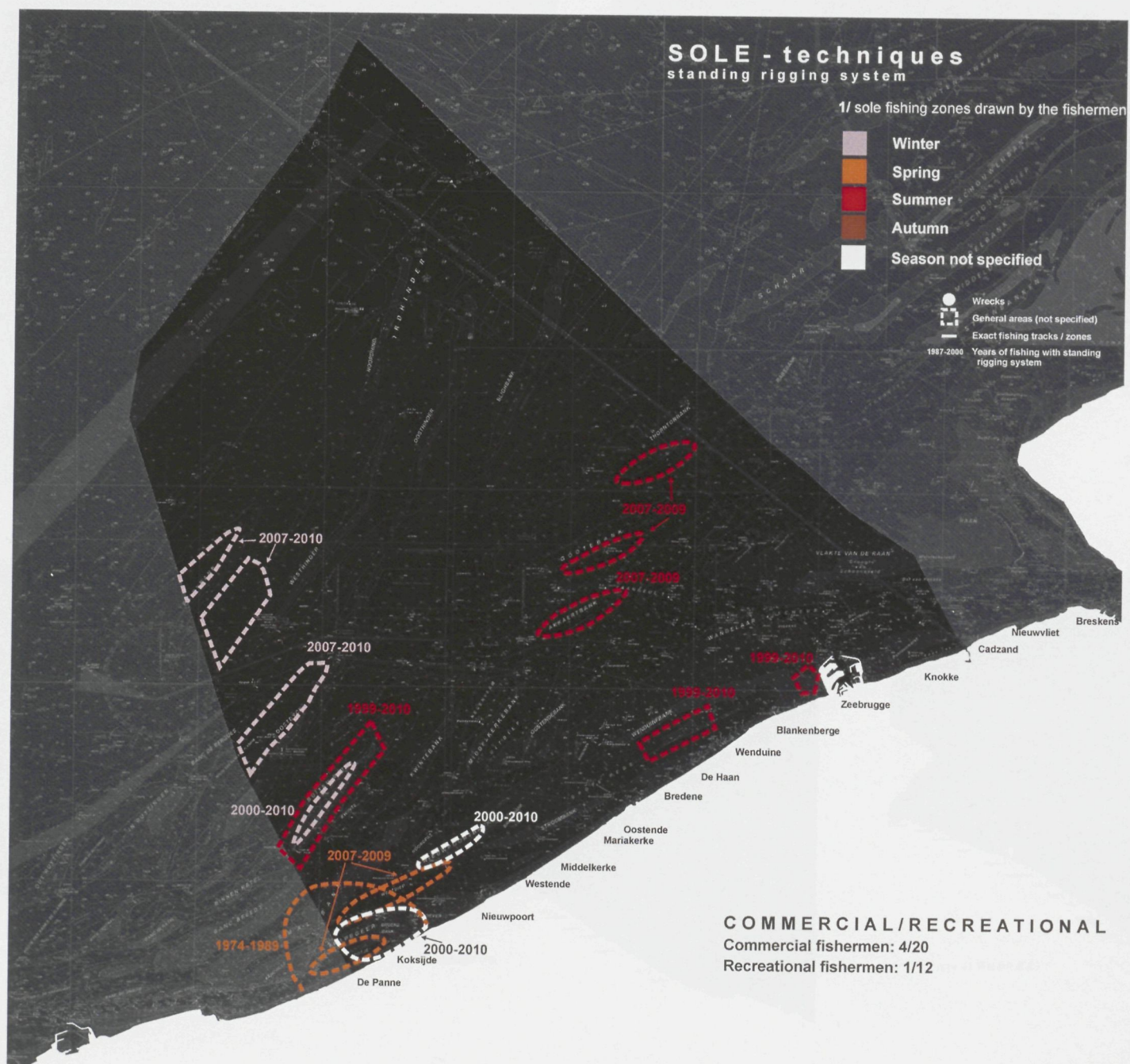
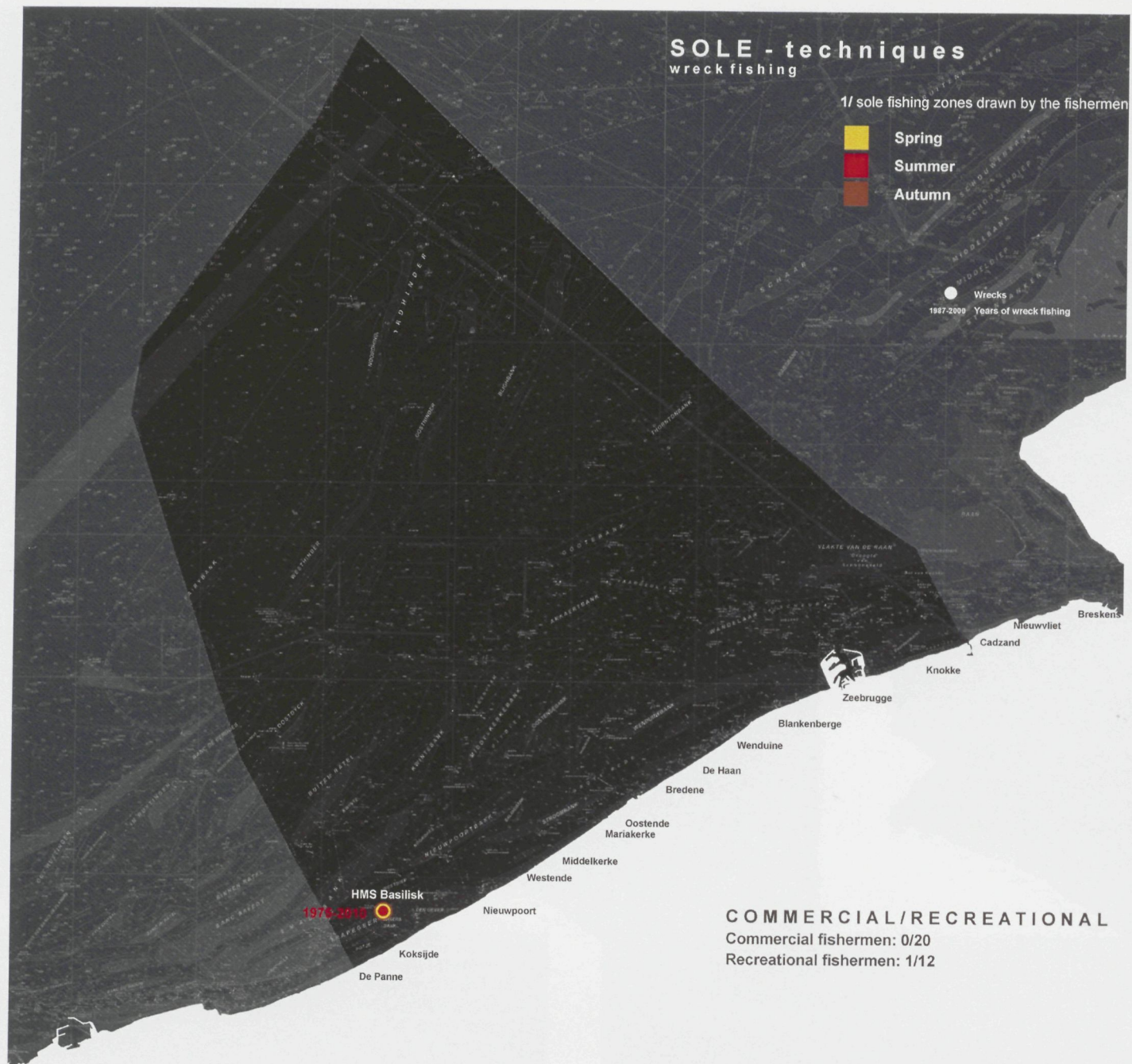


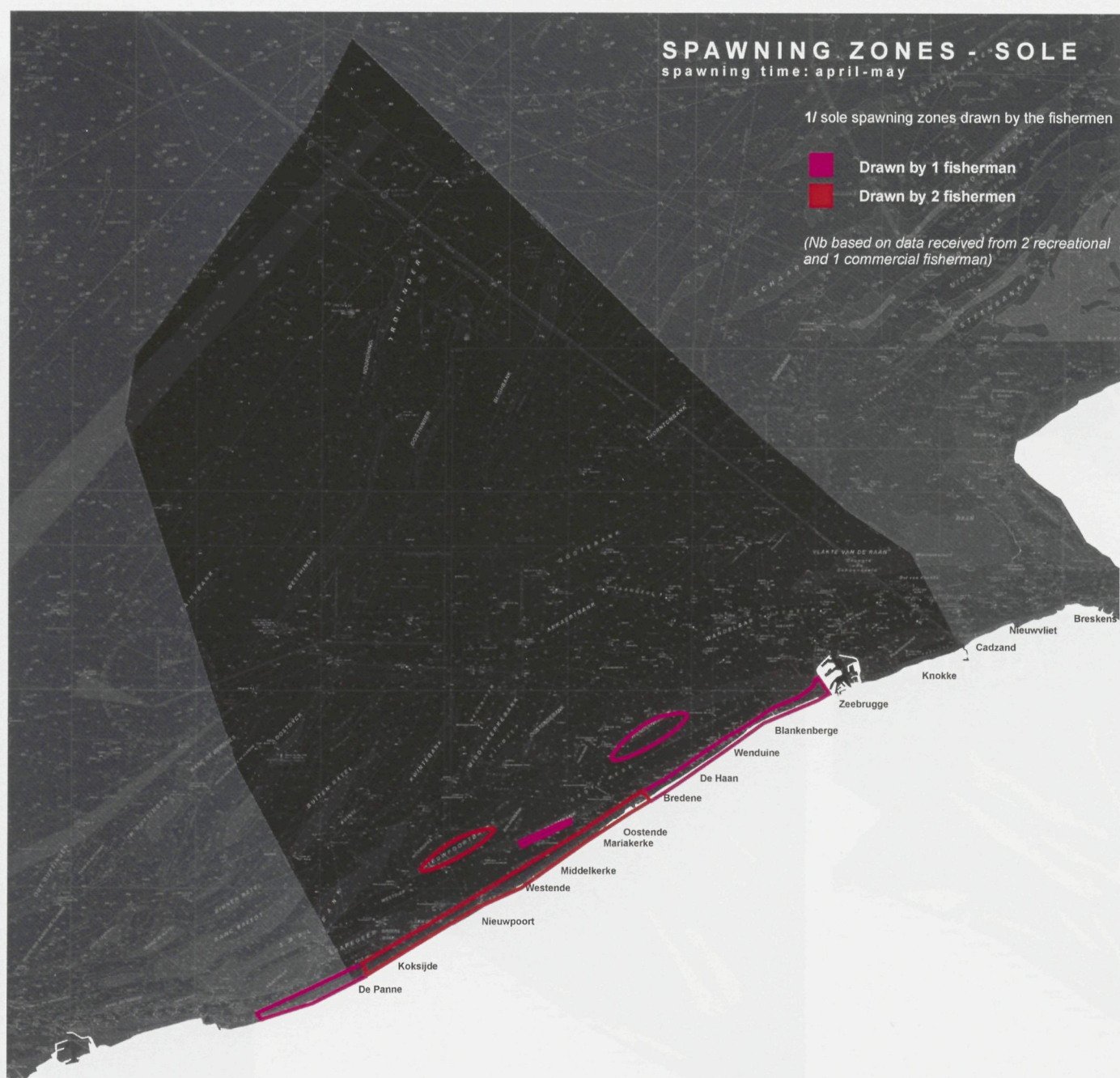
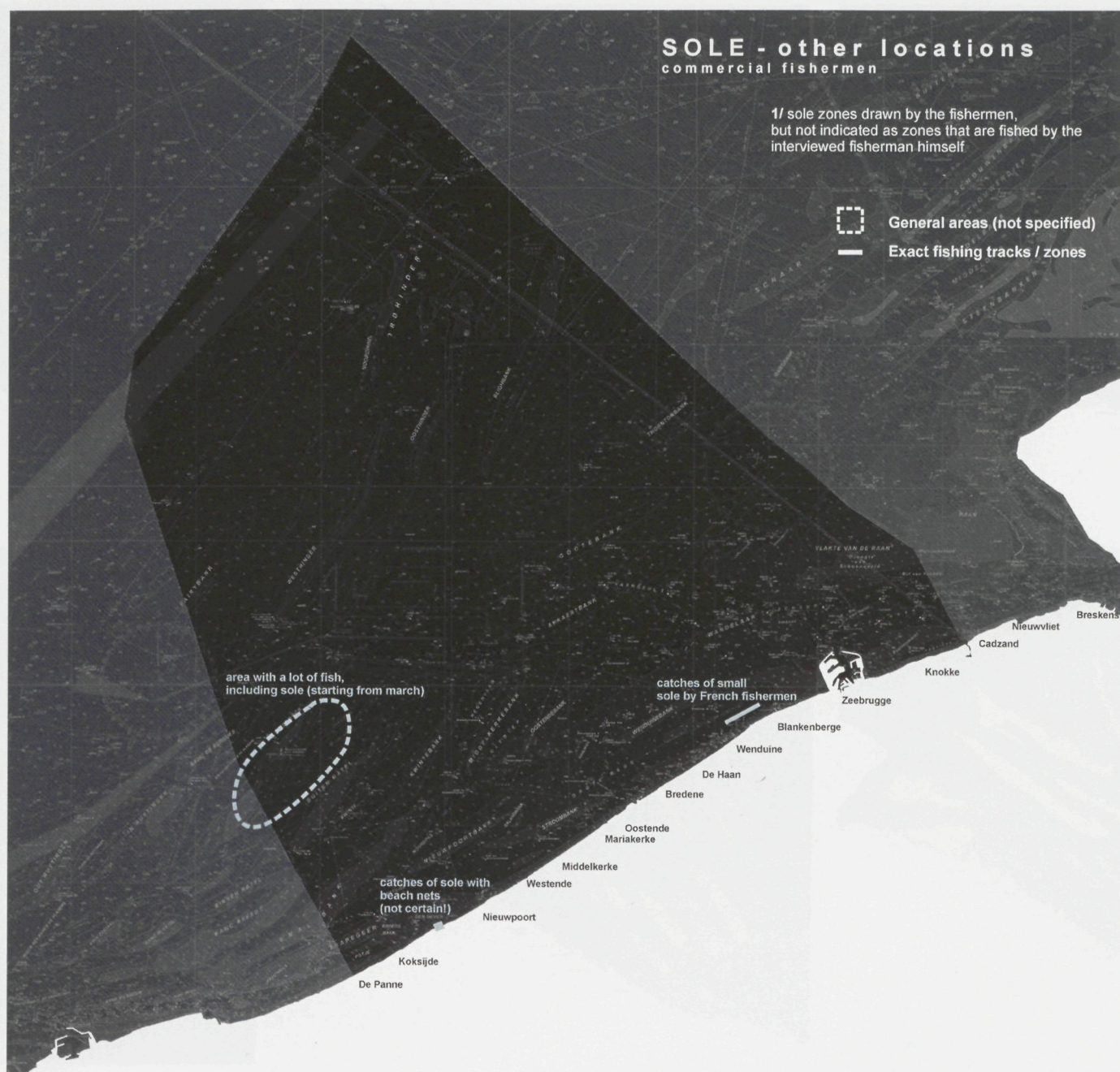
SOLE - evolution
commercial & recreational
fishermen 1960 - 2010
areas fished by 2 or more fishermen



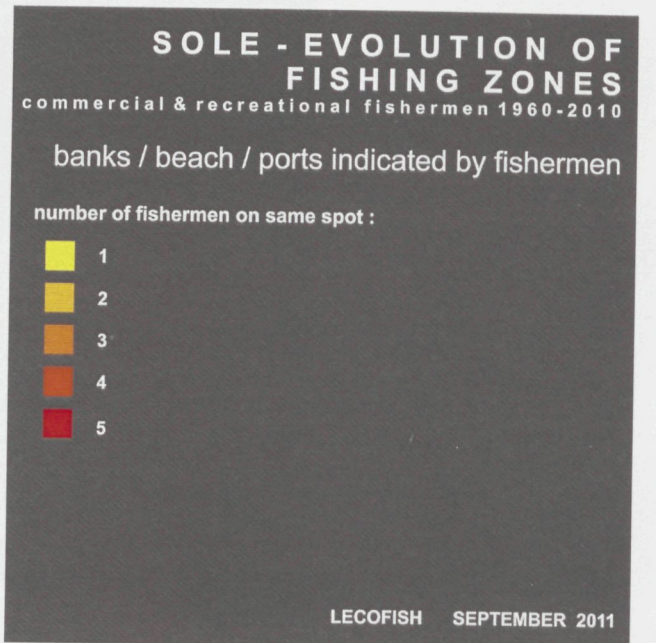
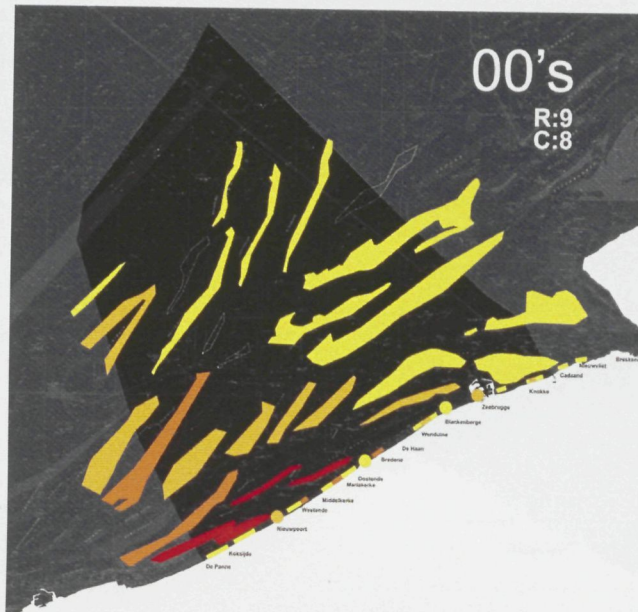
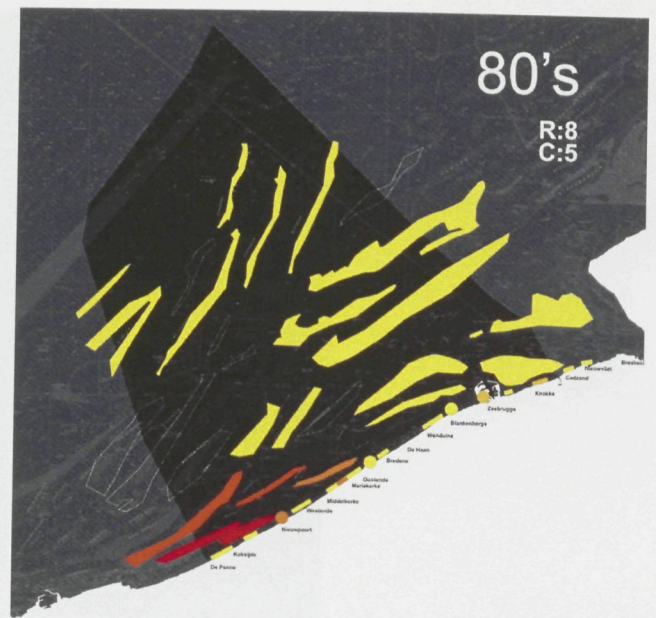
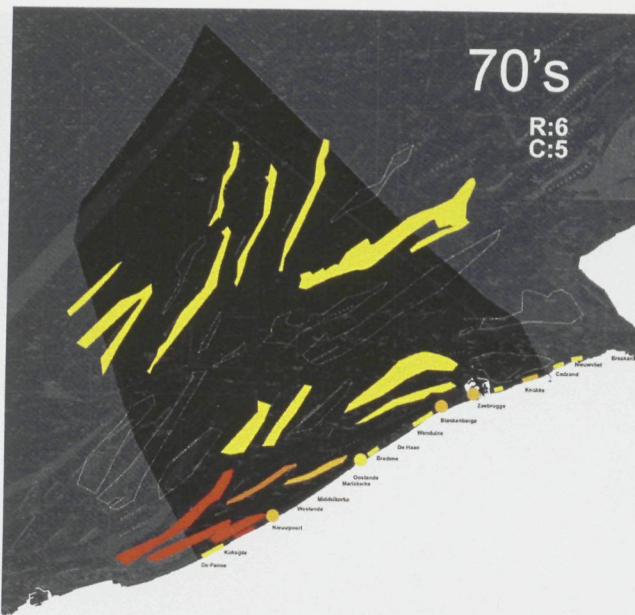
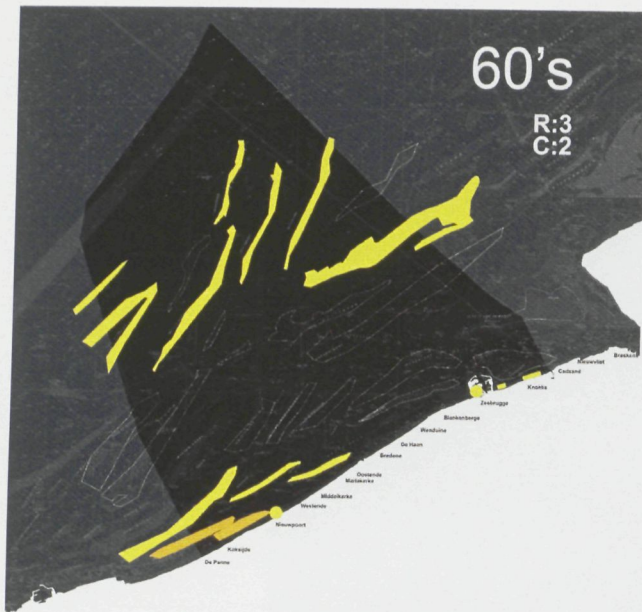


SOLE - seasonal changes
january-december
commercial & recreational fishermen 1960 - 2010





**SOLE - other locations
& spawning zones**
commercial & recreational fishermen 1950 - 2010



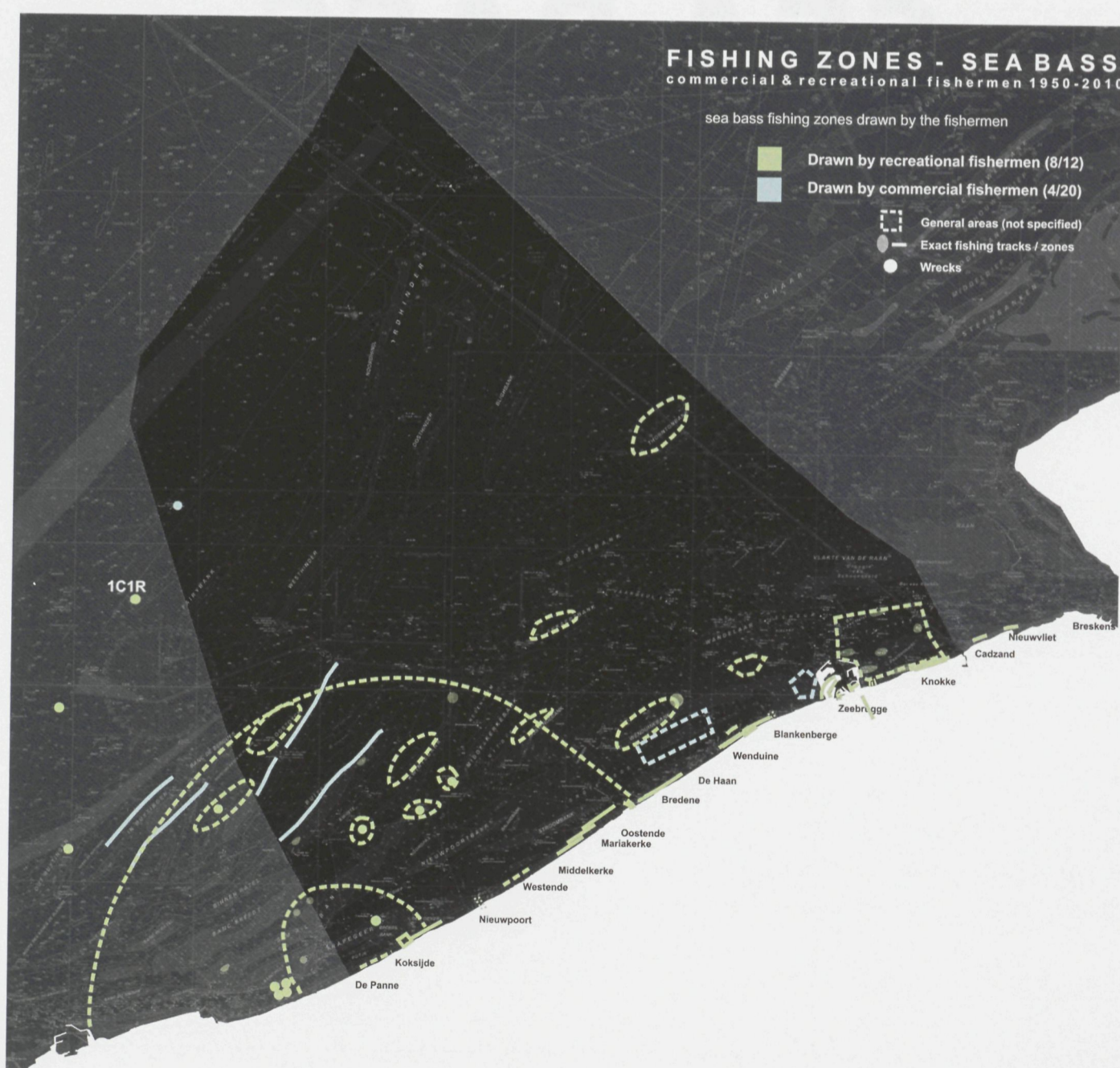
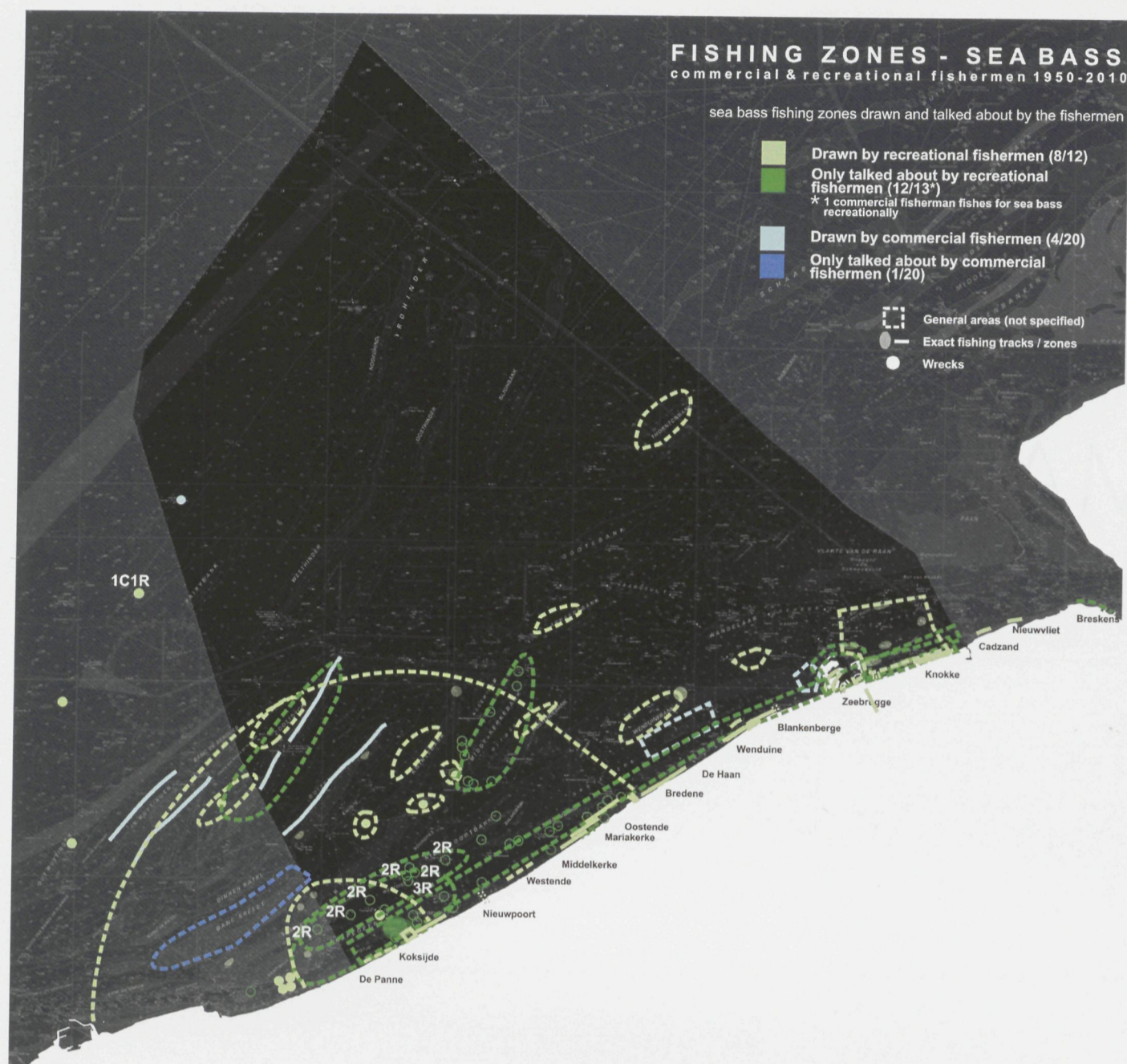
MAPS SERIES III

SEA BAS

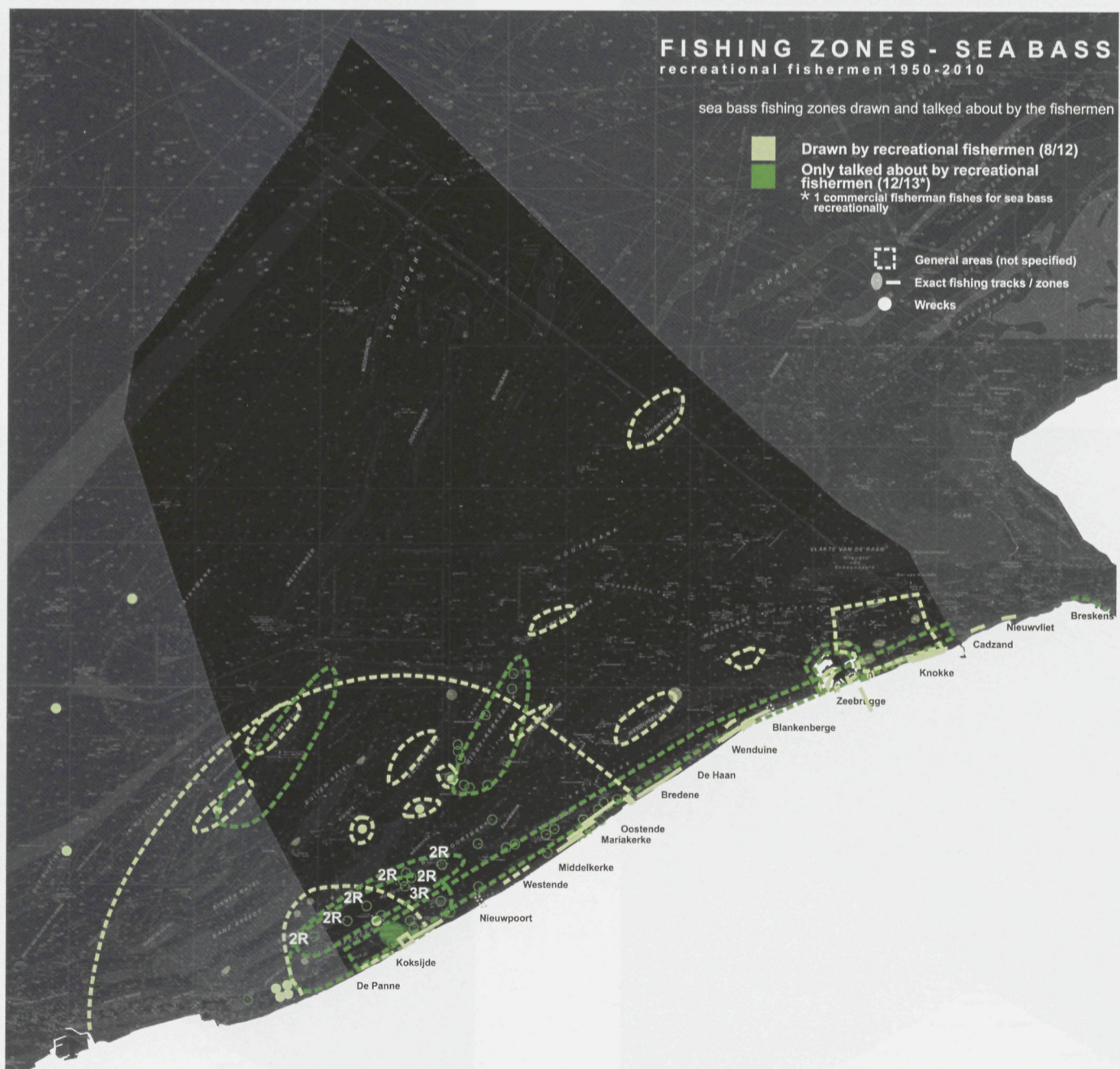
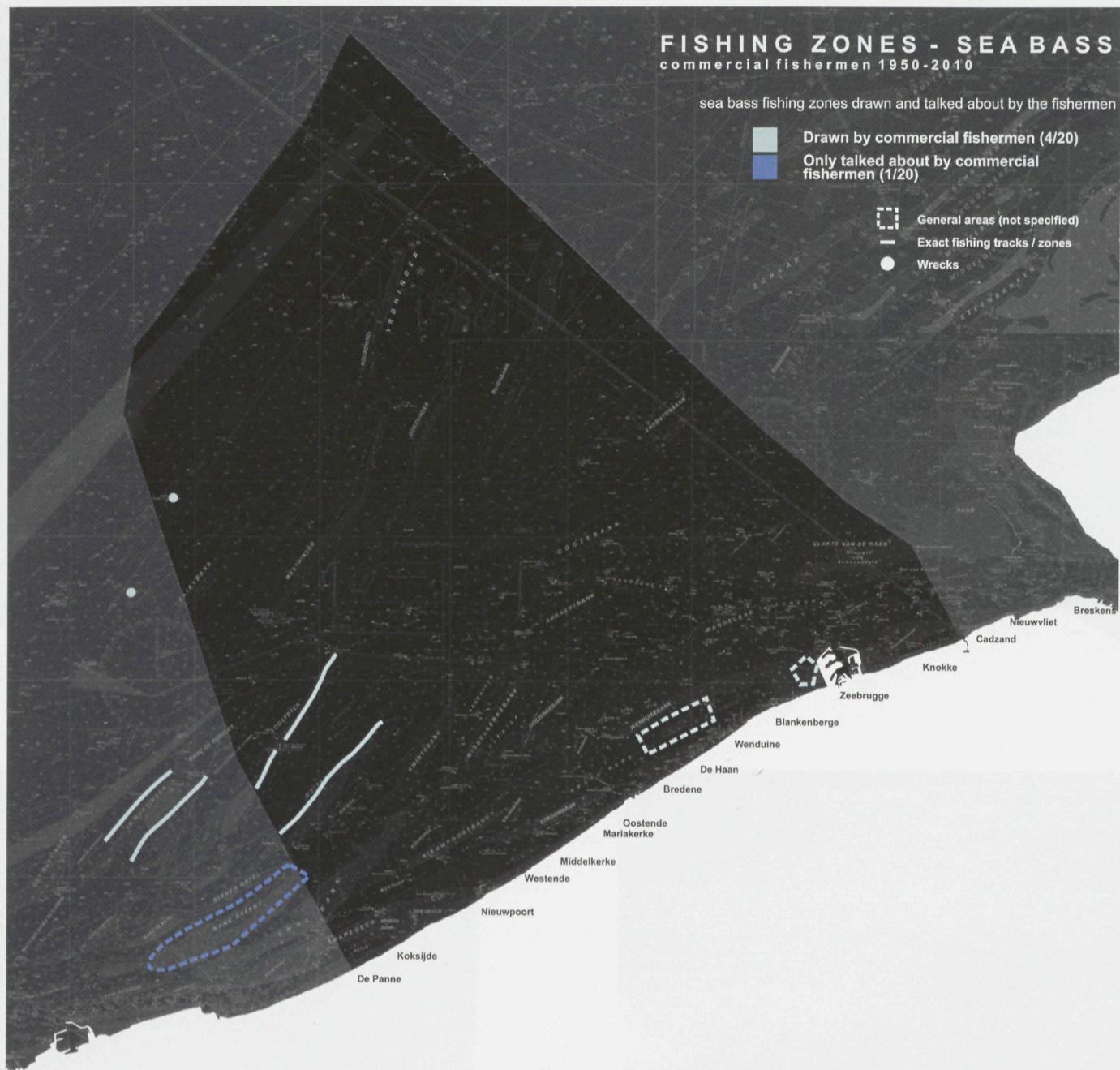


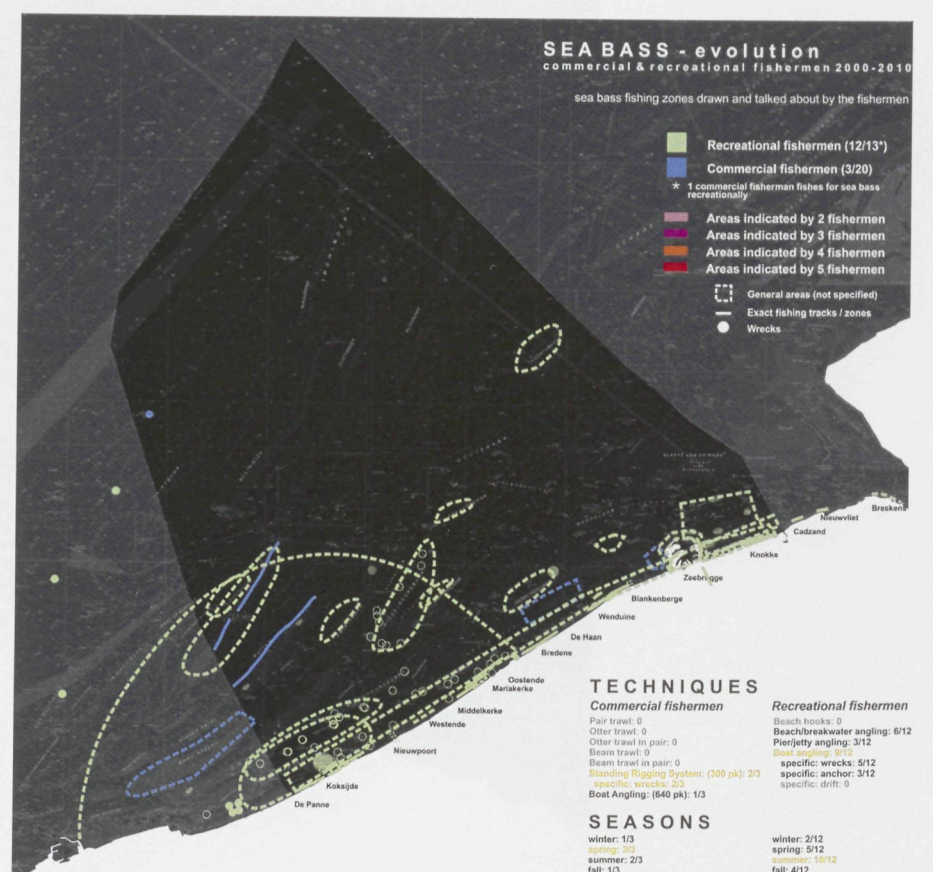
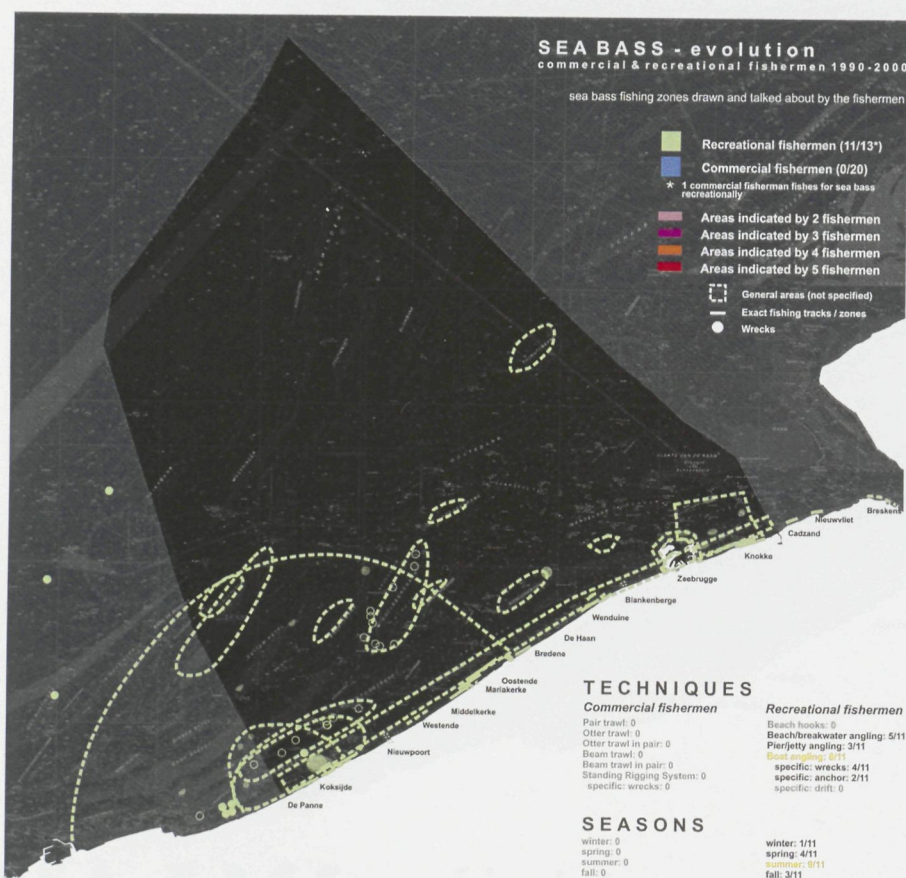
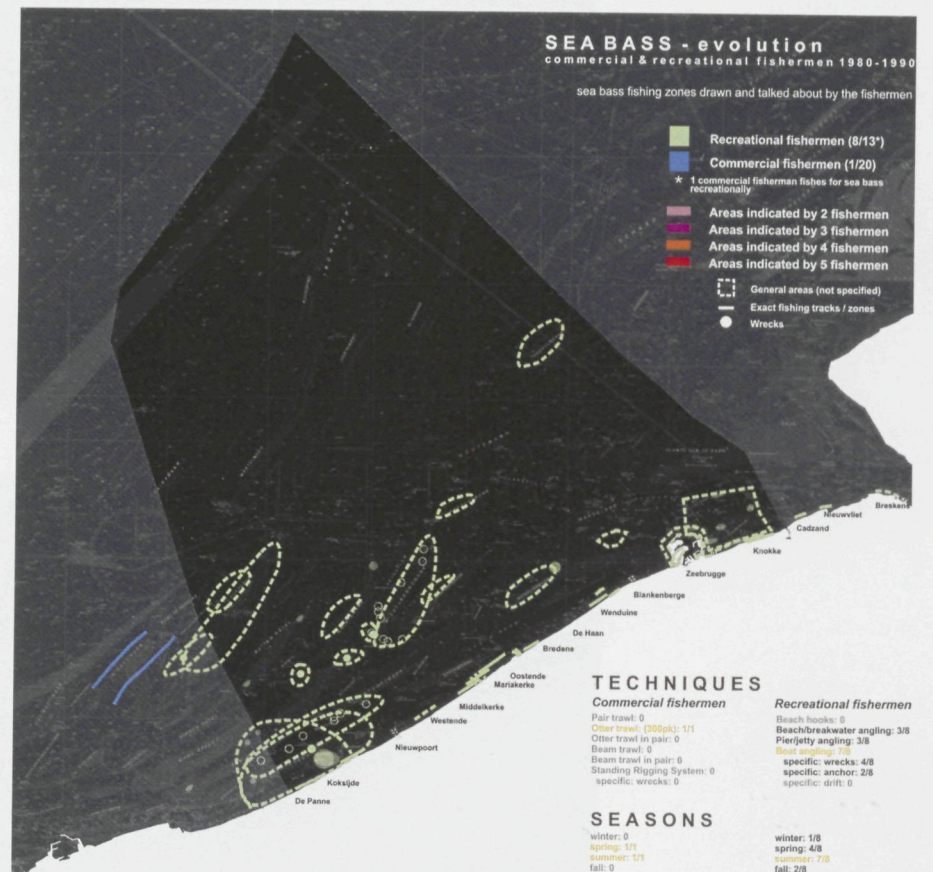
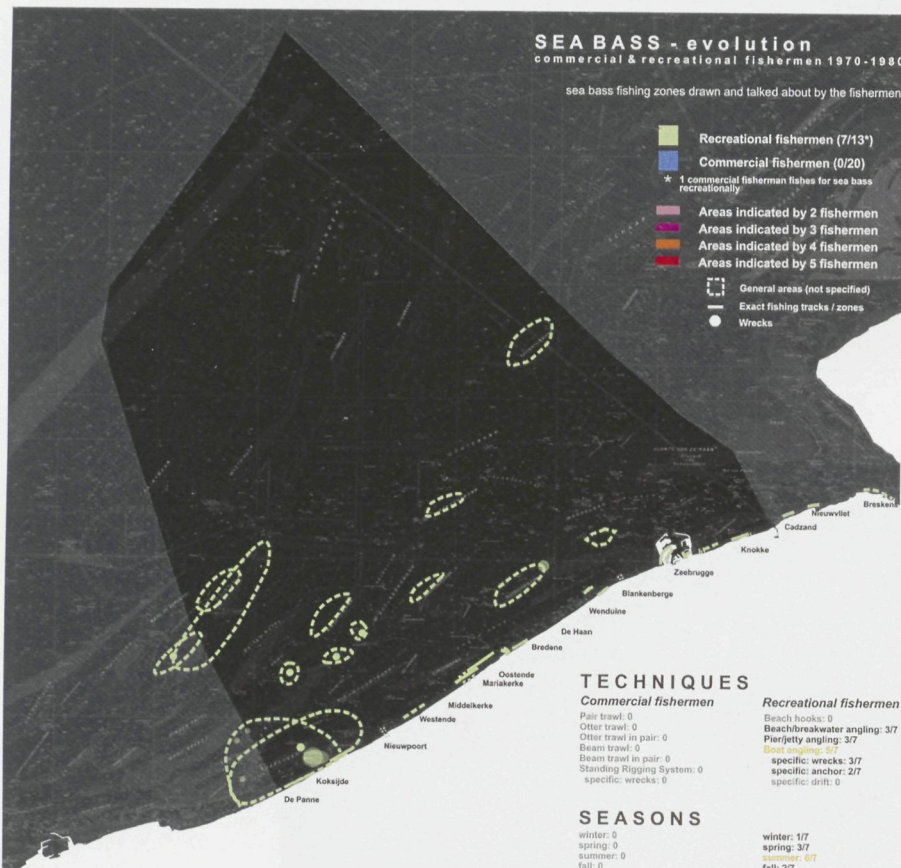
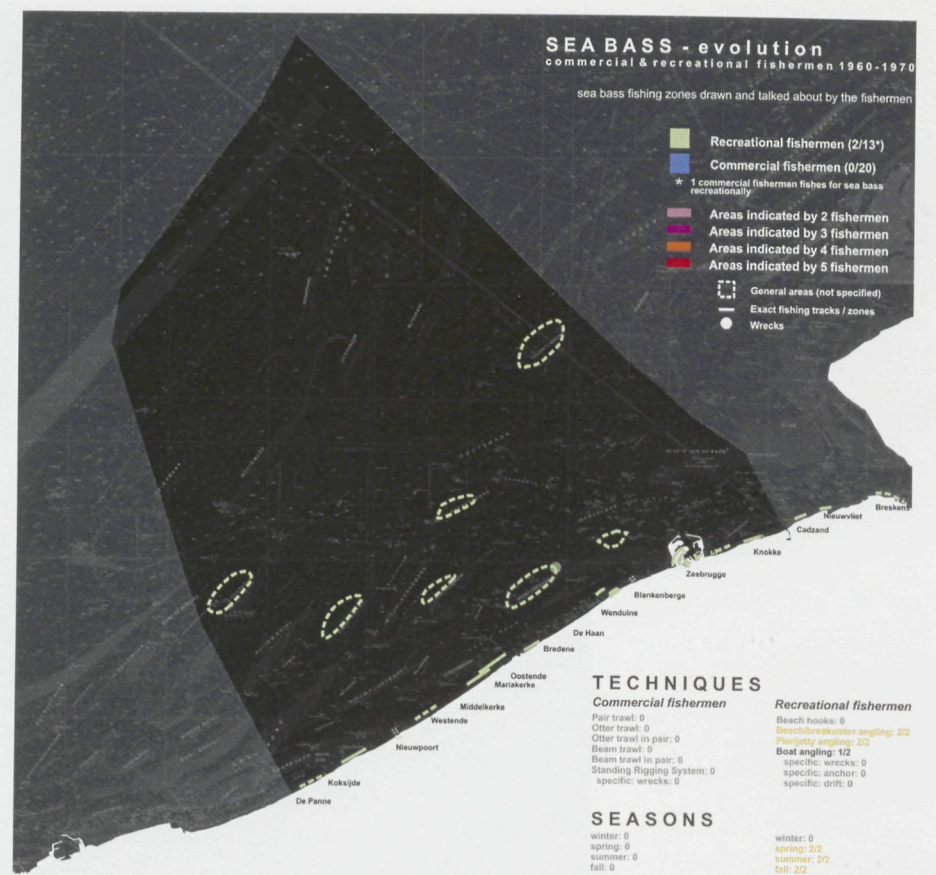
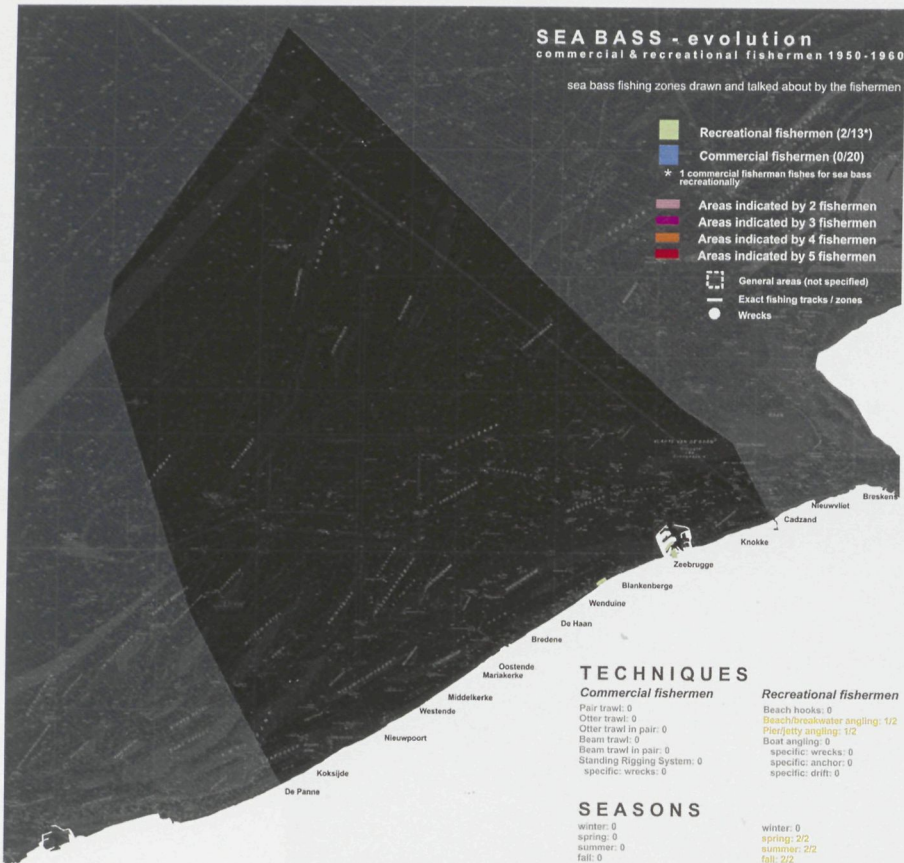
MAPS SERIES III

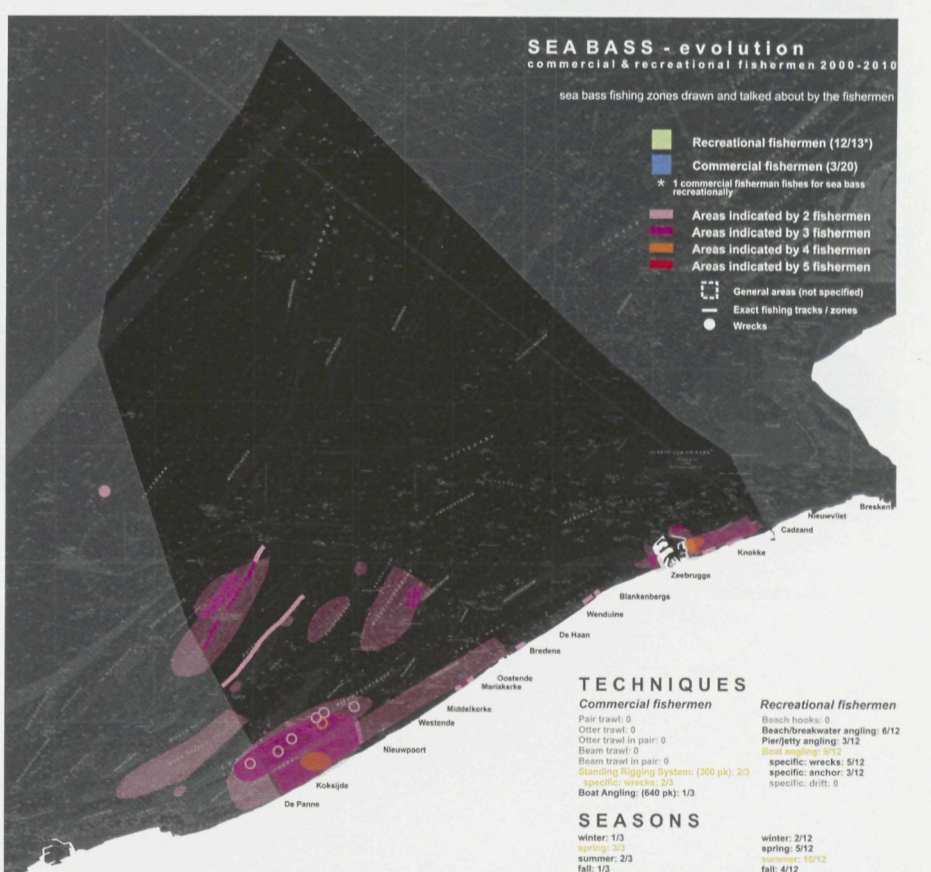
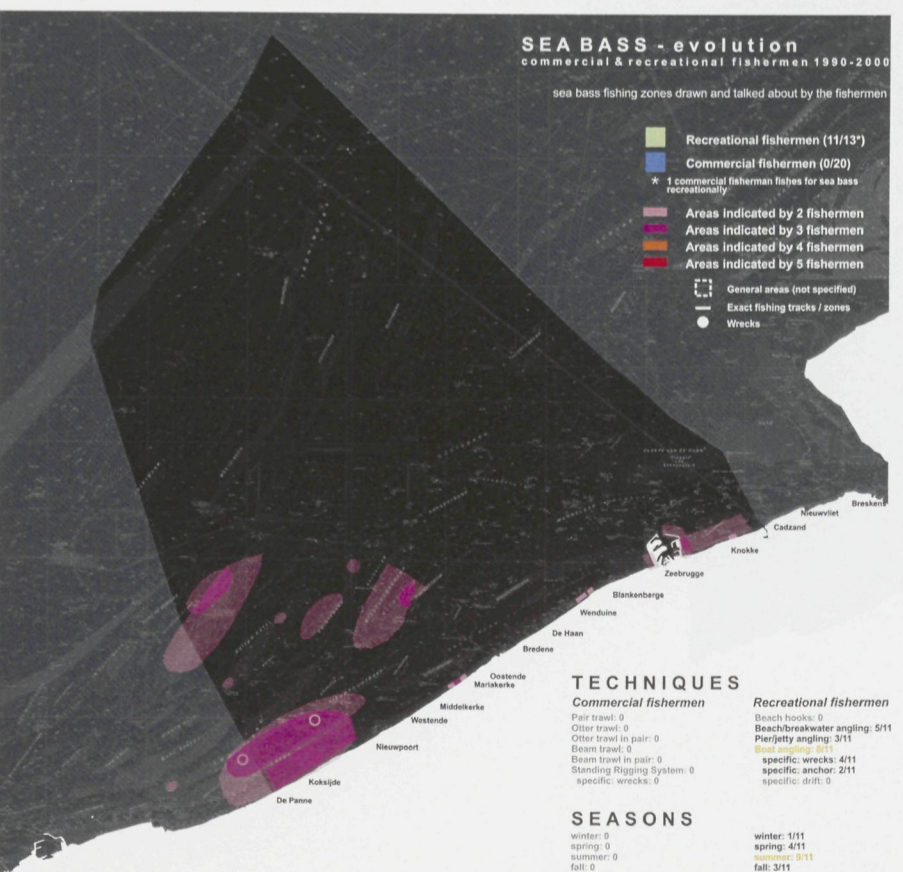
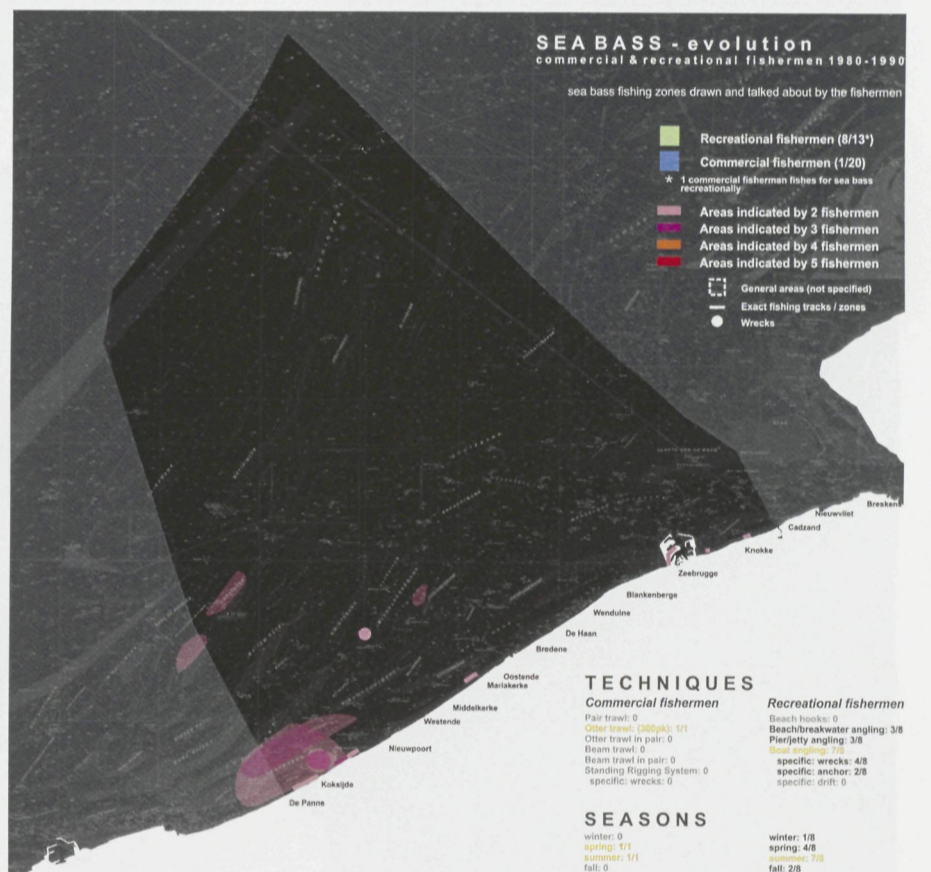
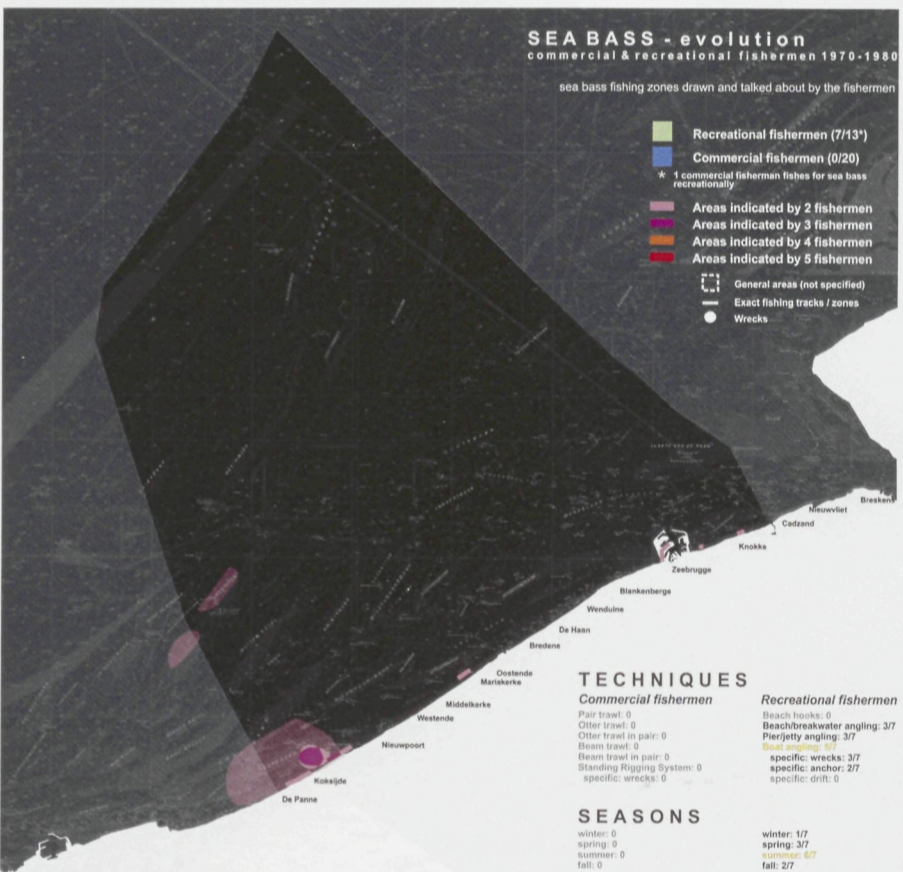
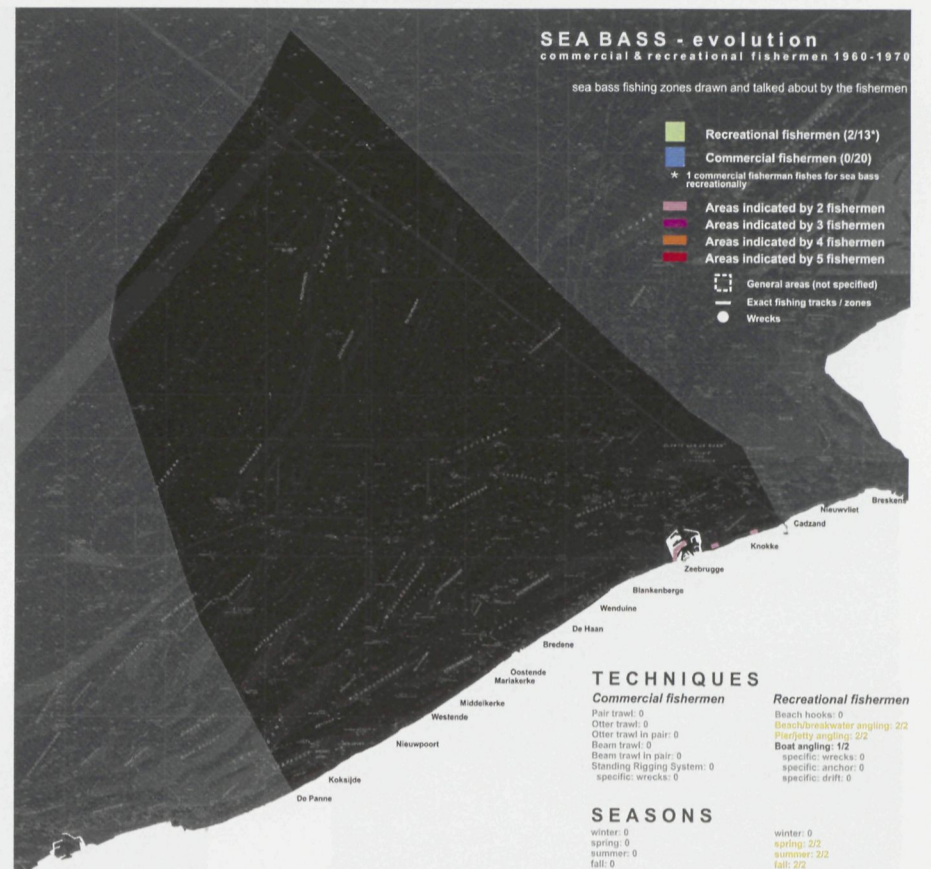
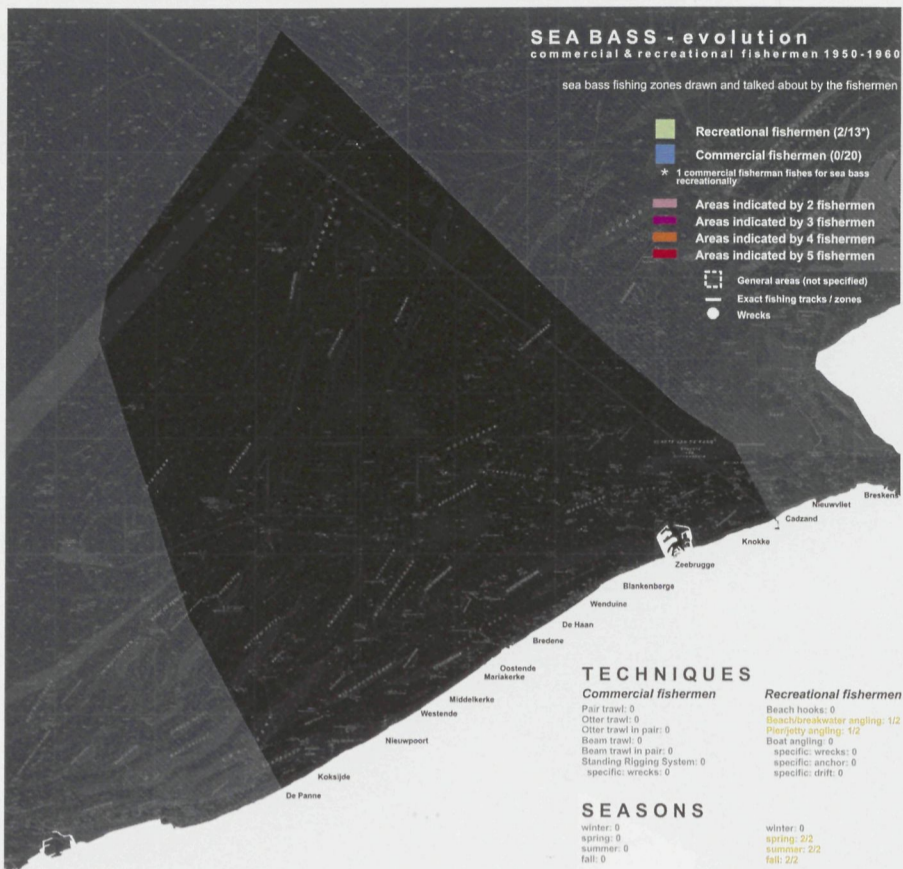
SEA BASS



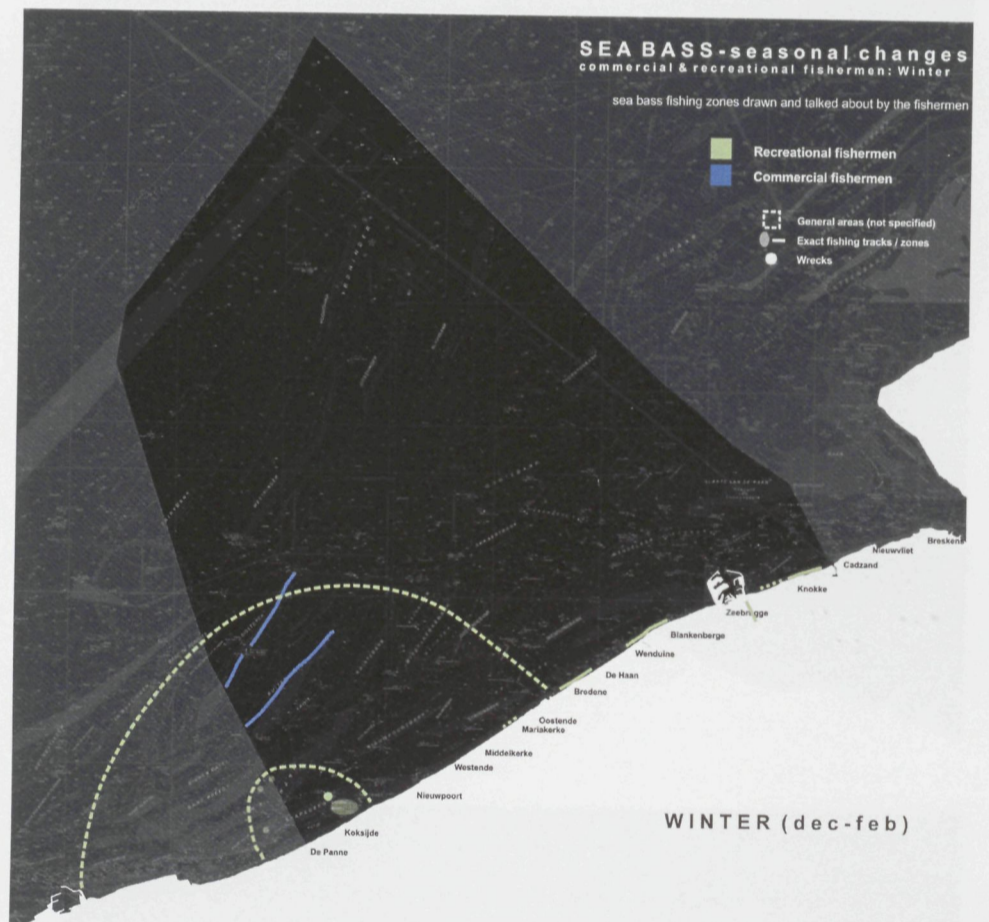
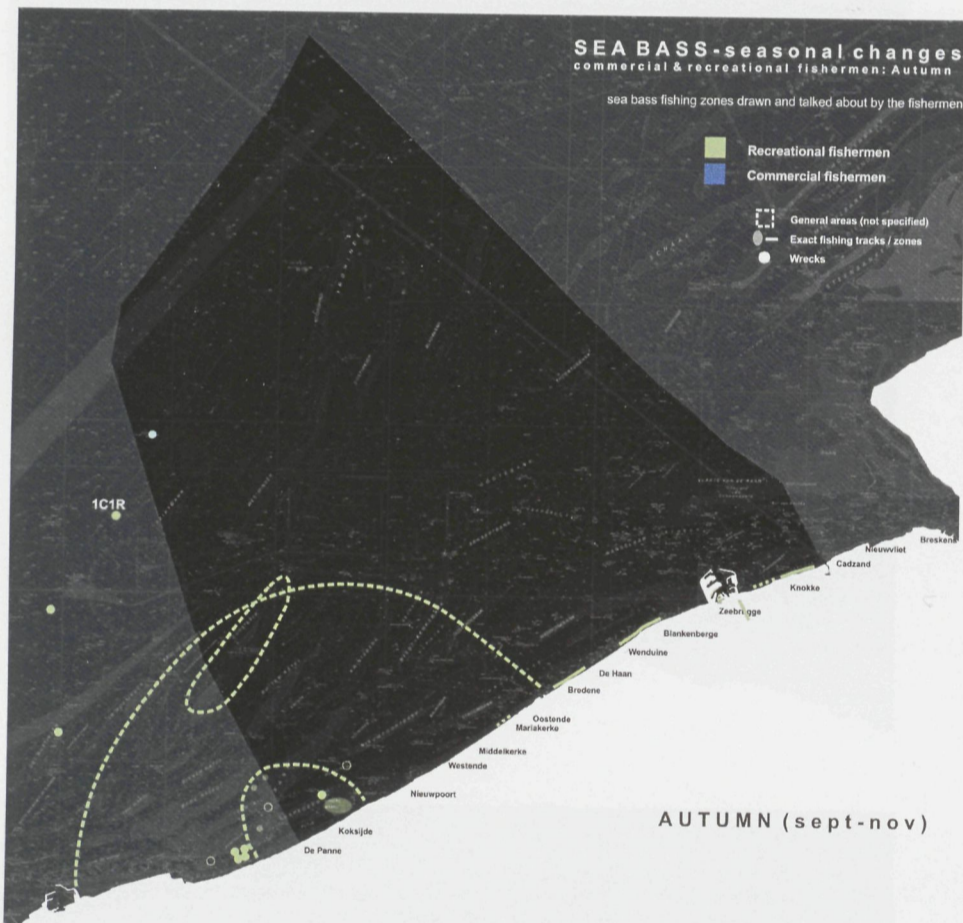
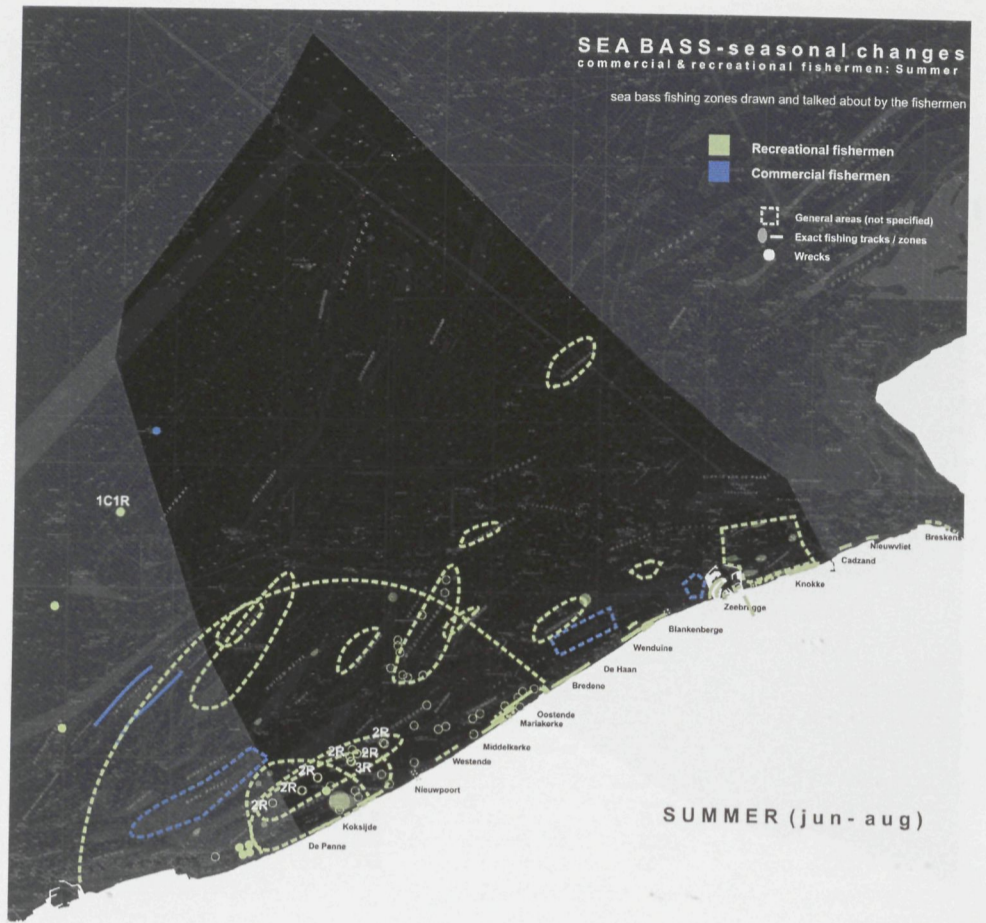
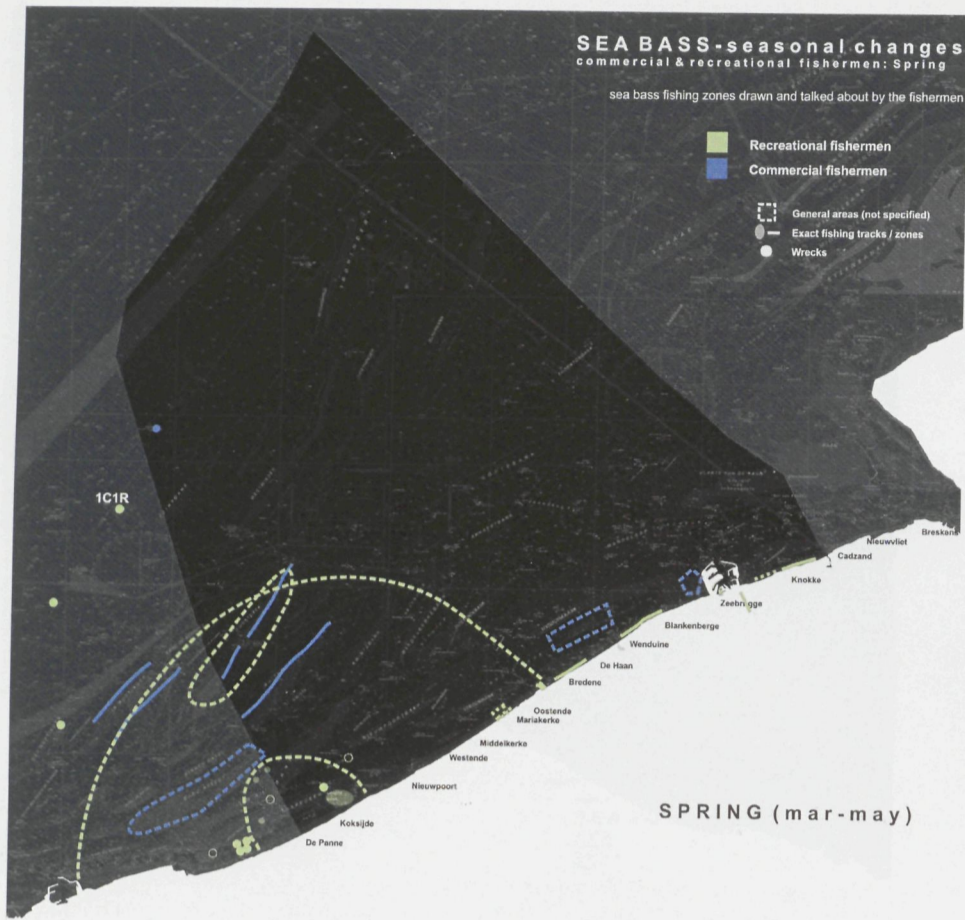
SEA BASS - fishing zones drawn and talked about commercial & recreational fishermen 1950 - 2010

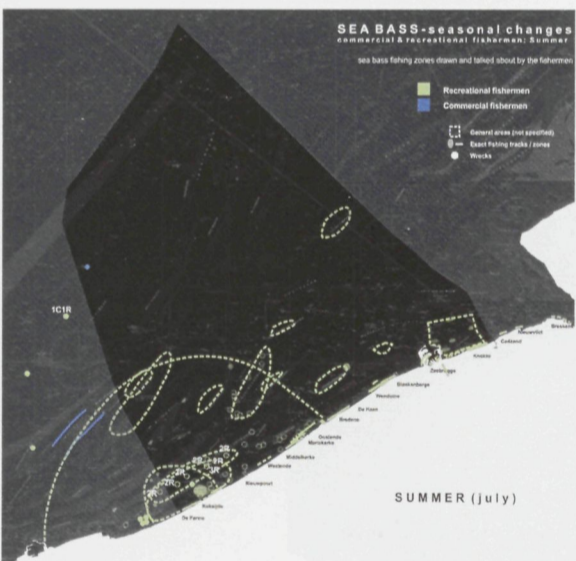
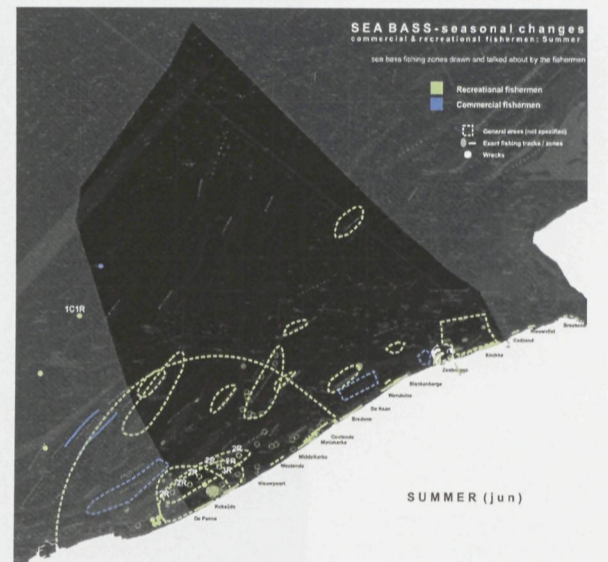
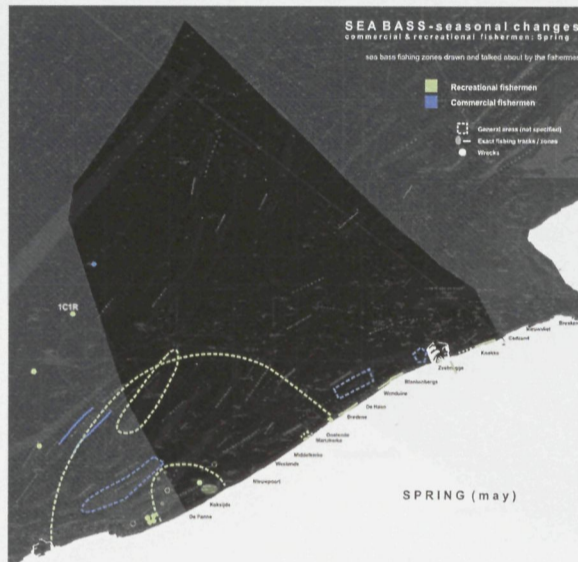
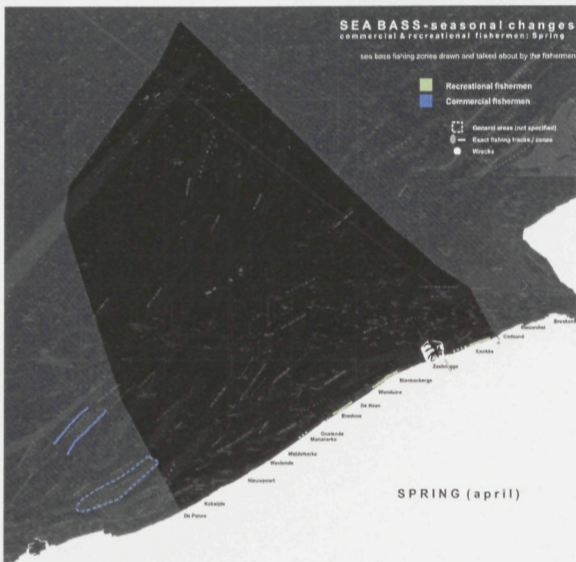
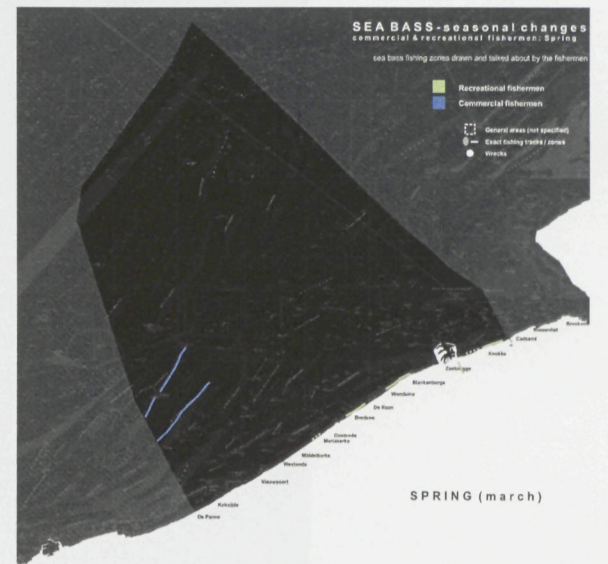
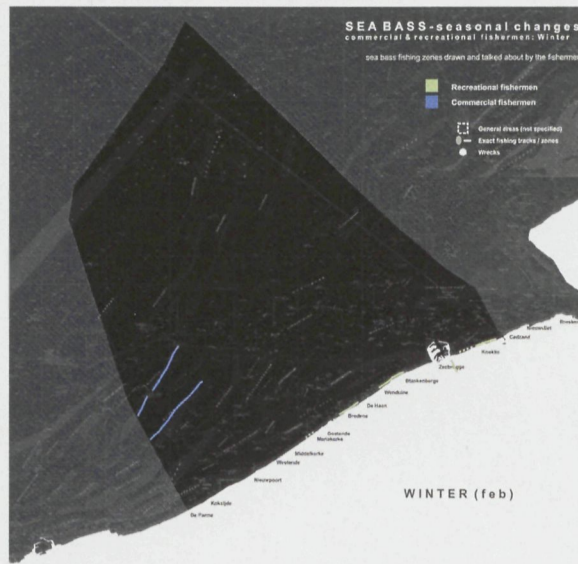




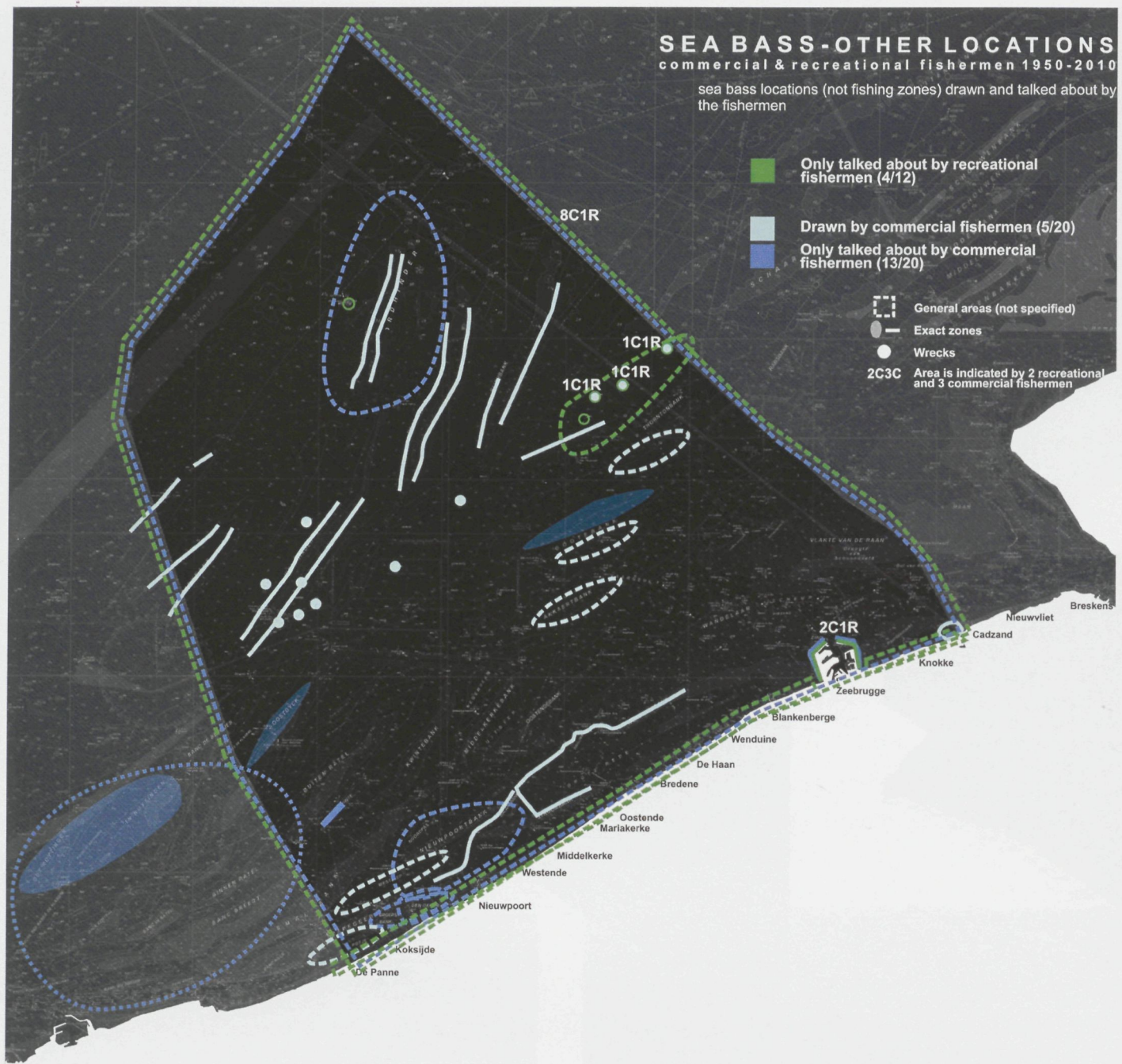


SEA BASS - evolution
commercial & recreational fishermen 1950 - 2010
areas fished by 2 or more fishermen





SEA BASS - seasonal changes
january-december
commercial & recreational fishermen 1950 - 2010



**SEA BASS - other locations
& spawning zones**
commercial & recreational fishermen 1950 - 2010

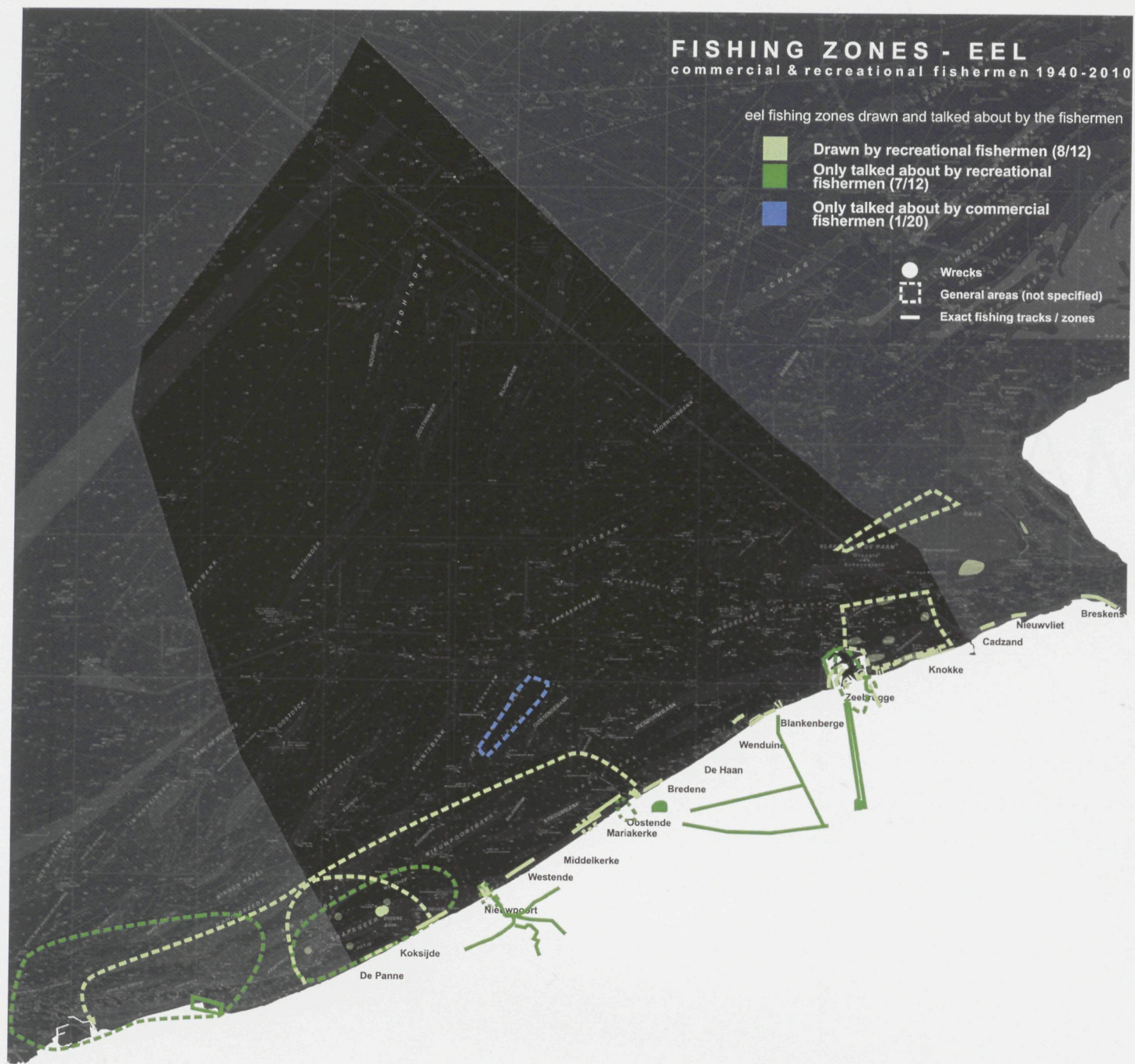
FEI

MAPS SERIES IV



MAPS SERIES IV

EEL



Nieuwpoort
1983-1996



Exact fishing locations for eel, only winter time (starting in November)

Nieuwpoort area
1965-1975



Fishing locations for eel (may - sept)

Oostende area
1970-2010



Fishing locations for eel in summer time (blue: seventies, yellow: 1970-2010)

Zeebrugge
1956-1965



Fishing locations for eel, summer time (dotted line: more in winter time, more exceptional)

Zeebrugge
1970-2010



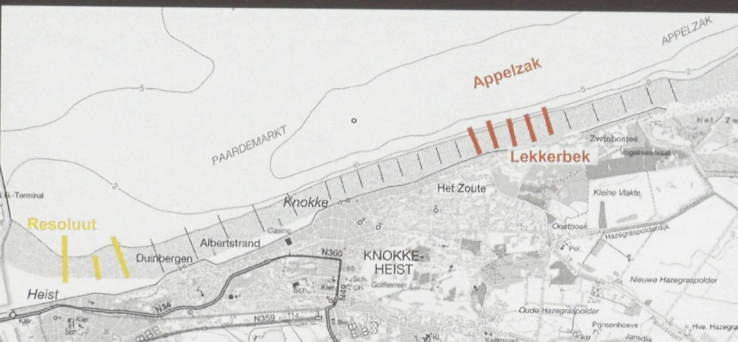
Fishing locations for eel in summer time (starting from May)

Zeebrugge
2000-2010



Fishing location for whiting, bycatch eel in May

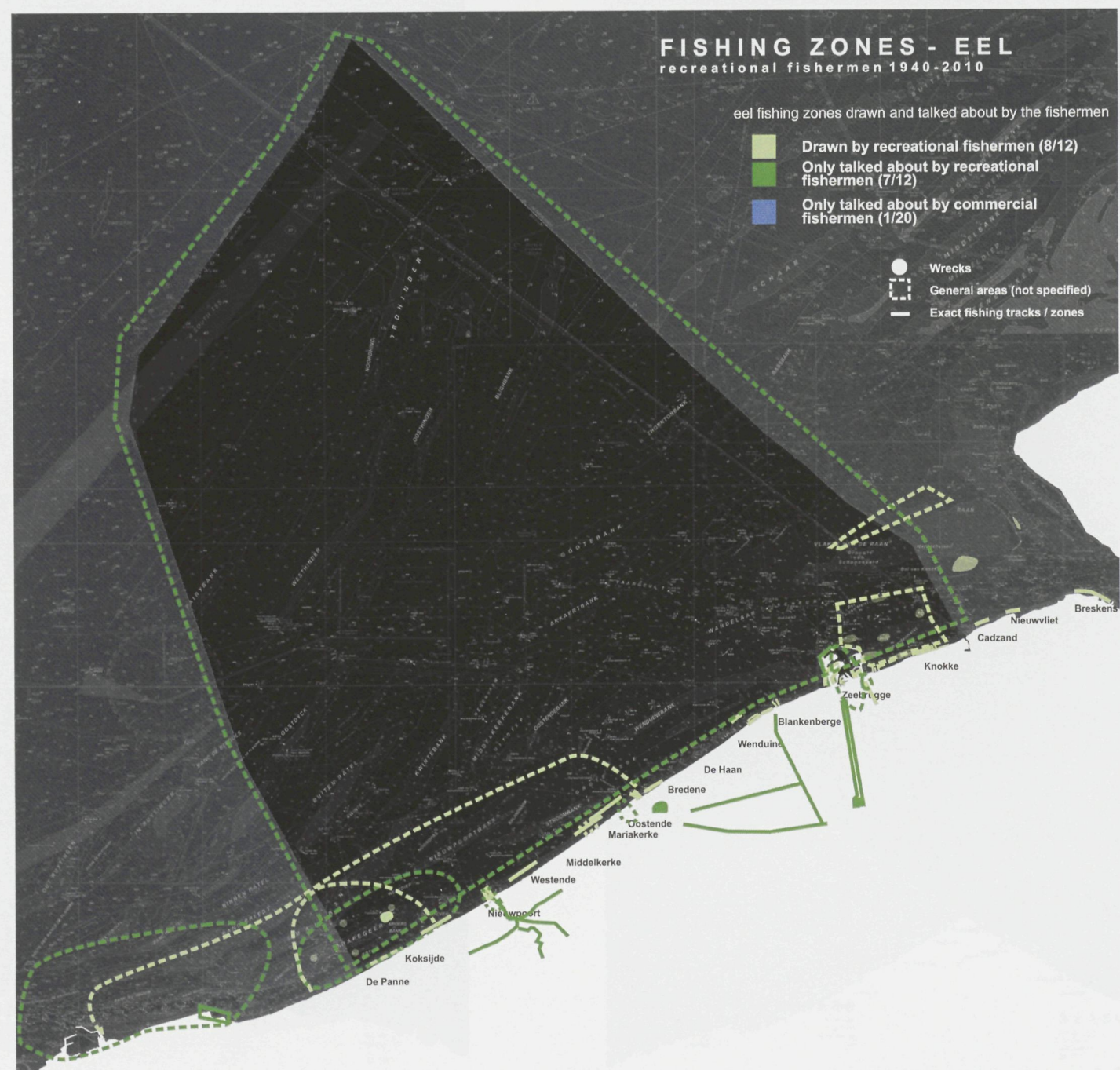
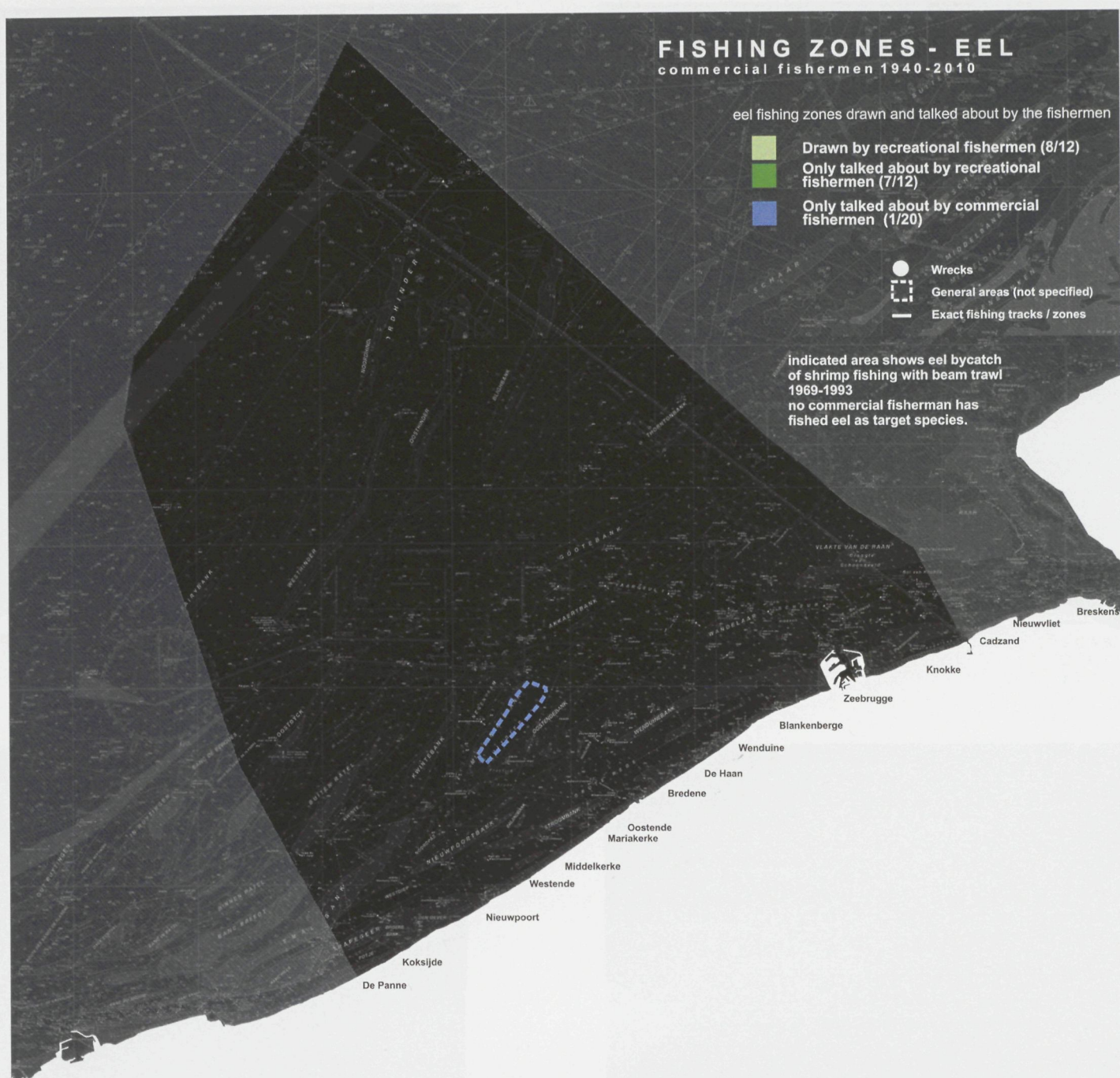
Knokke-Heist
1956-1988

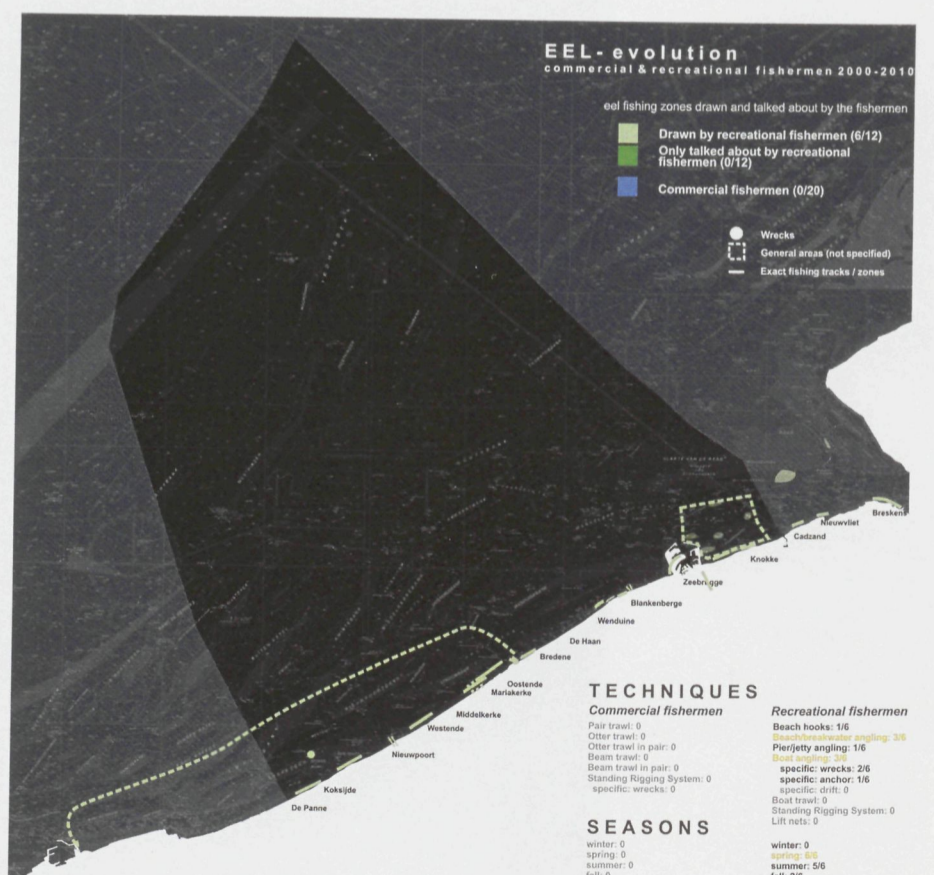
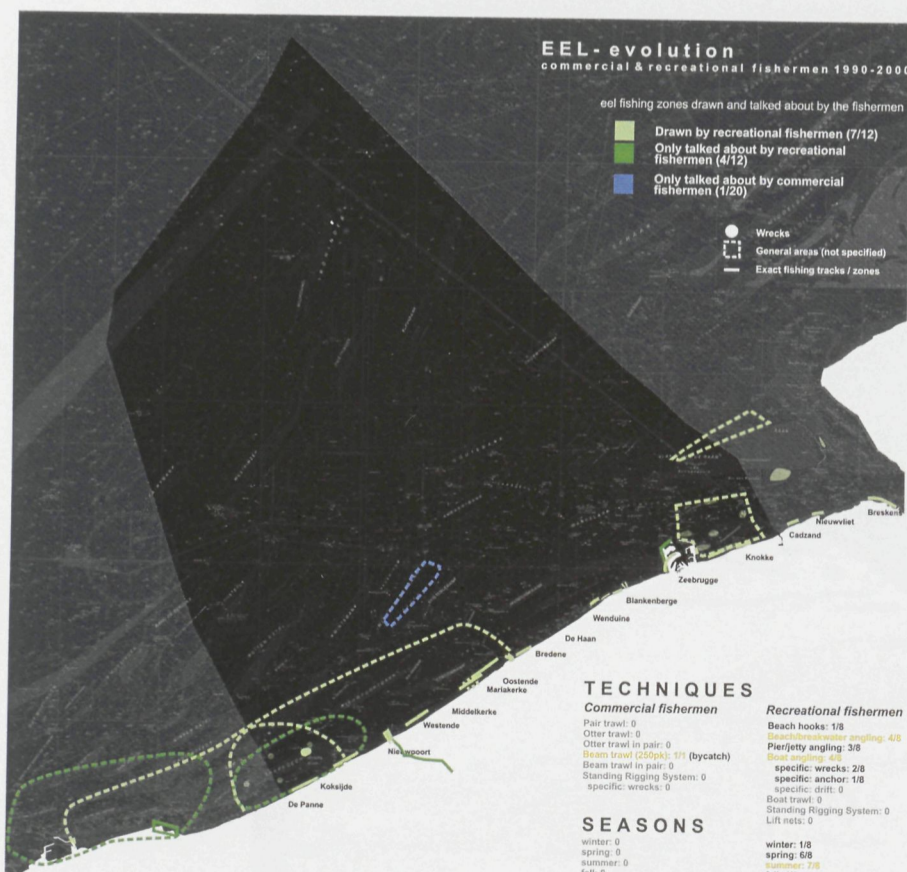
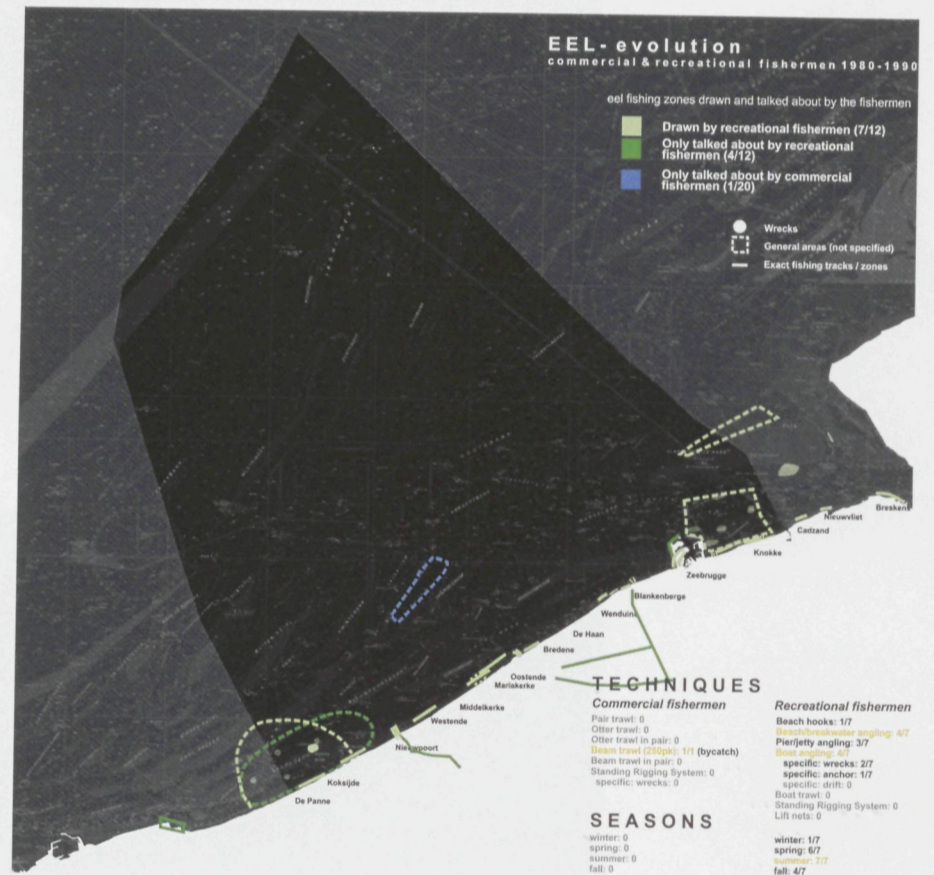
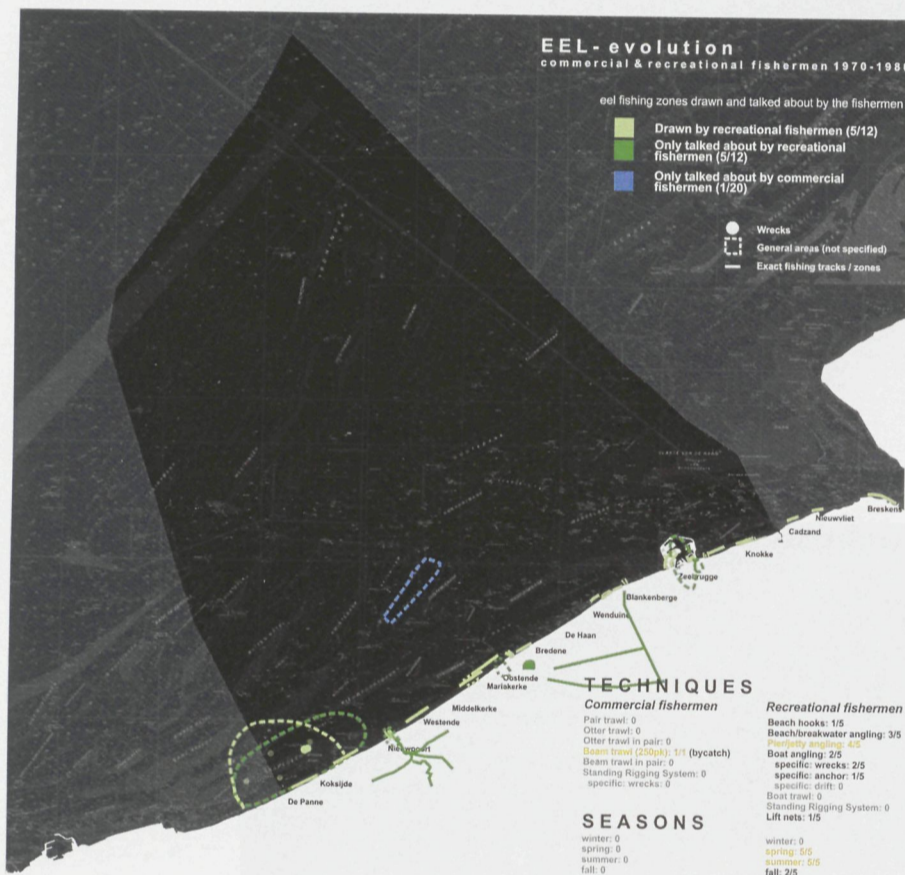
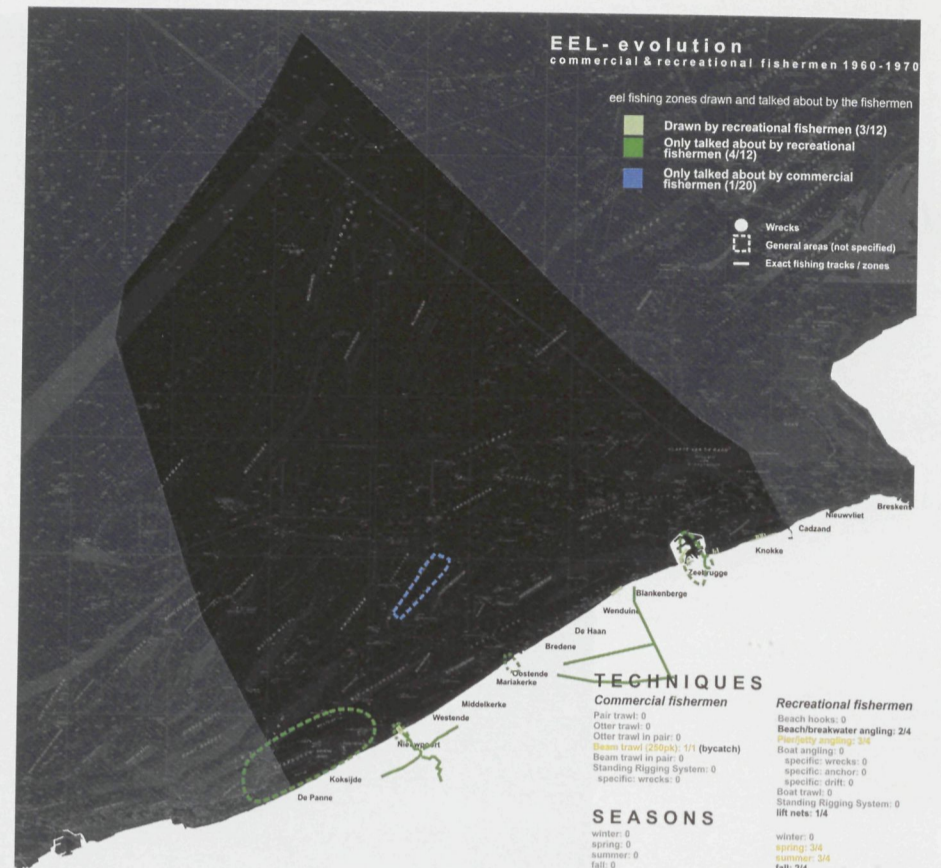
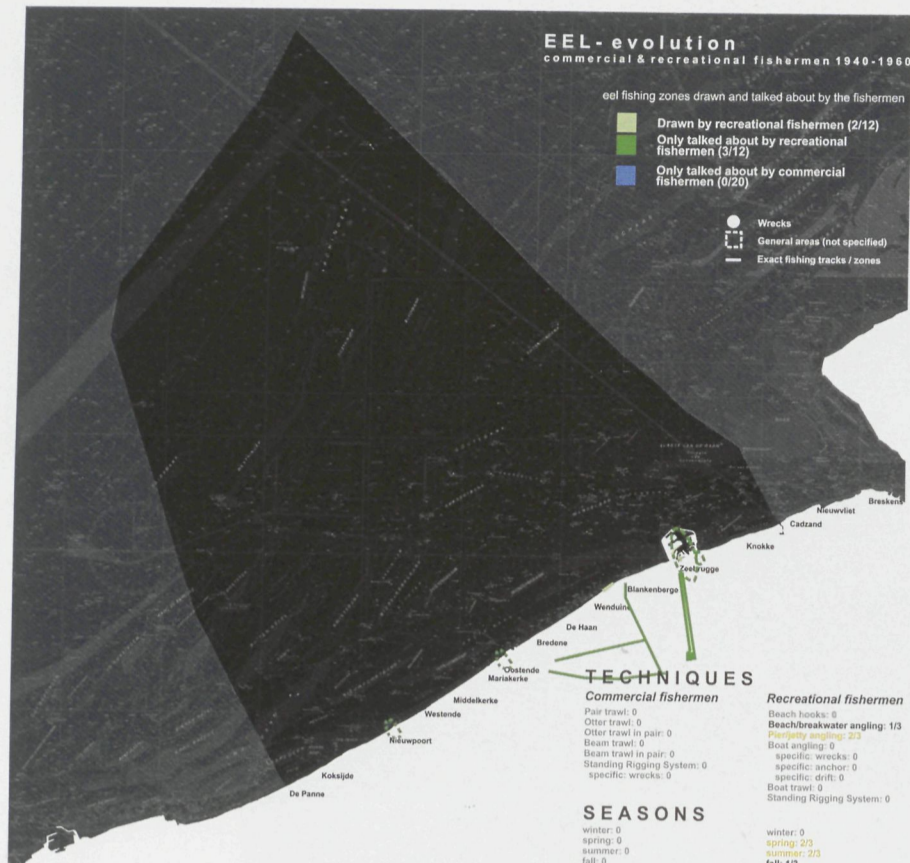


Fishing location for eel in summer time (may-oct, yellow: 1956-1965, orange: 1965-1988)

FISHING ZONES - EEL
recreational fishermen 1956-2010

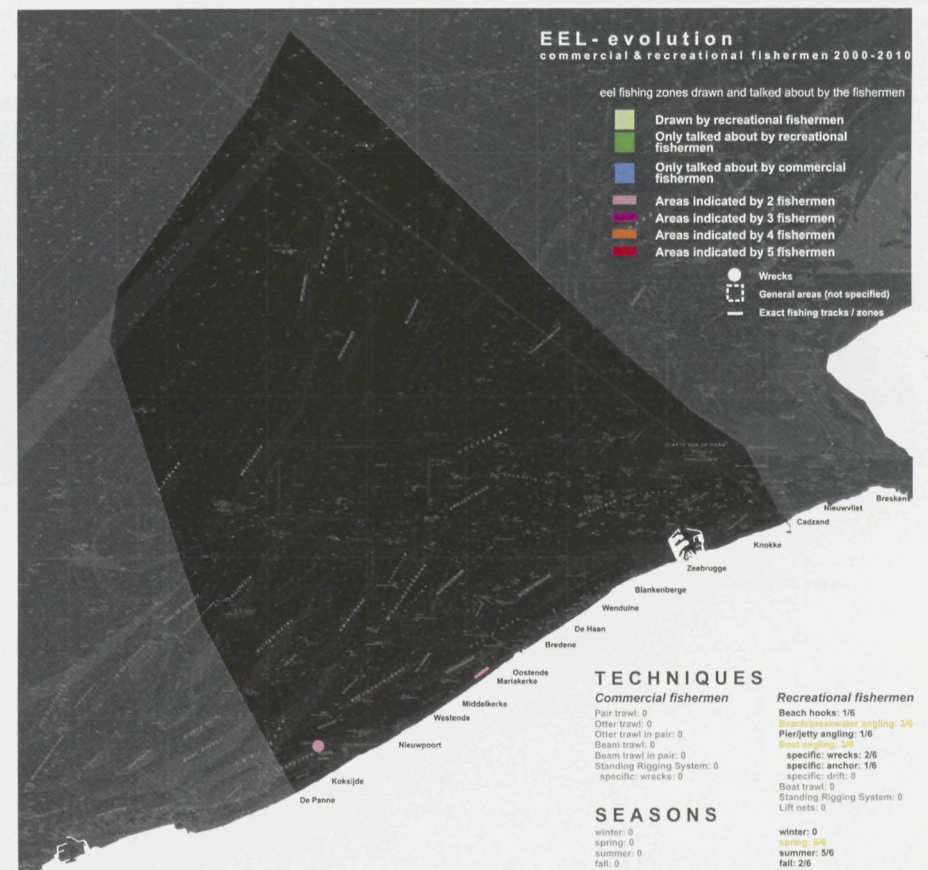
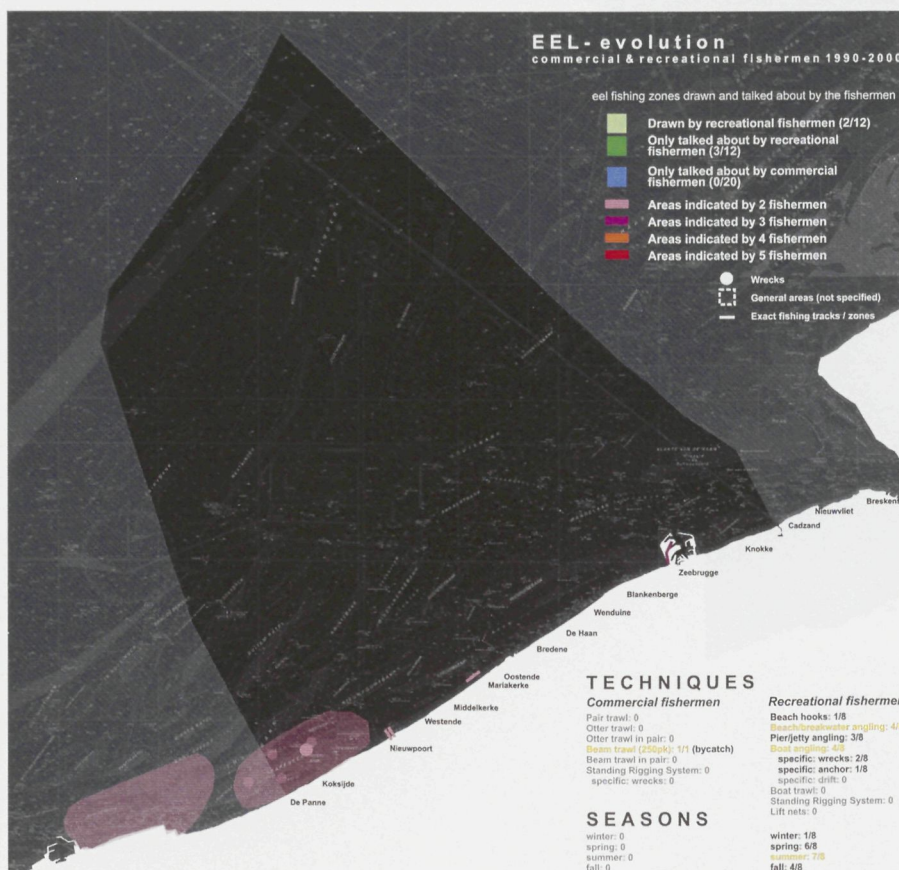
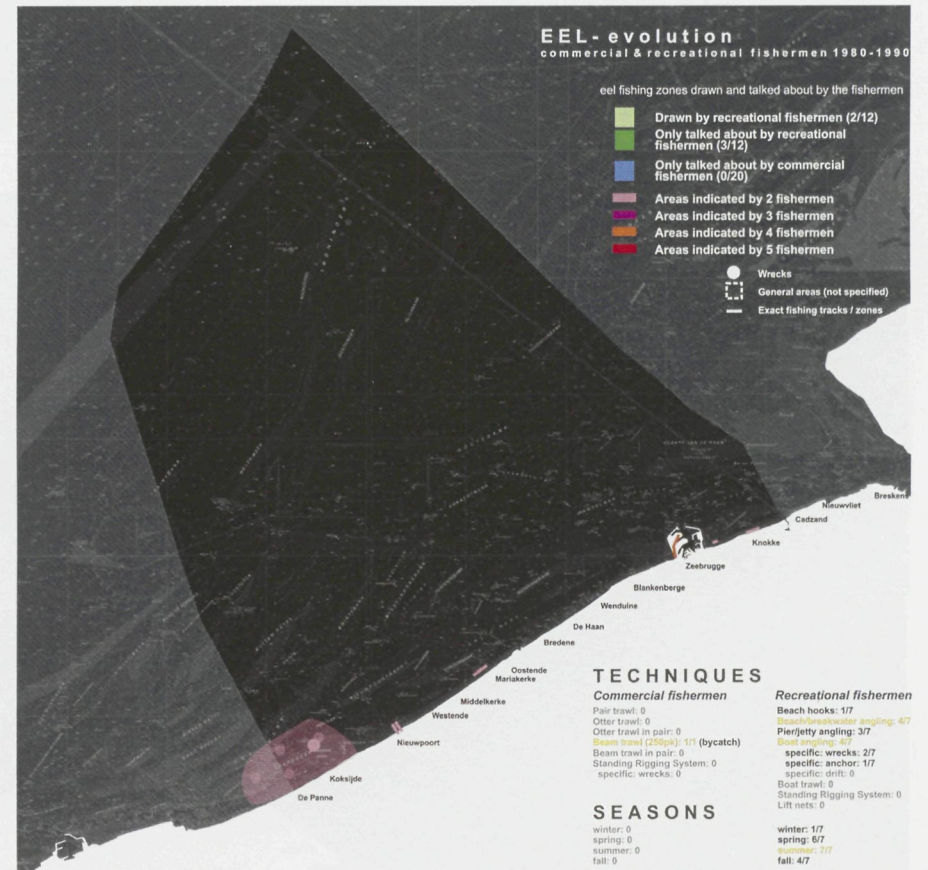
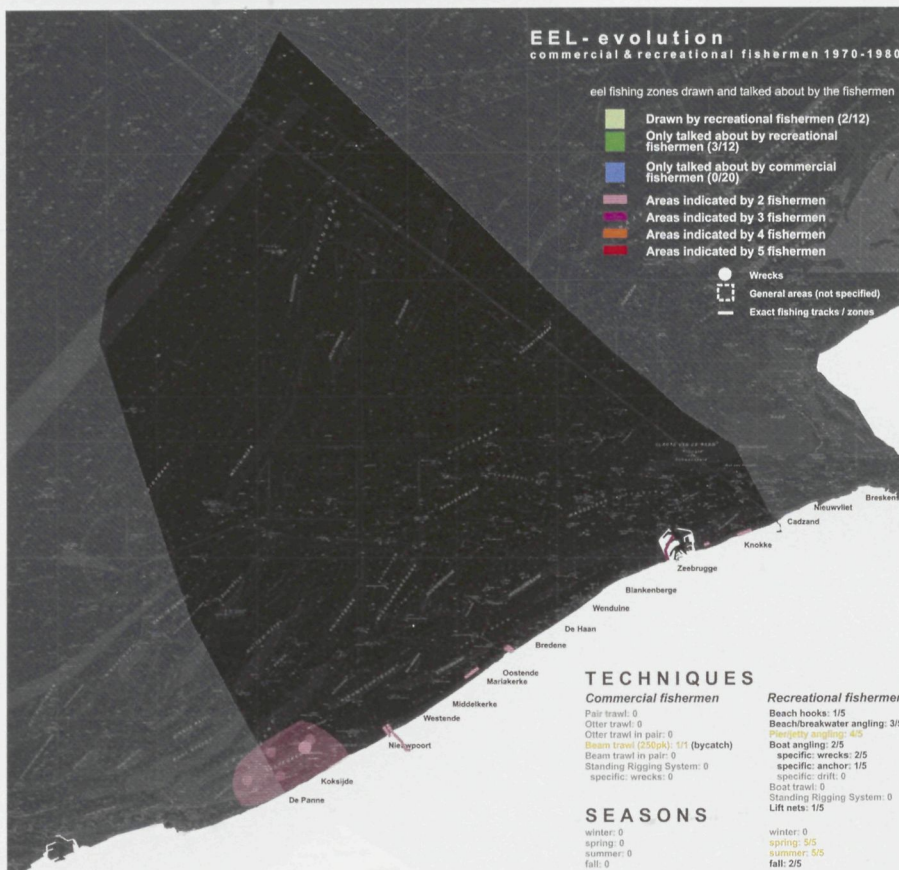
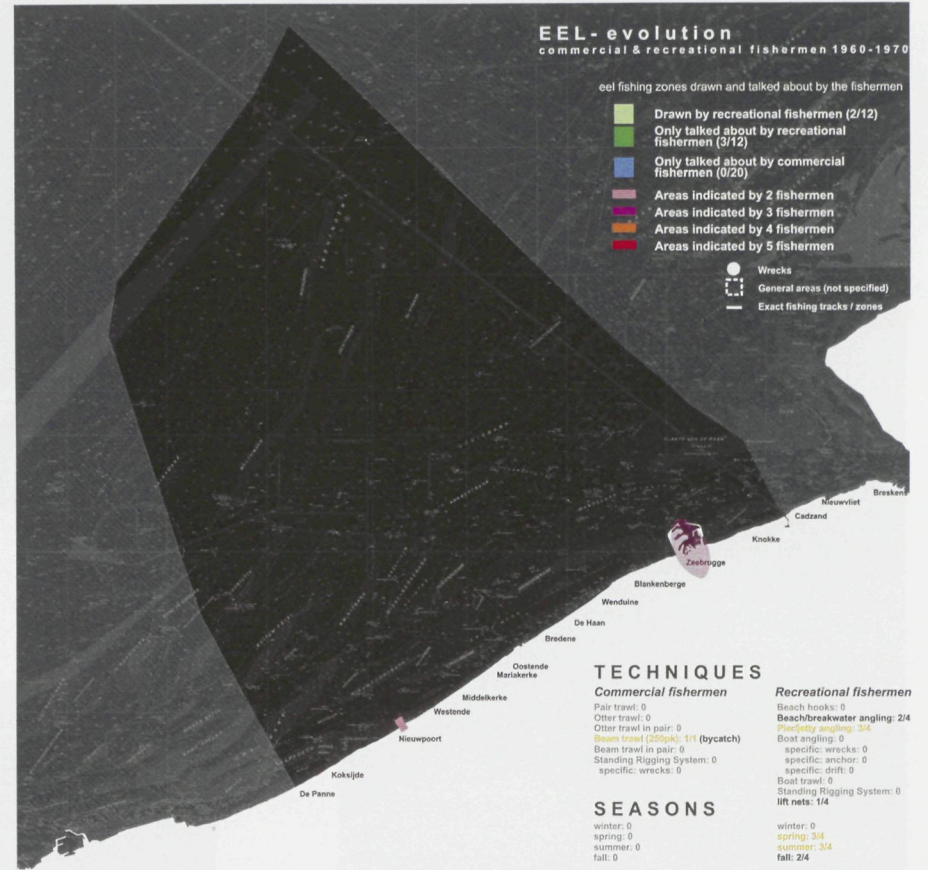
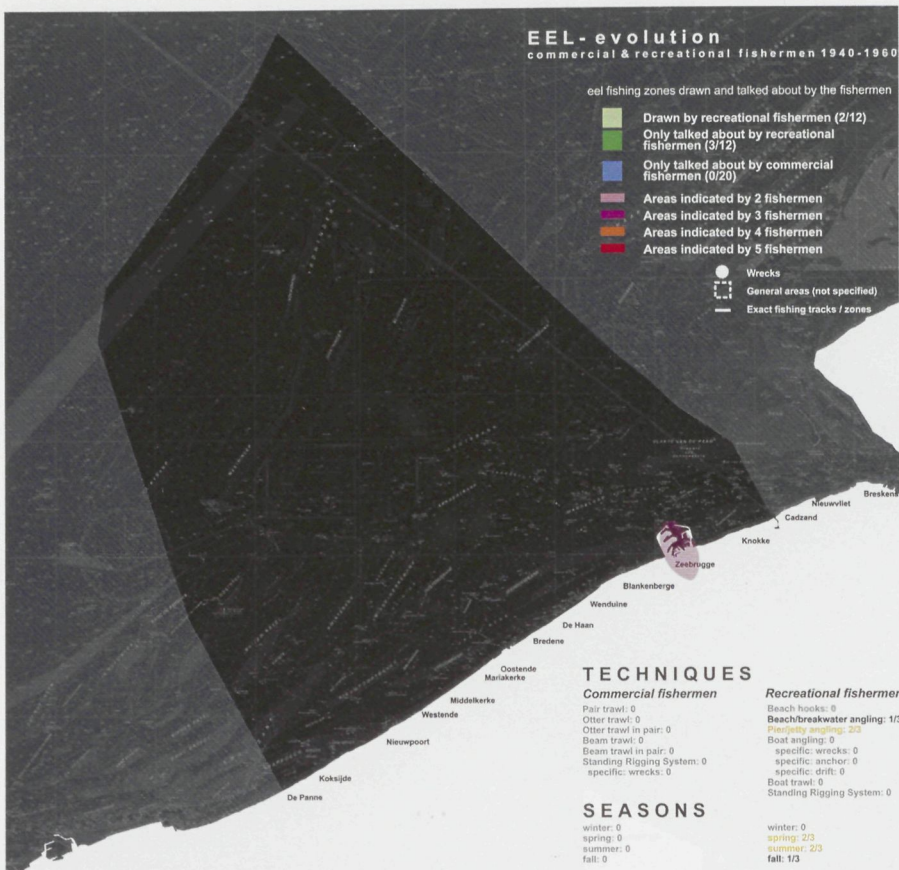
eel fishing zones drawn by the fishermen - detailed maps



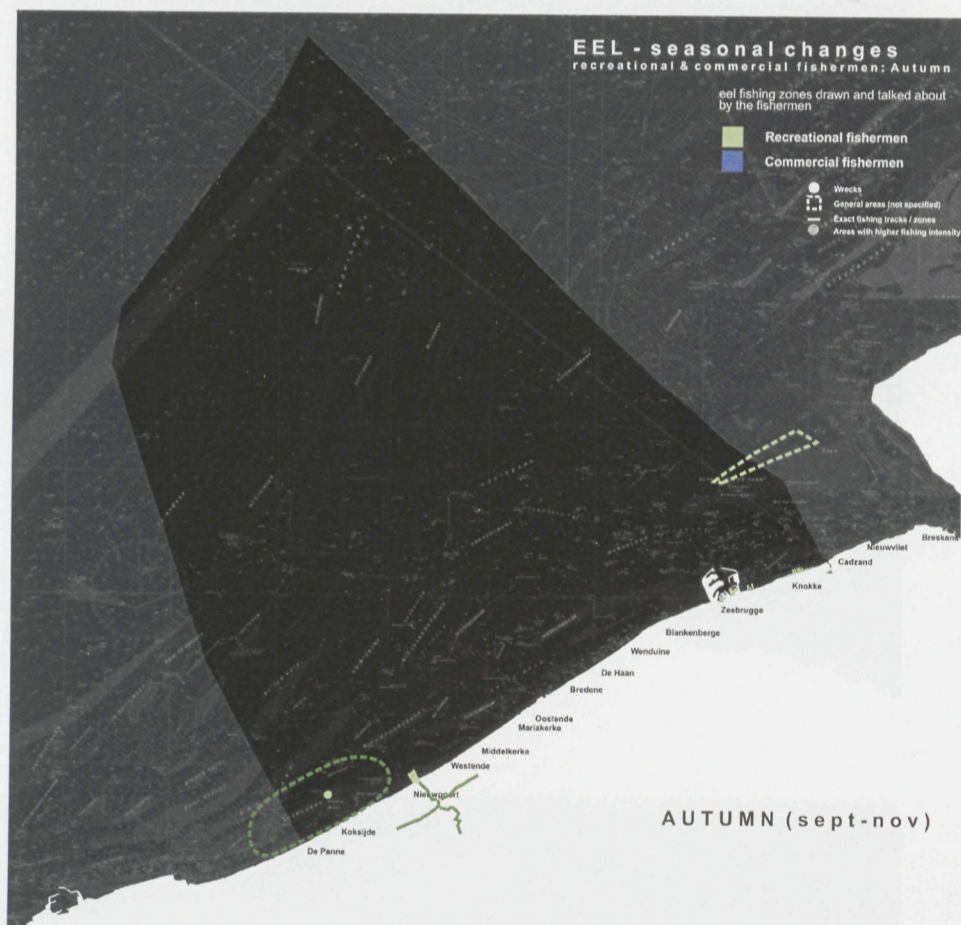
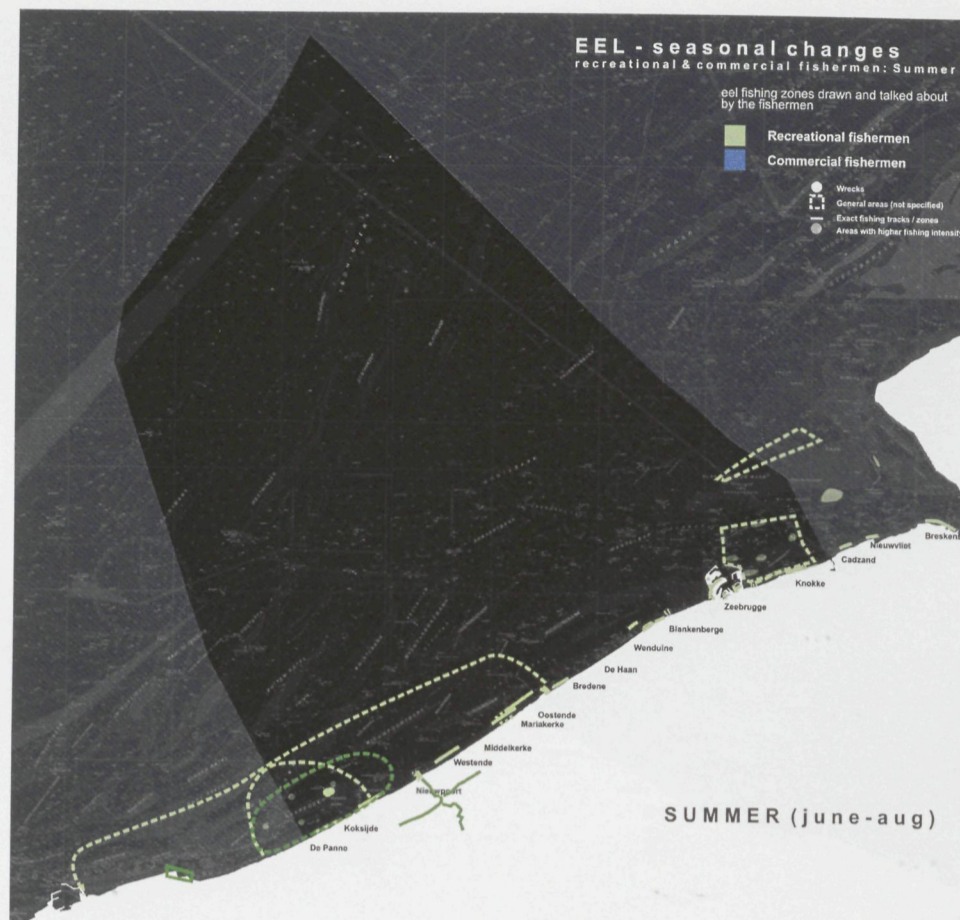
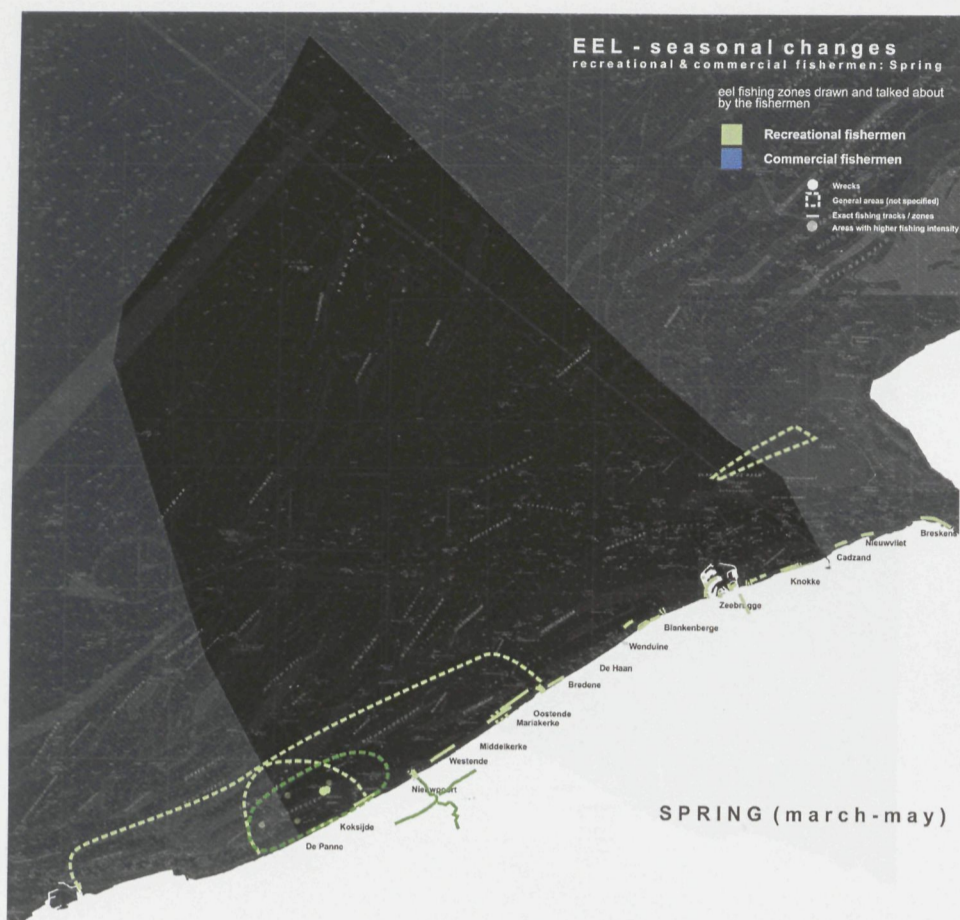


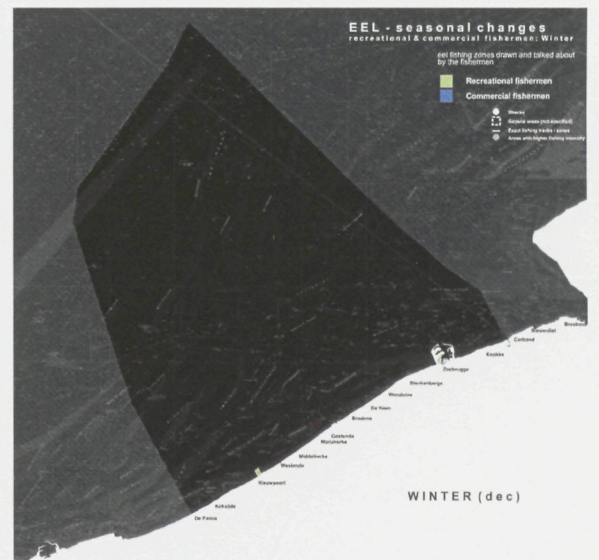
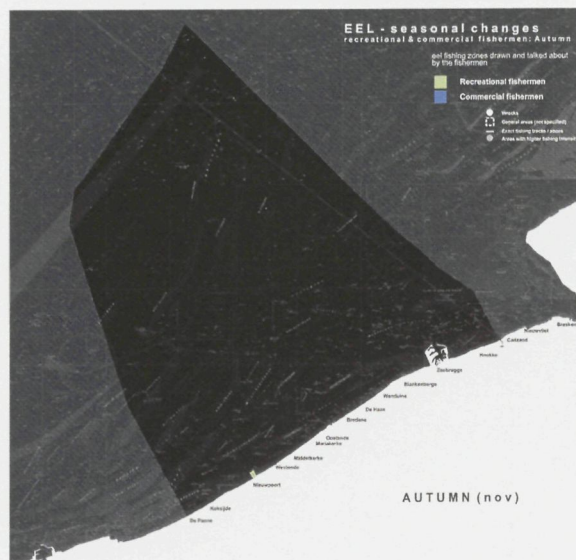
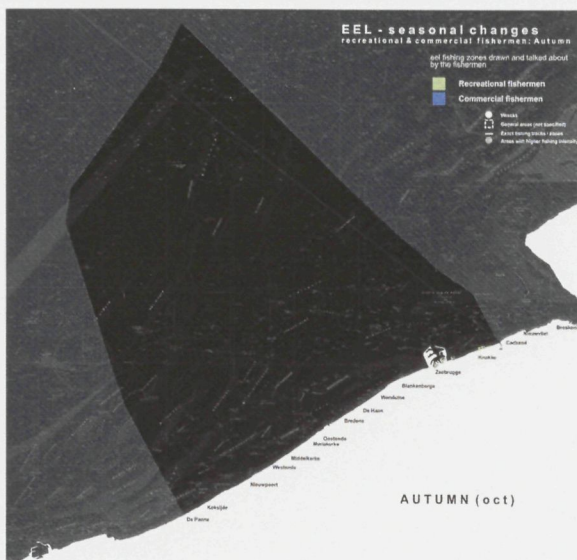
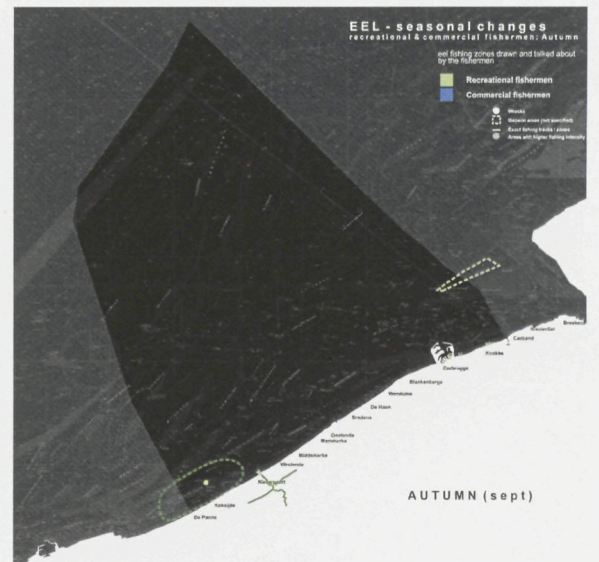
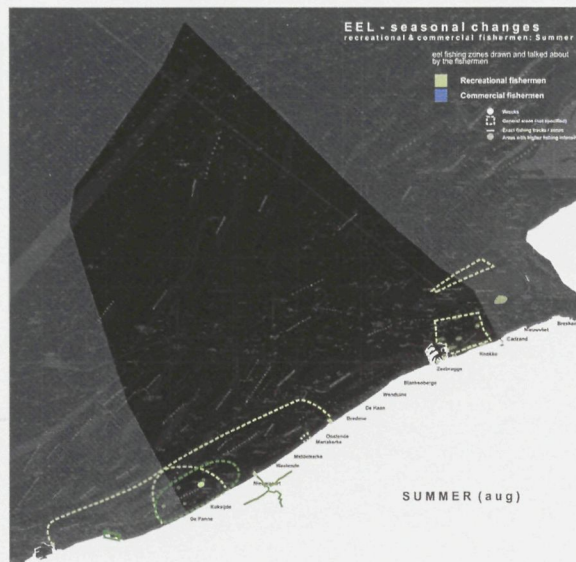
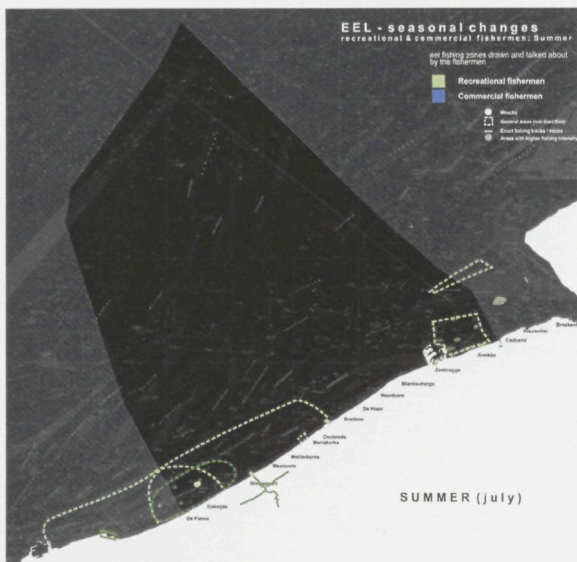
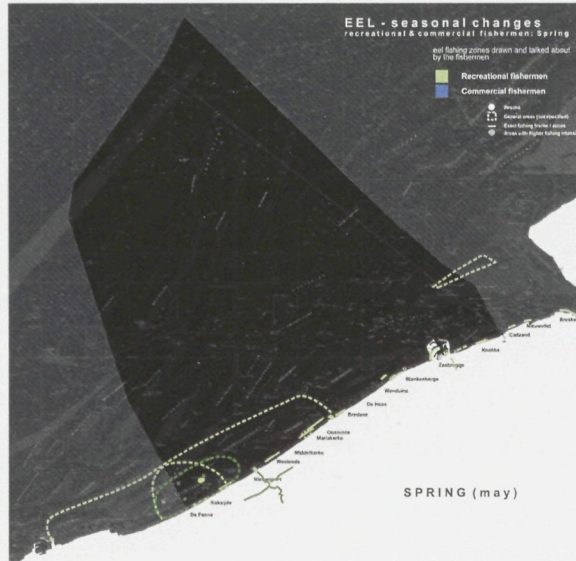
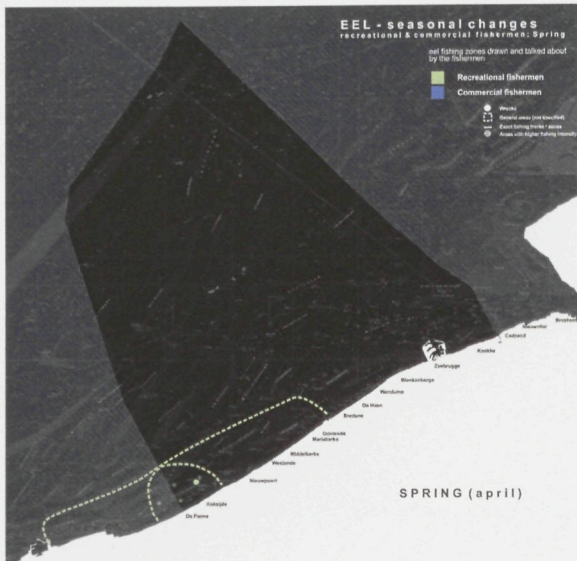
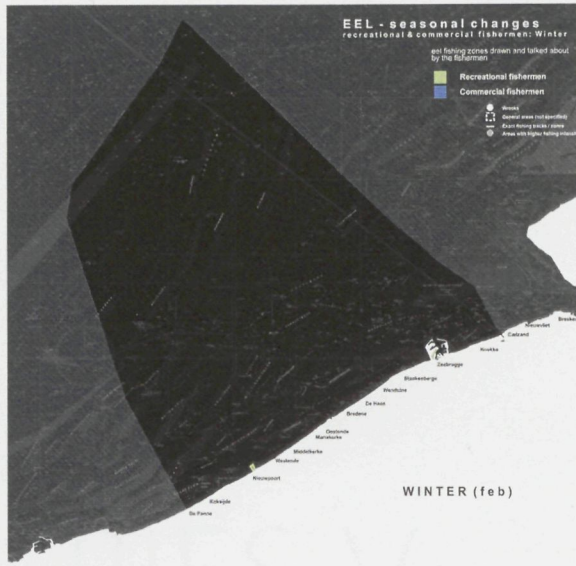
EEL - evolution

recreational & commercial fishermen 1940 - 2010



EEL - evolution
commercial & recreational fishermen 1940 - 2010
areas fished by 2 or more fishermen



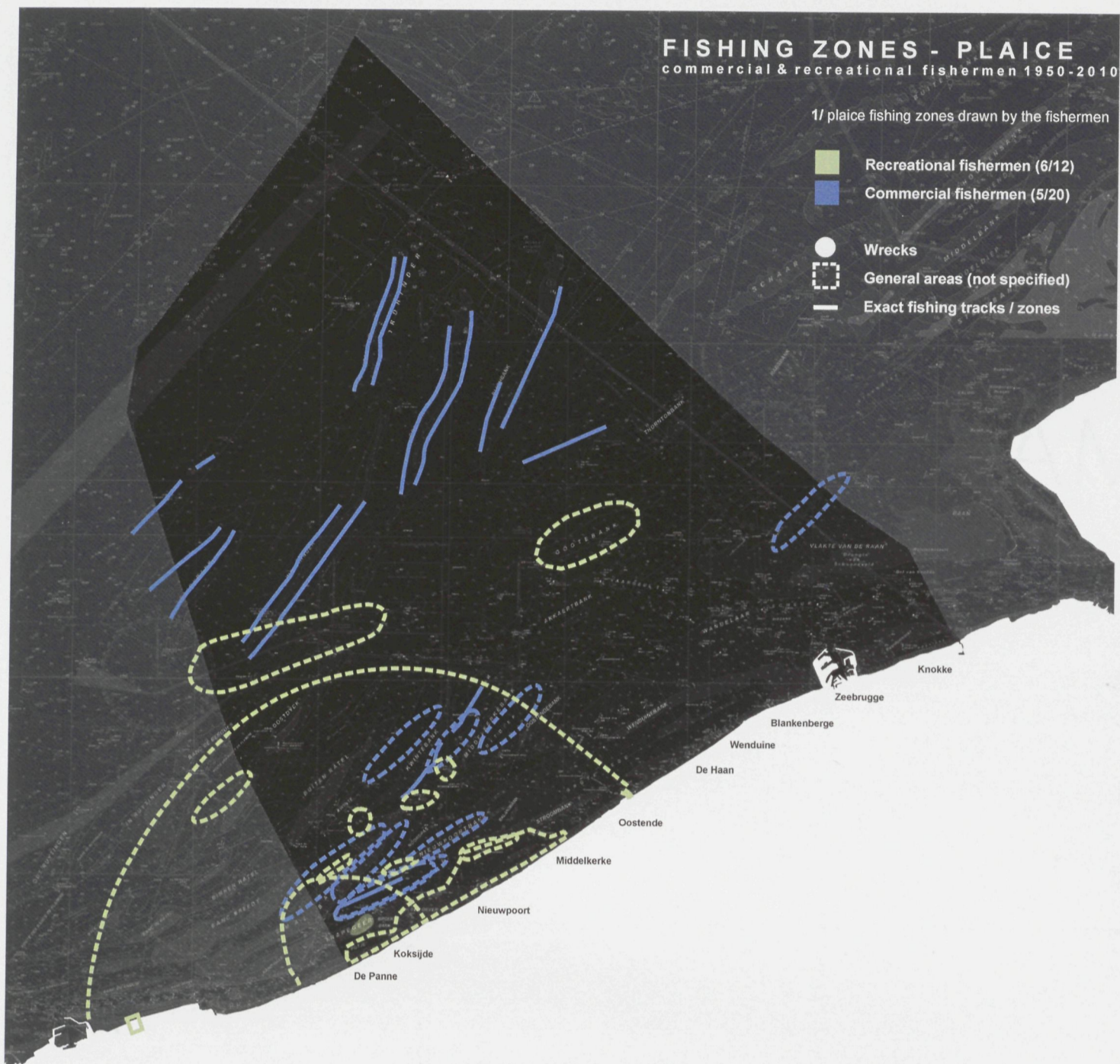


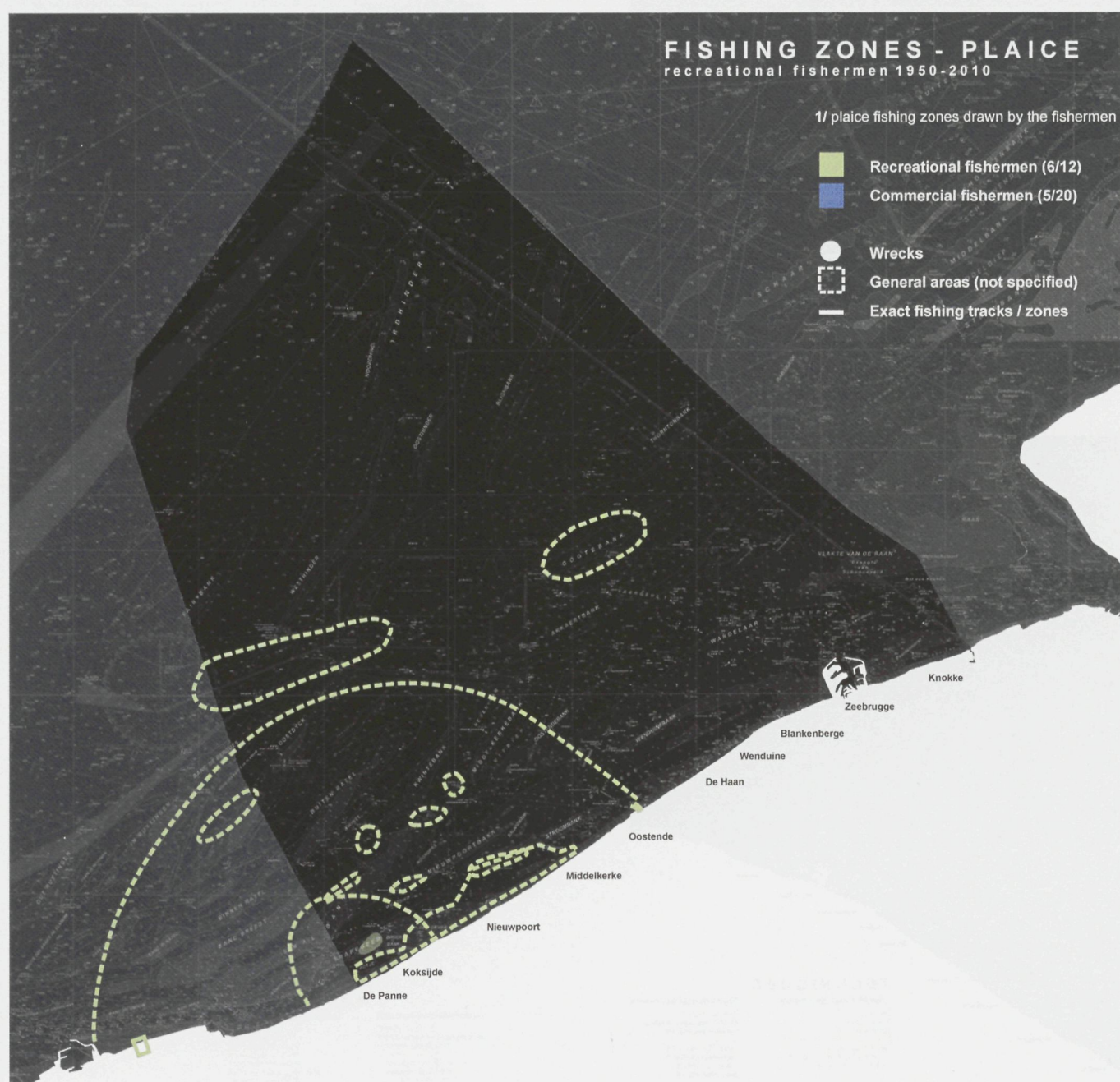
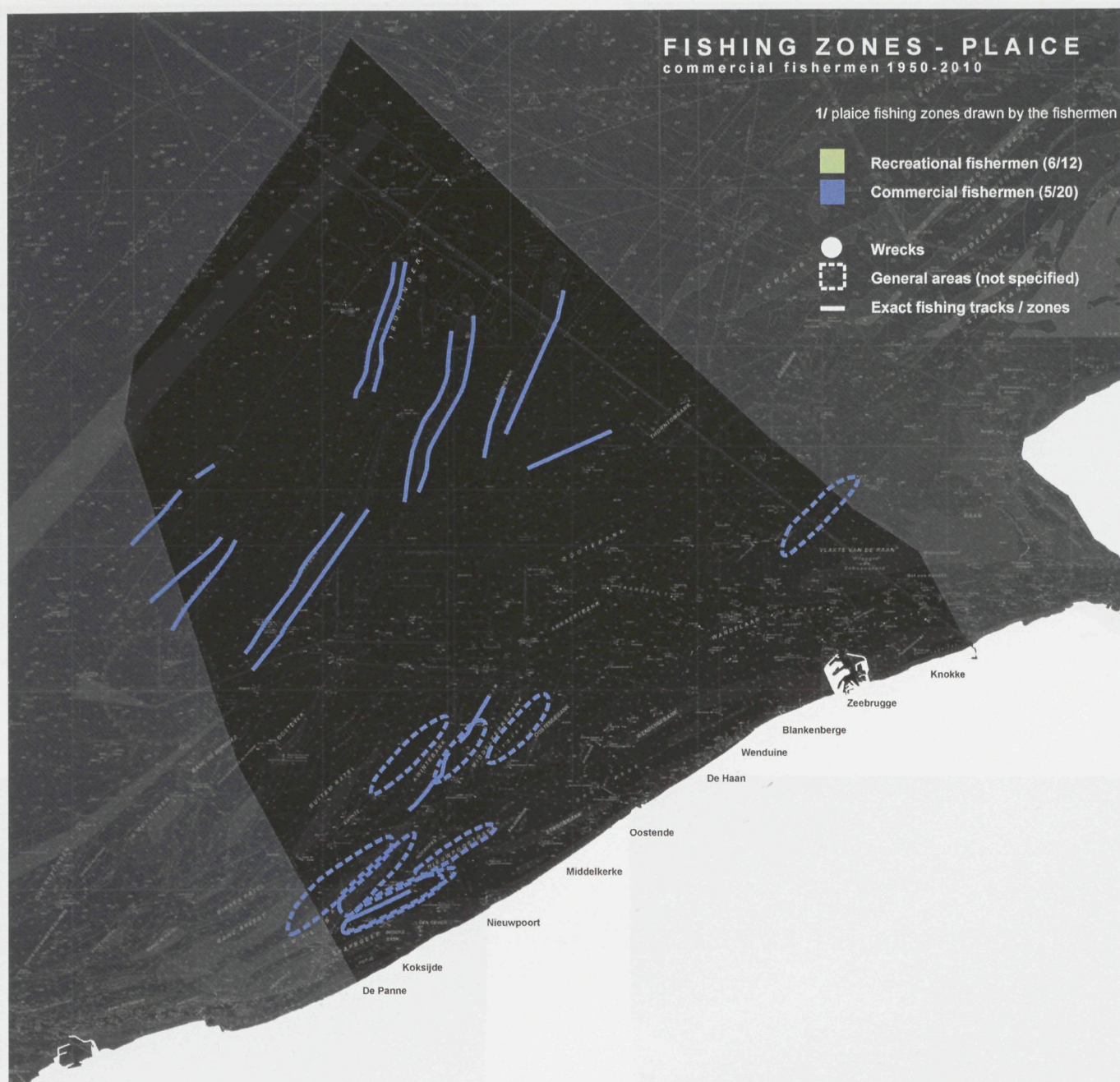
EEL - seasonal changes
january-december
commercial & recreational fishermen 1940 - 2010

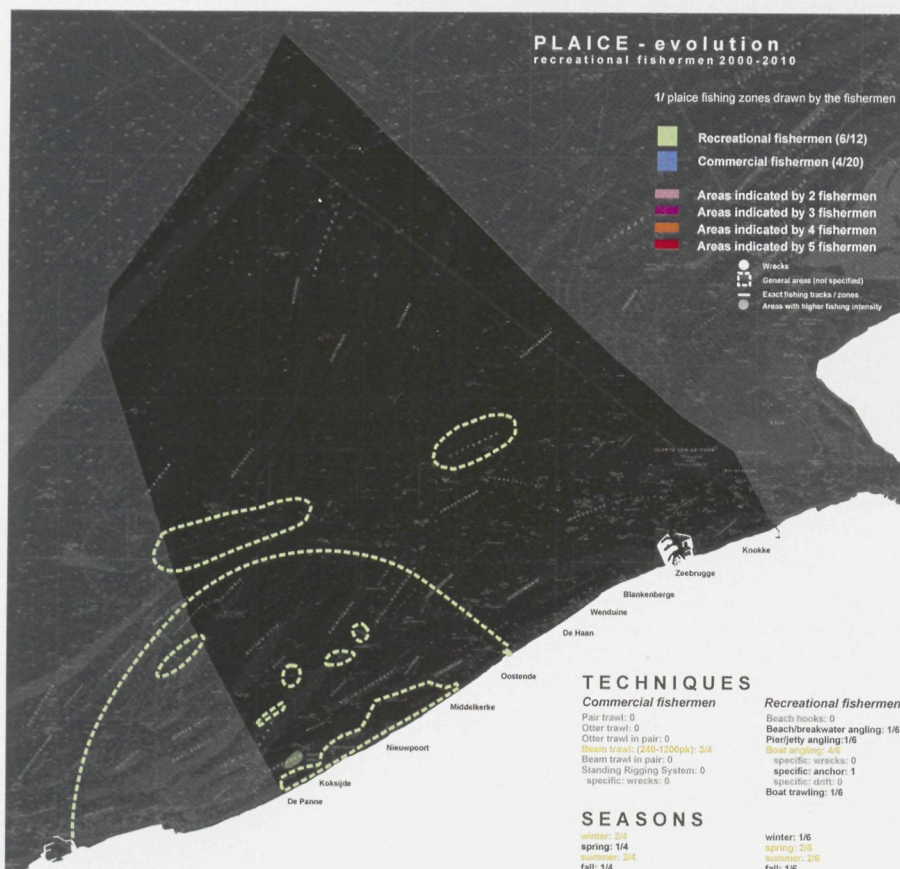
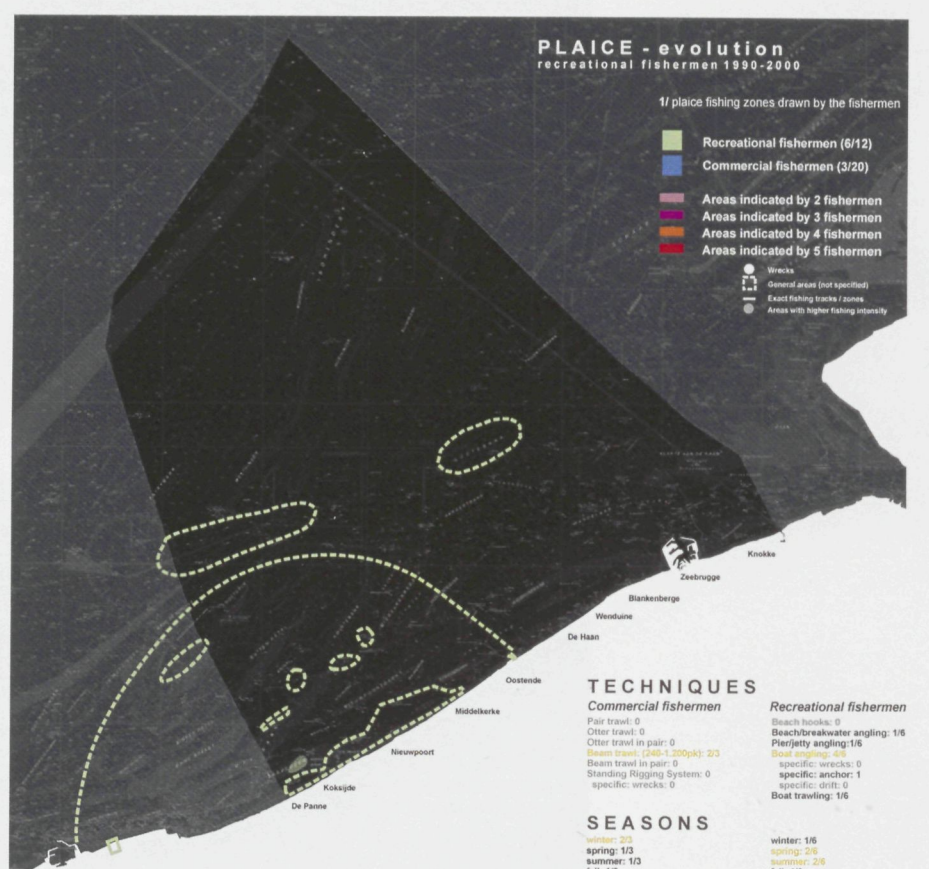
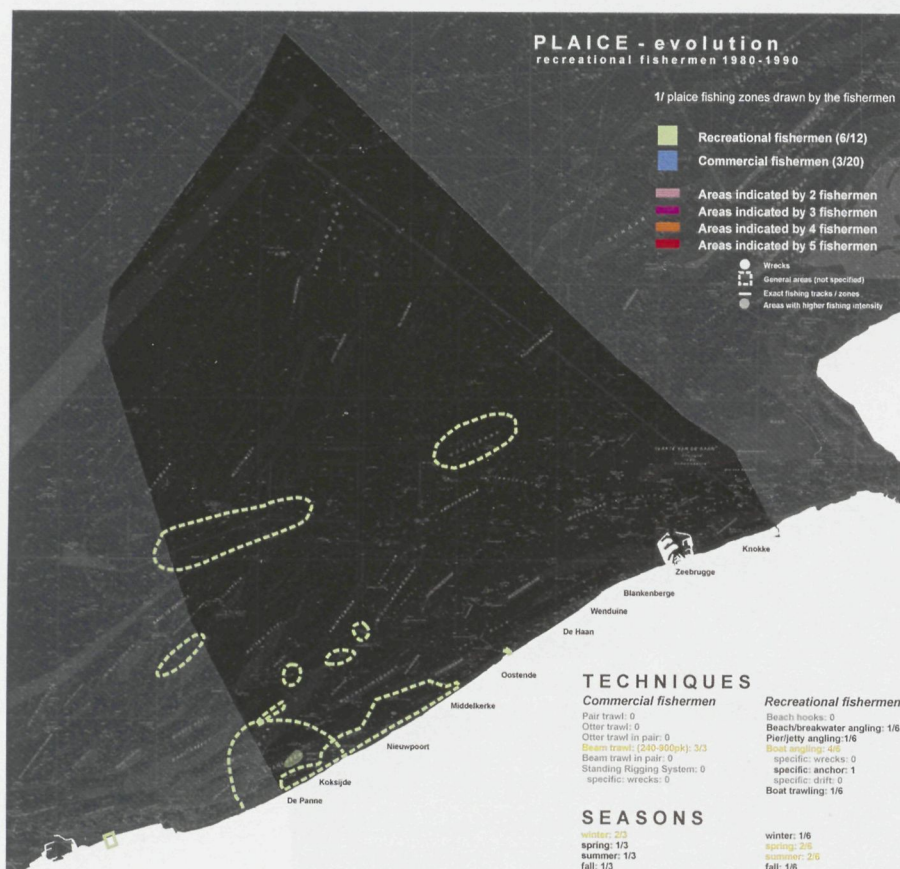
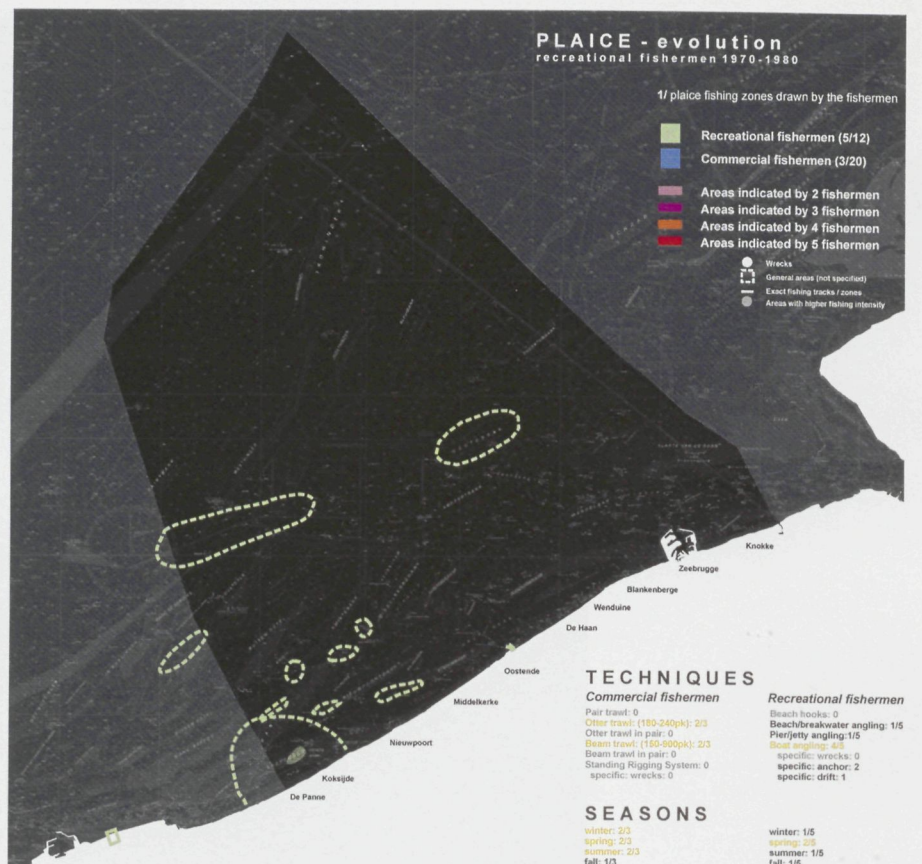
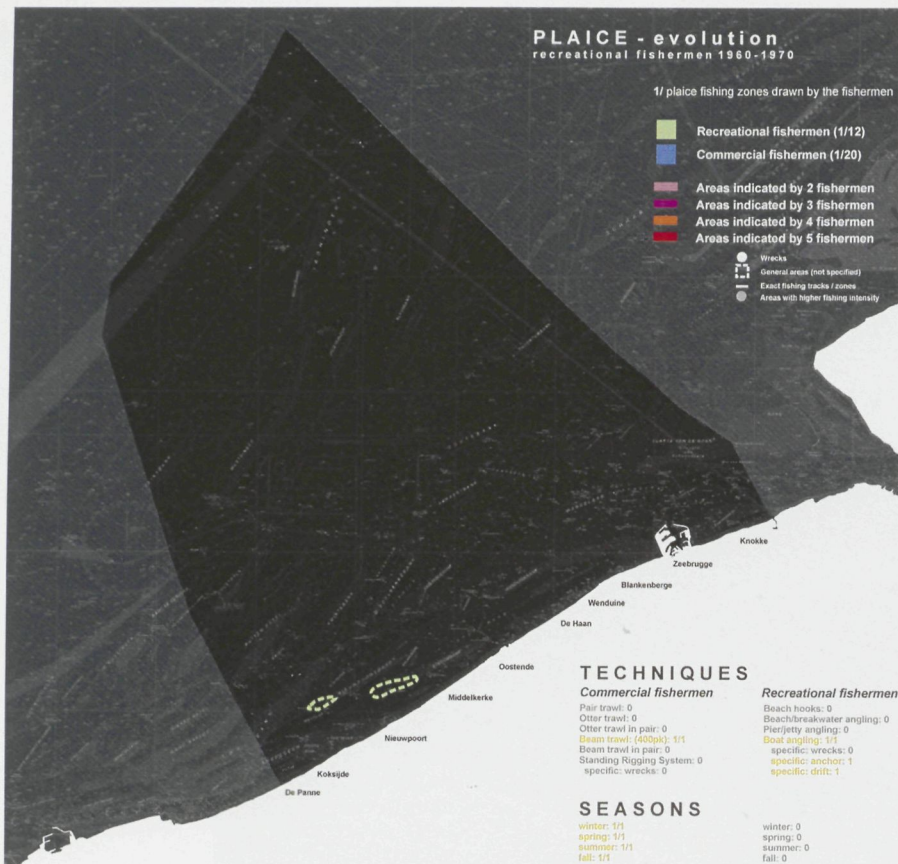


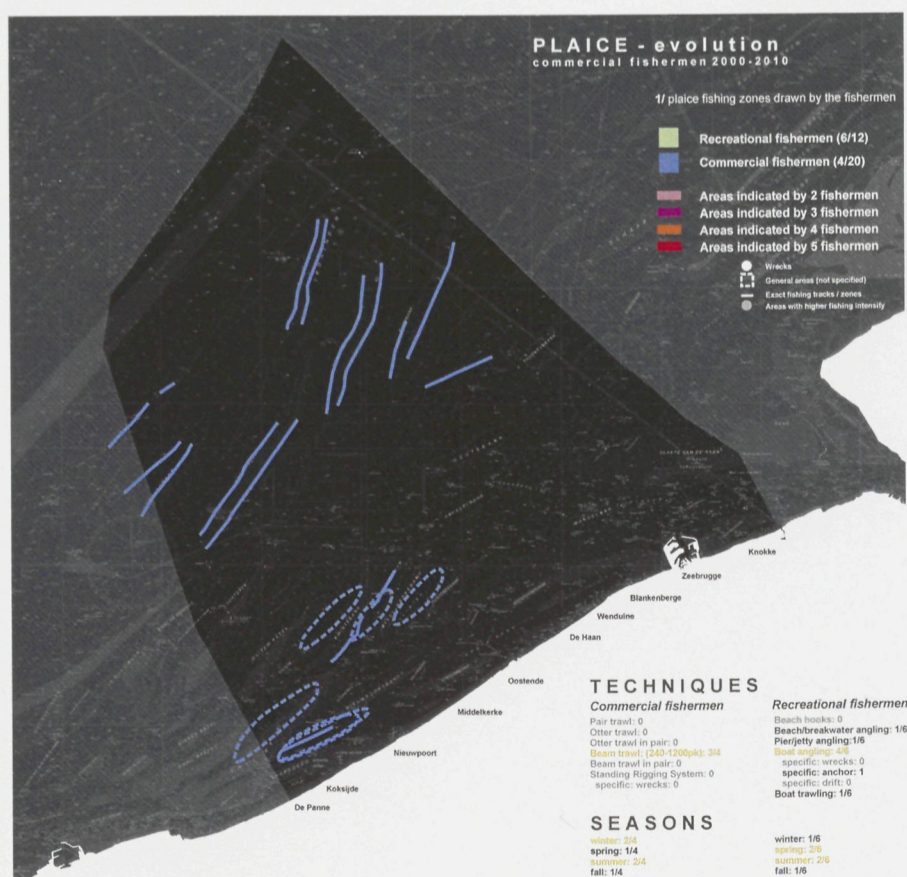
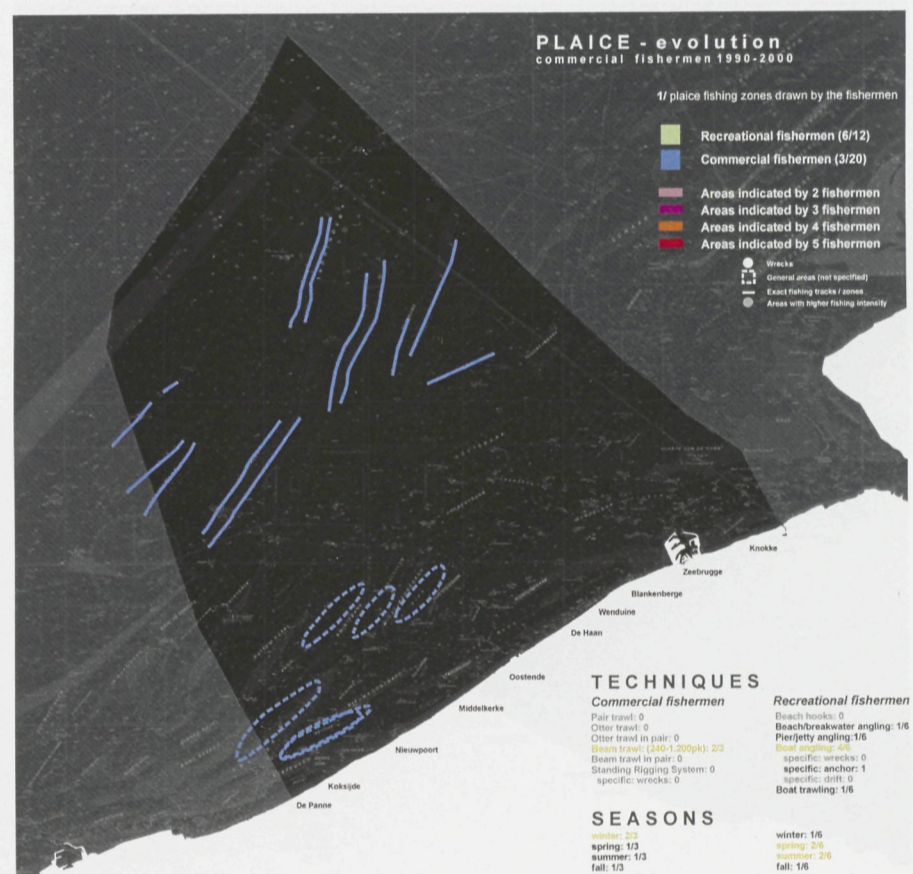
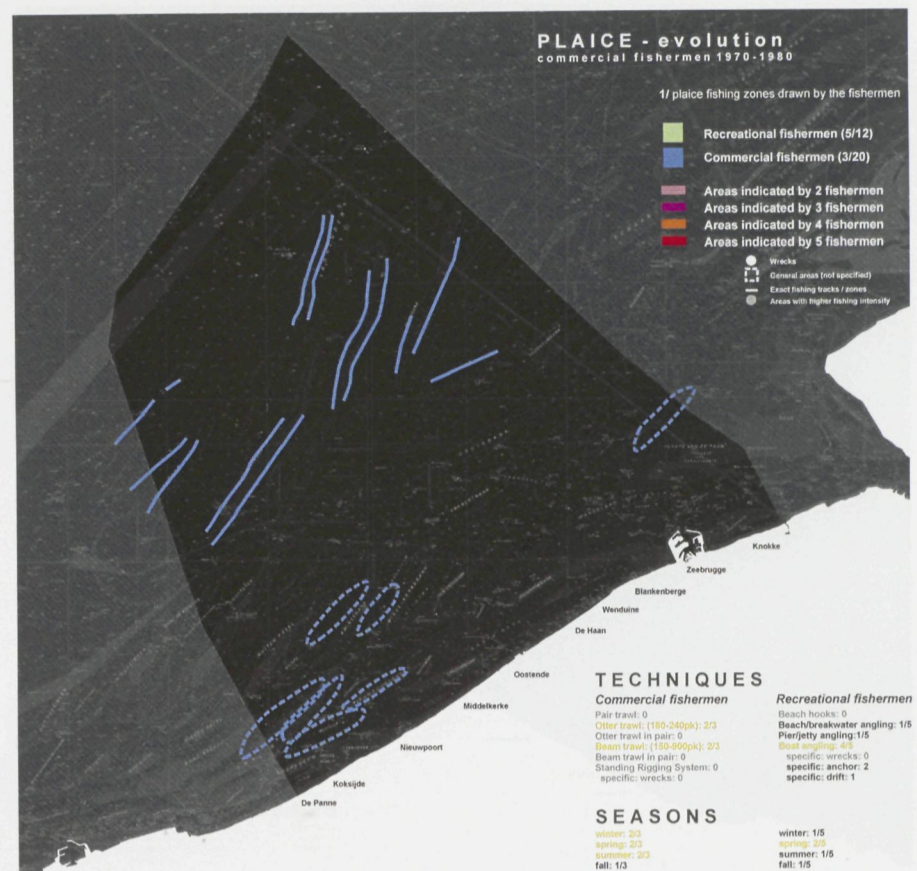
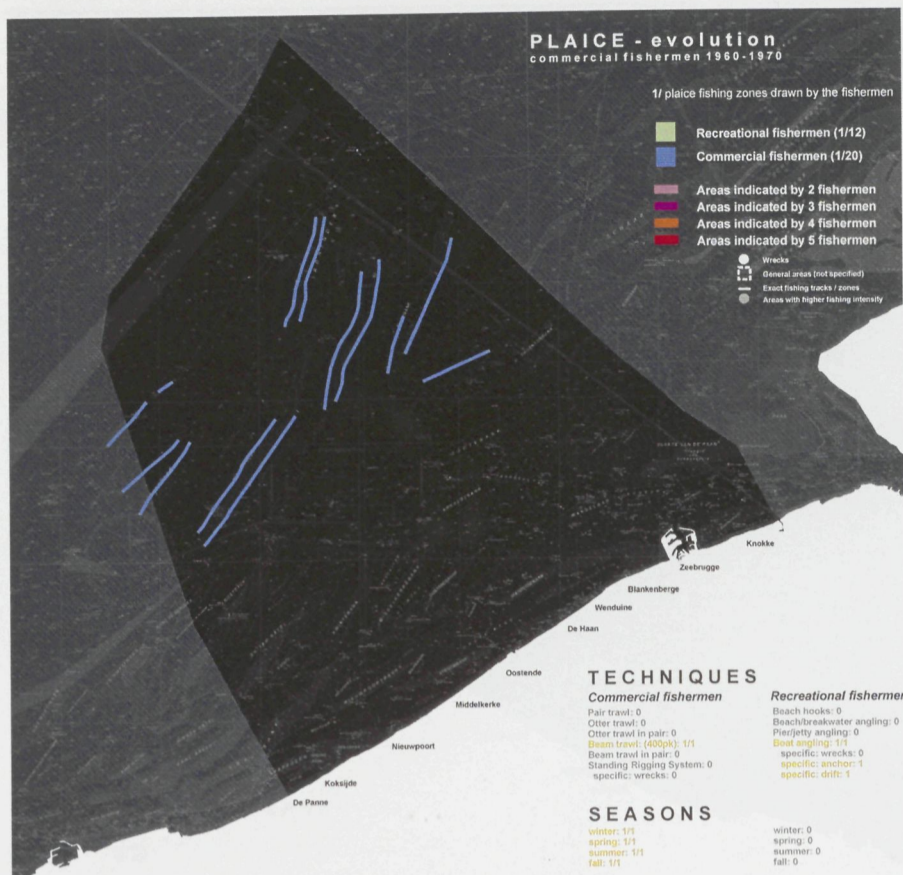
MAPS SERIES V

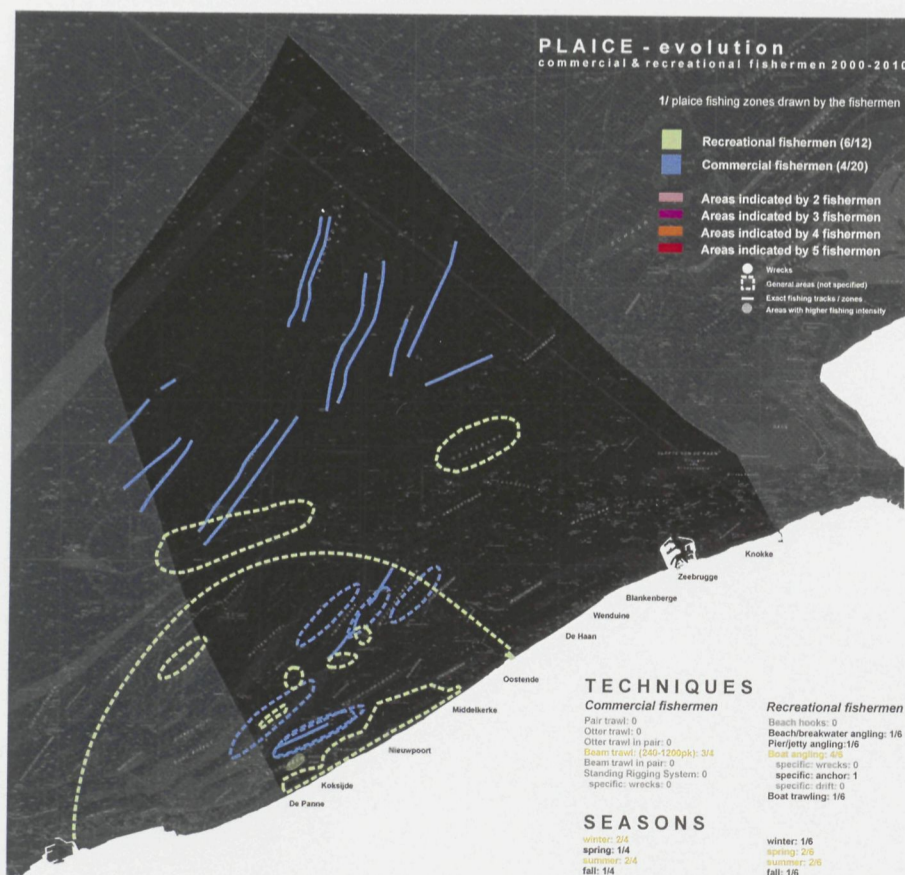
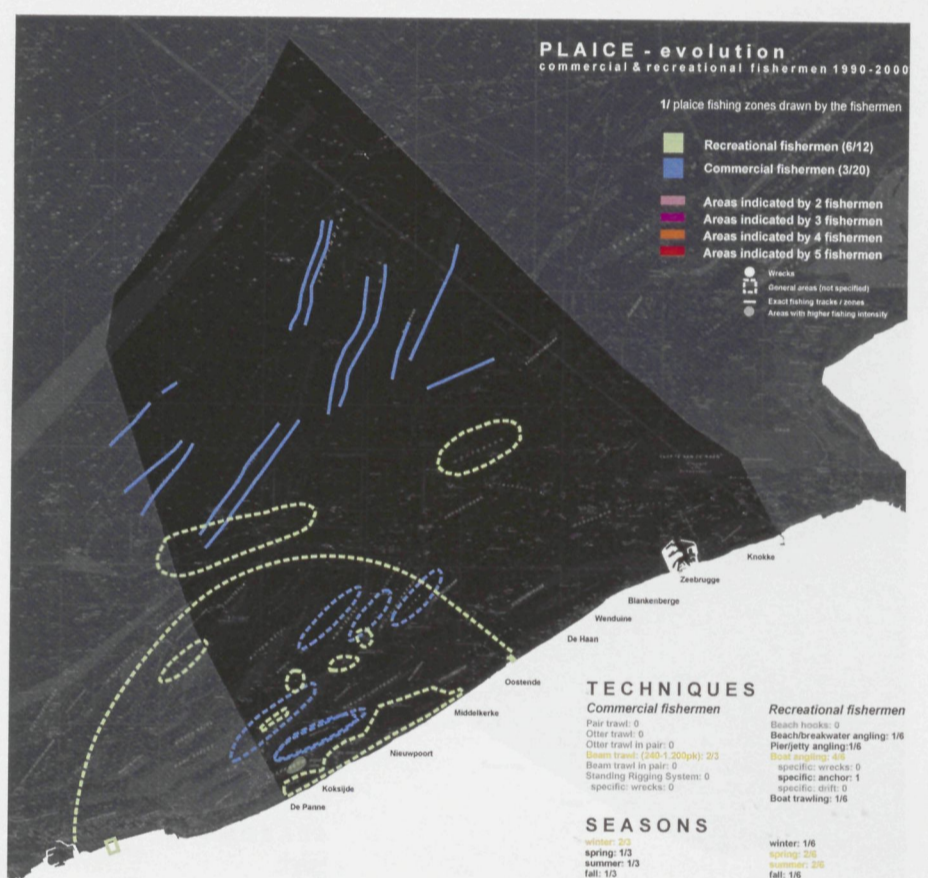
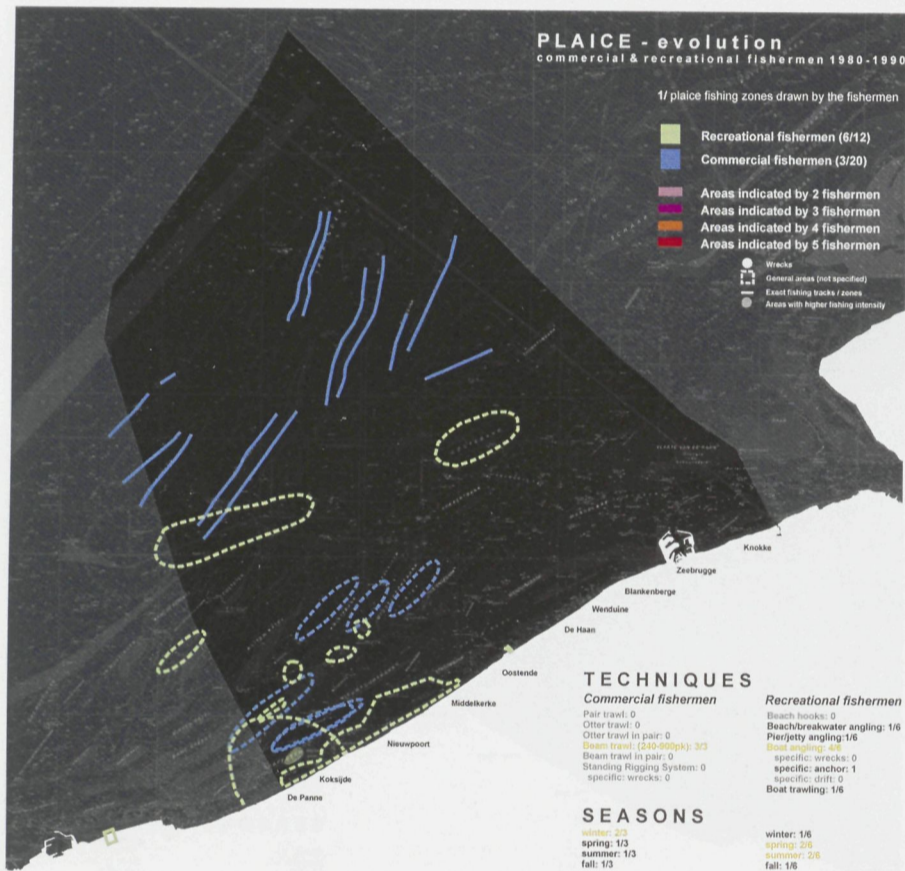
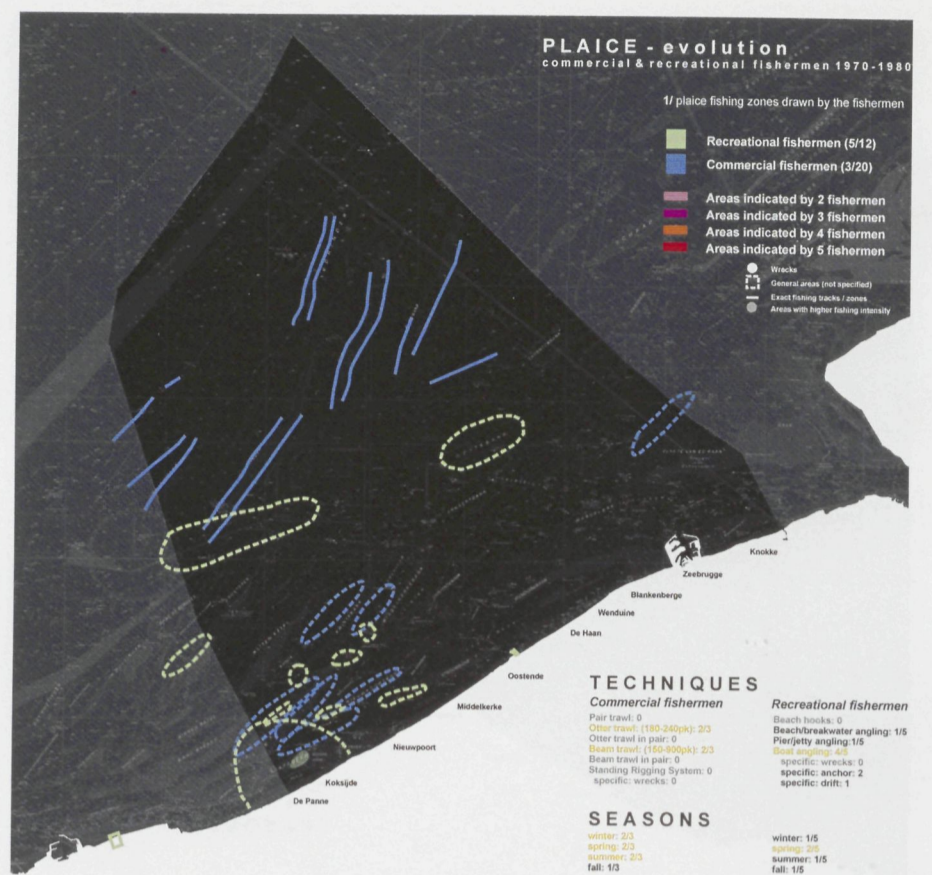
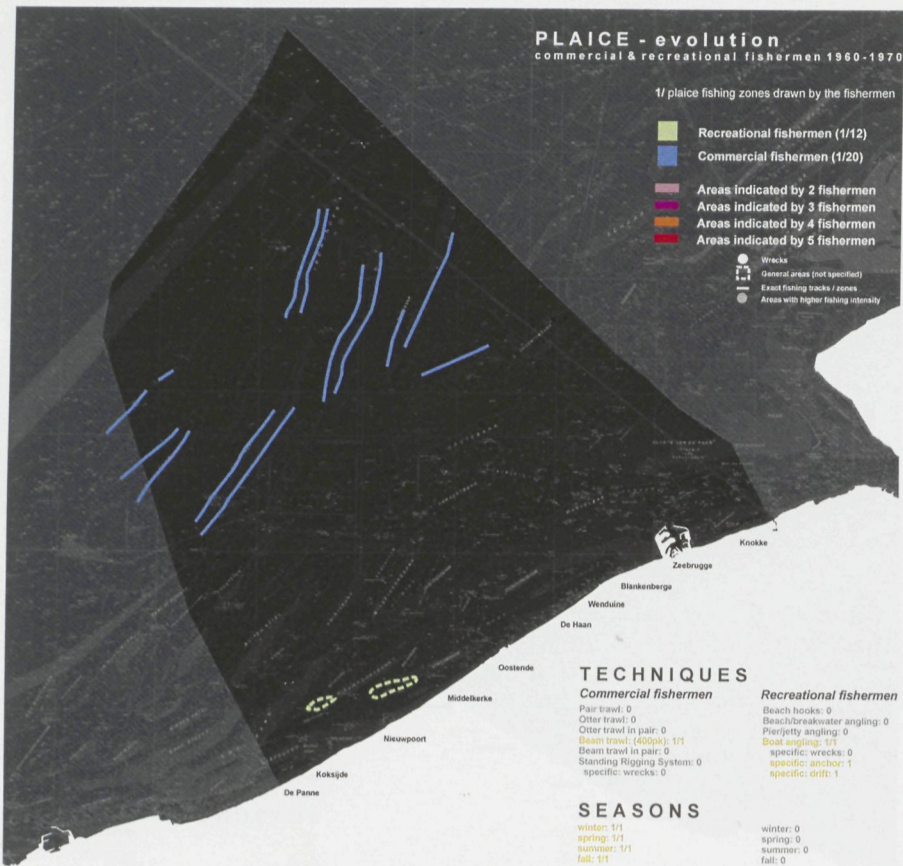
PLAICE

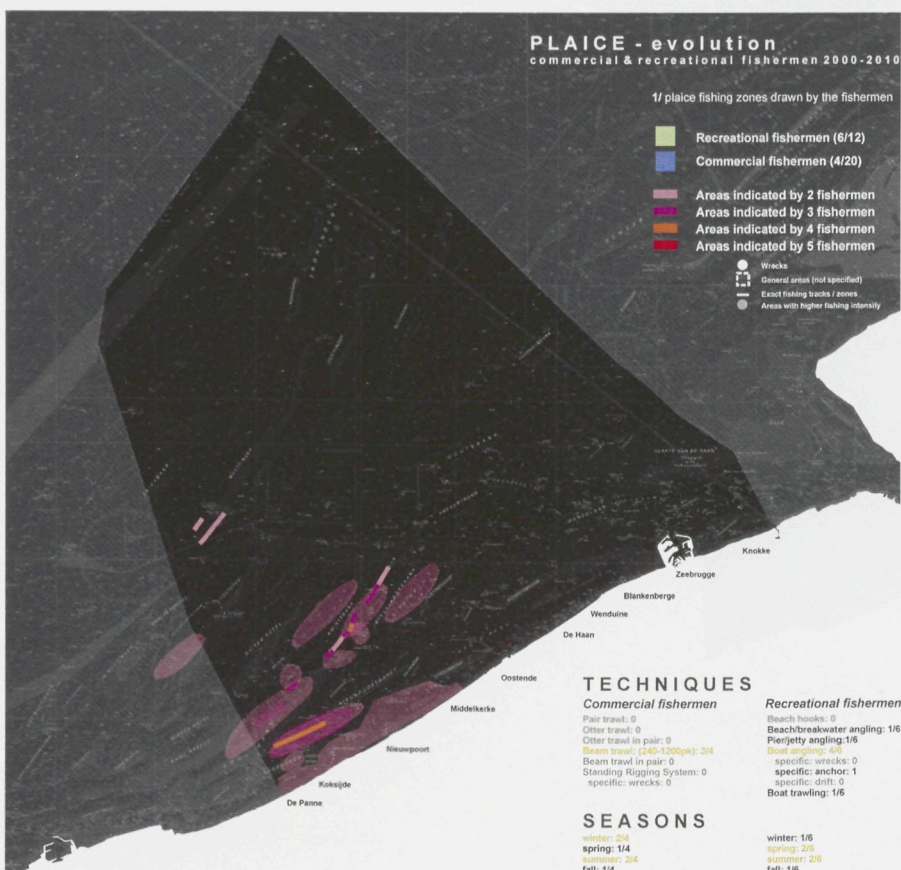
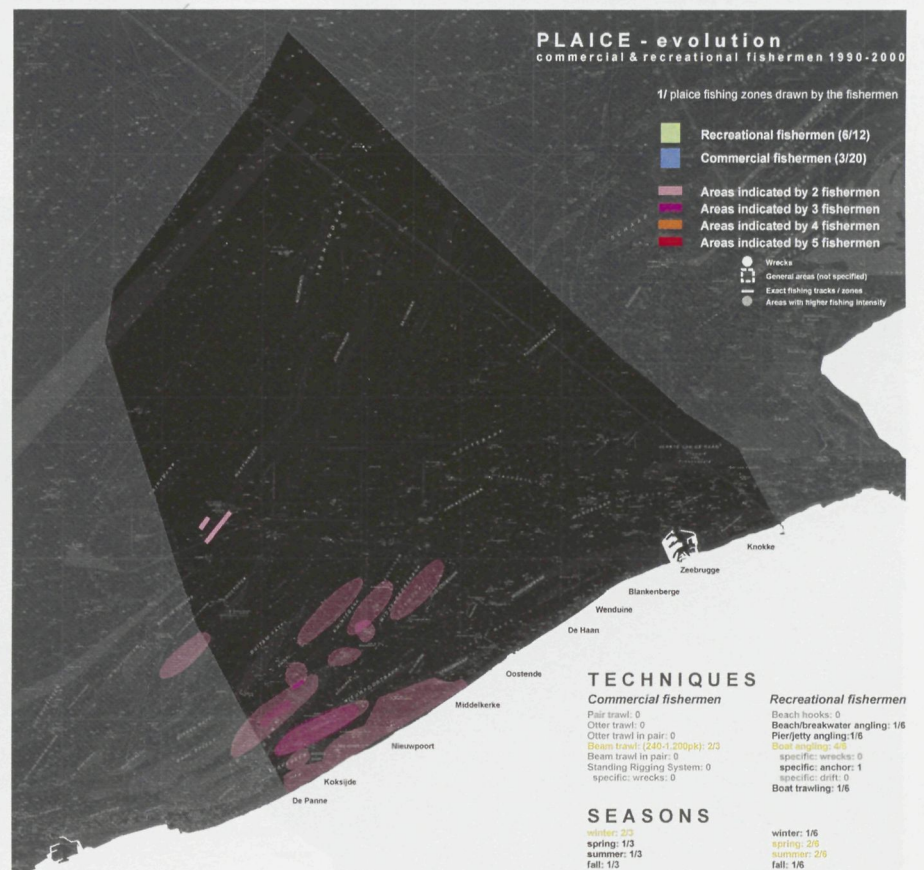
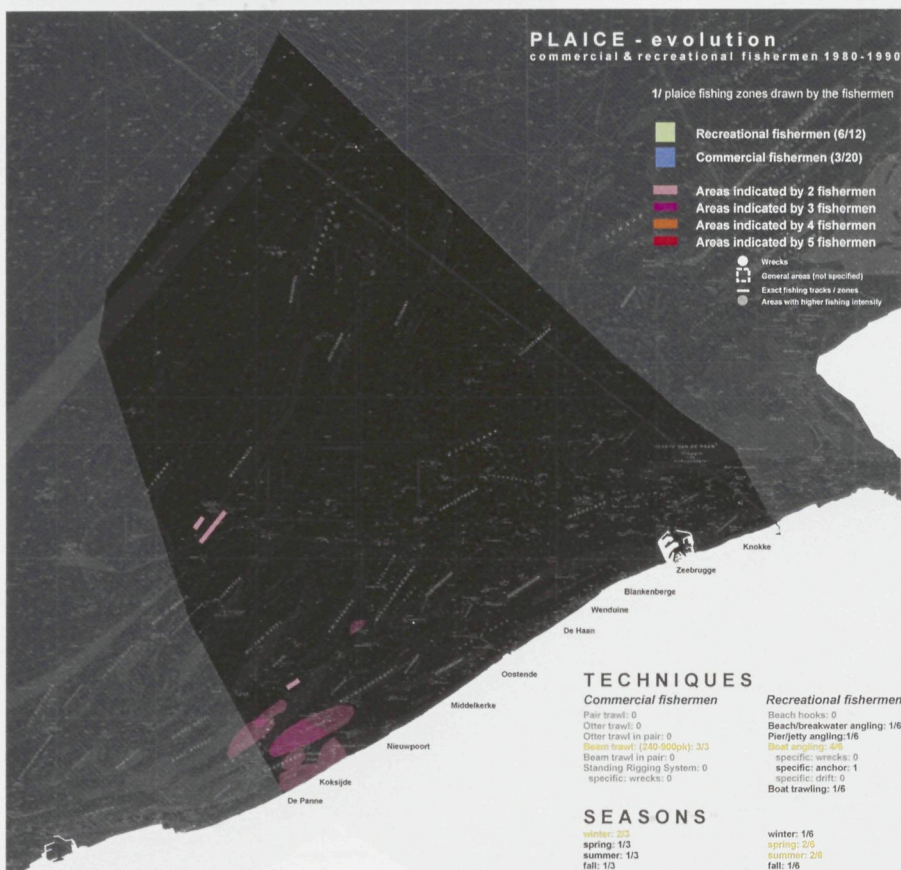
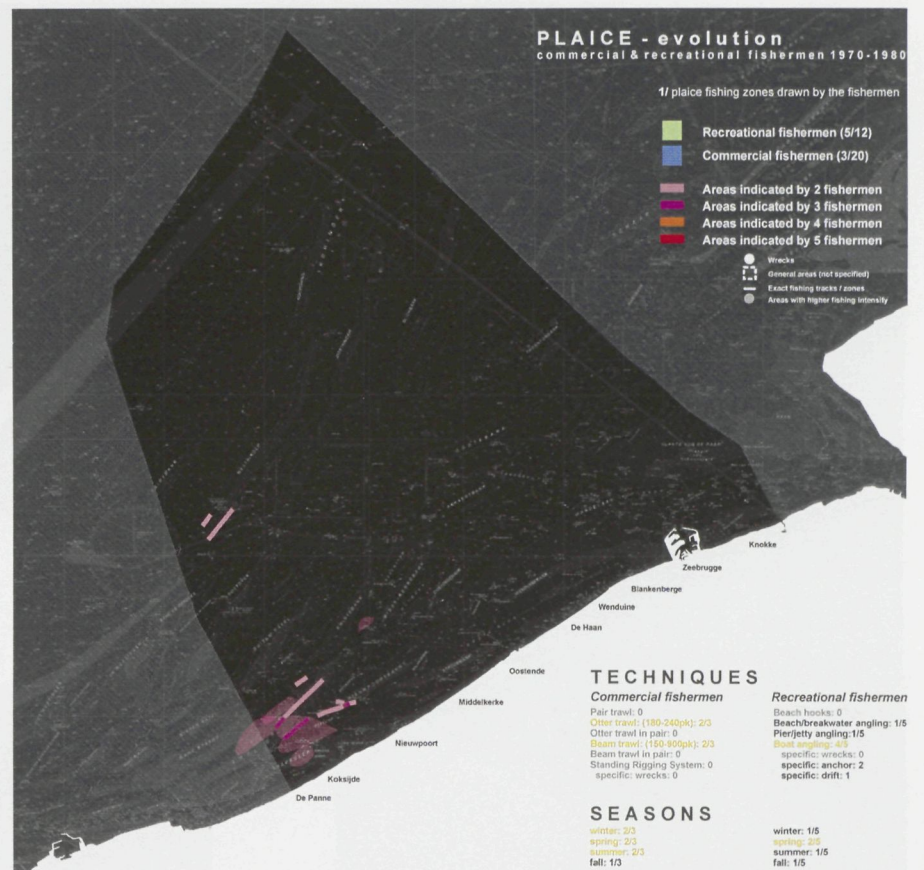
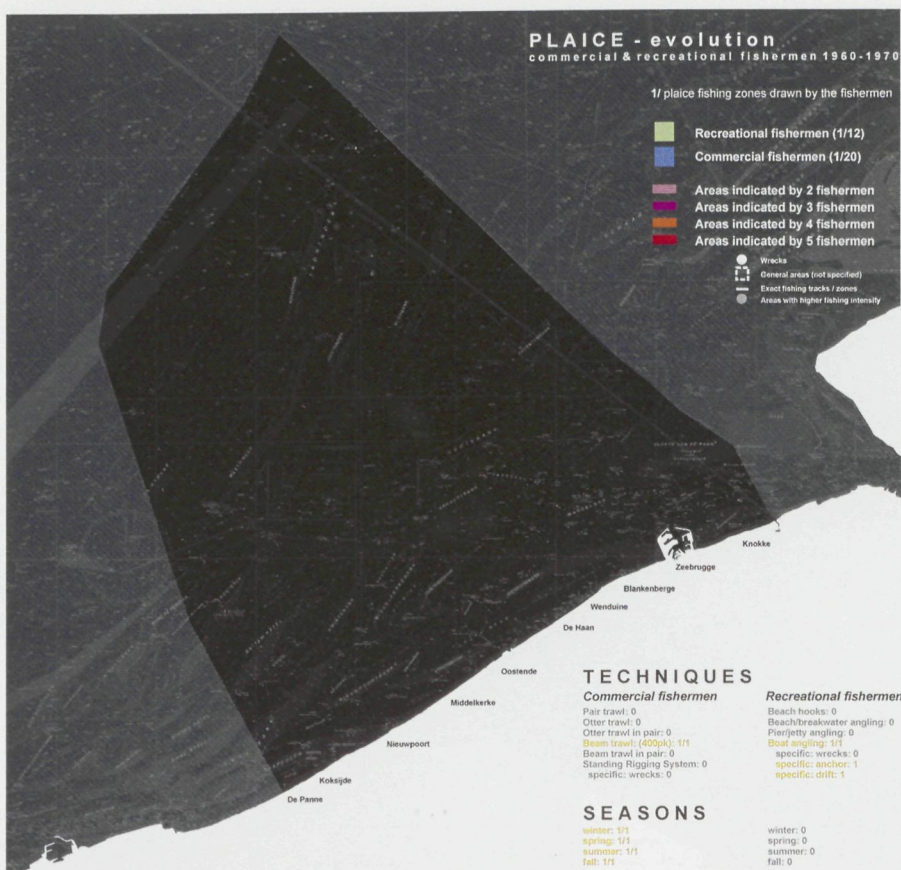




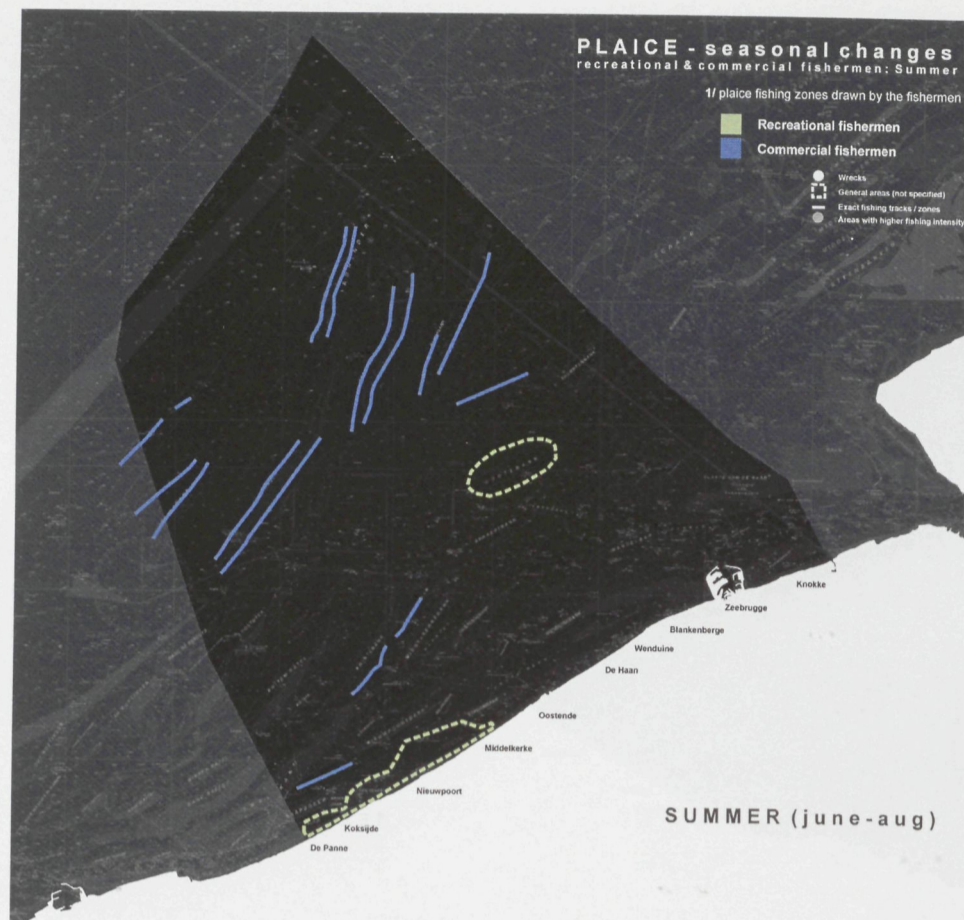
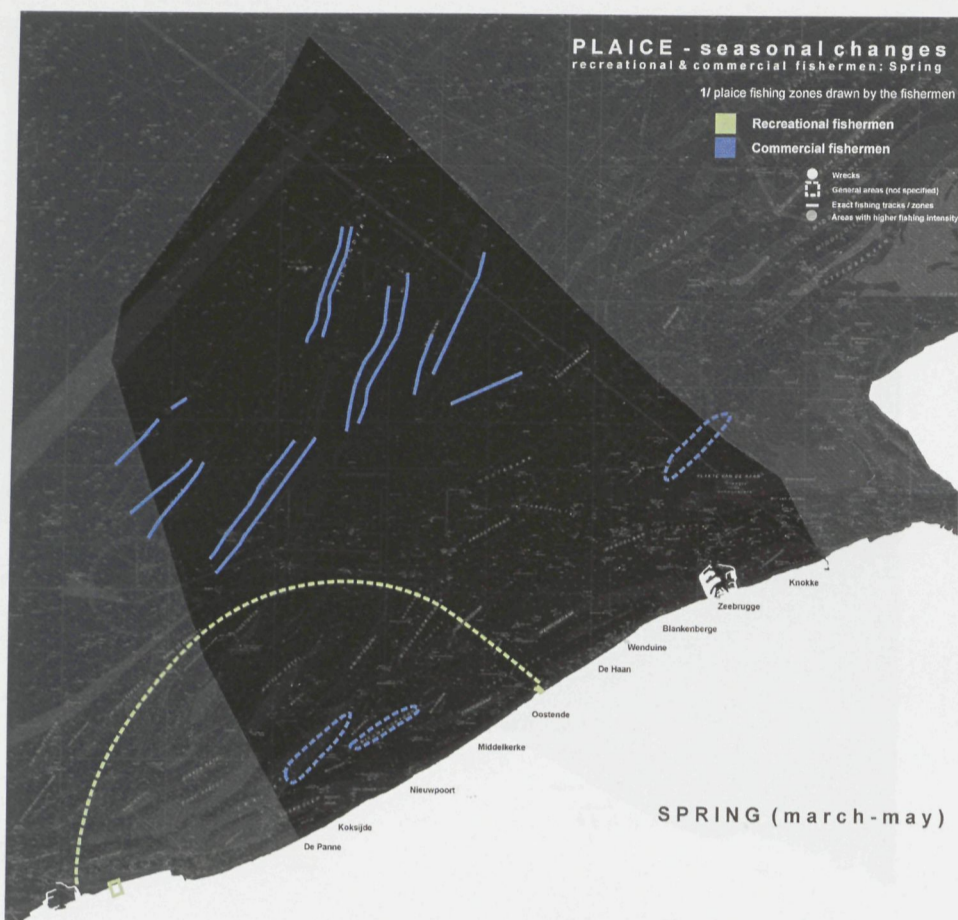


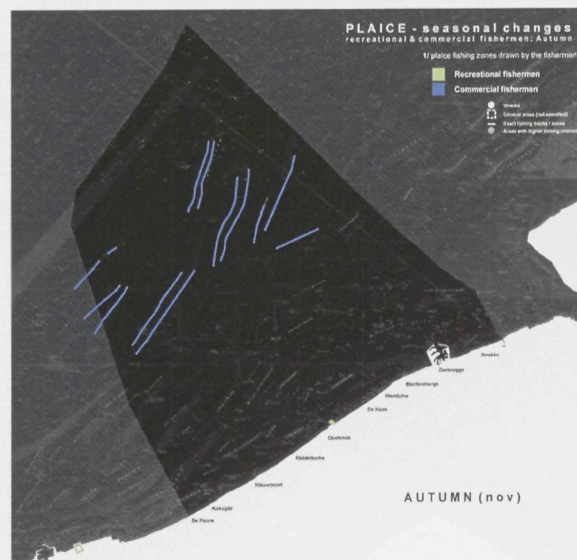
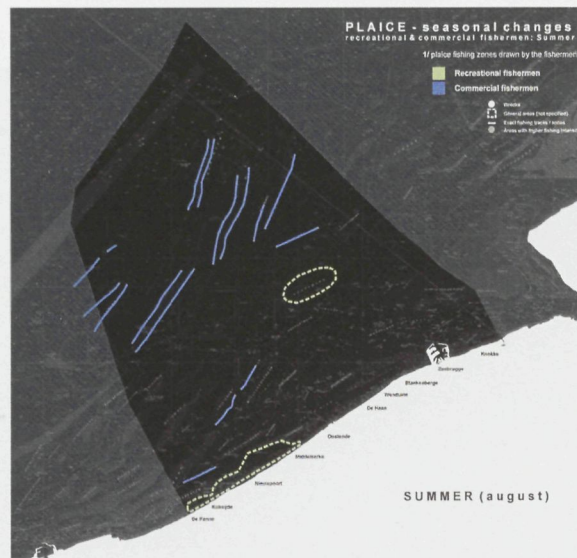
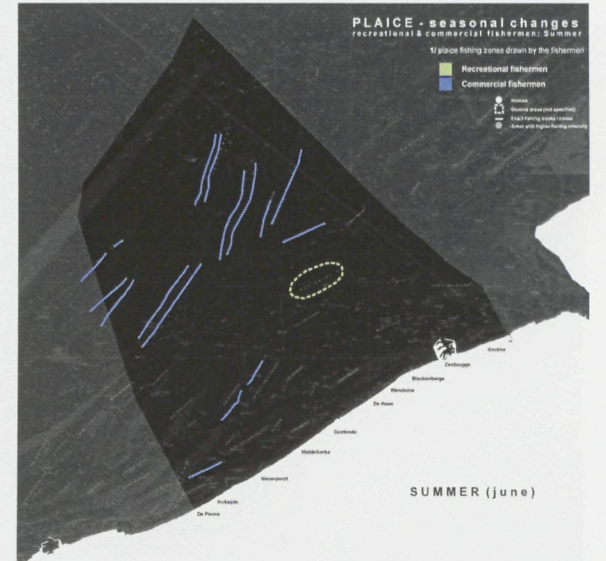
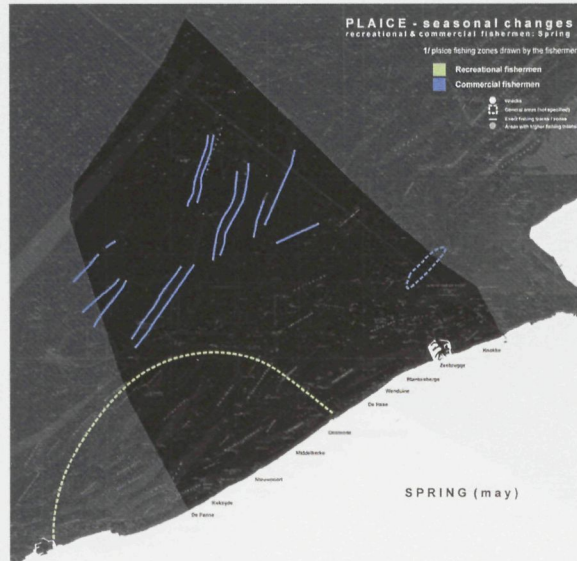
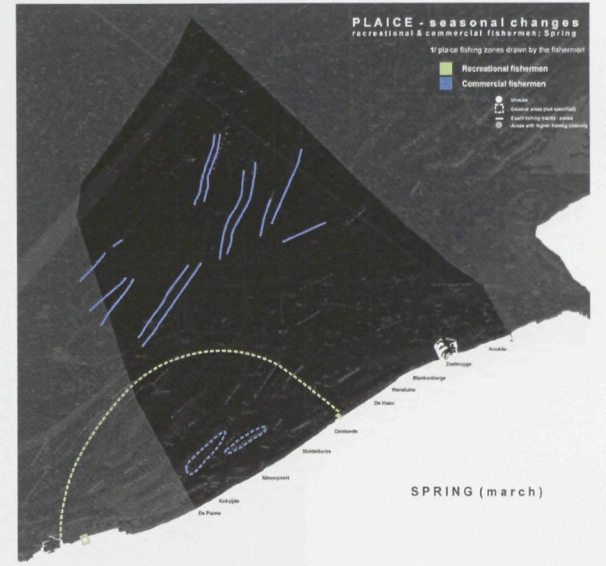
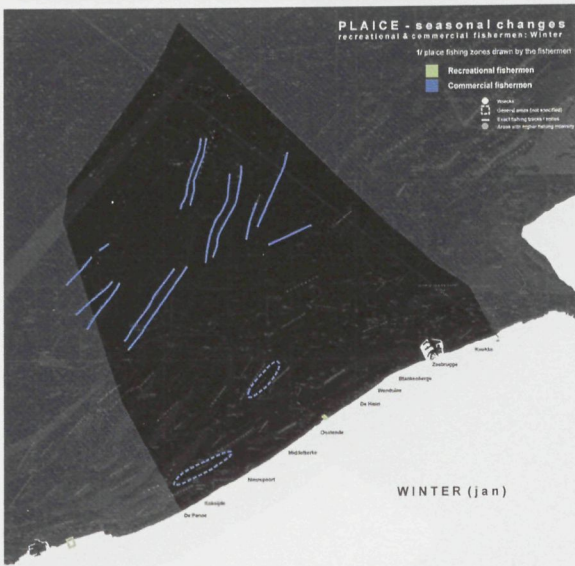




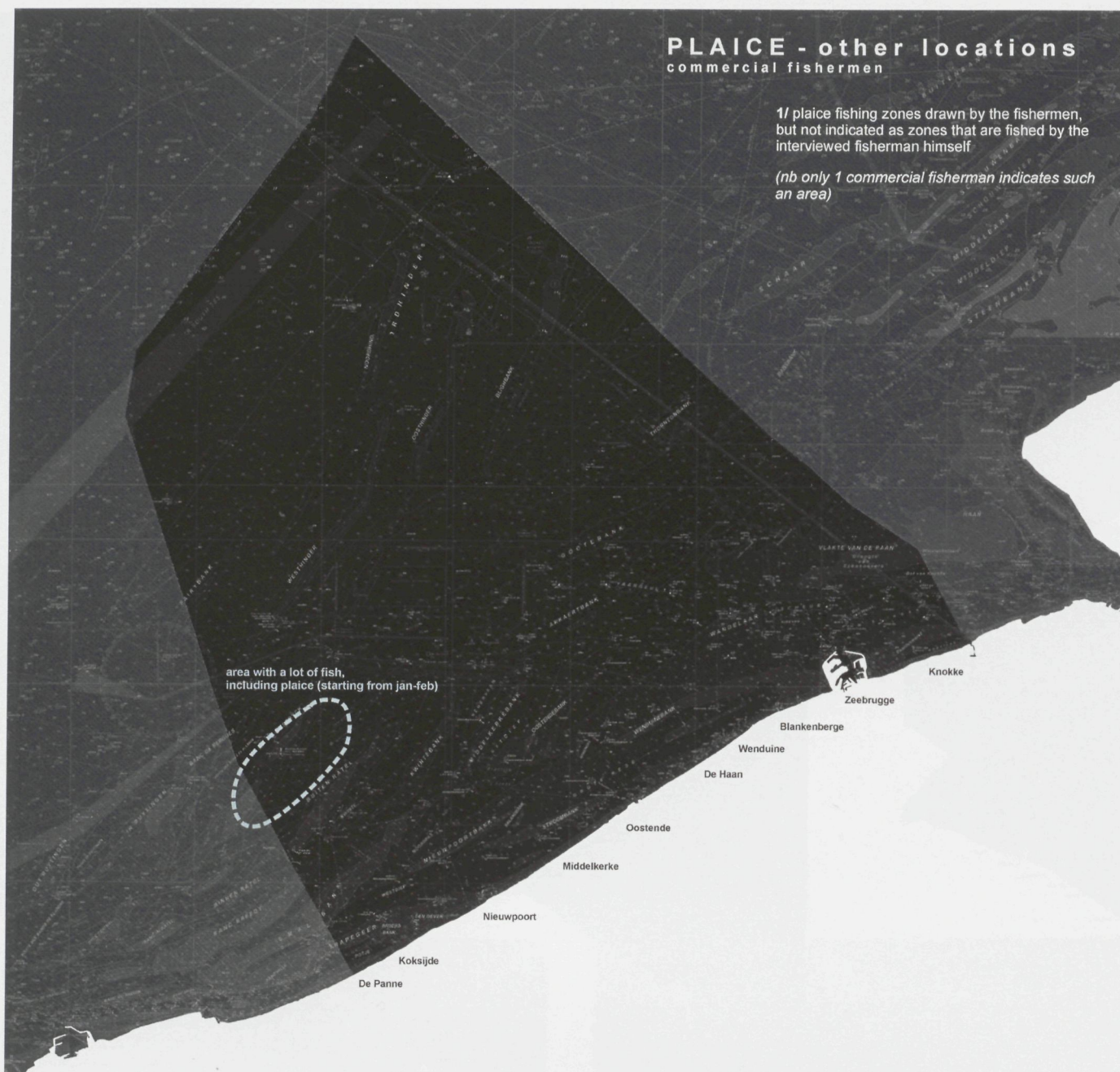


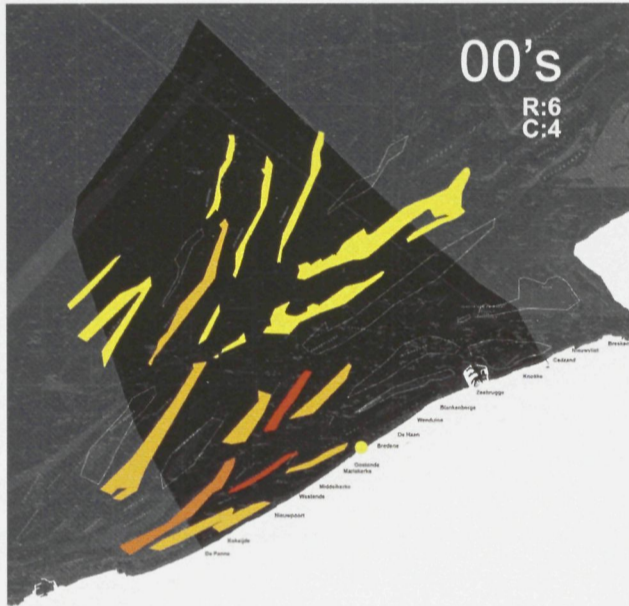
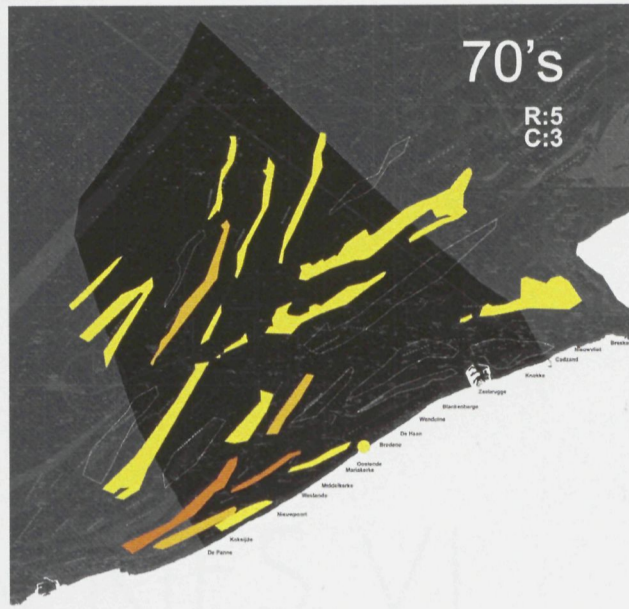
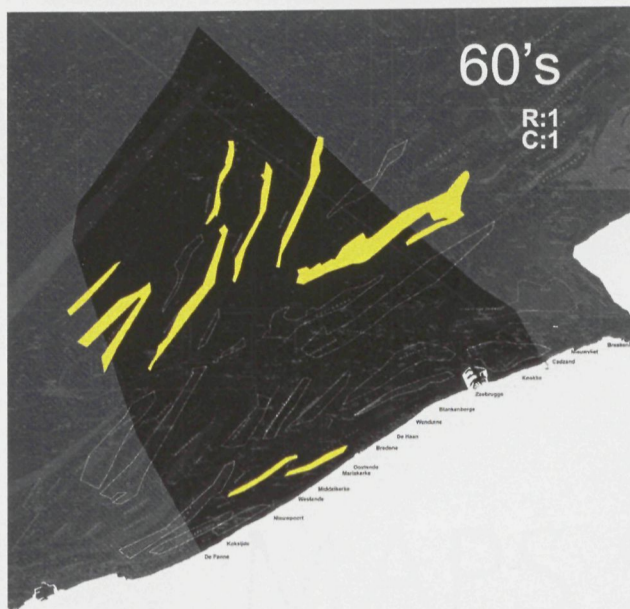
PLAICE - evolution
commercial & recreational fishermen 1960 - 2010
areas fished by 2 or more fishermen





PLAICE - seasonal changes
january-december
commercial & recreational fishermen 1950 - 2010



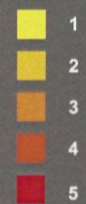


PLAICE - EVOLUTION OF FISHING ZONES

commercial & recreational fishermen 1960-2010

banks / beach / ports indicated by fishermen

number of fishermen on same spot :



LECOFISH SEPTEMBER 2011

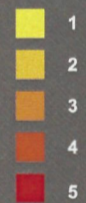


PLAICE - SEASONAL CHANGES

commercial & recreational fishermen 1960-2010

banks / beach / ports indicated by fishermen

number of fishermen on same spot :



LECOFISH SEPTEMBER 2011



PLAICE - structure maps

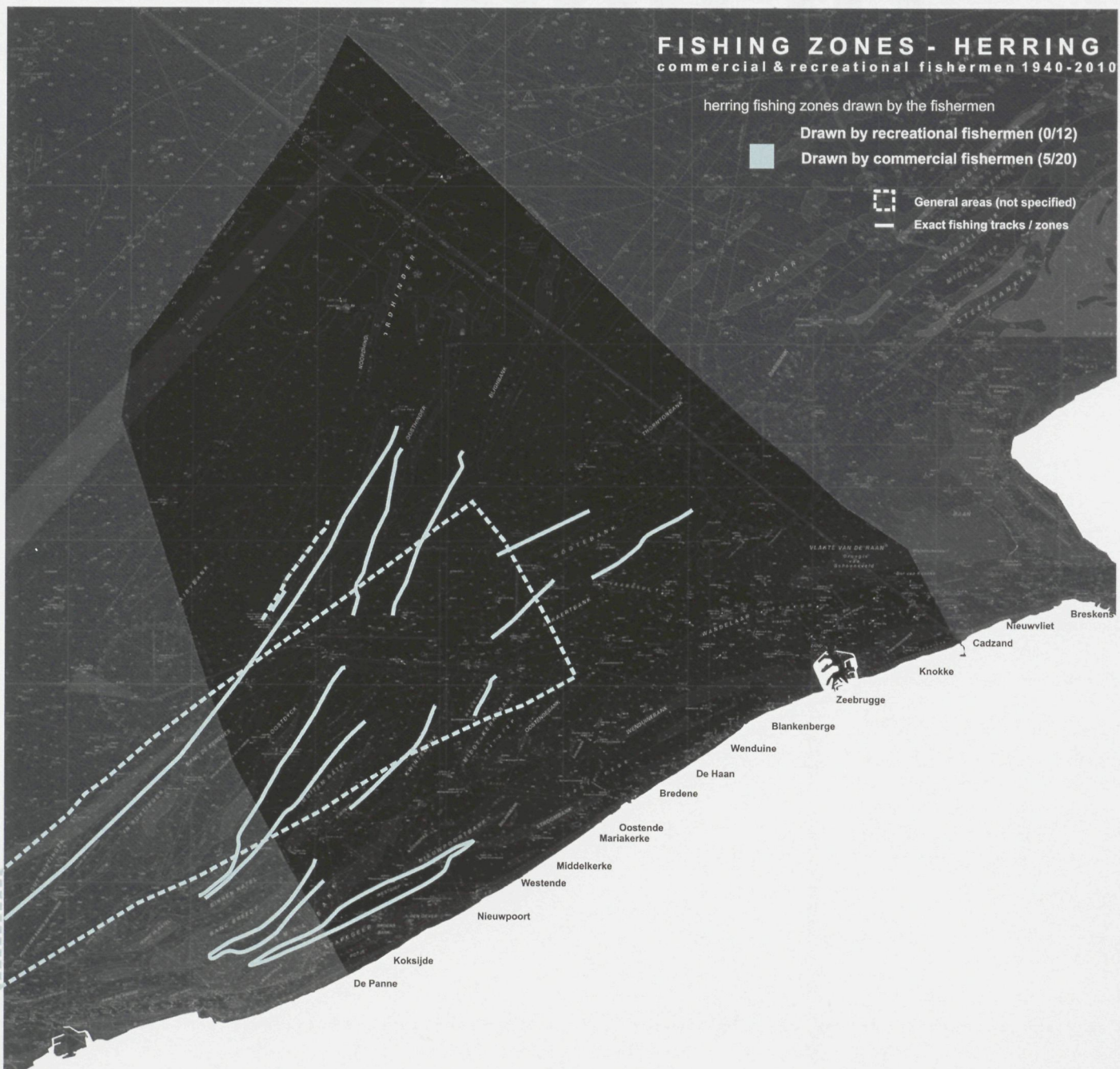
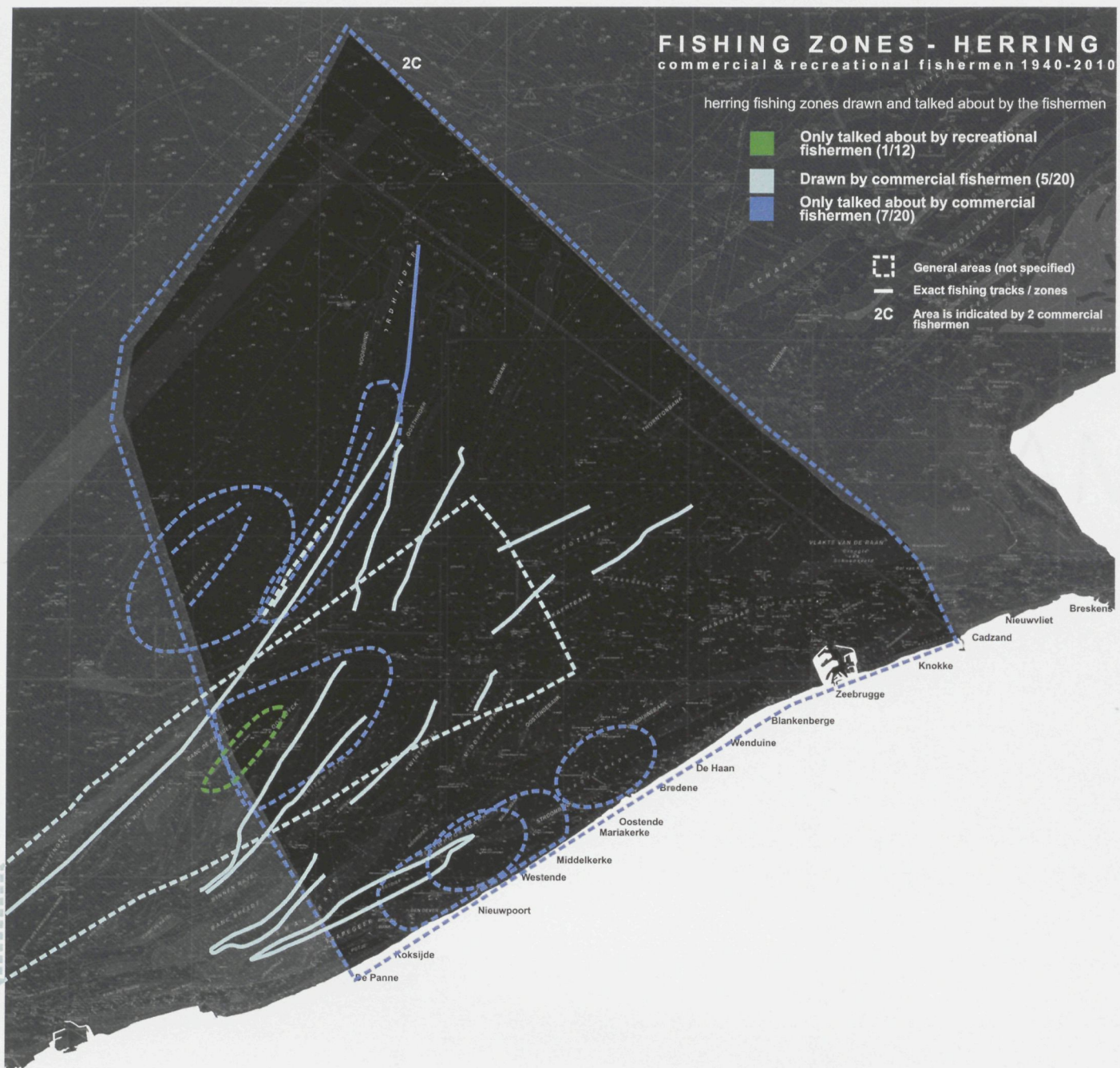
commercial & recreational fishermen 1950 - 2010



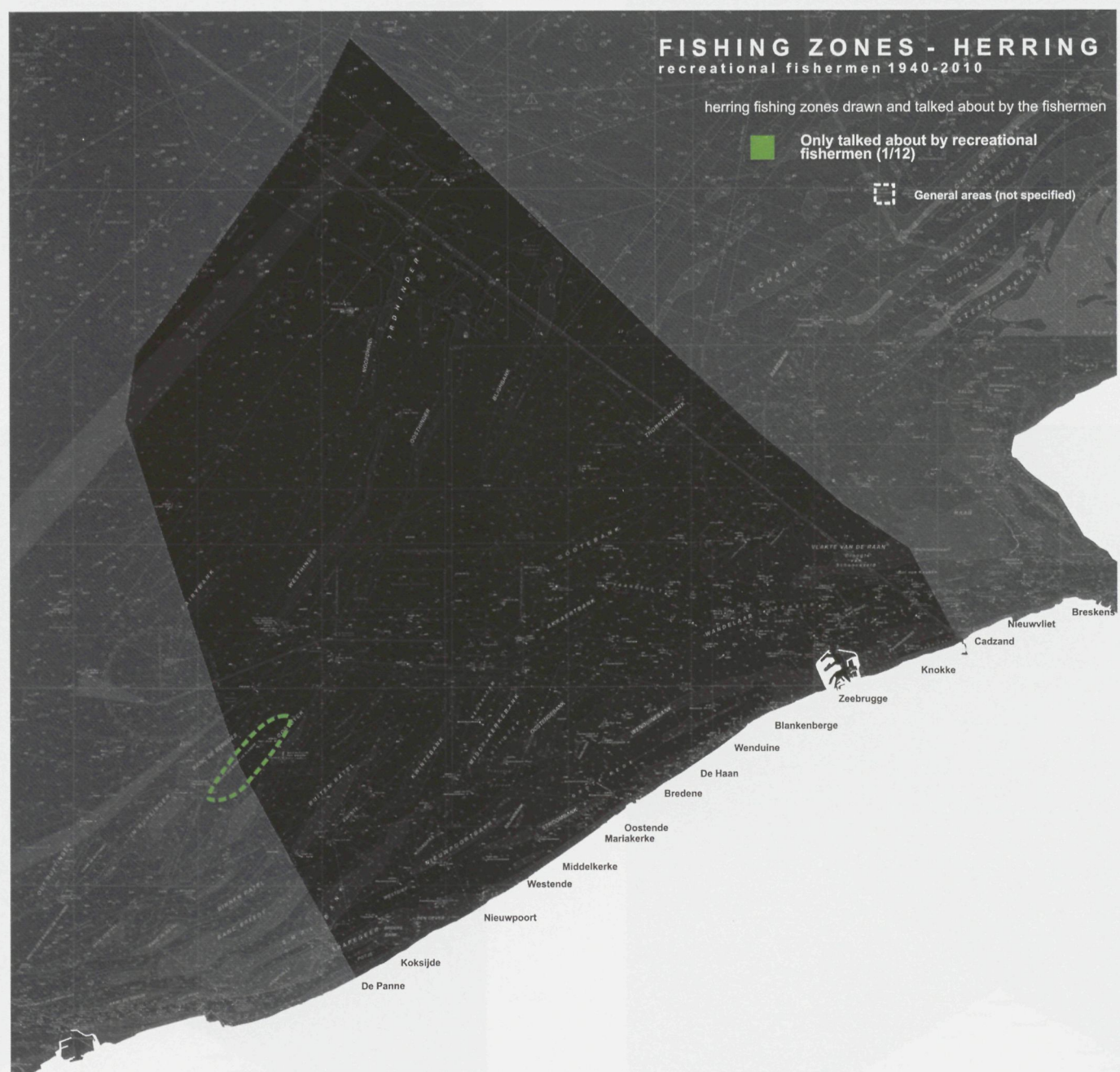
MAPS SERIES VI

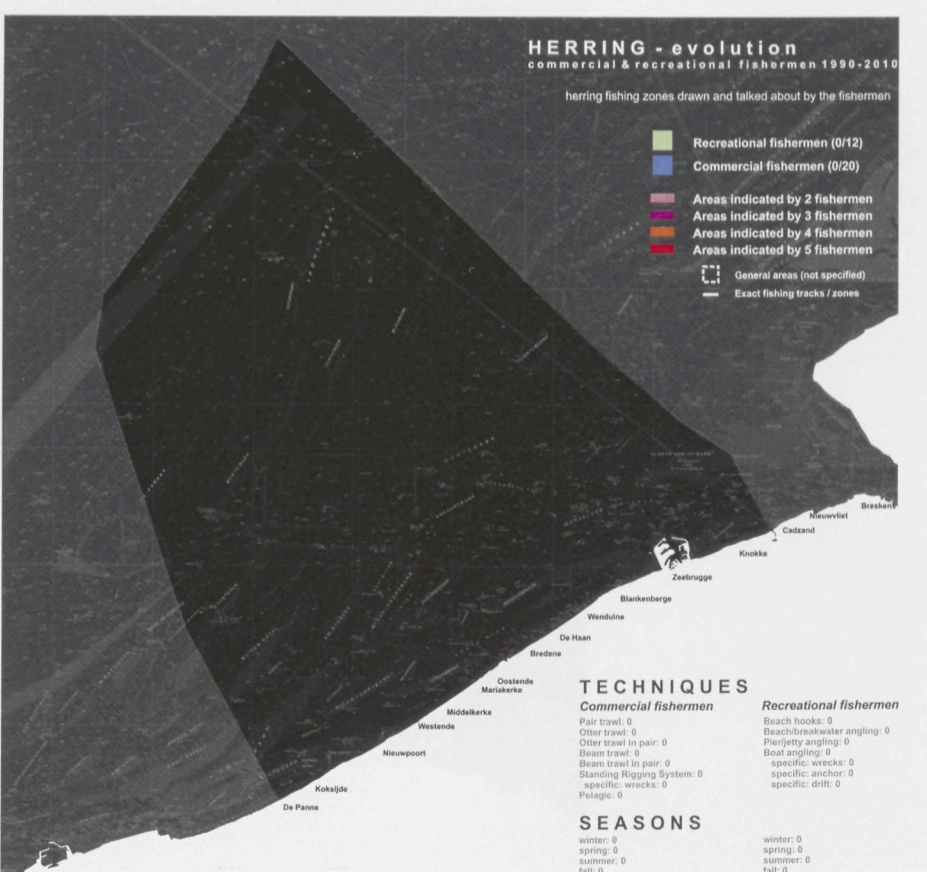
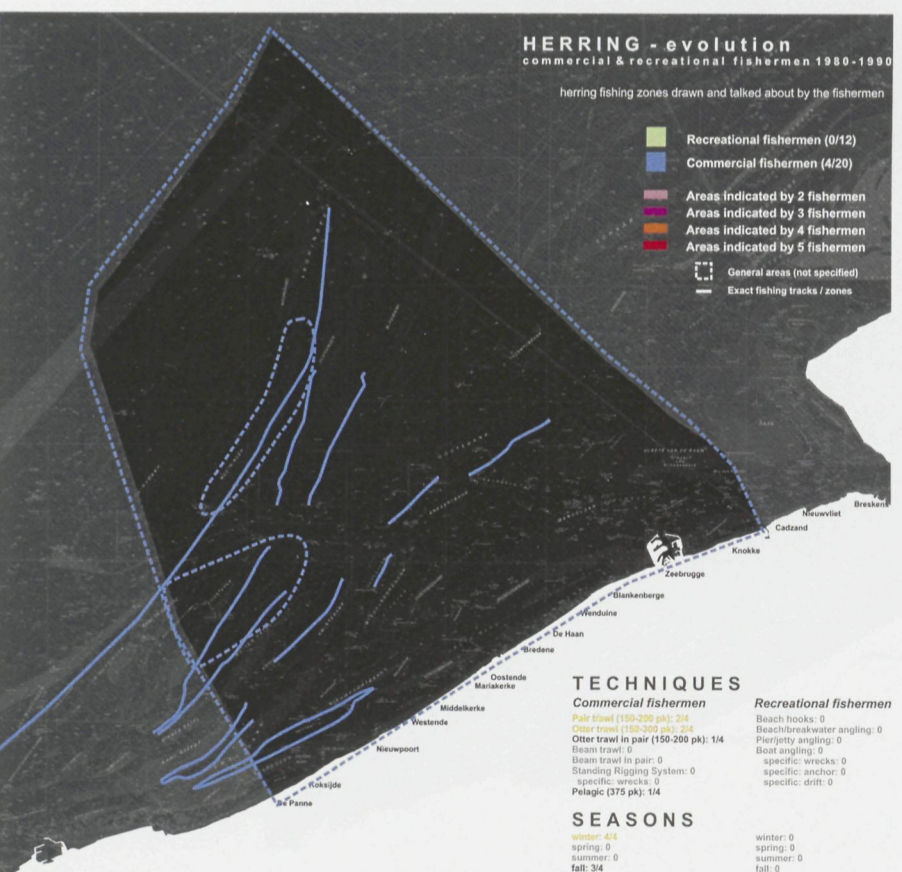
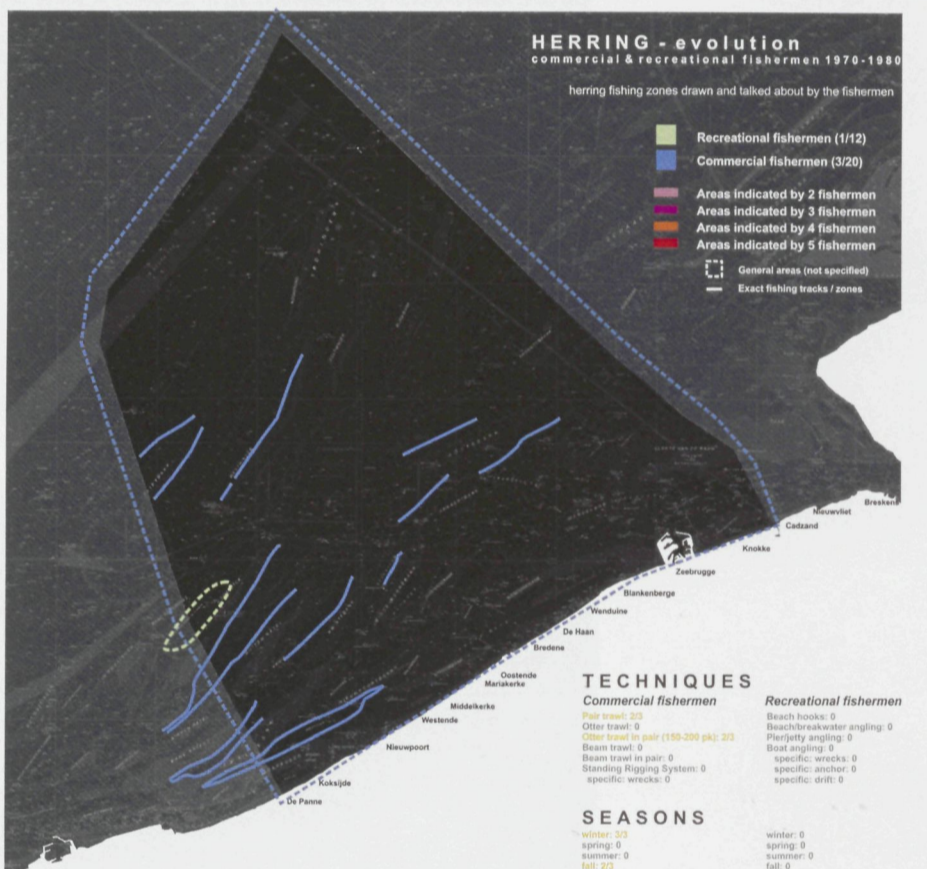
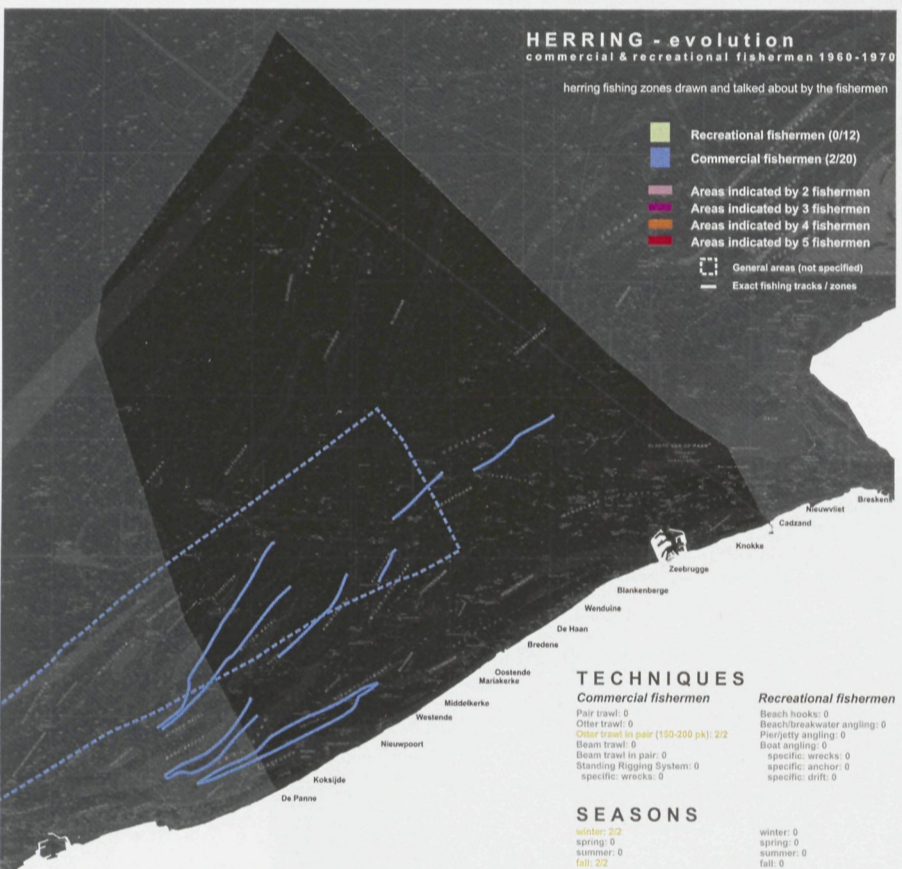
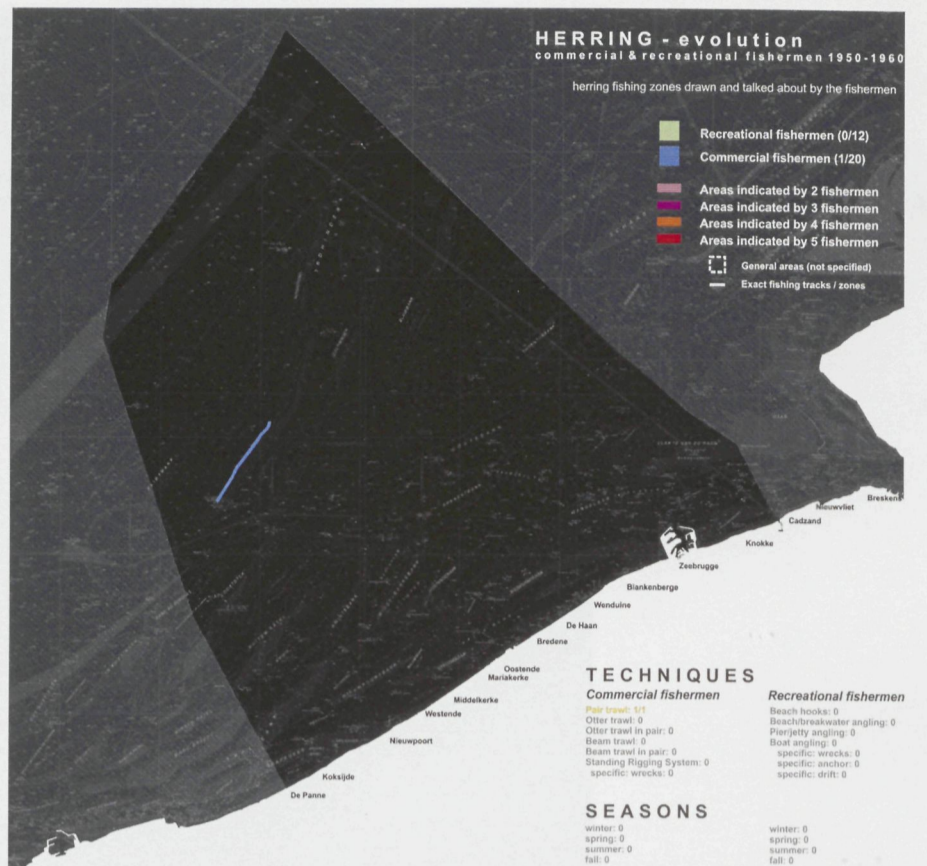
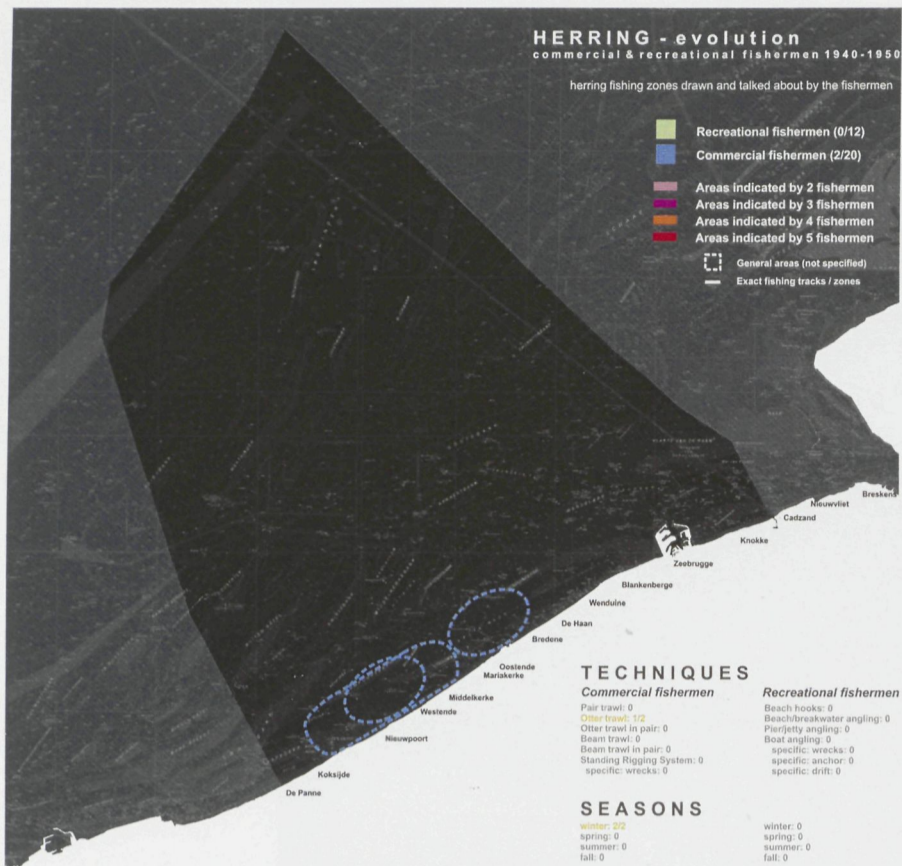
HERRING

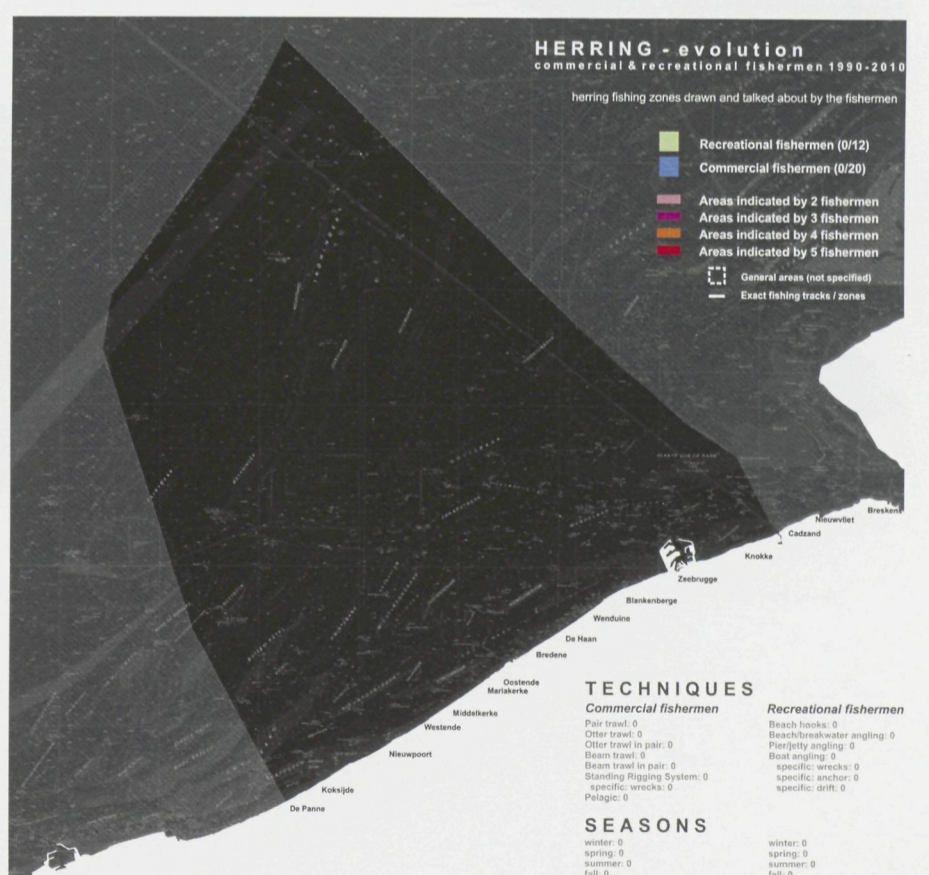
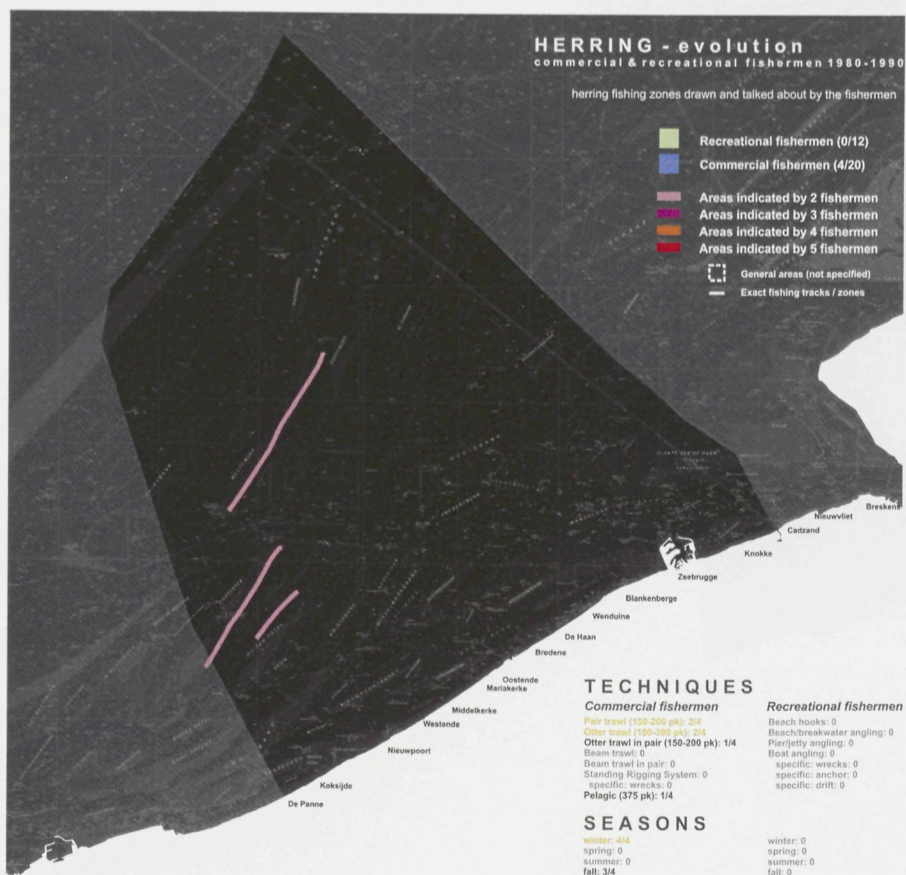
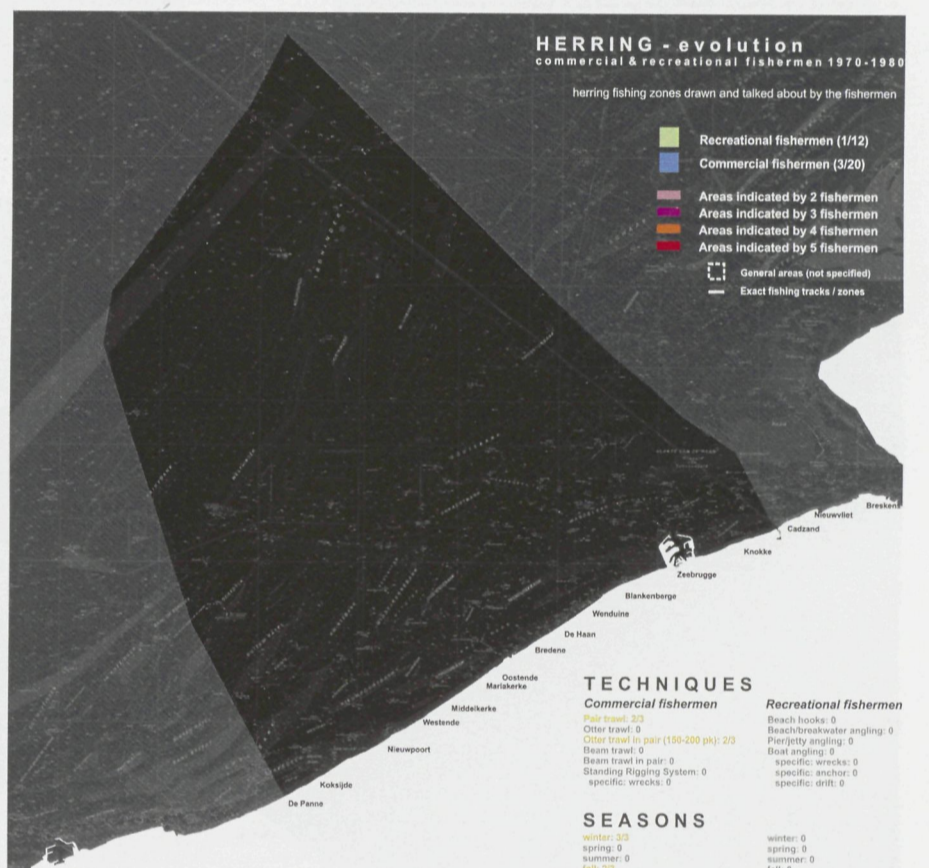
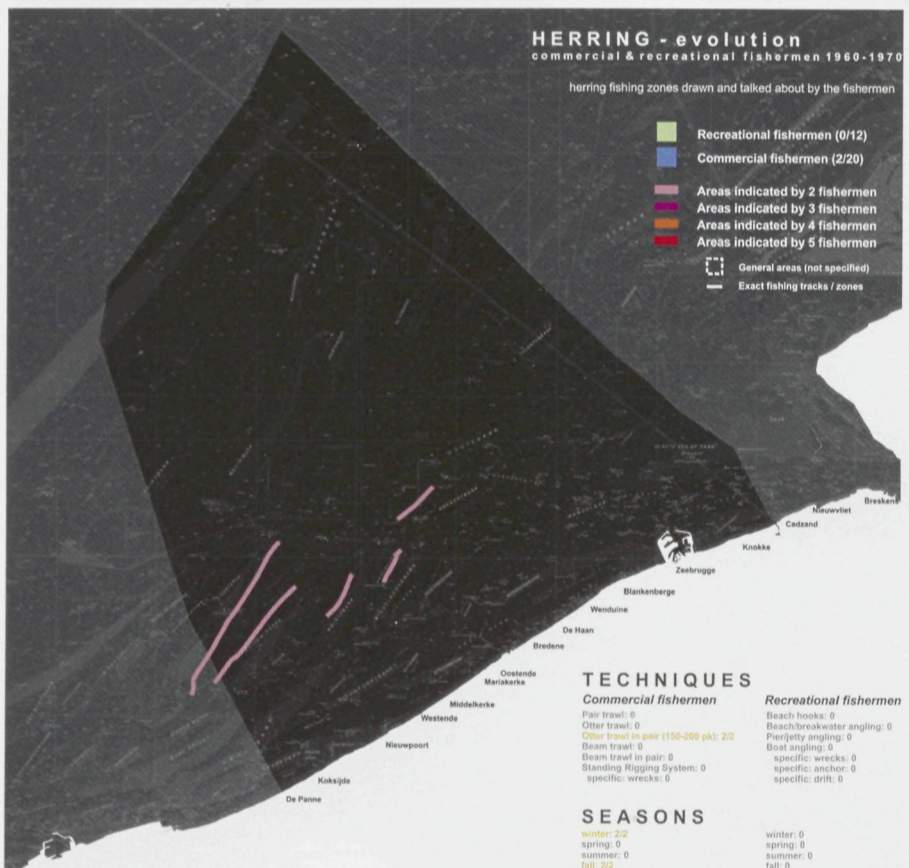
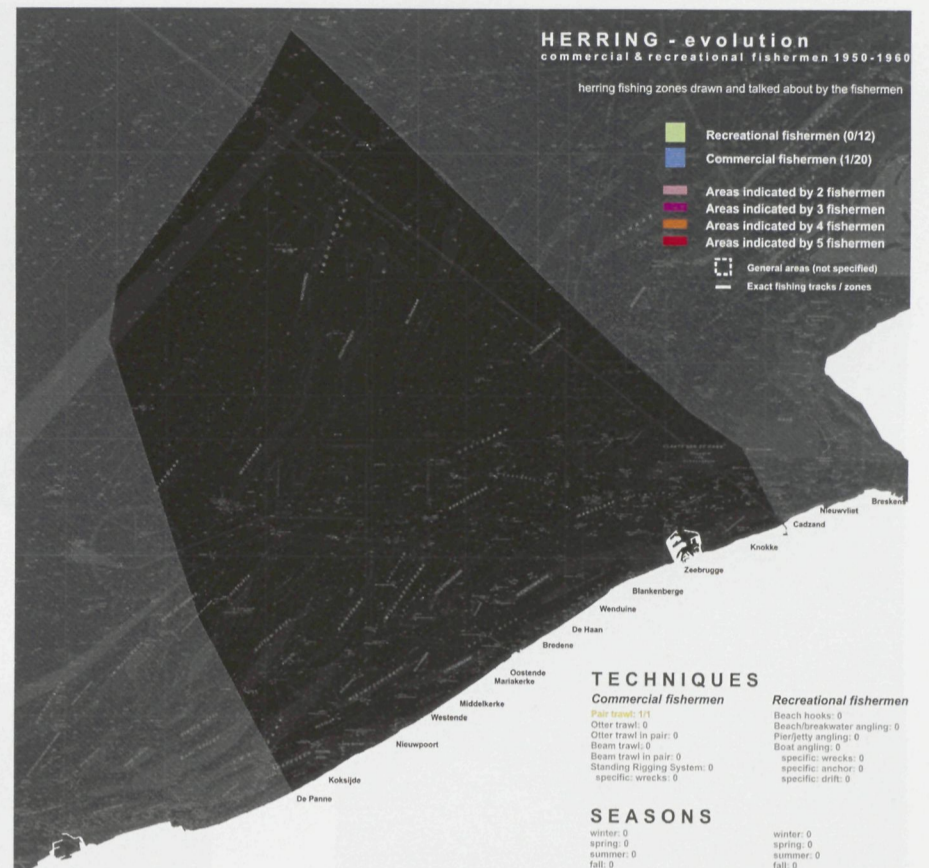
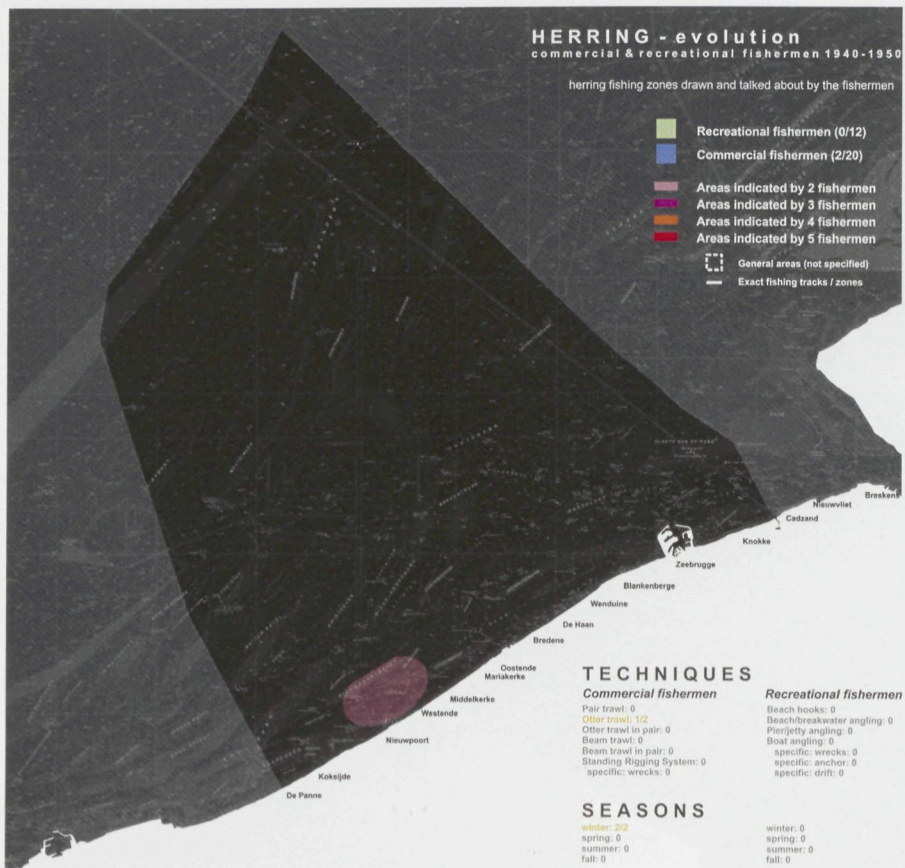
HERRING - fishing zones
how you can find them
1040-4040



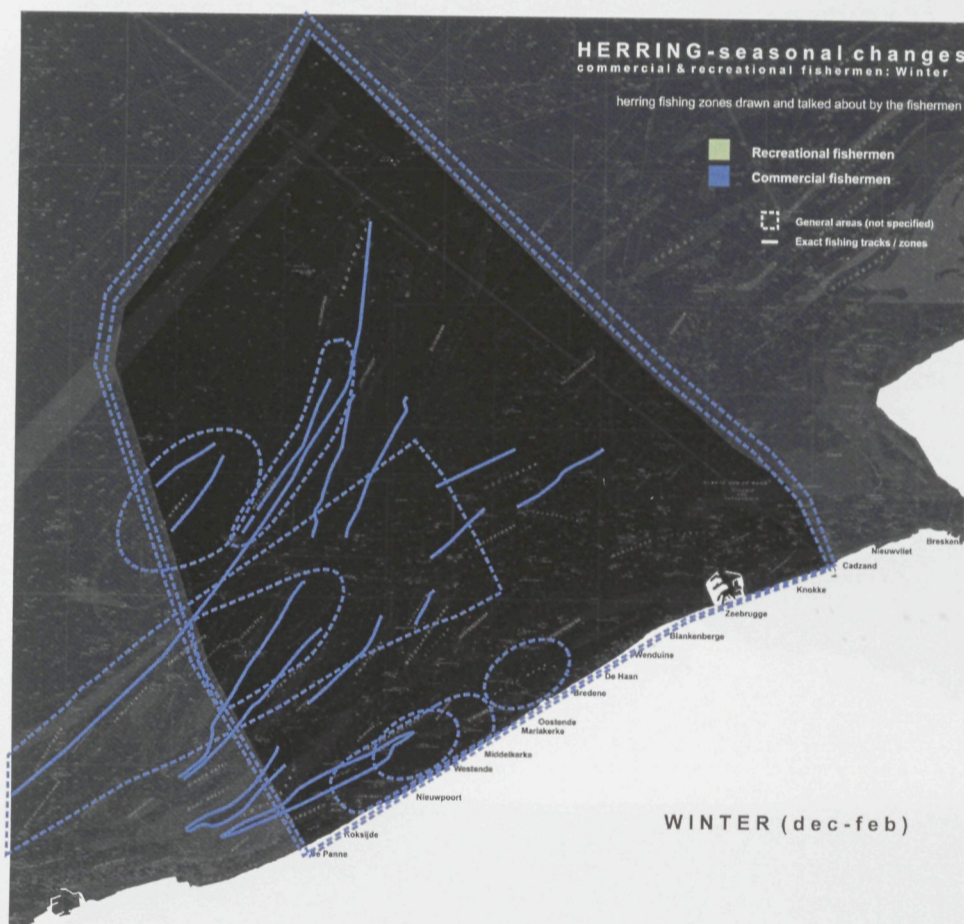
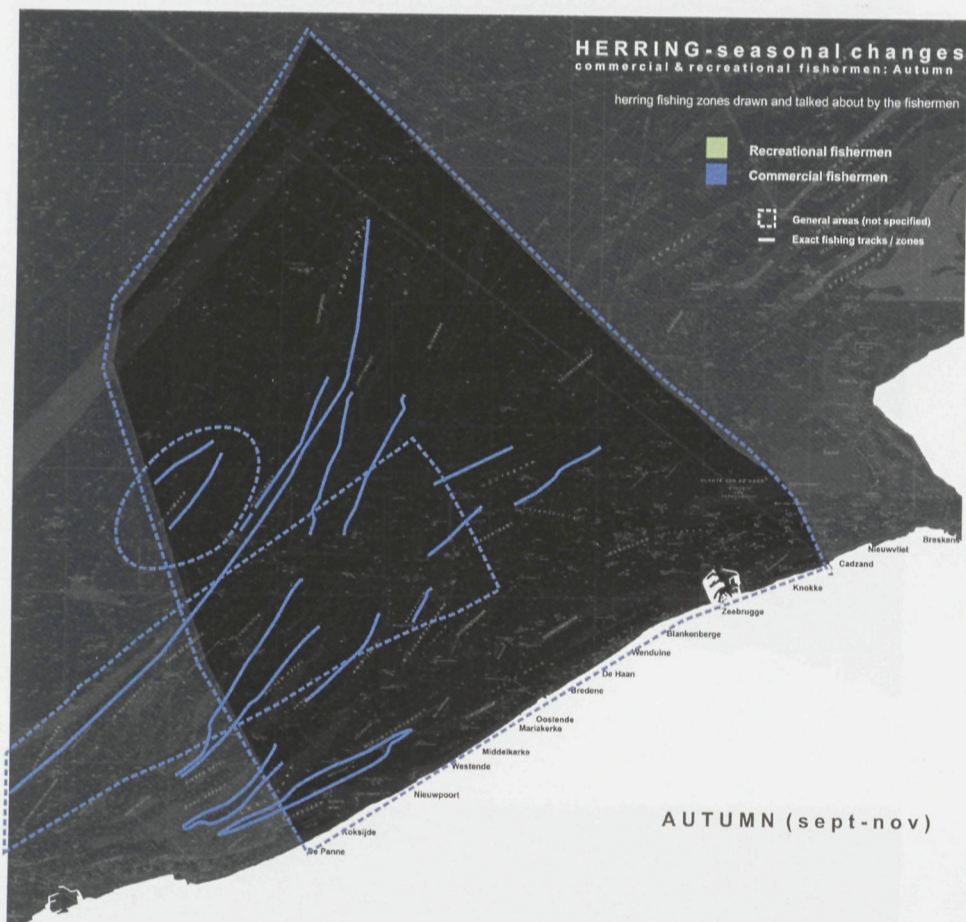
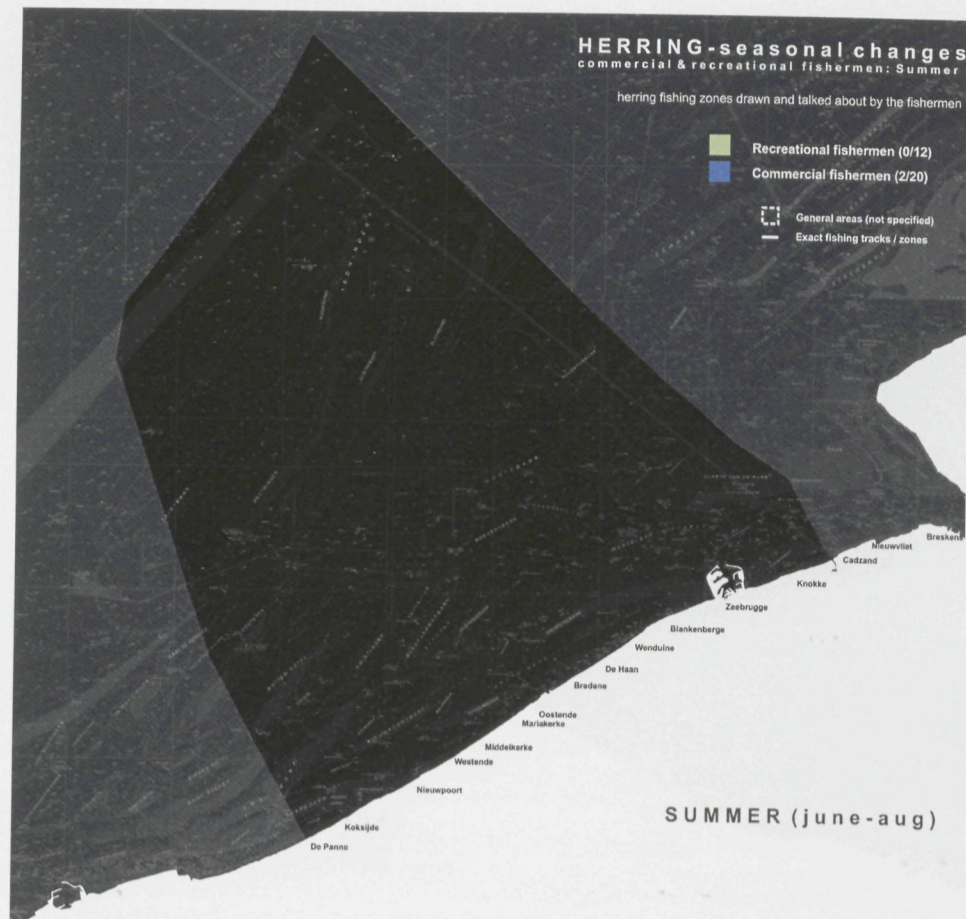
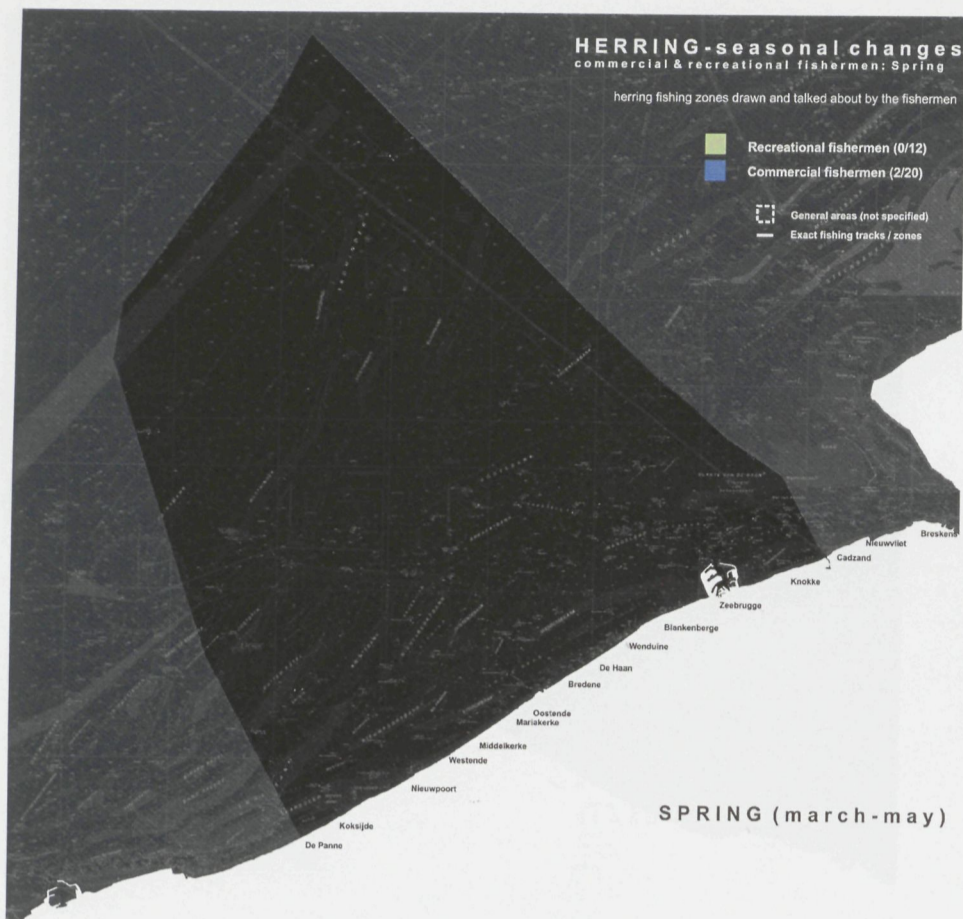
HERRING - fishing zones
drawn and talked about
commercial & recreational fishermen 1940 - 2010

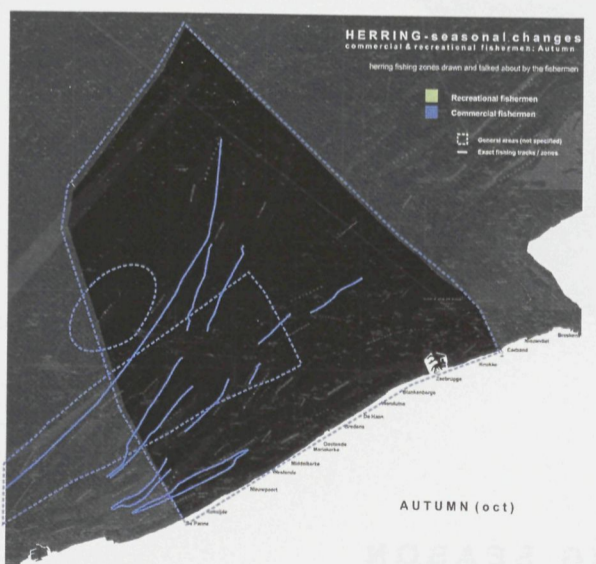
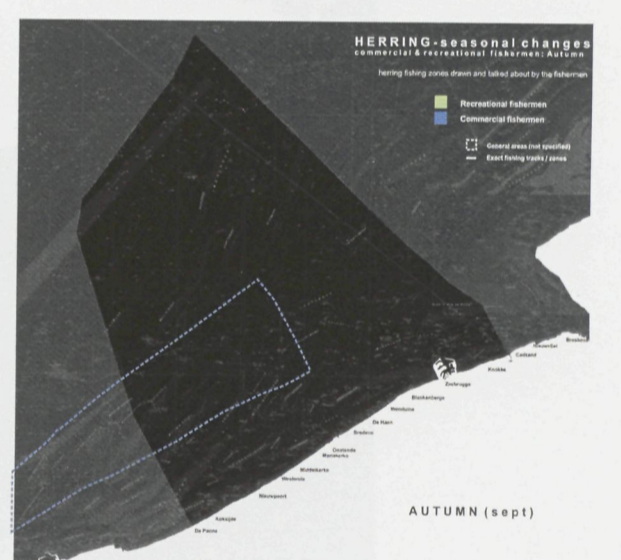
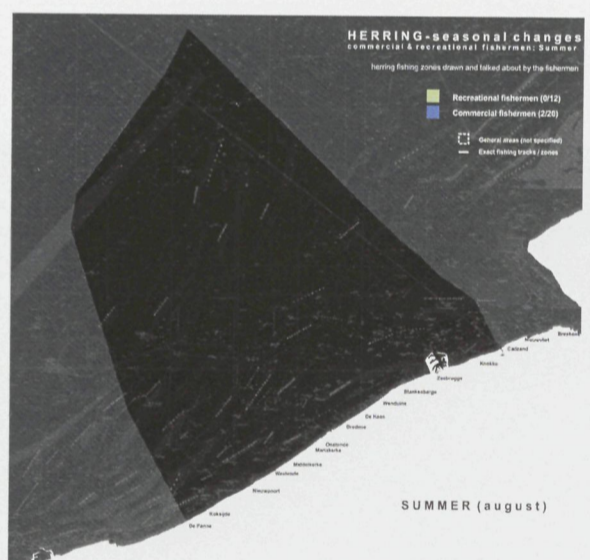
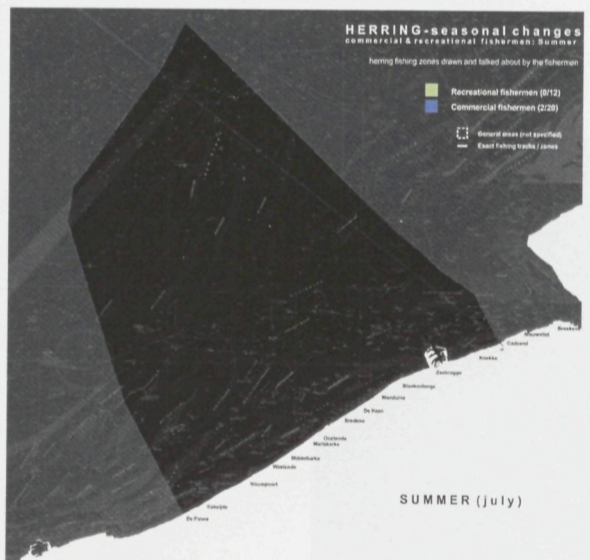
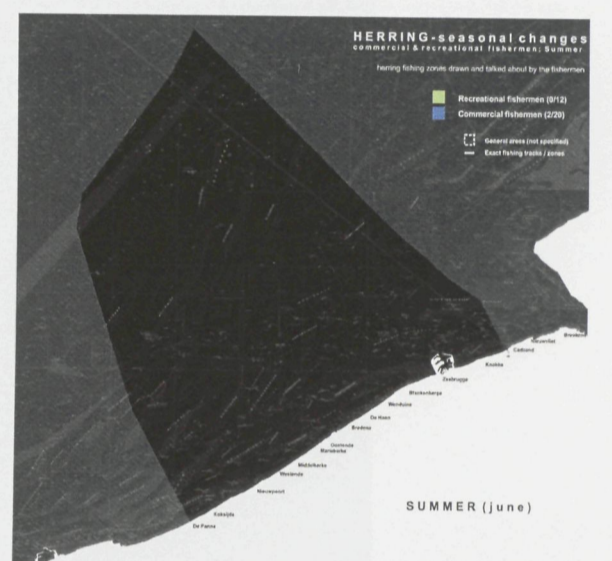
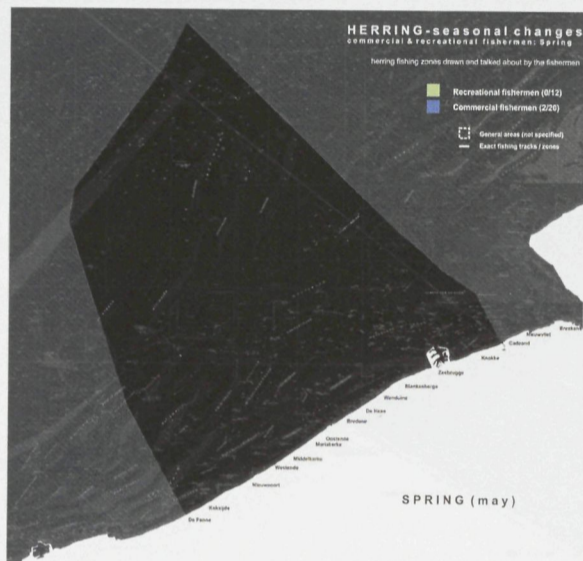
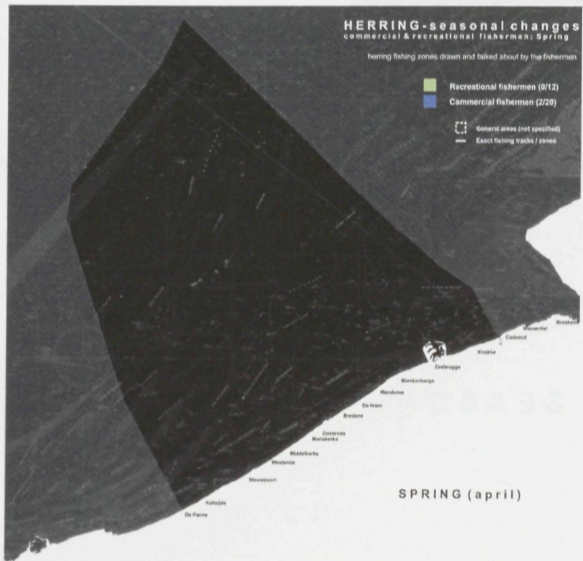
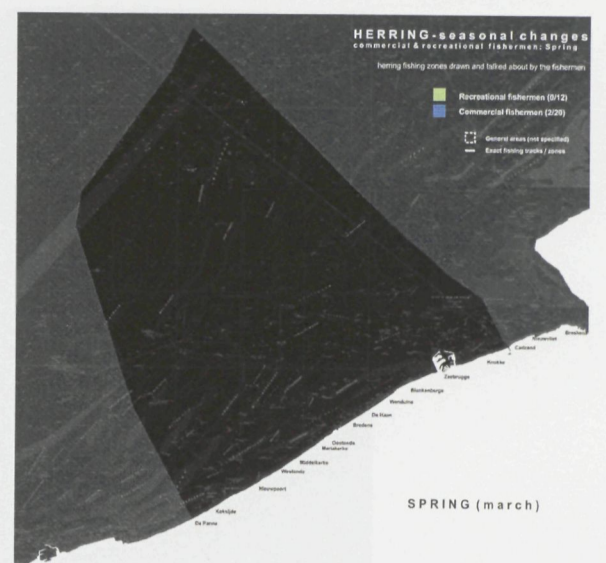




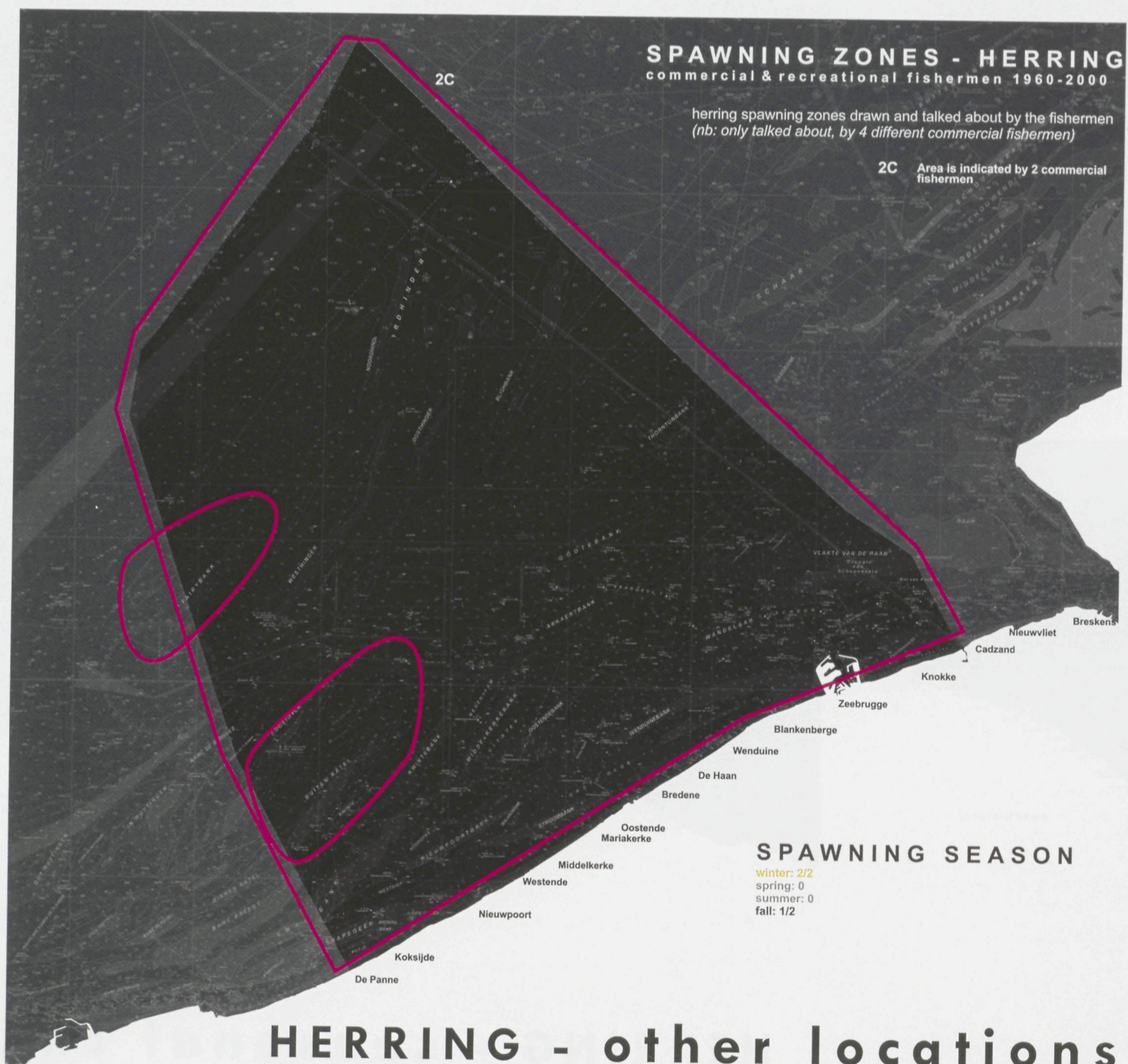
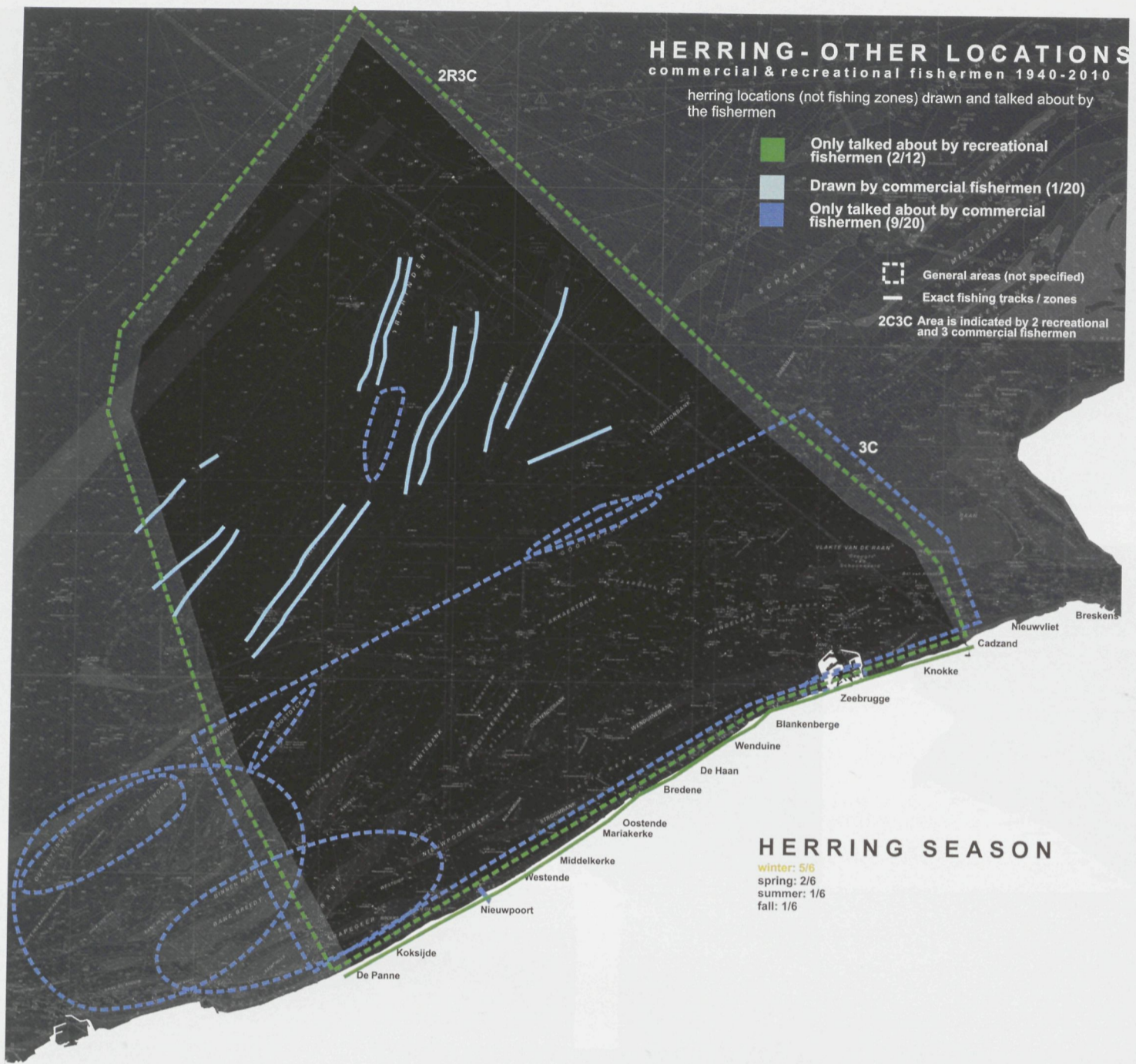


HERRING - evolution
commercial & recreational fishermen 1940 - 2010
areas fished by 2 or more fishermen





HERRING - seasonal changes
january-december
commercial & recreational fishermen 1940 - 2010



HERRING - other locations & spawning zones

commercial & recreational fishermen 1940 - 2010

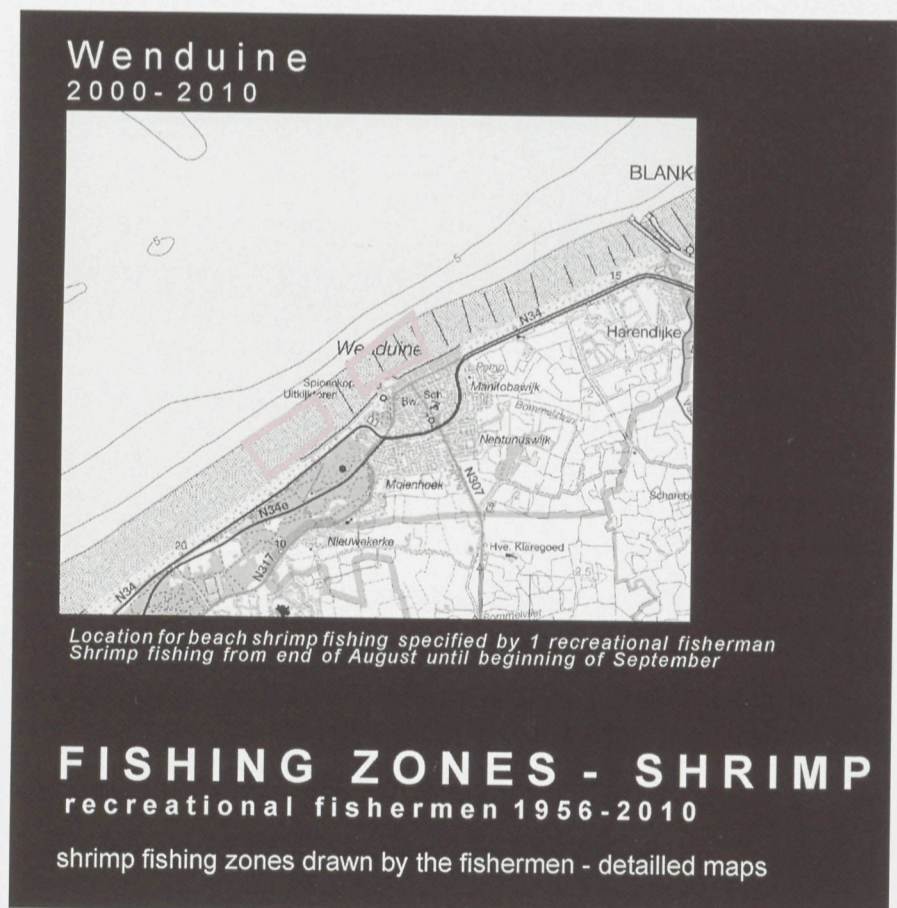
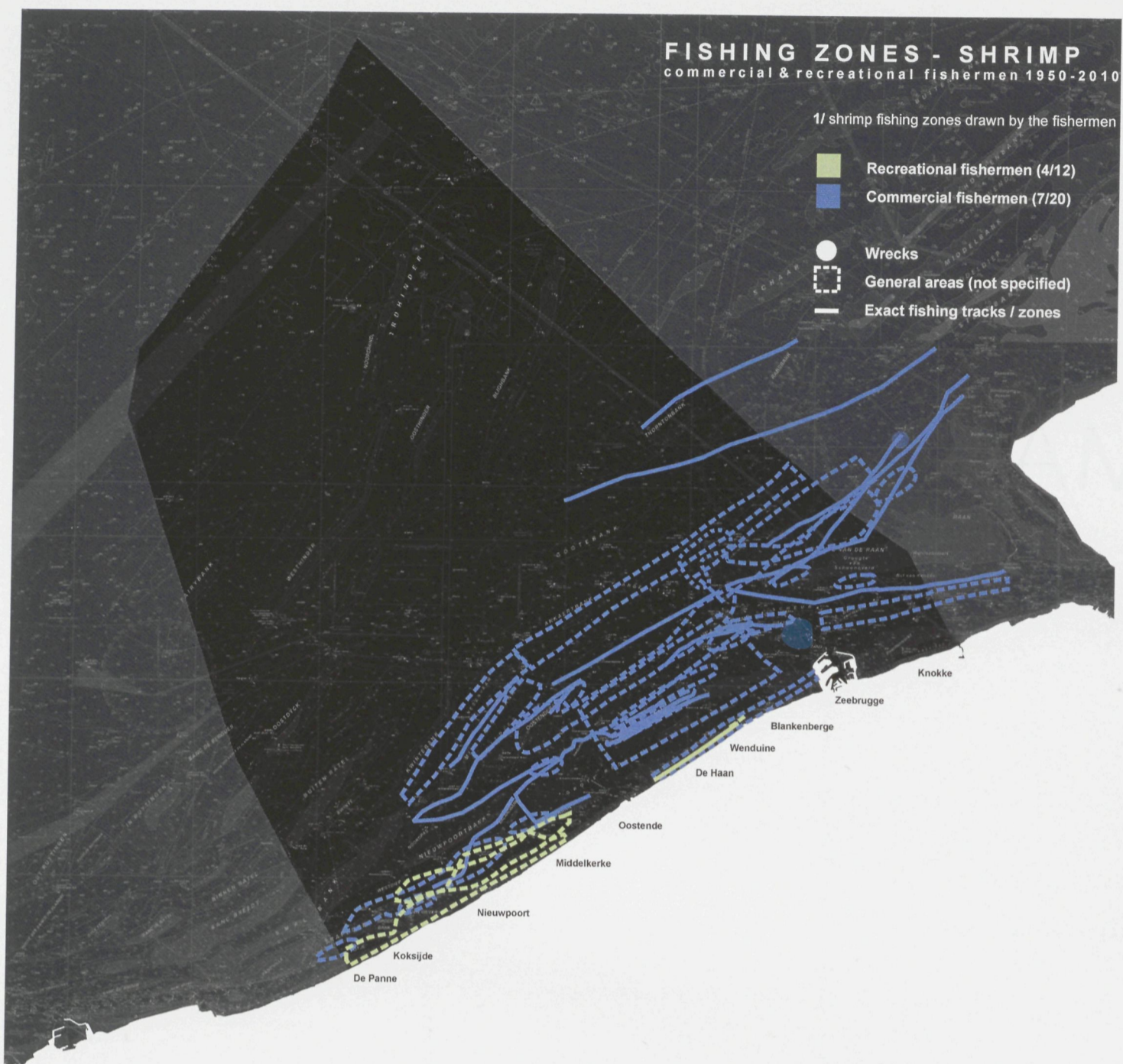
MAPS SERIES VII

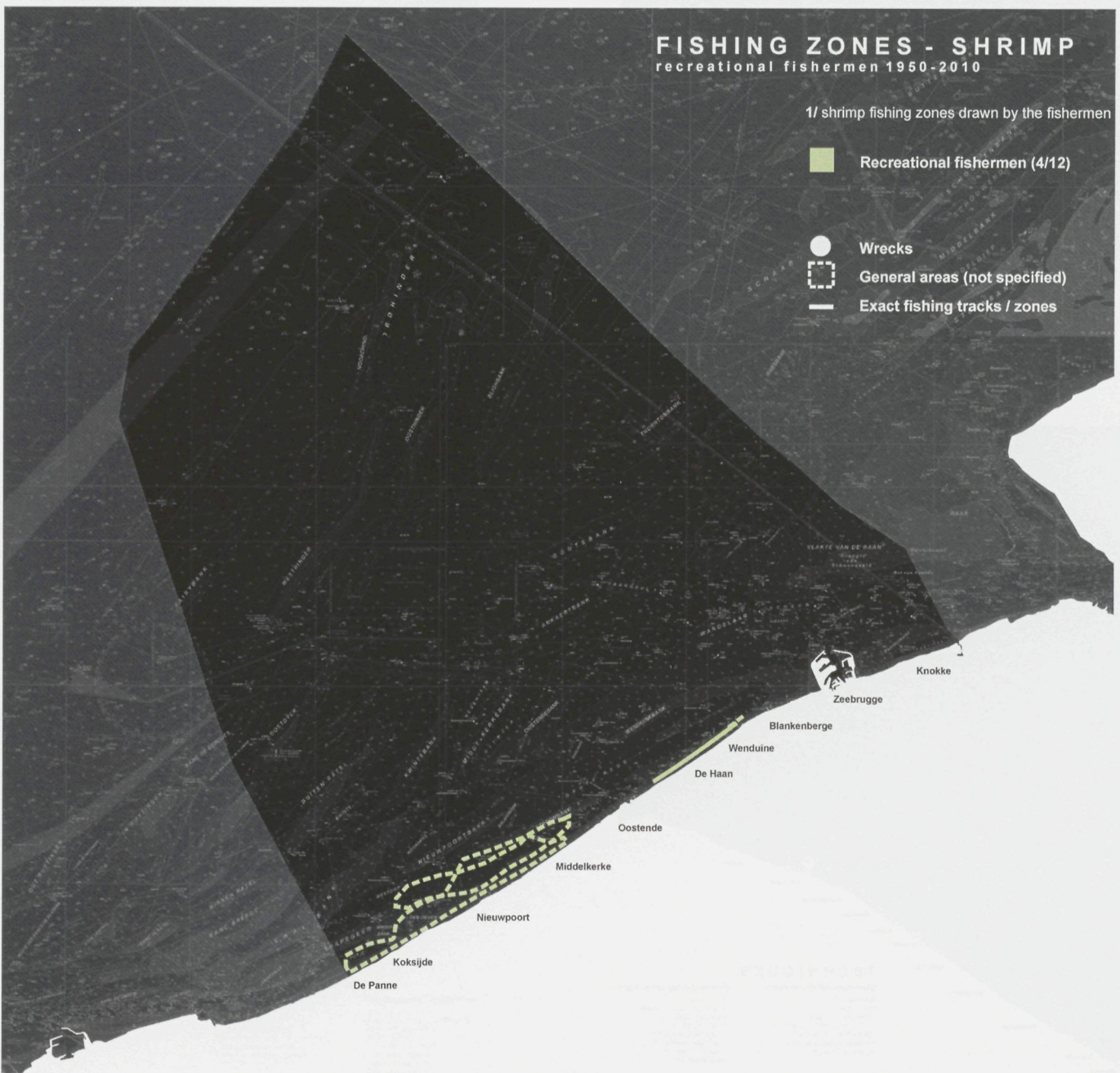
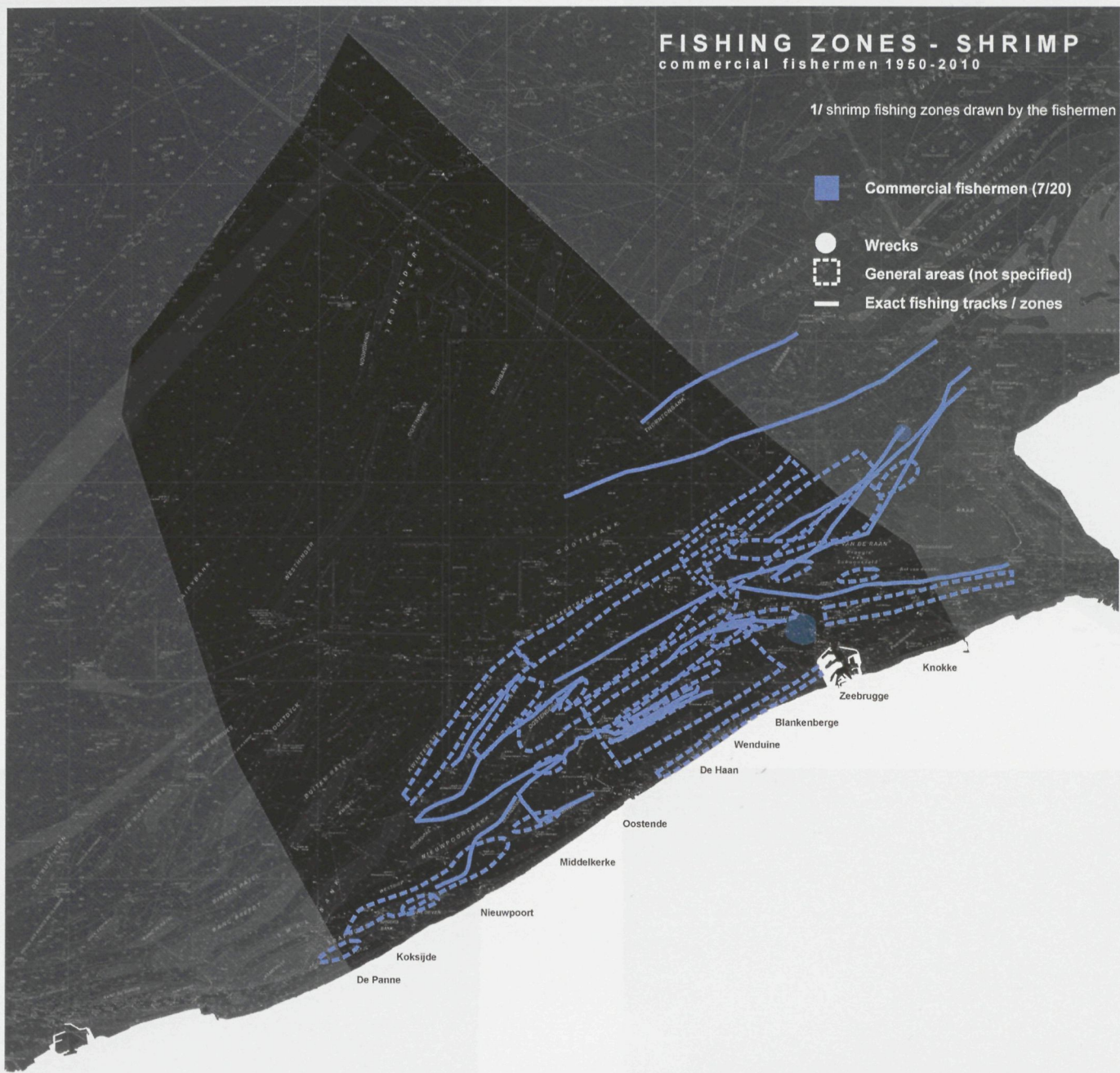
SHRIMP

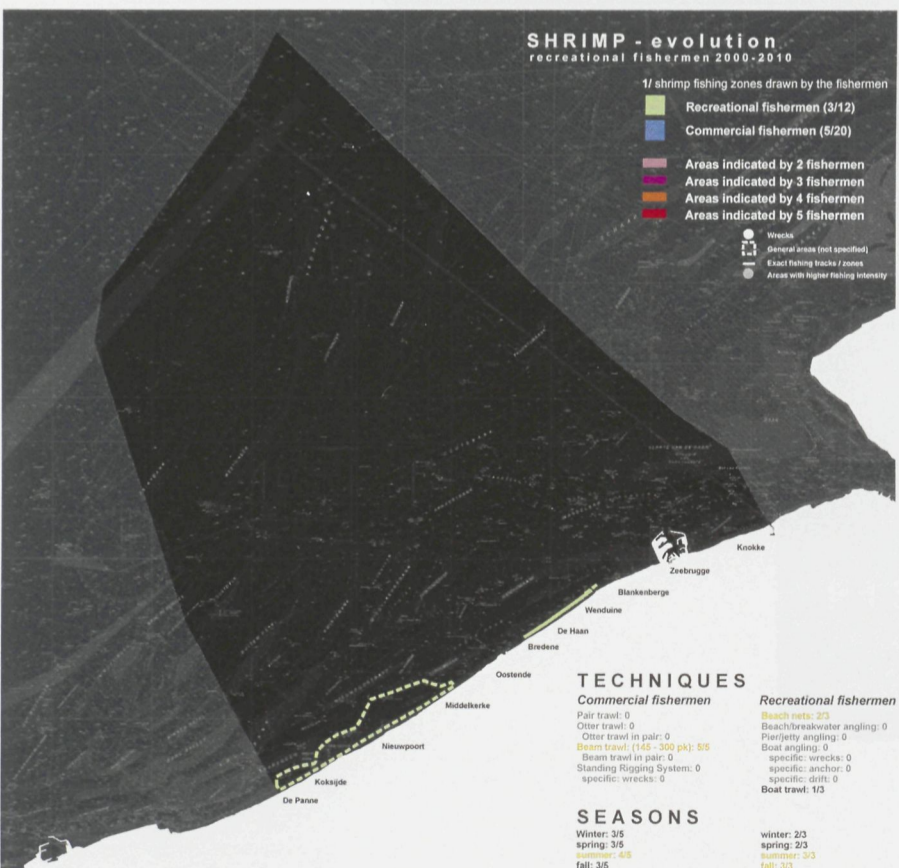
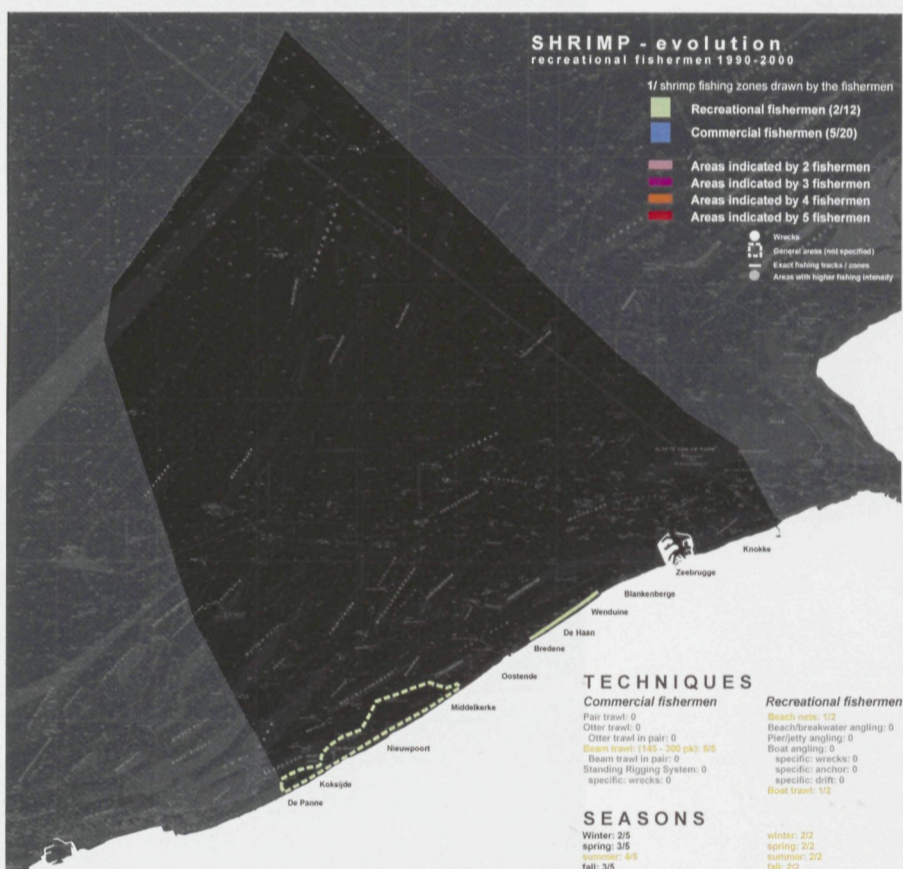
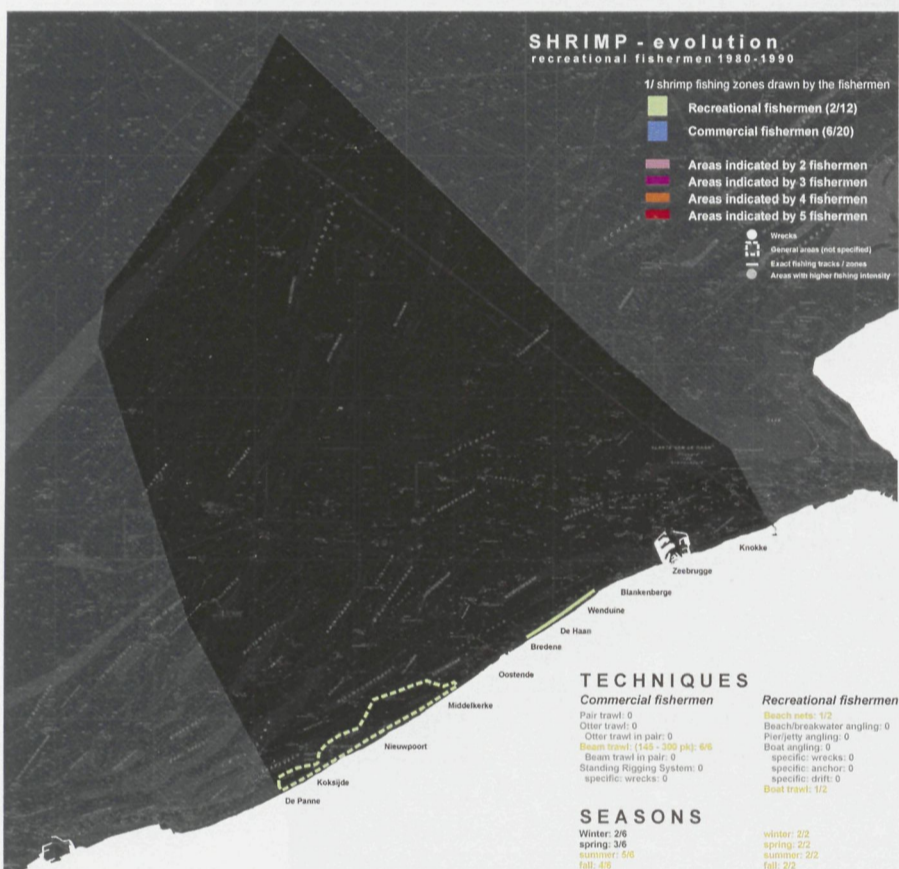
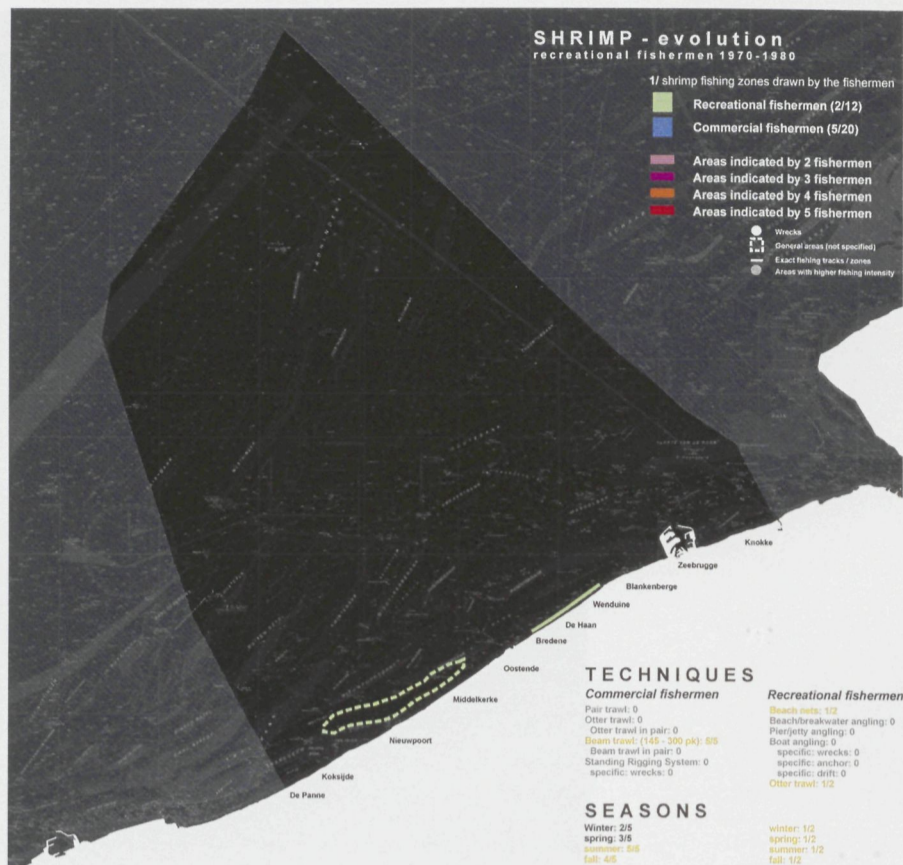
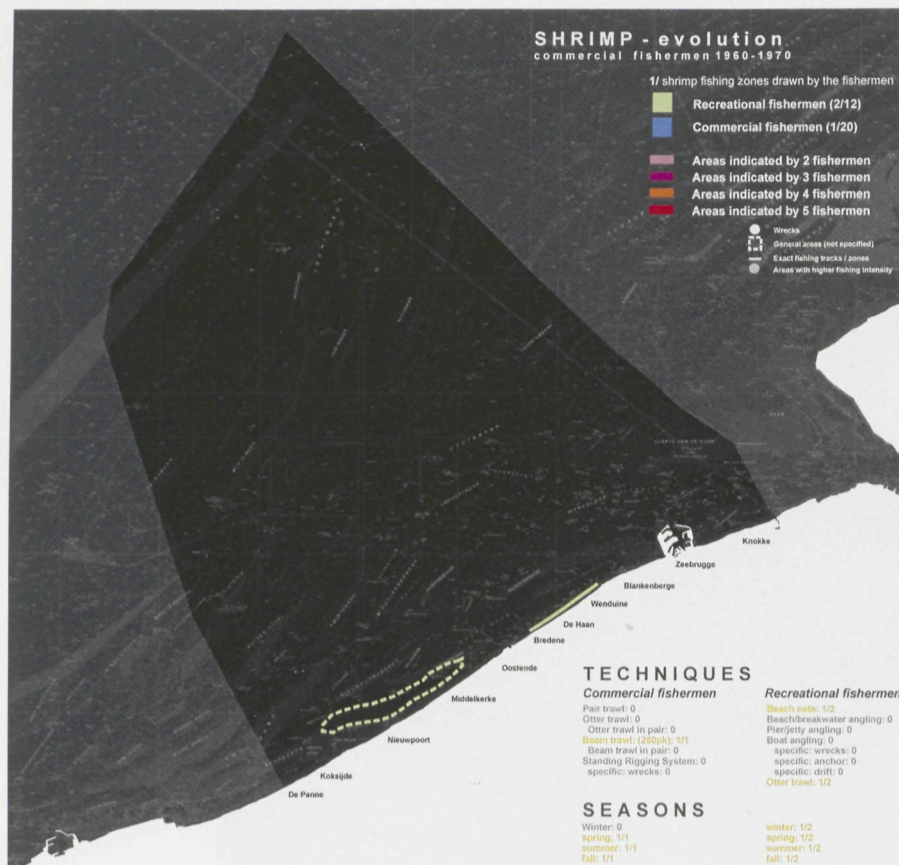


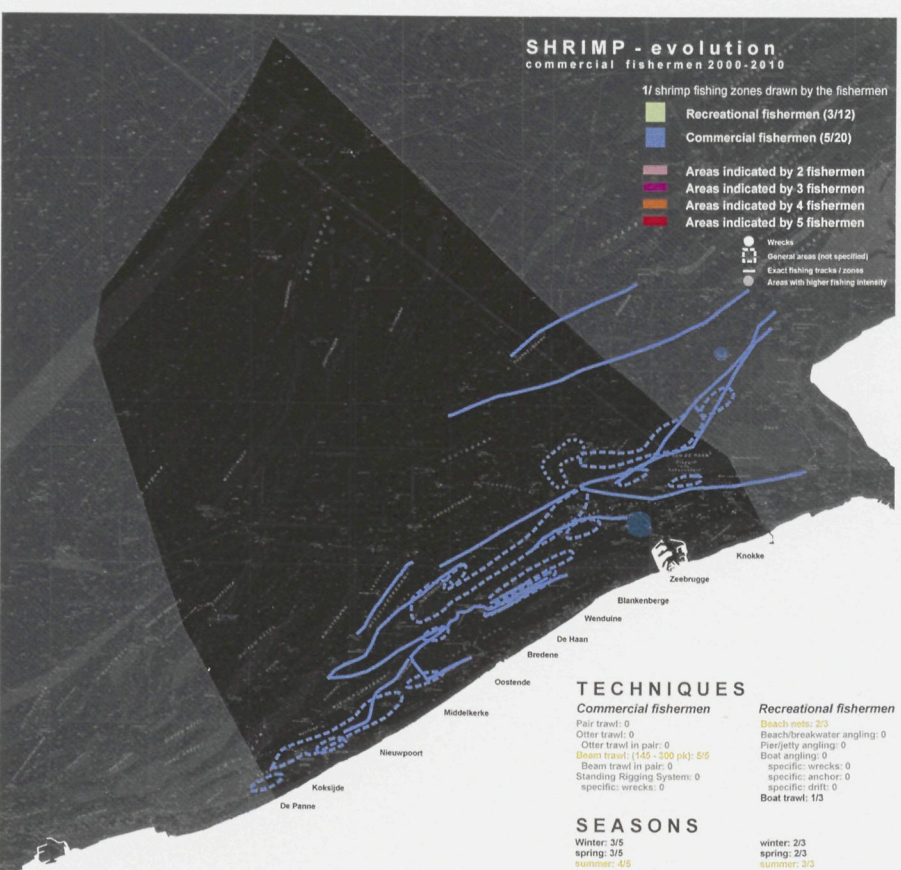
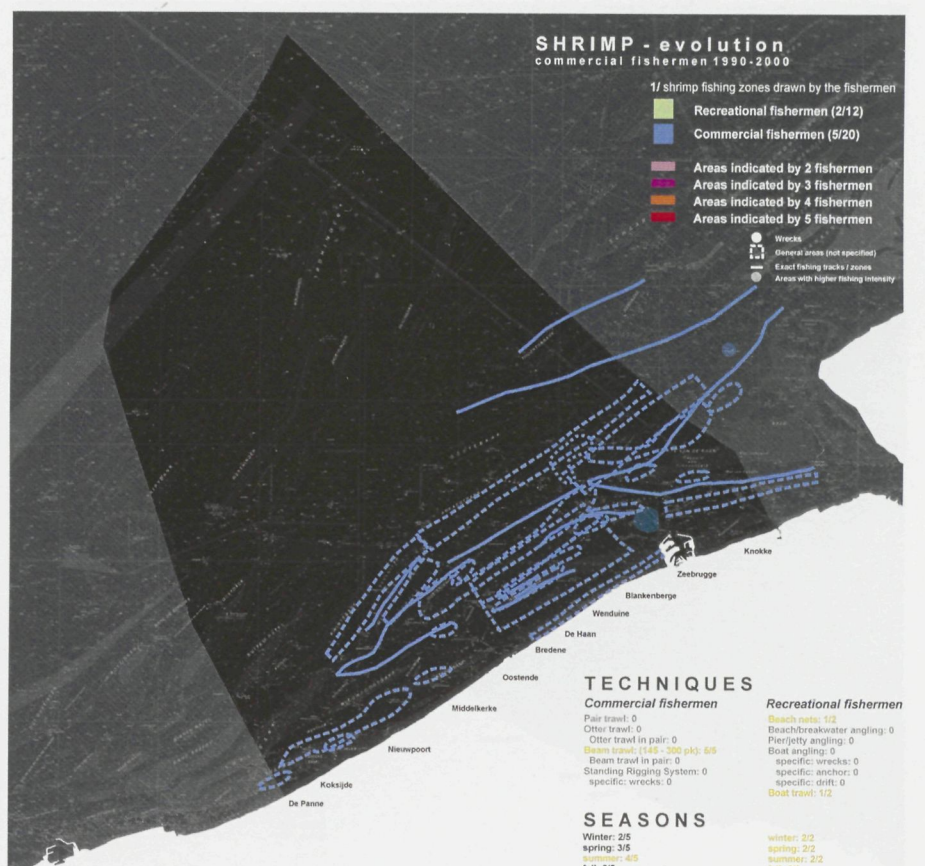
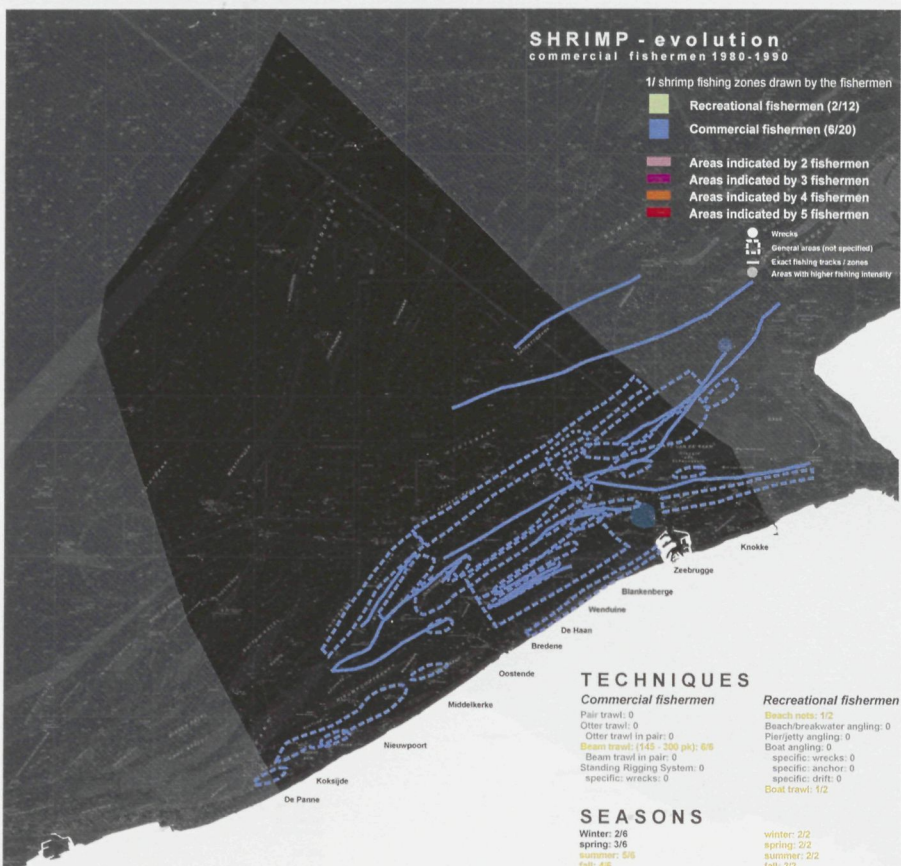
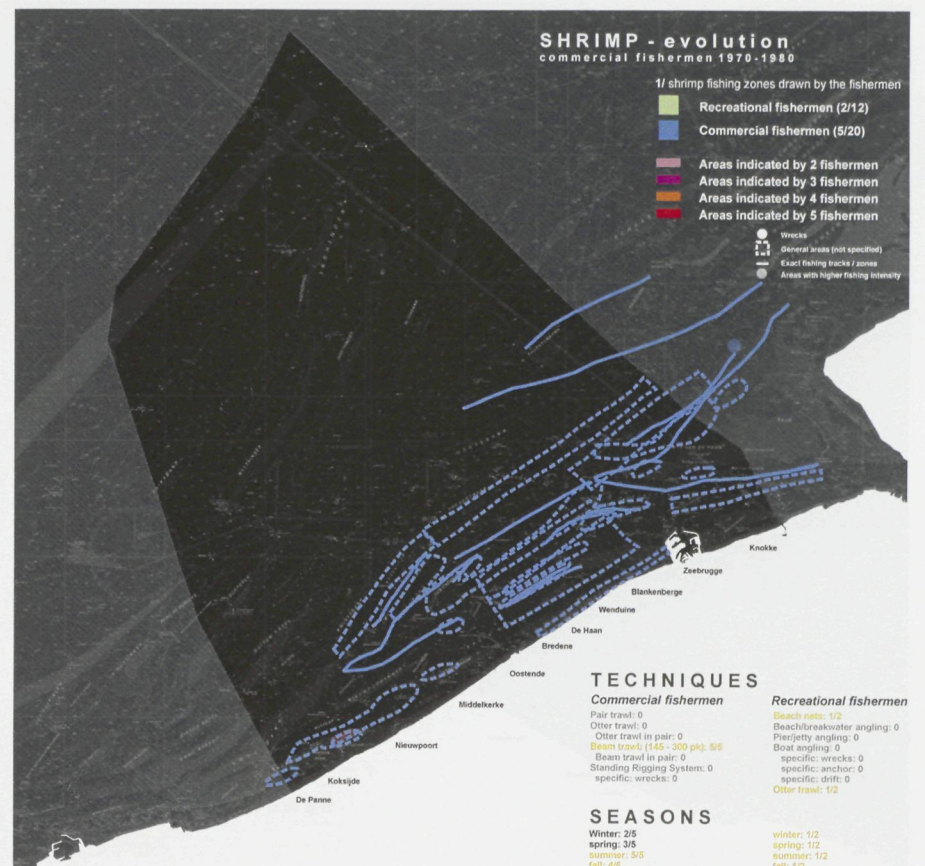
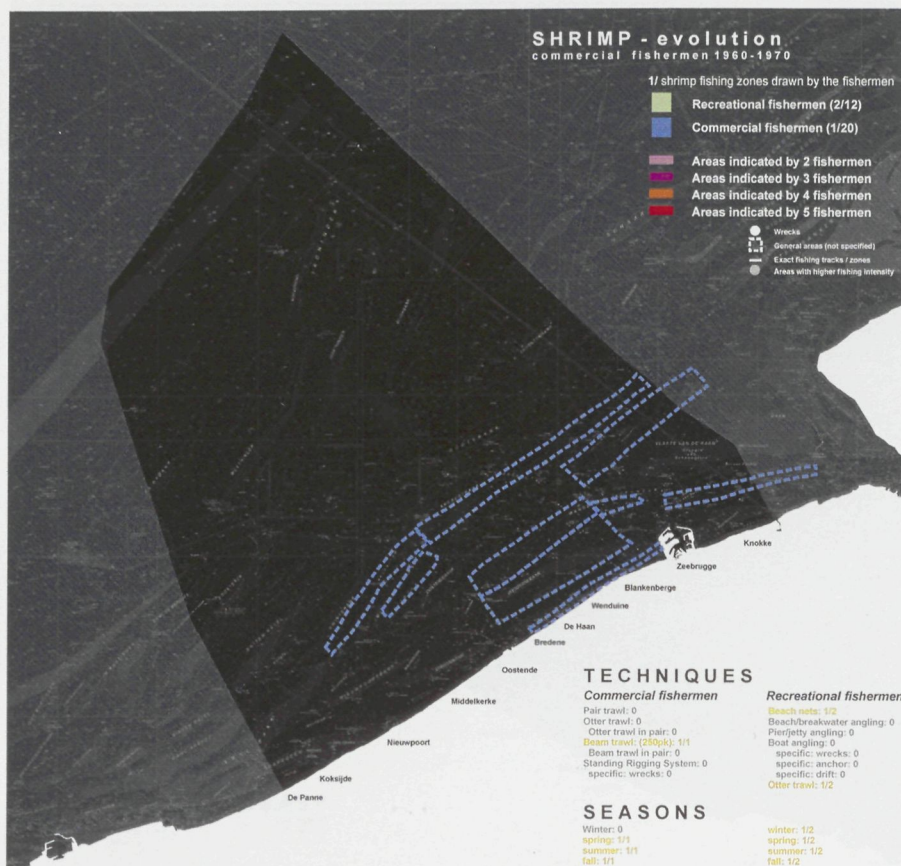
MAPS SERIES VII

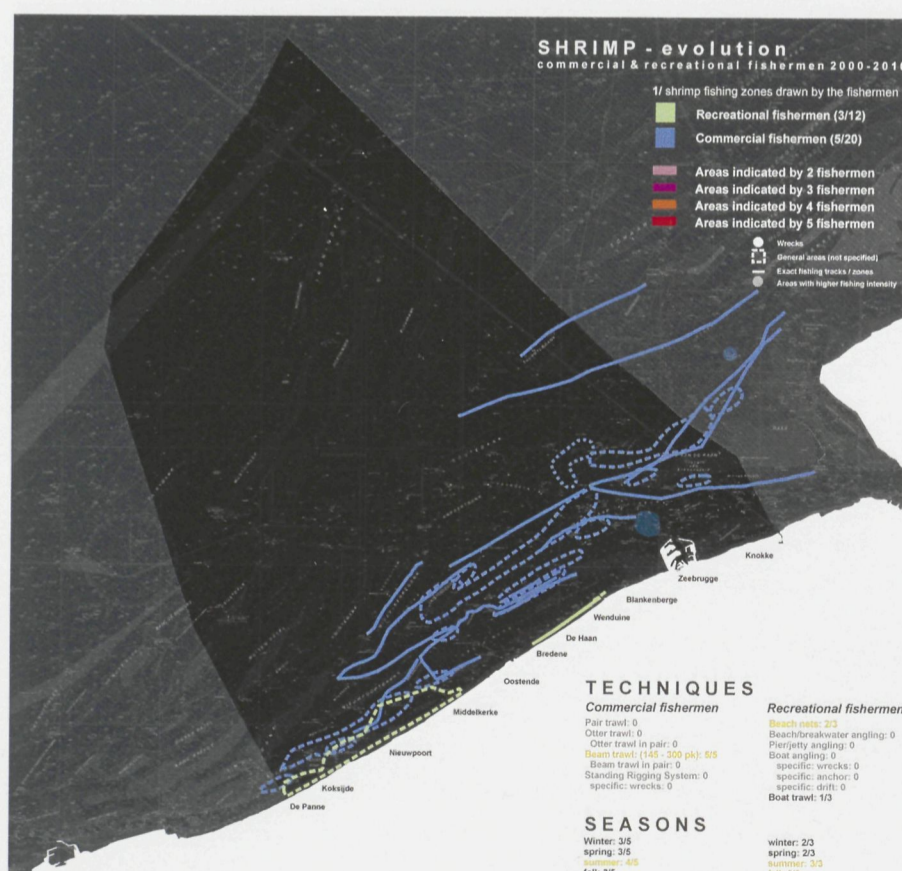
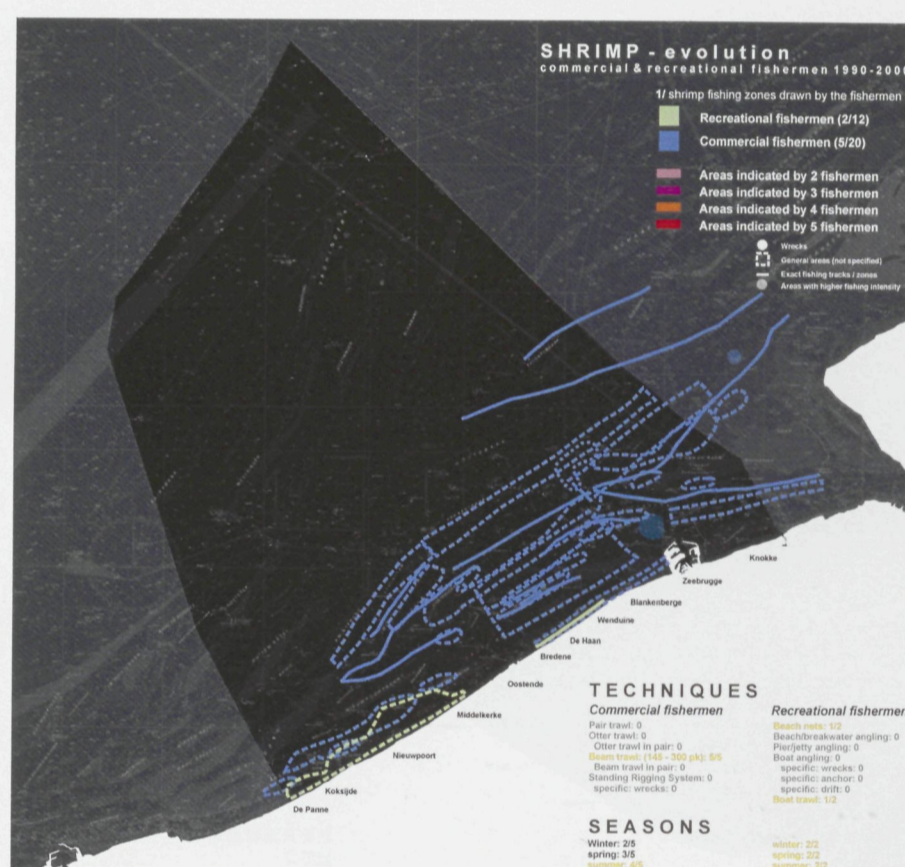
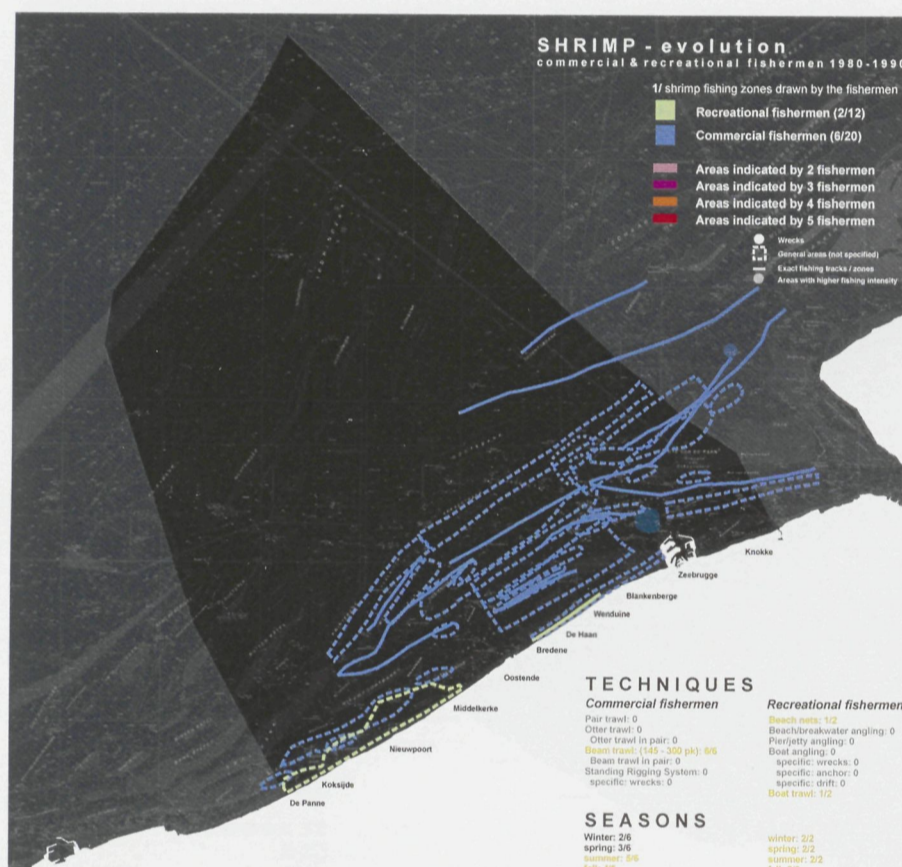
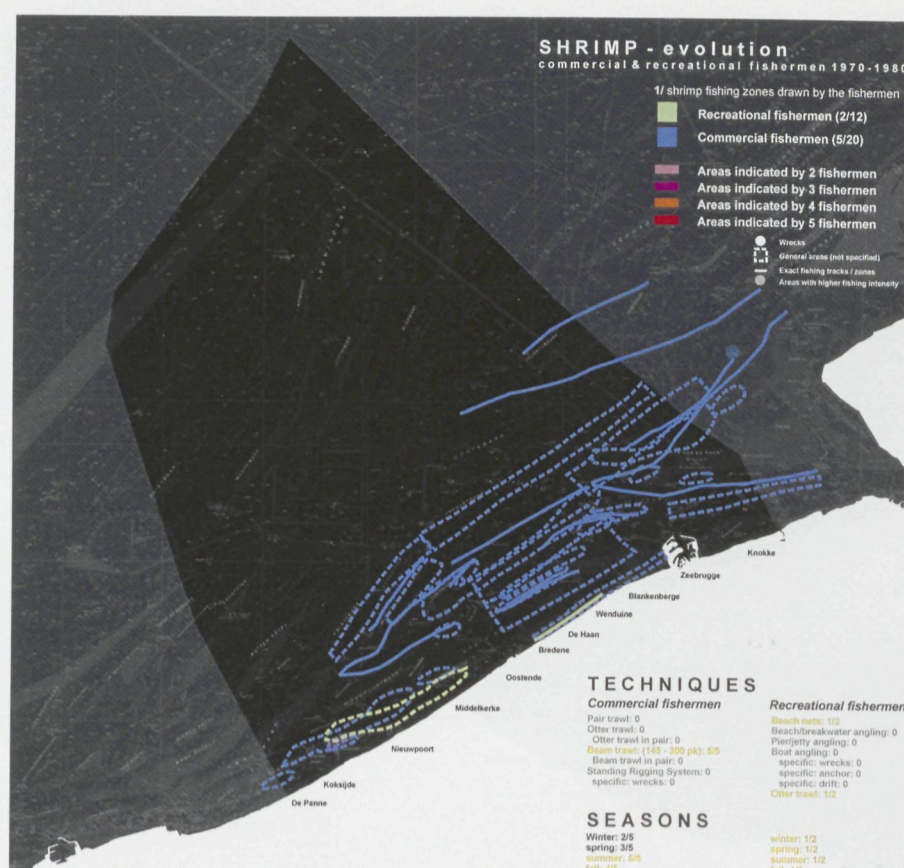
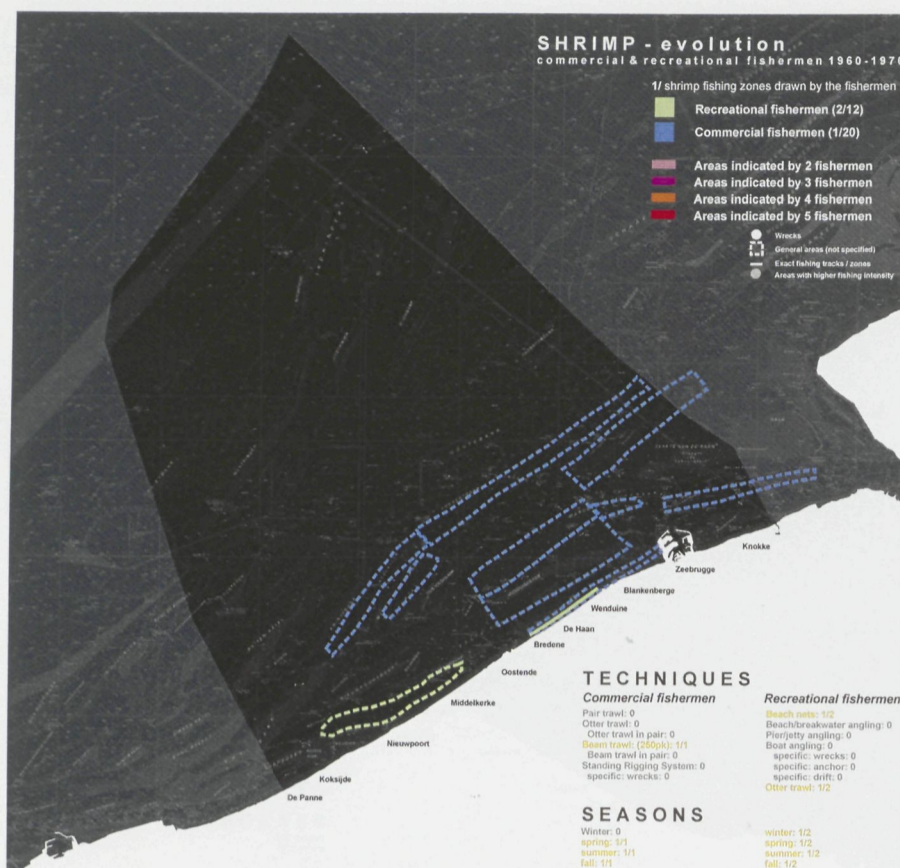
SHRIMP

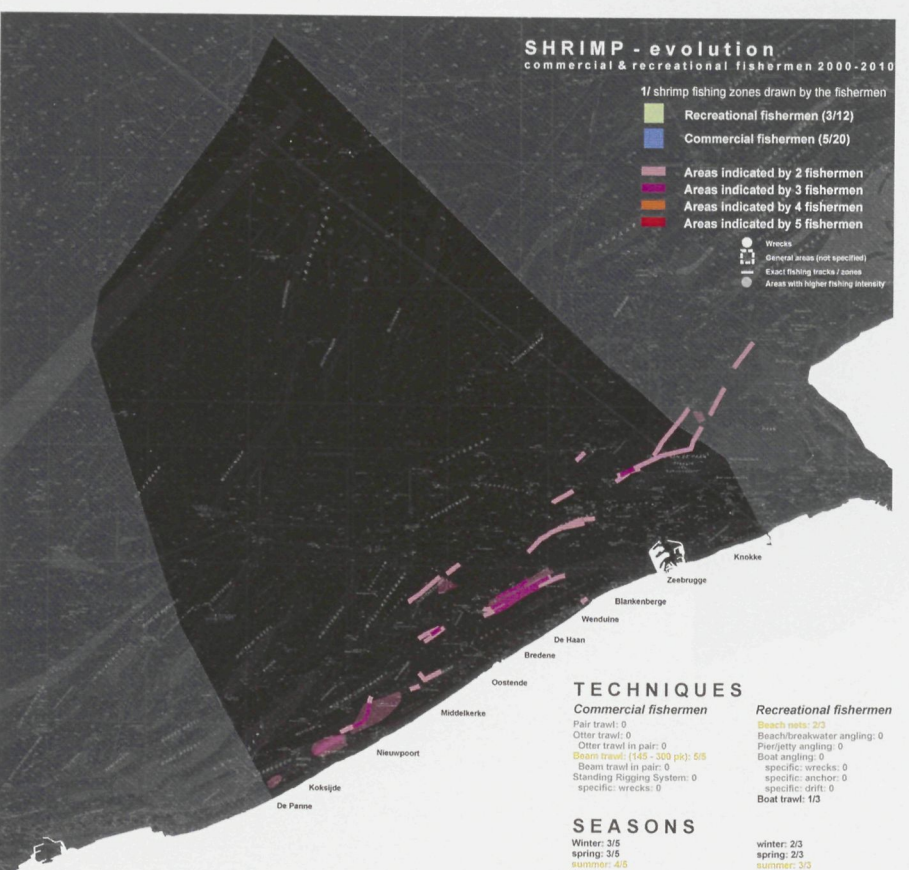
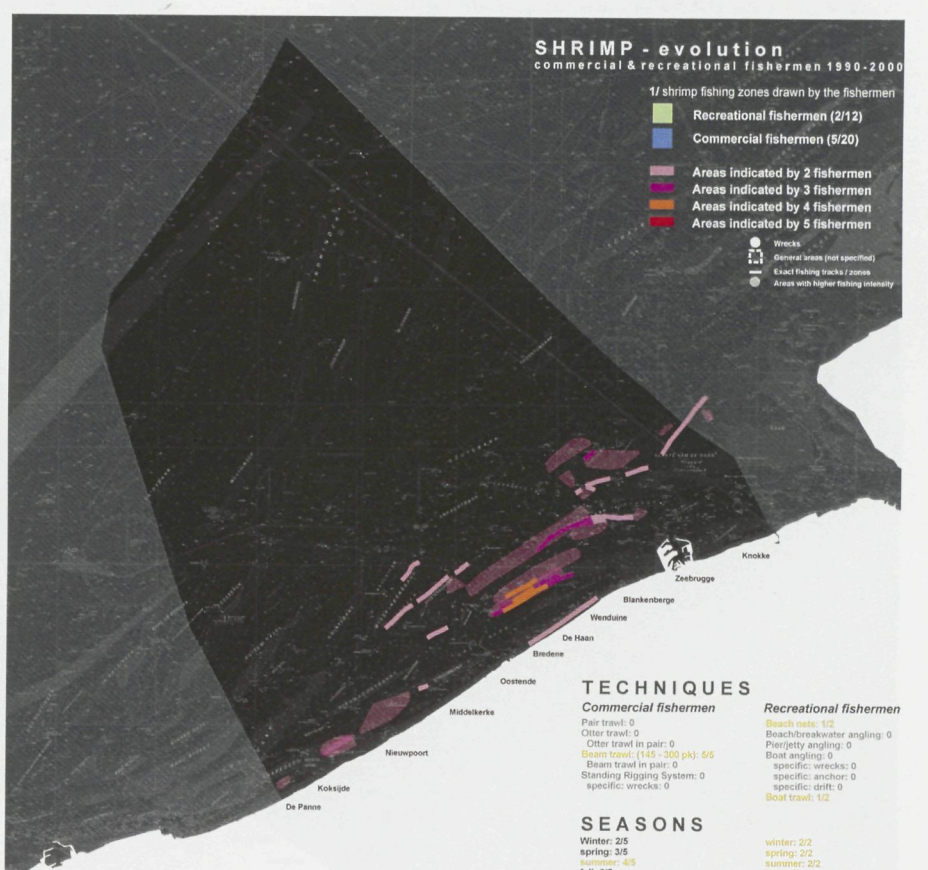
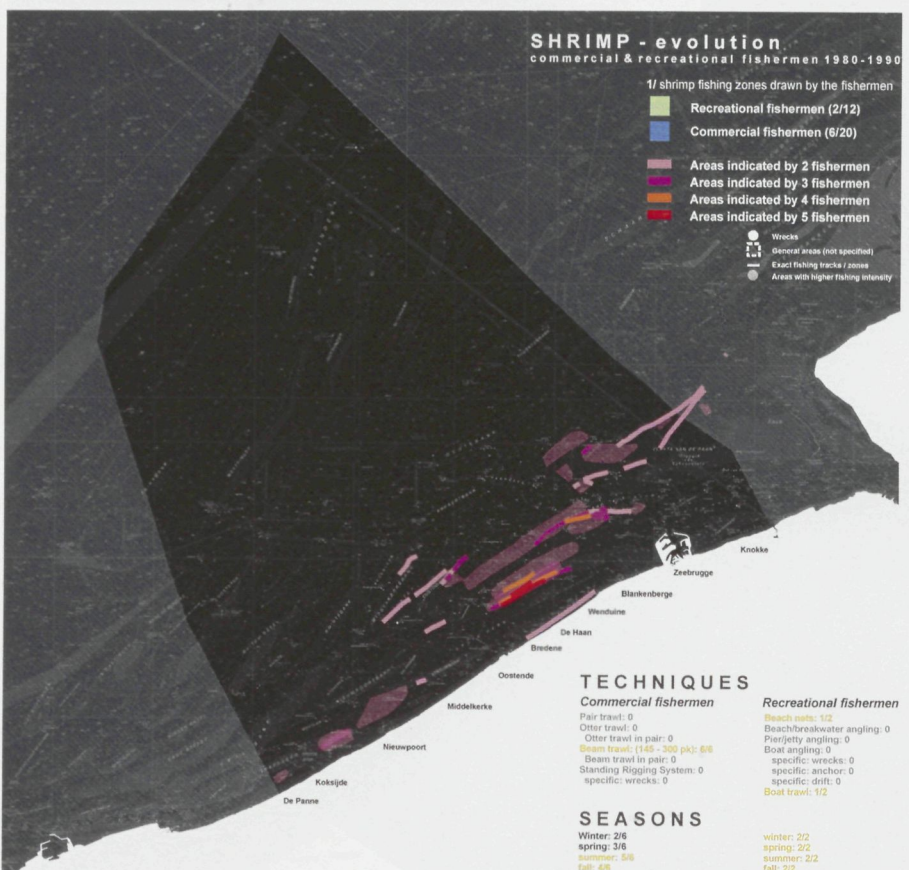
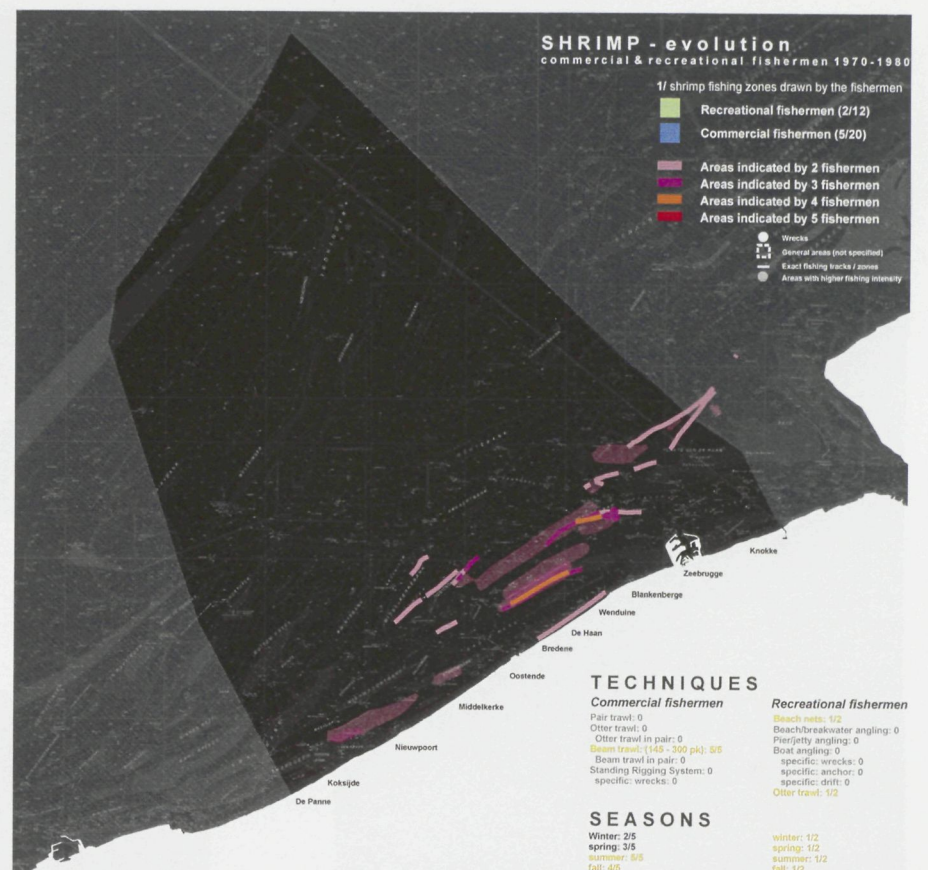
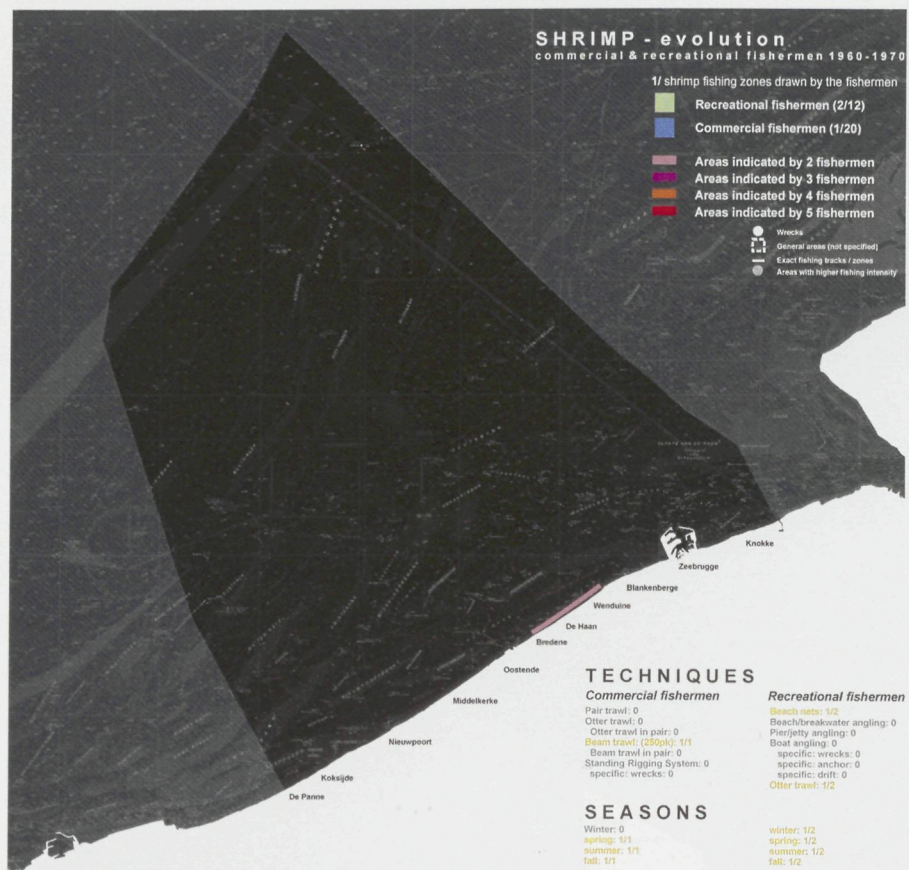




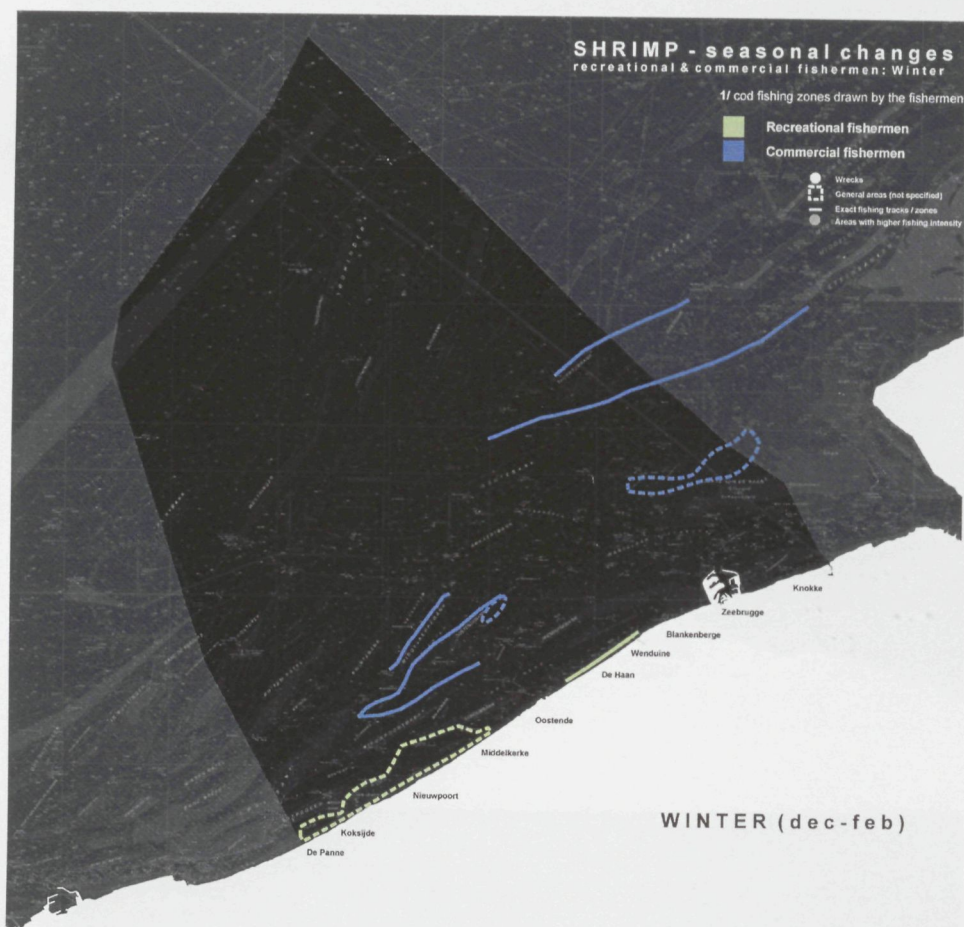
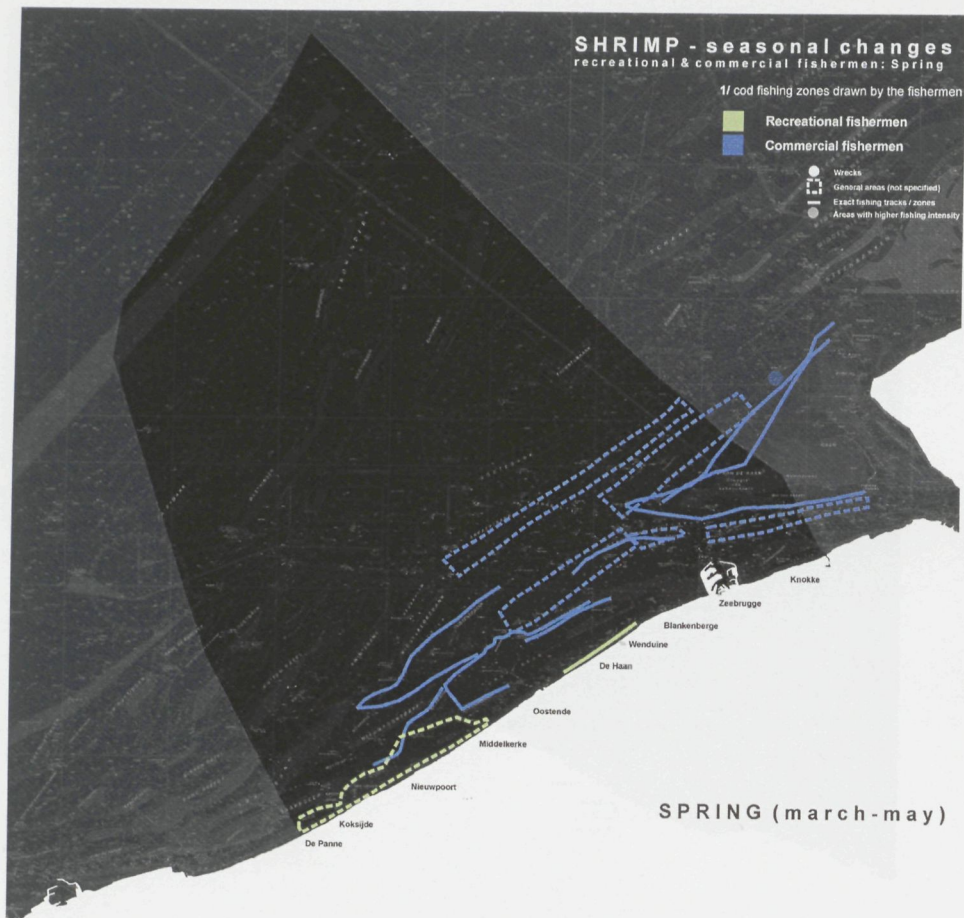


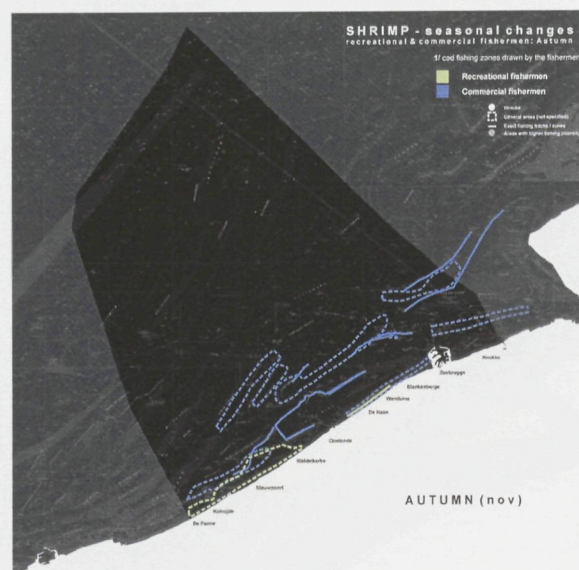
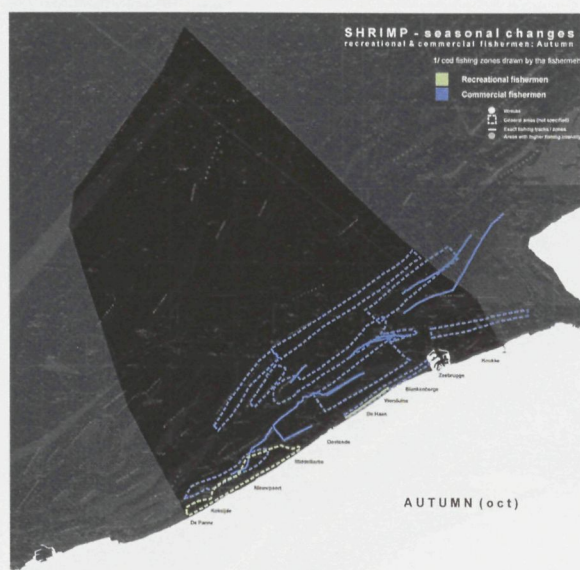
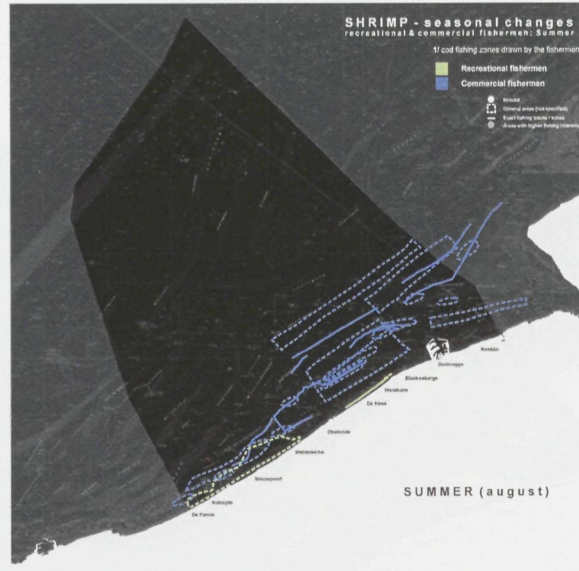
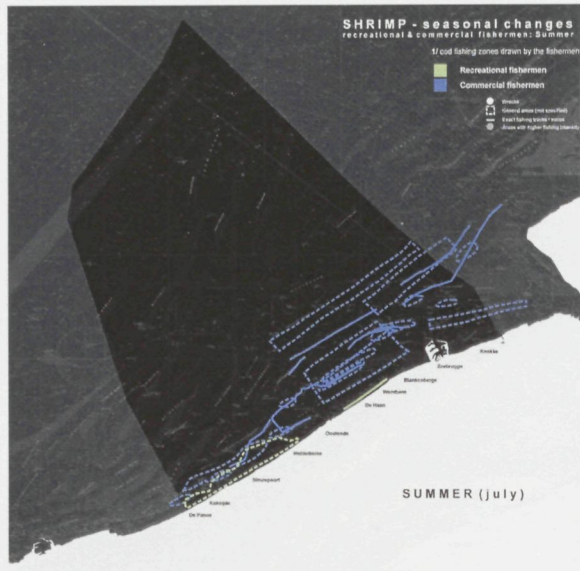
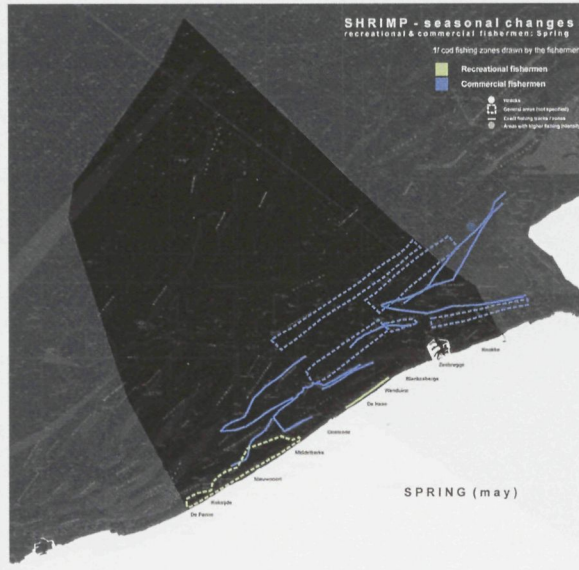




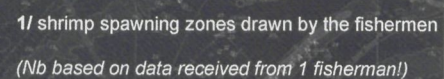


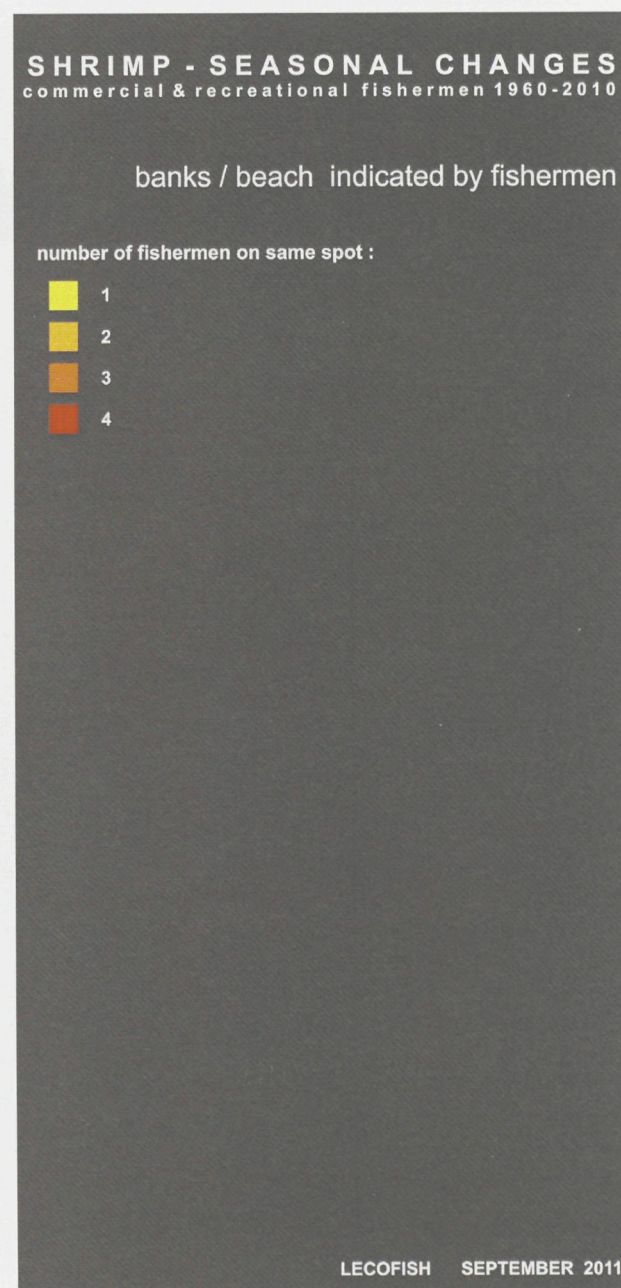
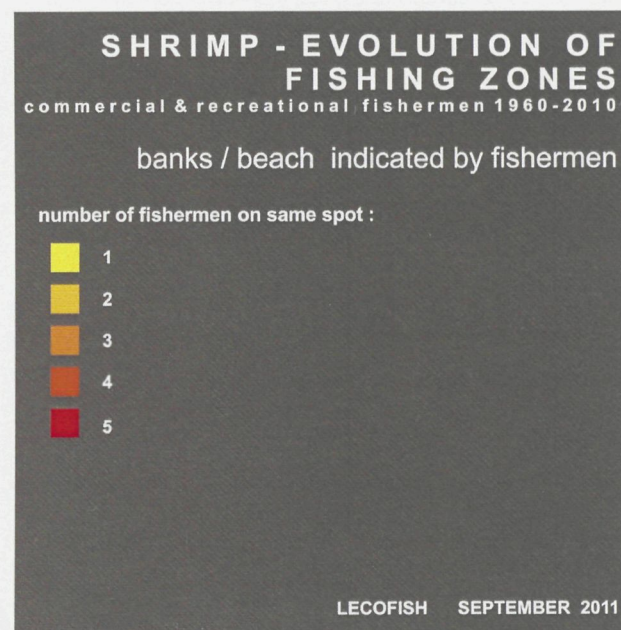
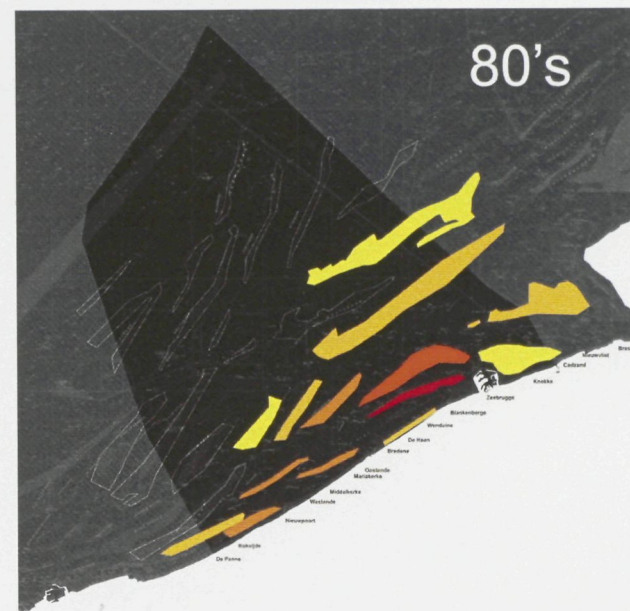
SHRIMP - evolution
commercial & recreational fishermen 1960 - 2010
areas fished by 2 or more fishermen





SHRIMP - seasonal changes january-december commercial & recreational fishermen 1950 - 2010

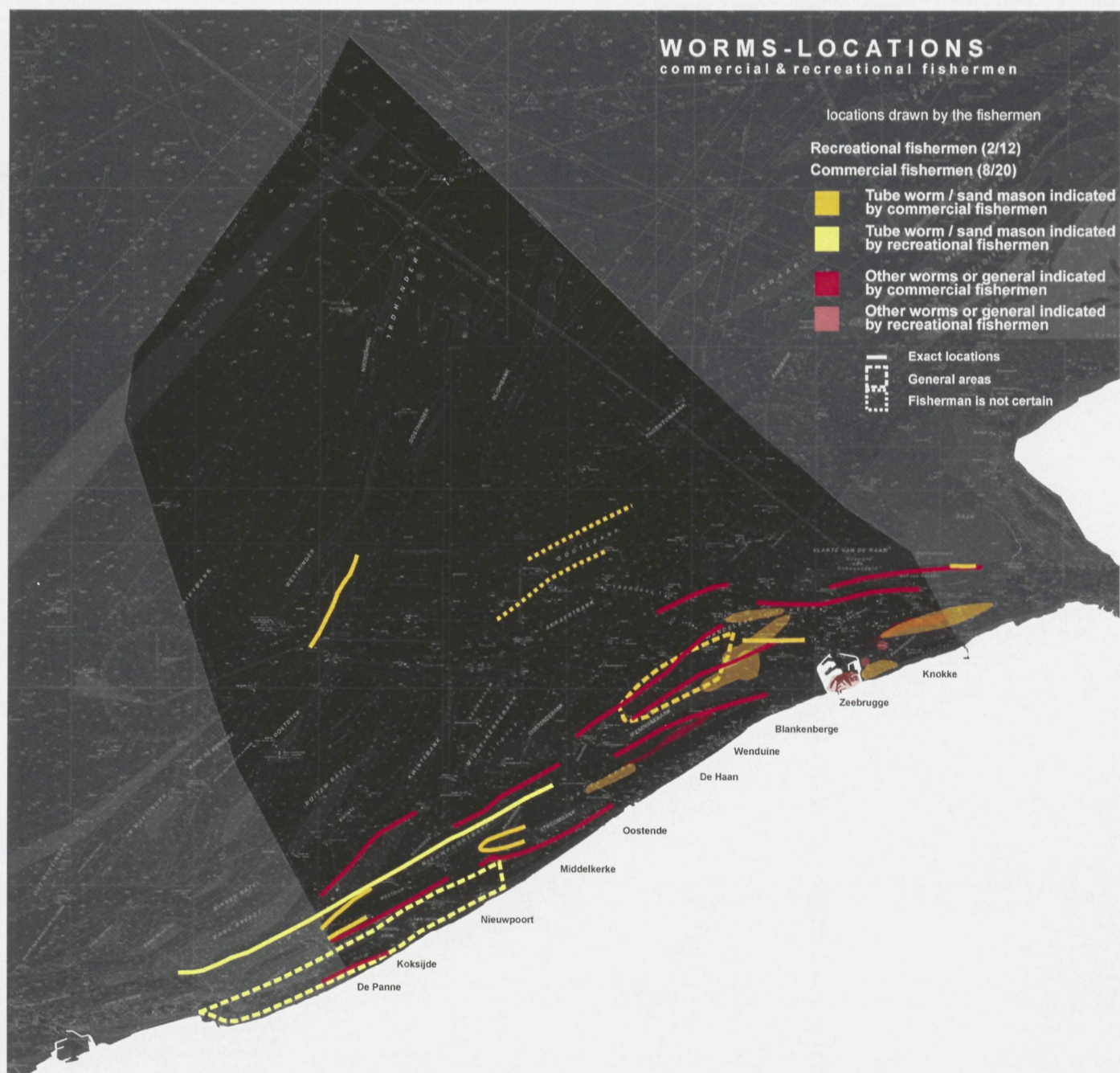
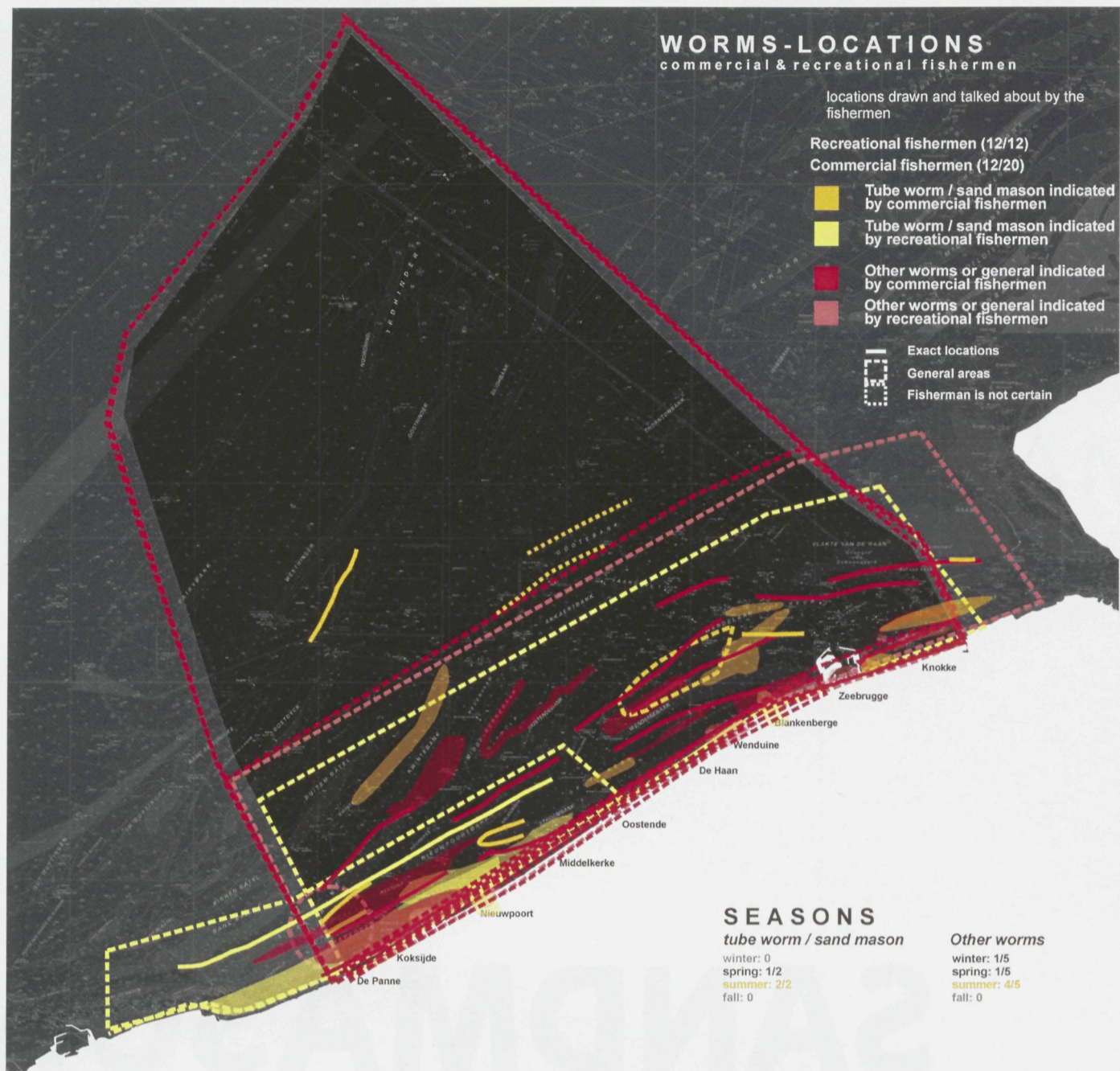




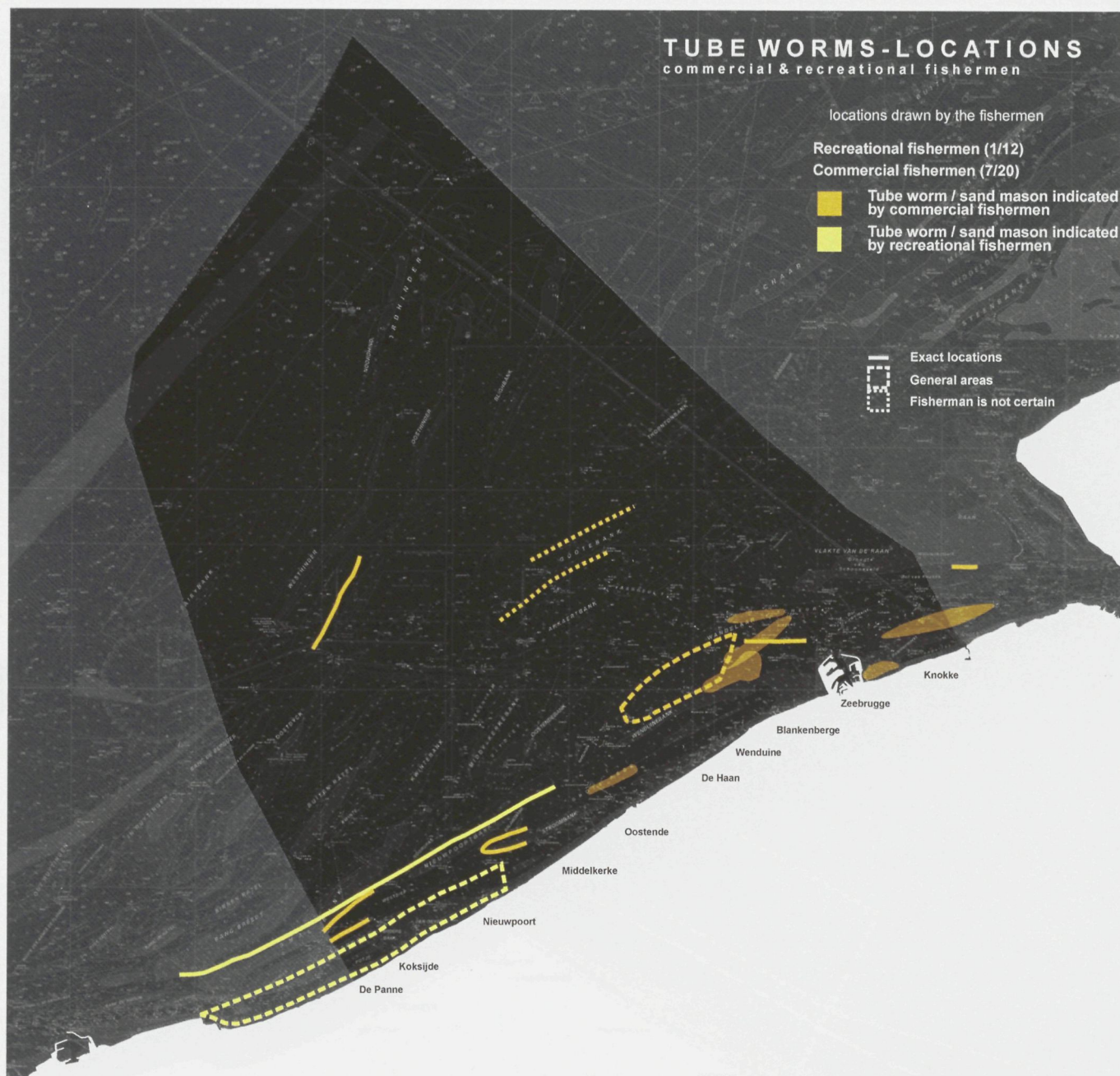
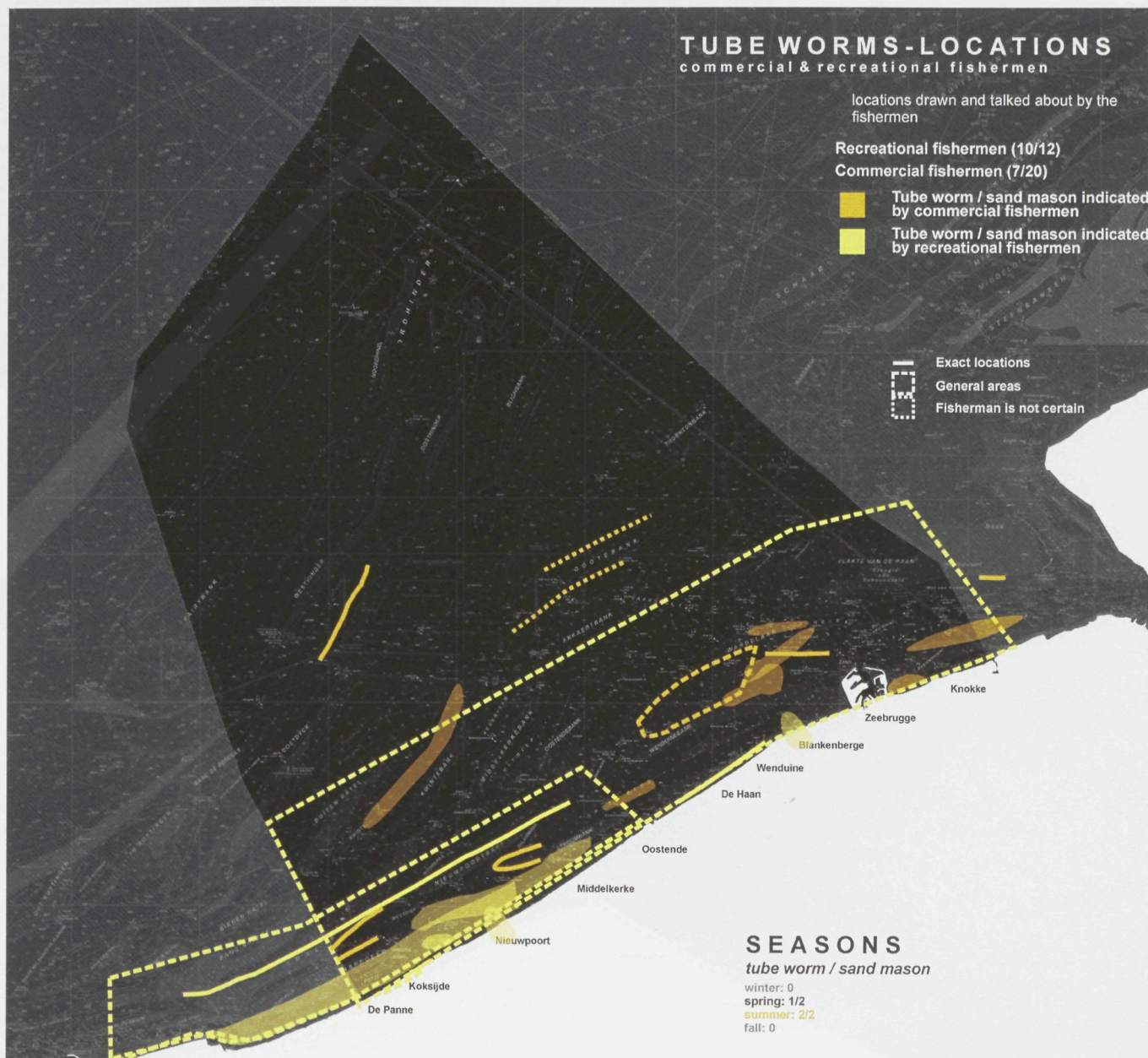


MAPS SERIES VIII

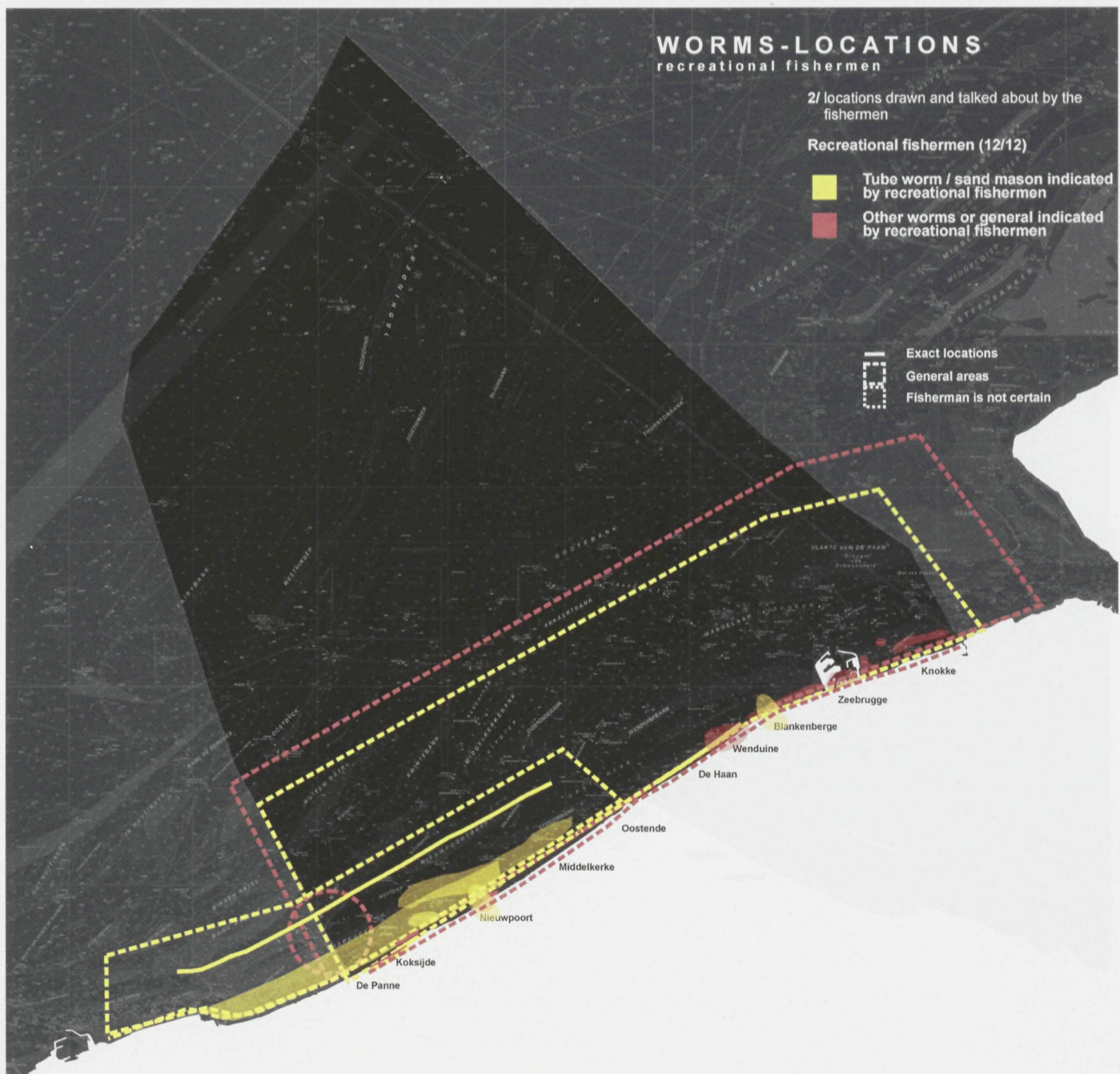
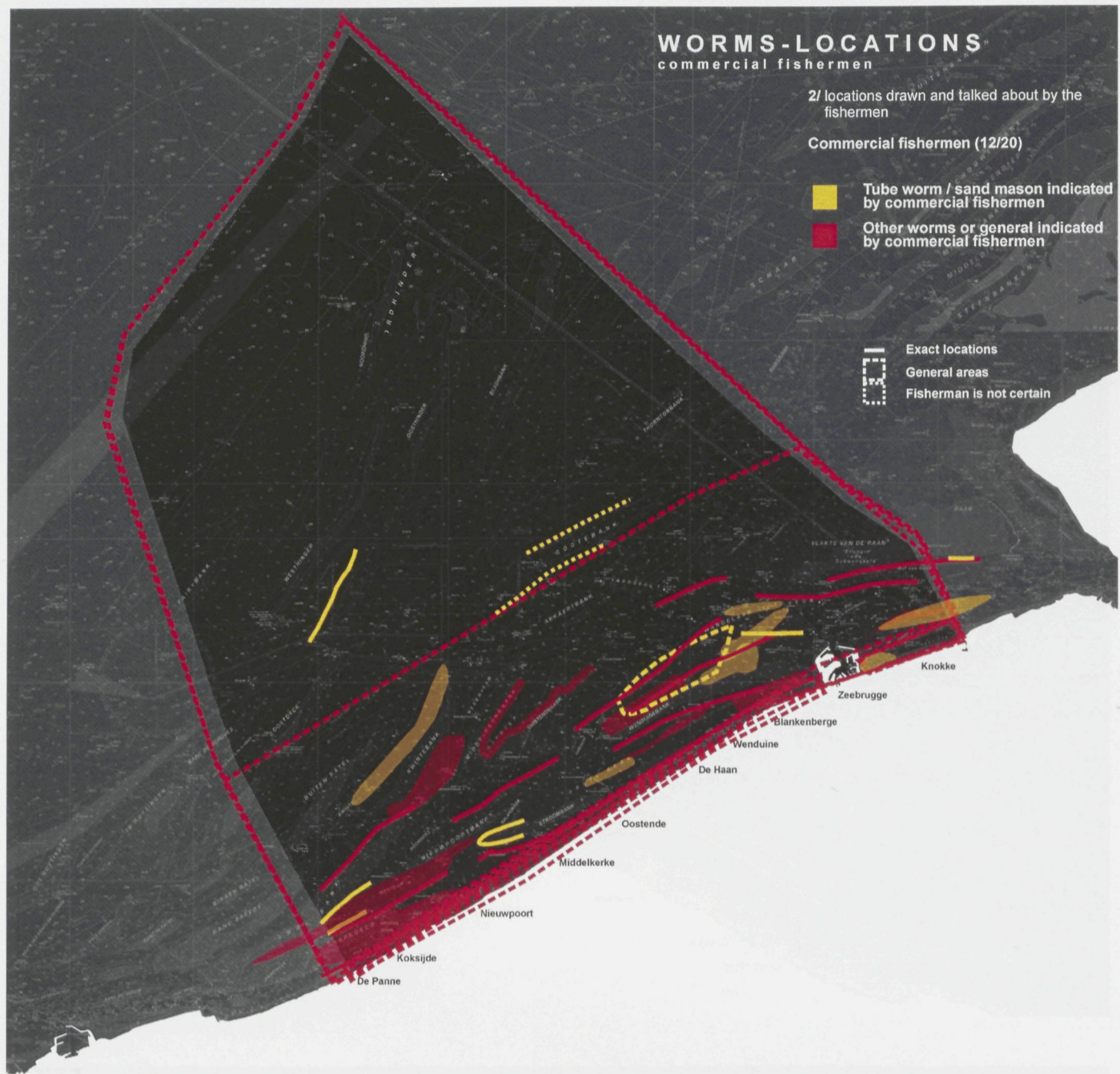
SANDMASON AND OTHER WORMS



WORMS - locations
drawn and talked about
commercial & recreational fishermen 1950 - 2010

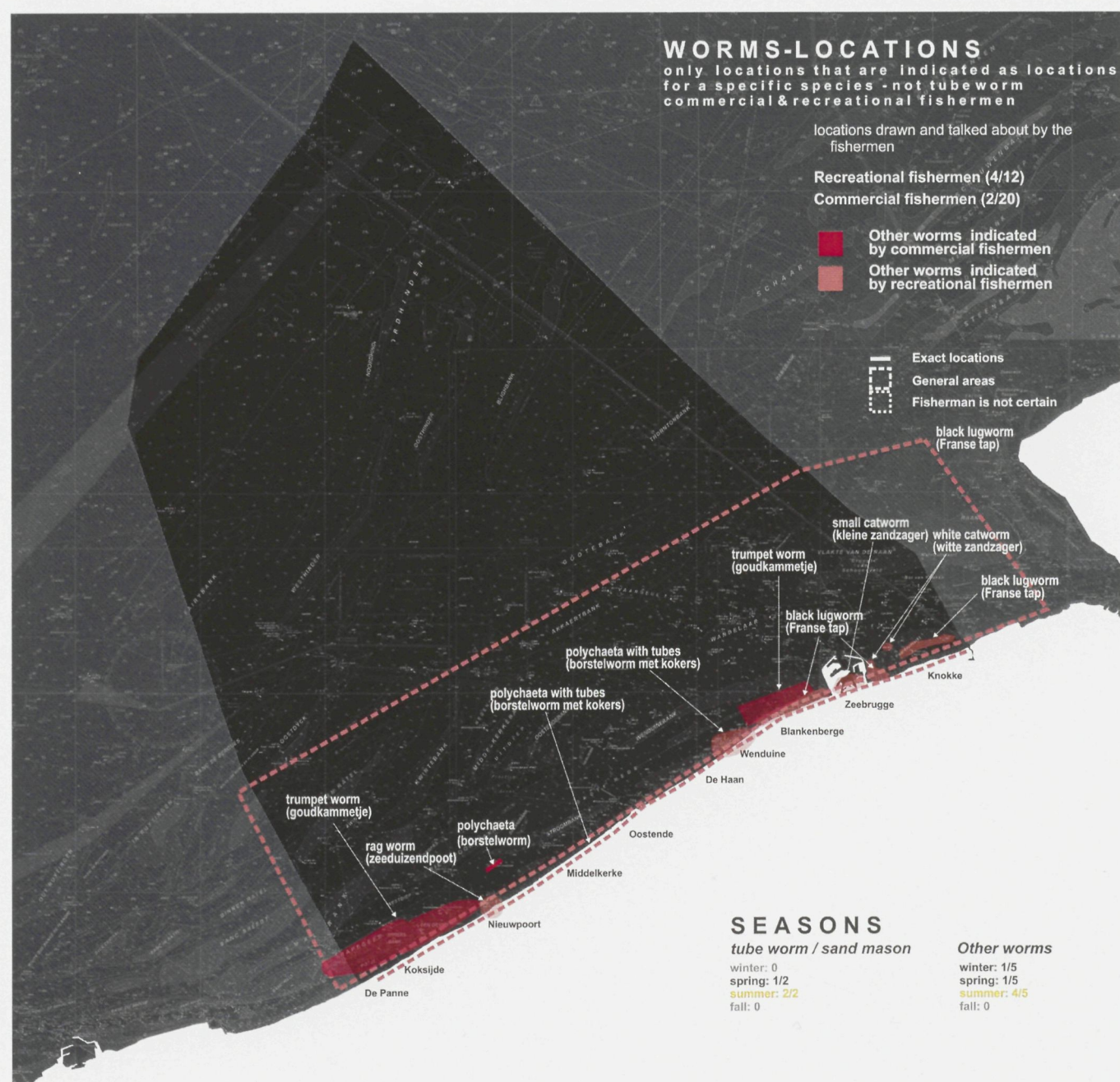
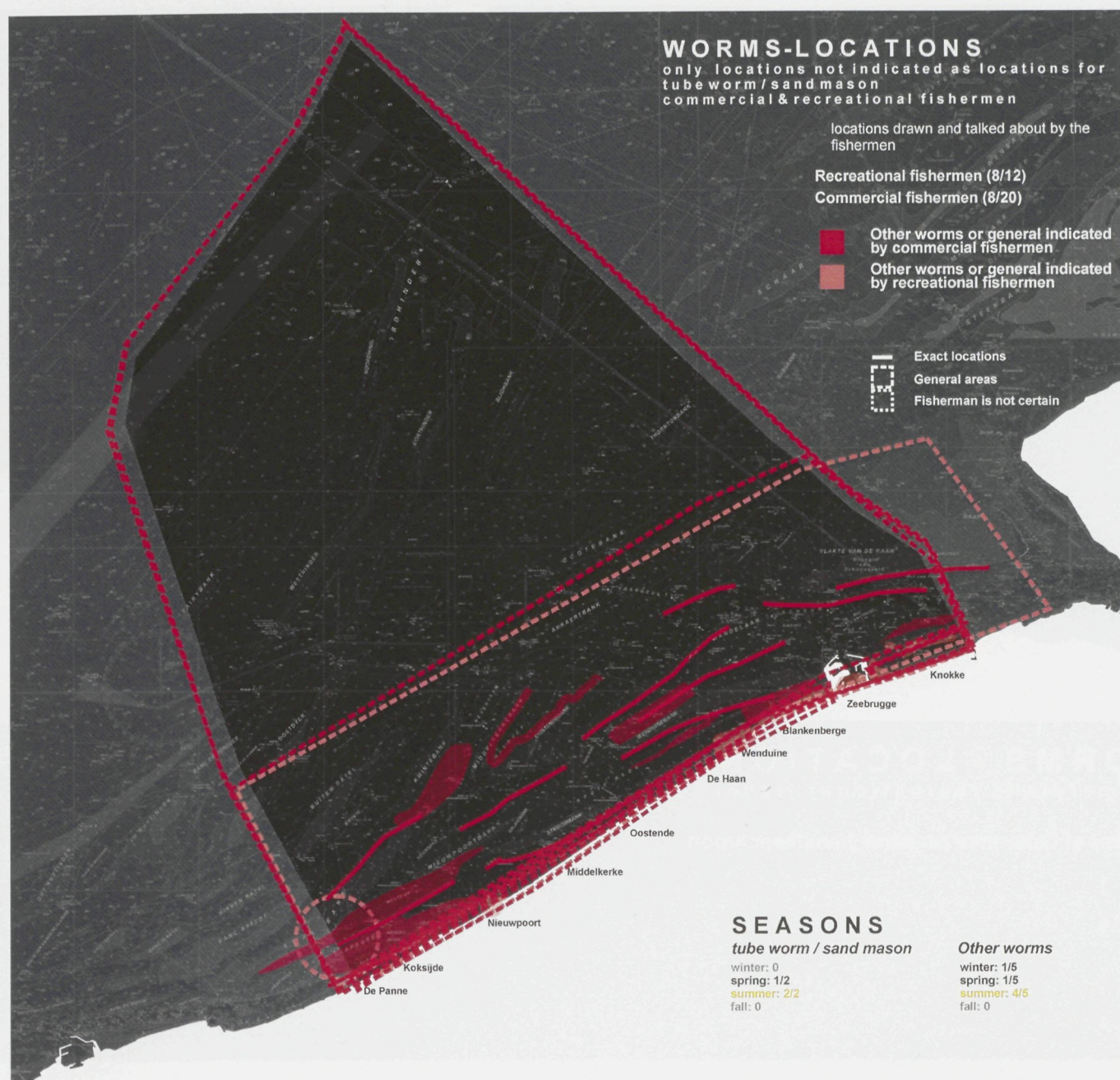


WORMS - not
**TUBE WORMS - locations
drawn and talked about**
commercial & recreational fishermen 1950 - 2010

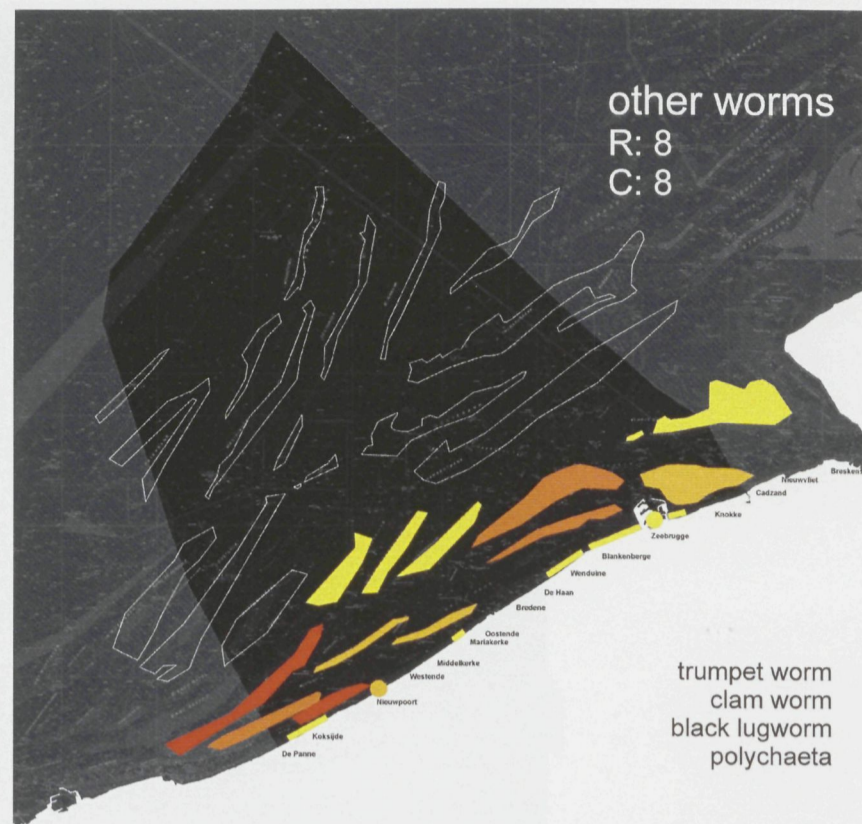
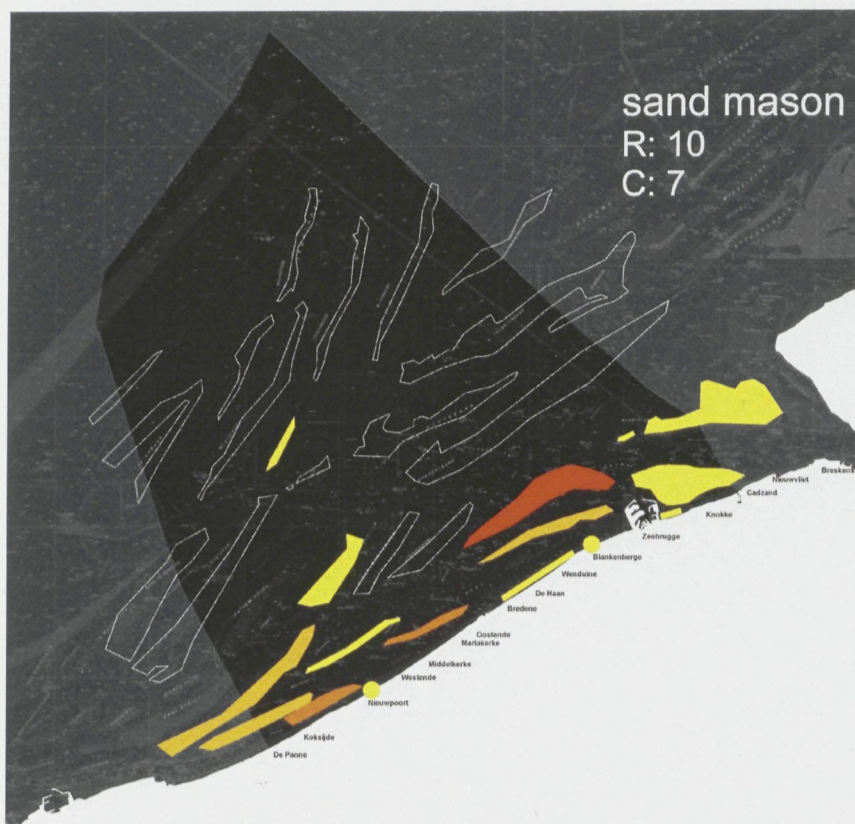


WORMS - locations

commercial & recreational fishermen 1950 - 2010



**WORMS - not sand mason - locations
drawn and talked about
commercial & recreational fishermen 1950 - 2010**



WORMS - LOCATIONS

commercial & recreational fishermen 1960-2010

number of fishermen on same bank/beach/port:



banks / beach ports indicated by fishermen

LECOFISH SEPTEMBER 2011

WORMS - structure maps

commercial & recreational fishermen 1950 - 2010

MAPS SERIES IX

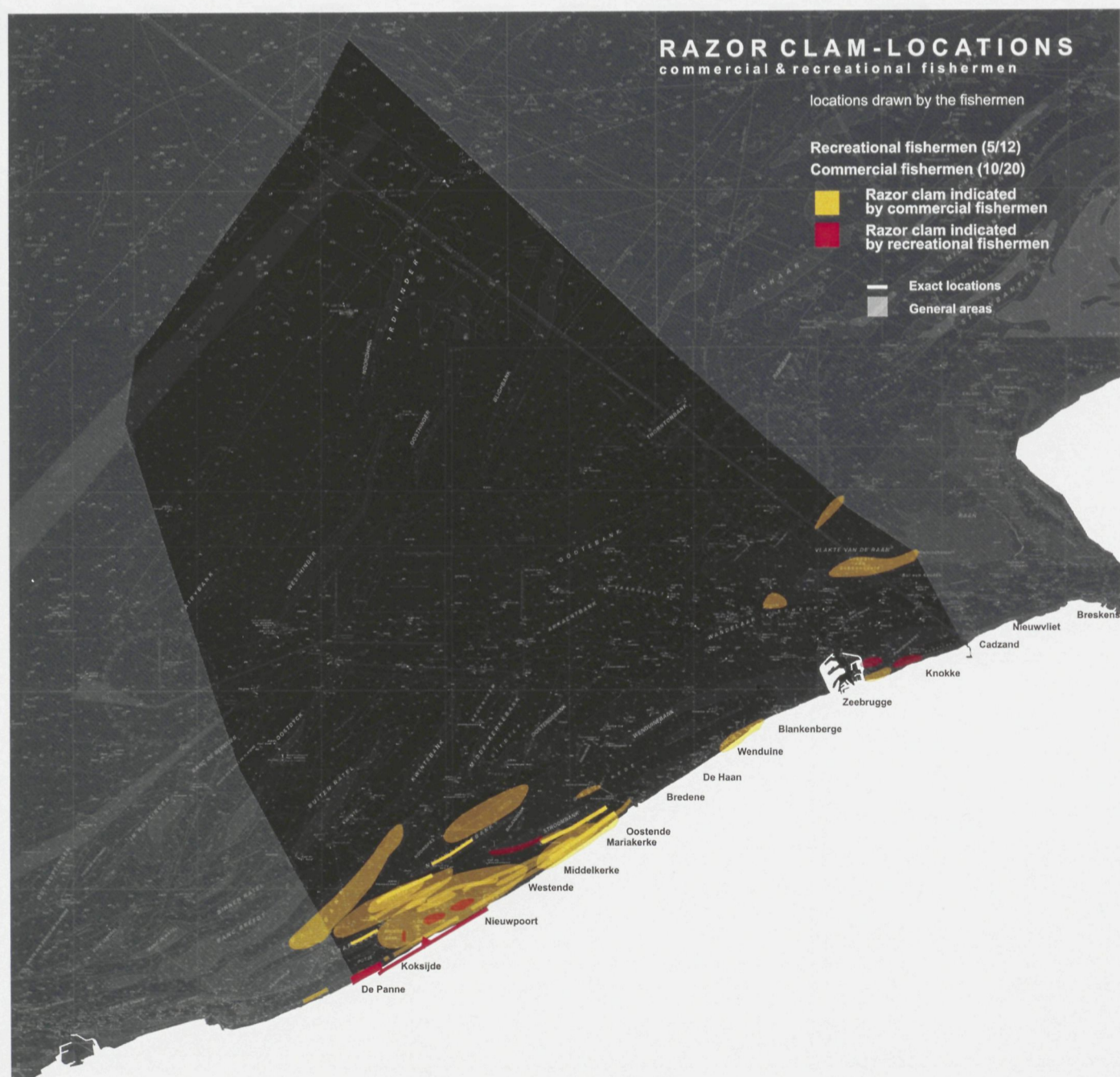
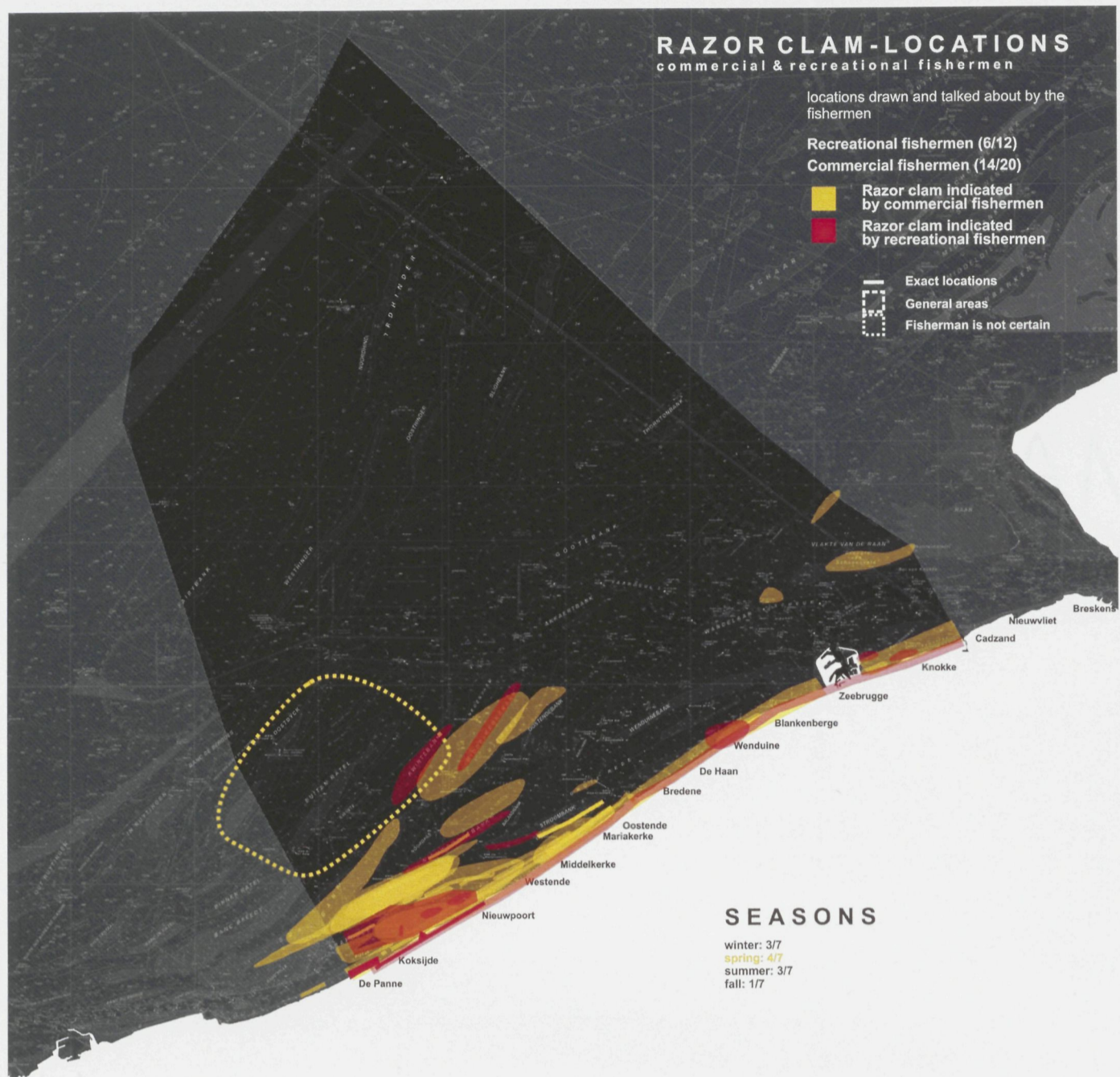
RAZOR CLAM



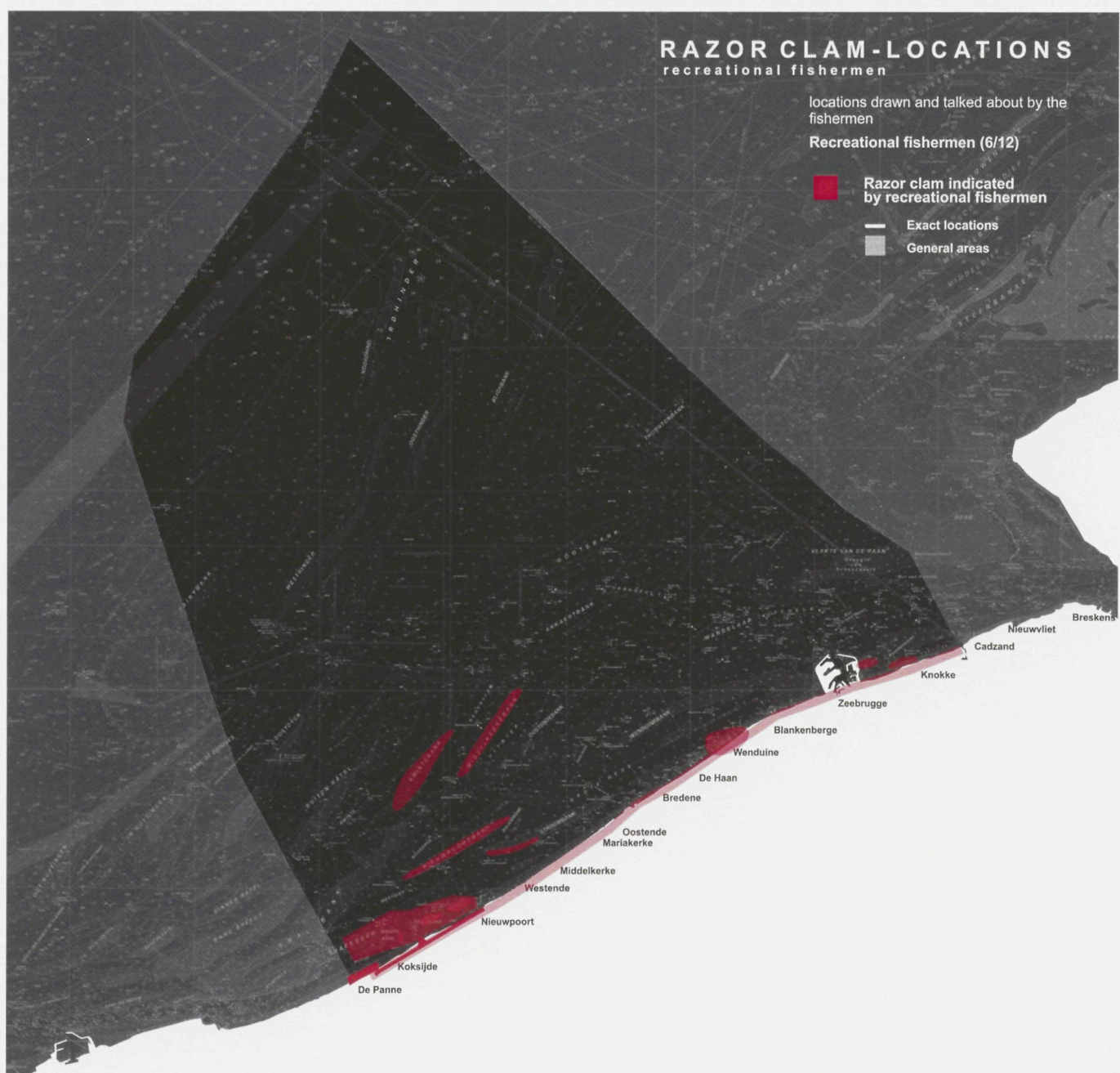
MAPS SERIES IX

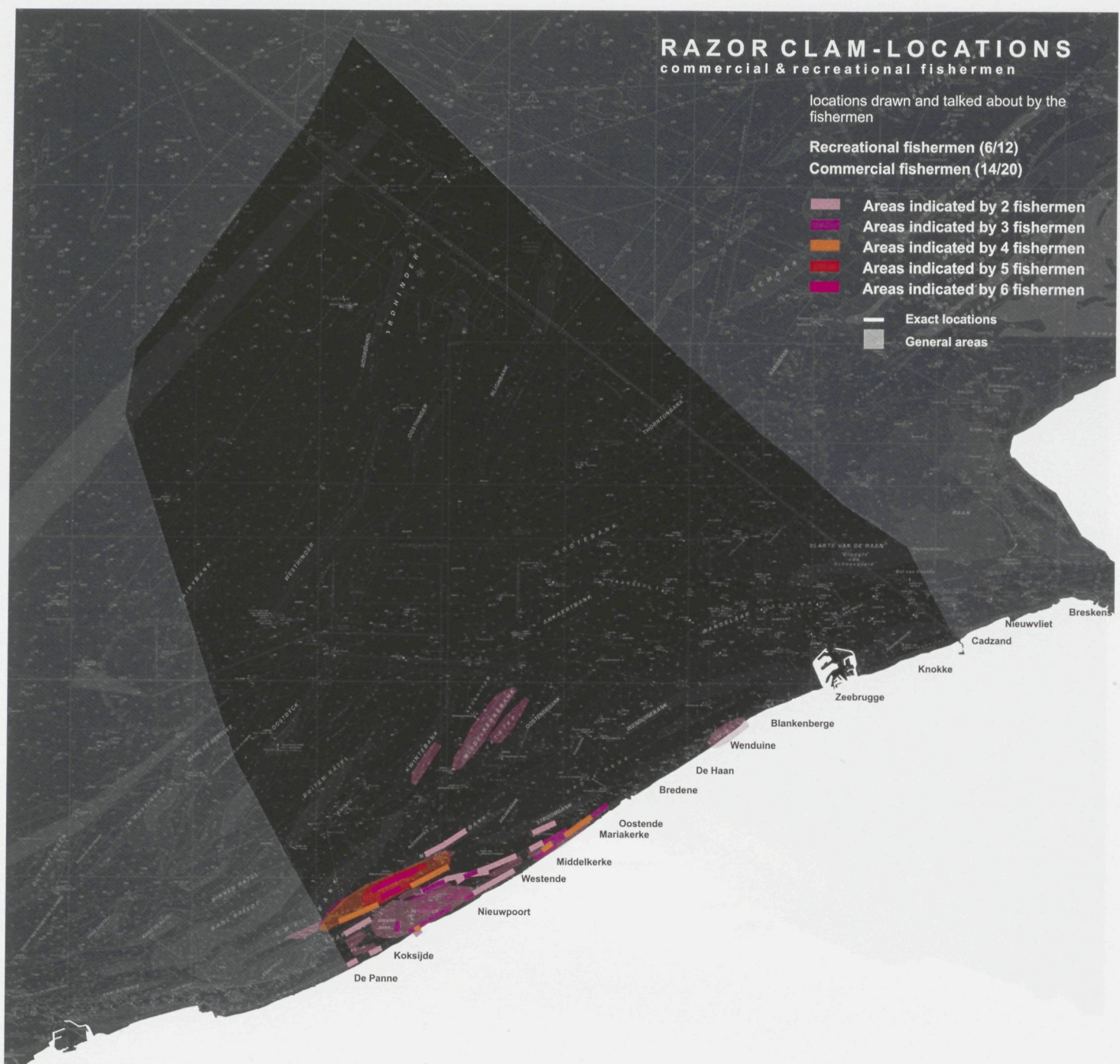
RAZOR CLAM

RAZOR CLAM - locations
and where to find them
0400-0000-0000-0000



**RAZOR CLAM - locations
drawn and talked about**
commercial & recreational fishermen 1950 - 2010

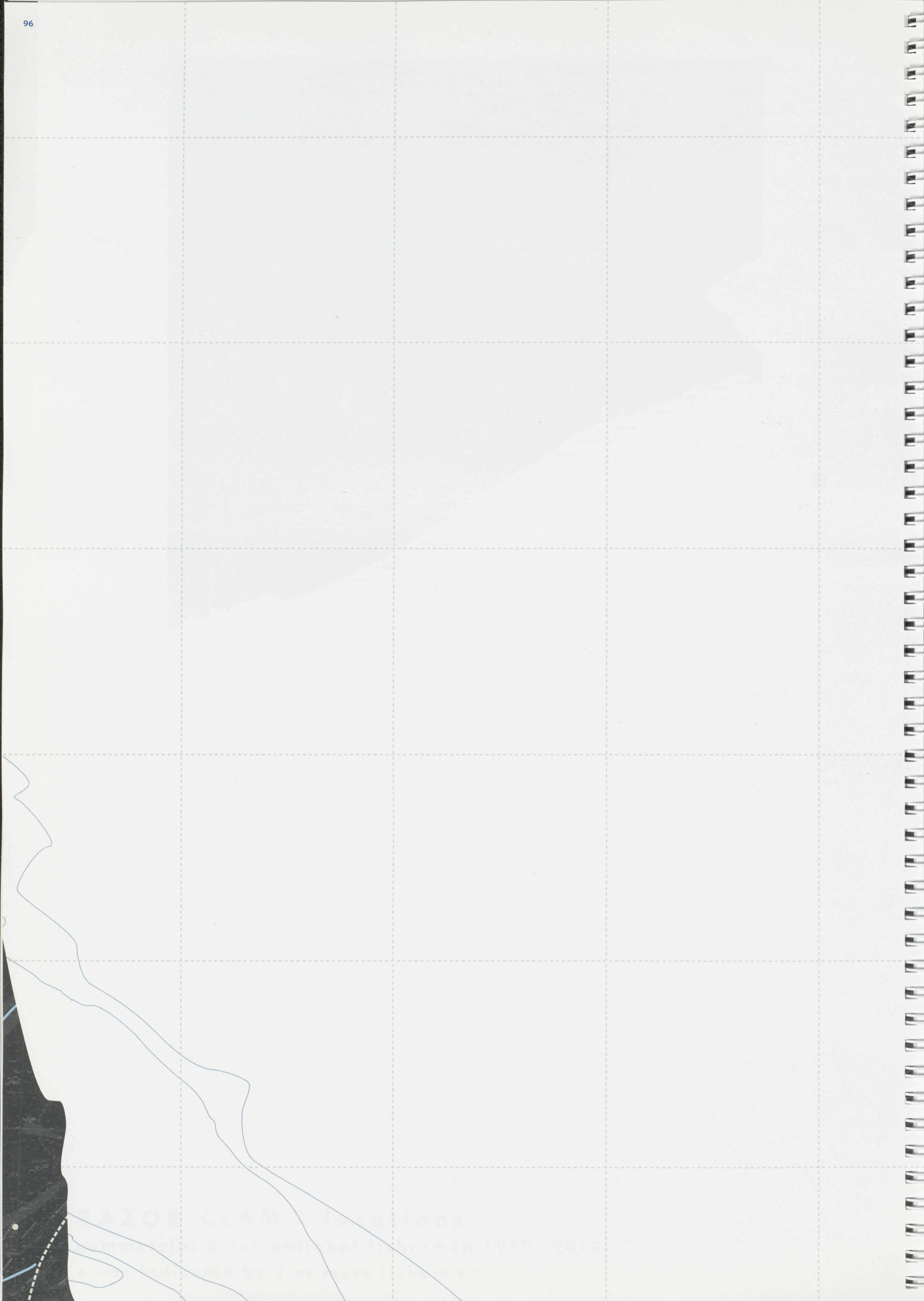




RAZOR CLAM - locations
commercial & recreational fishermen 1950 - 2010
areas indicated by 2 or more fishermen

MAPS SERIES X

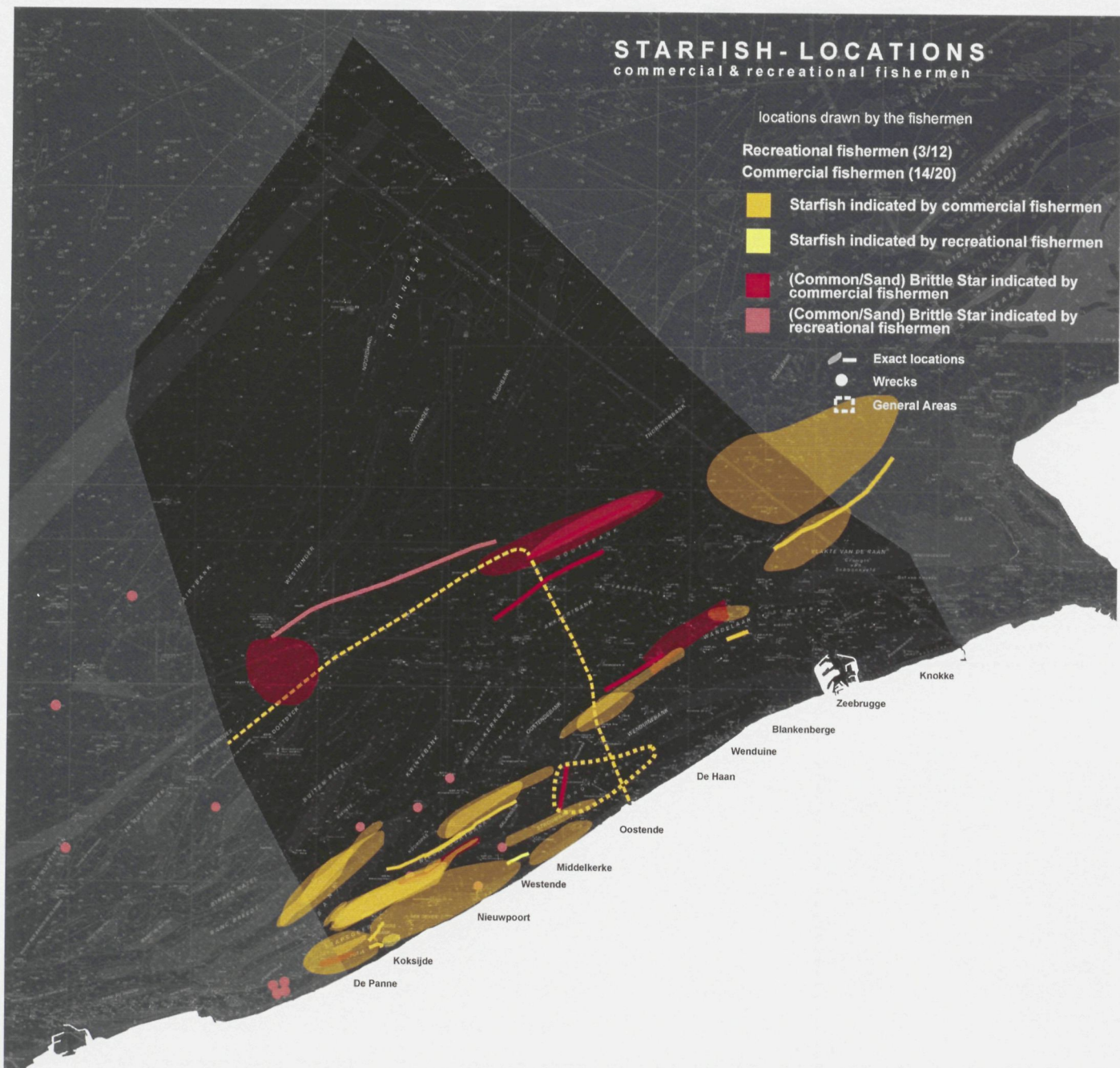
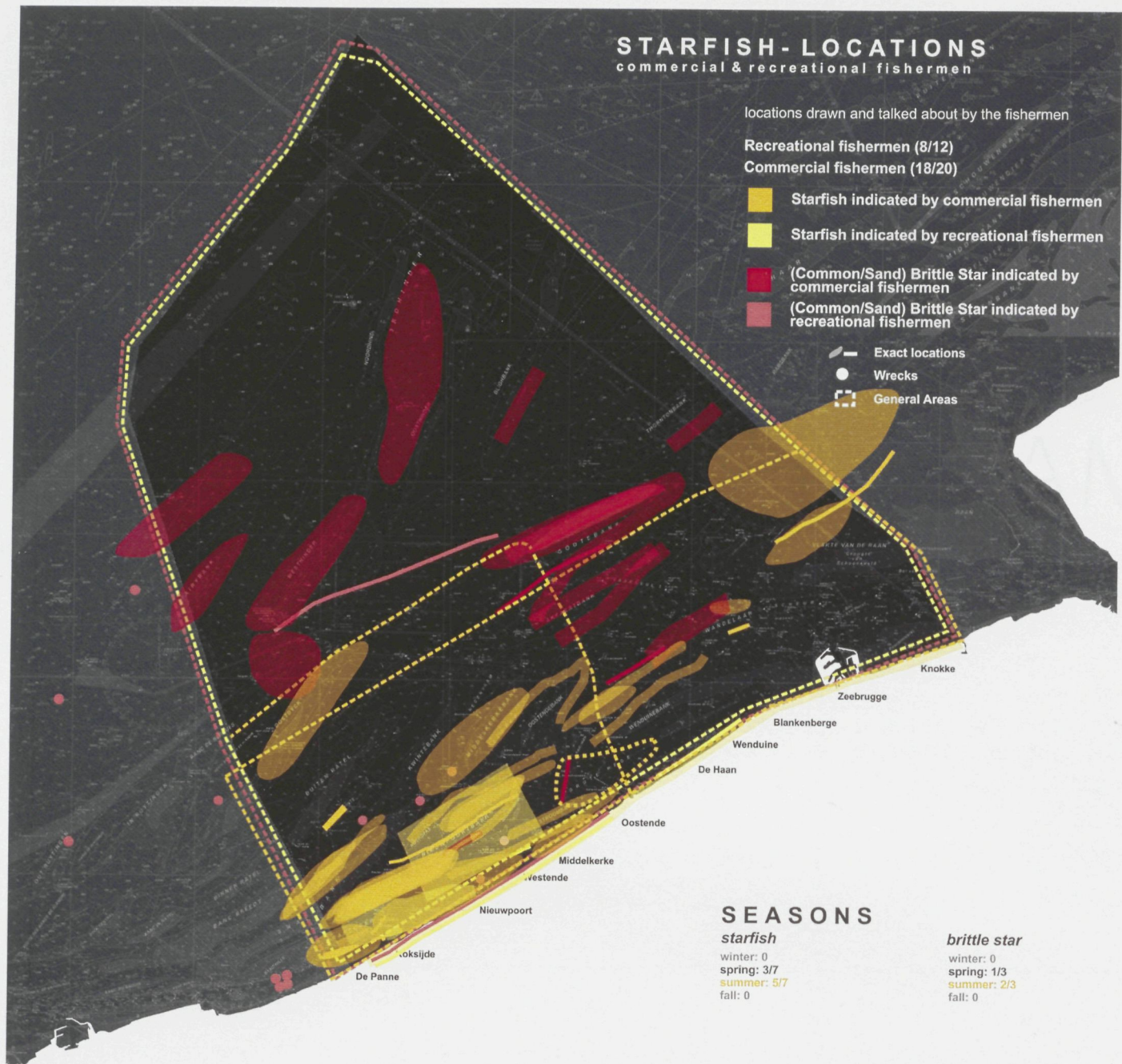
STARFISH



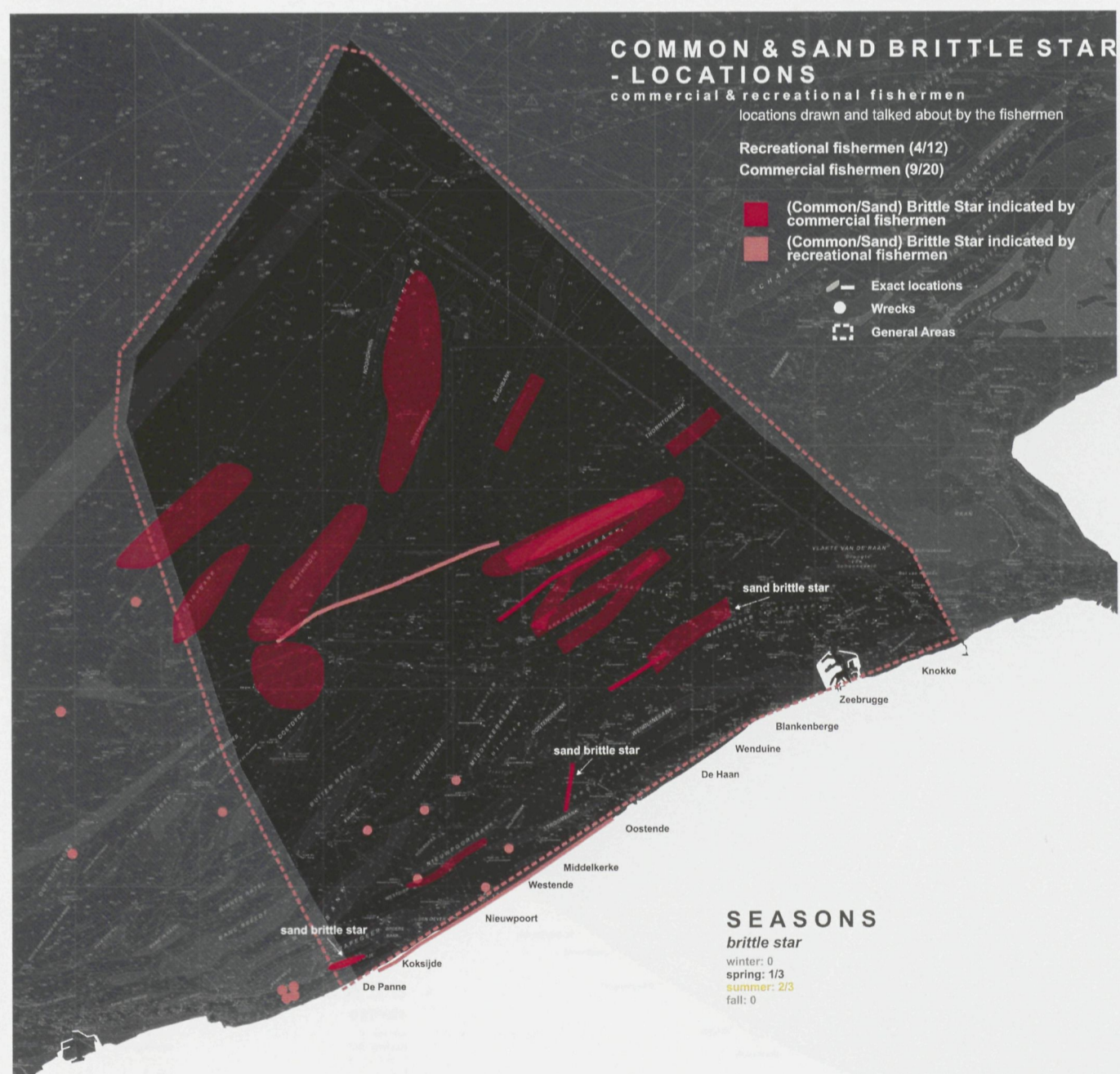
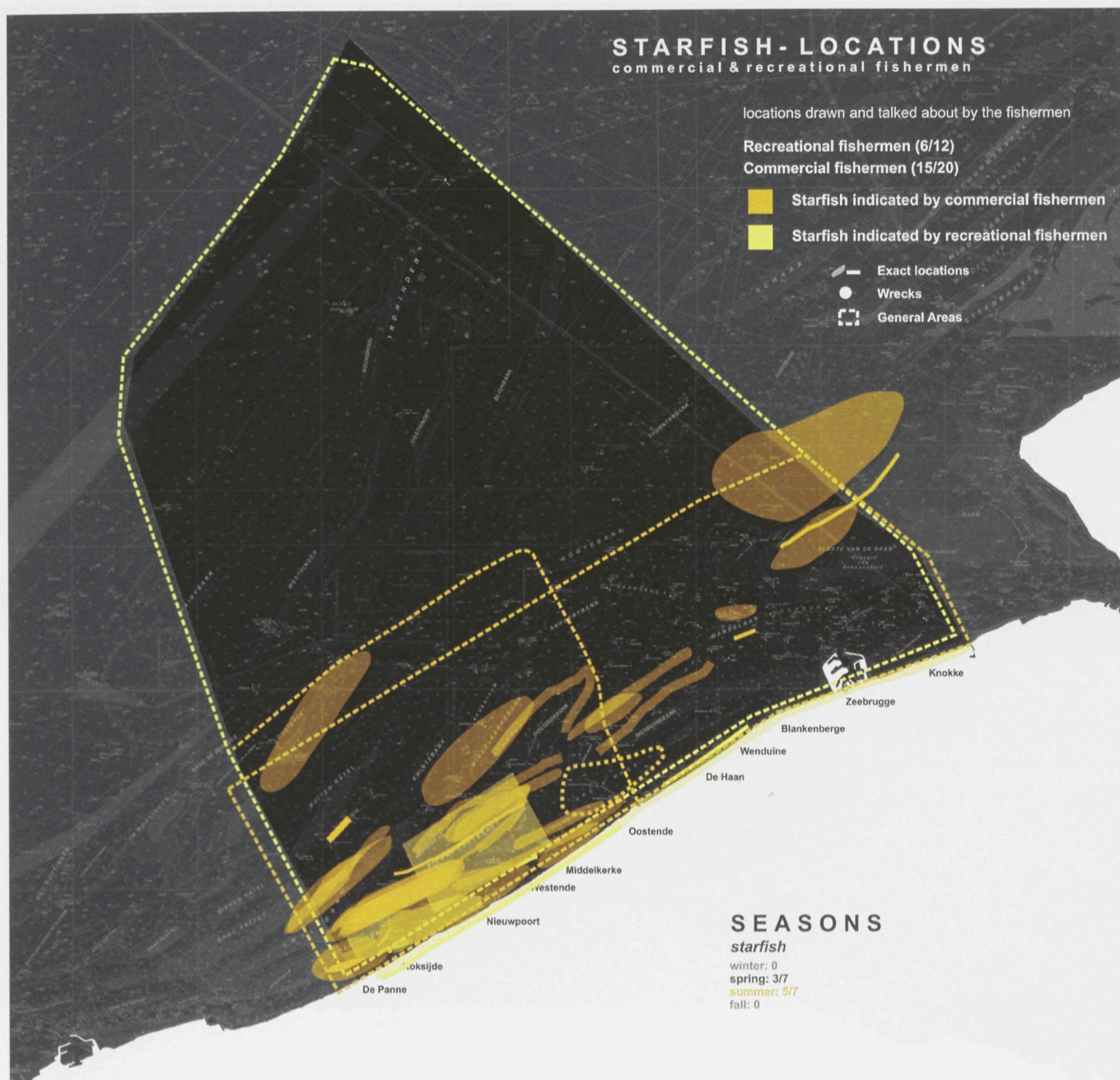
MAPS SERIES X

STARFISH

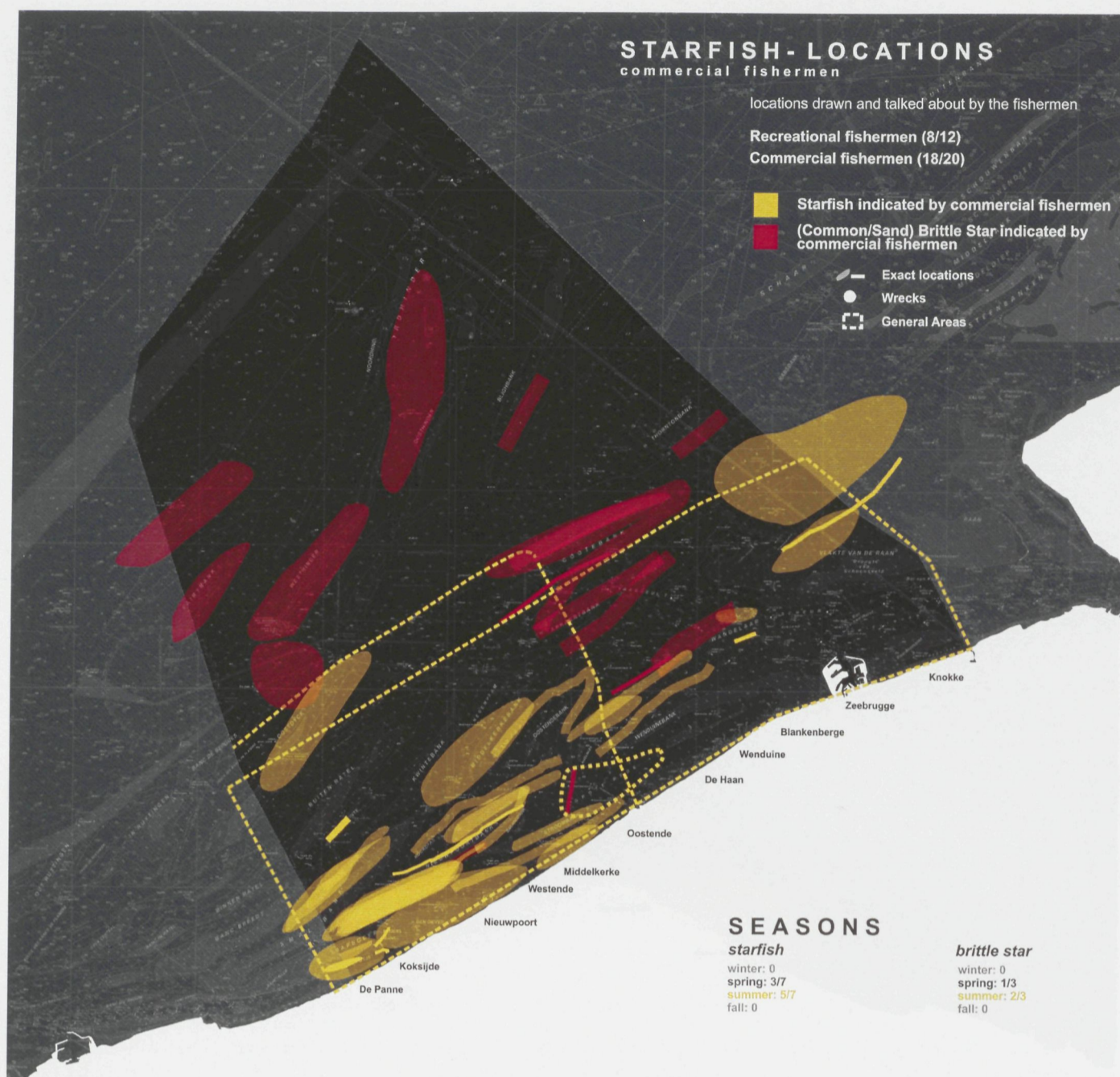
STARFISH & COWDOR
du poveri...
0400-0100



STARFISH - locations
drawn and talked about
commercial & recreational fishermen 1950 - 2010



STARFISH - locations
starfish & common/sand brittle star
commercial & recreational fishermen 1950 - 2010





STARFISH - LOCATIONS

commercial & recreational fishermen 1960-2010

number of fishermen on same bank/beach/port:



banks / beach ports indicated by fishermen

LECOFISH SEPTEMBER 2011

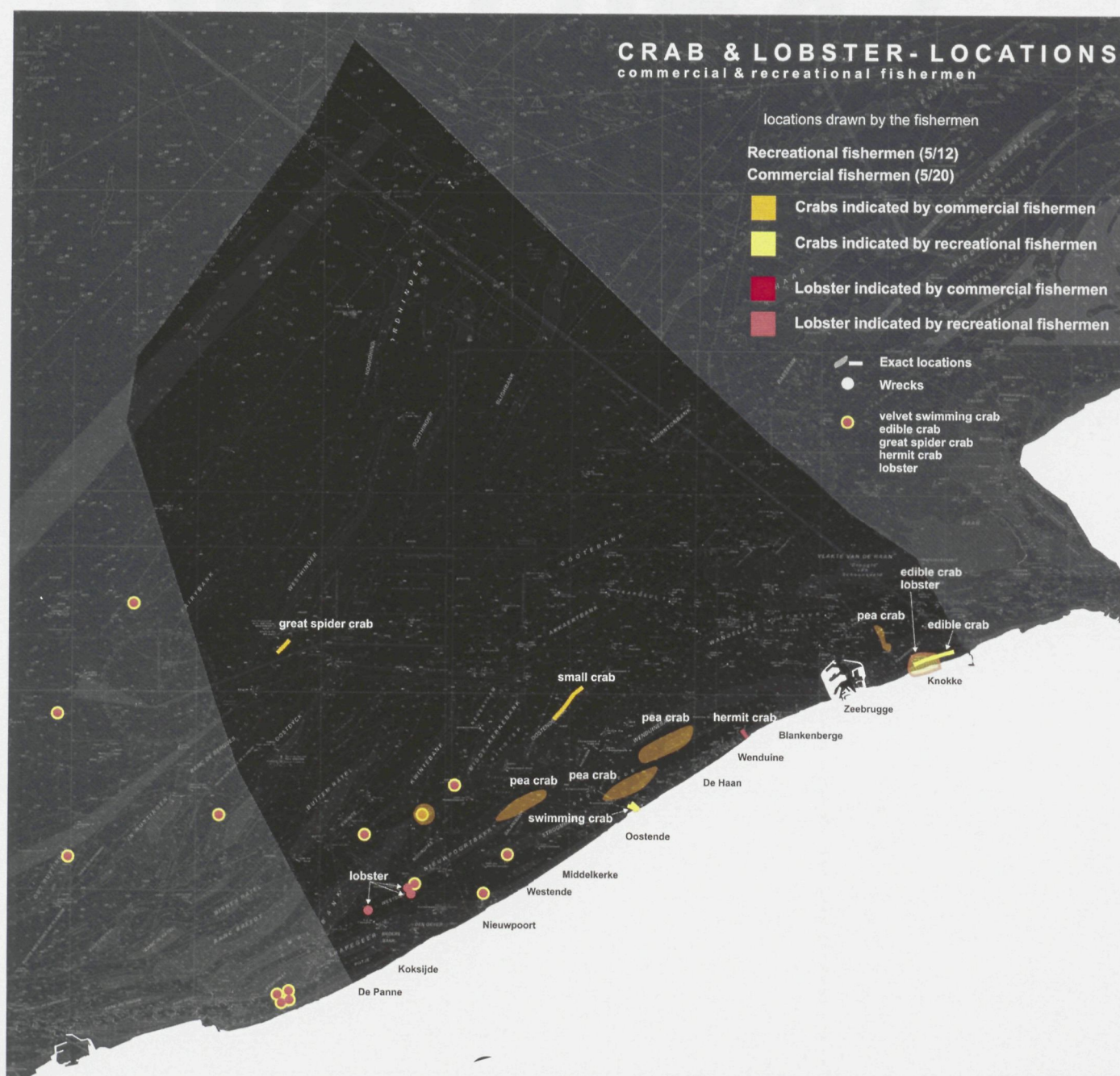
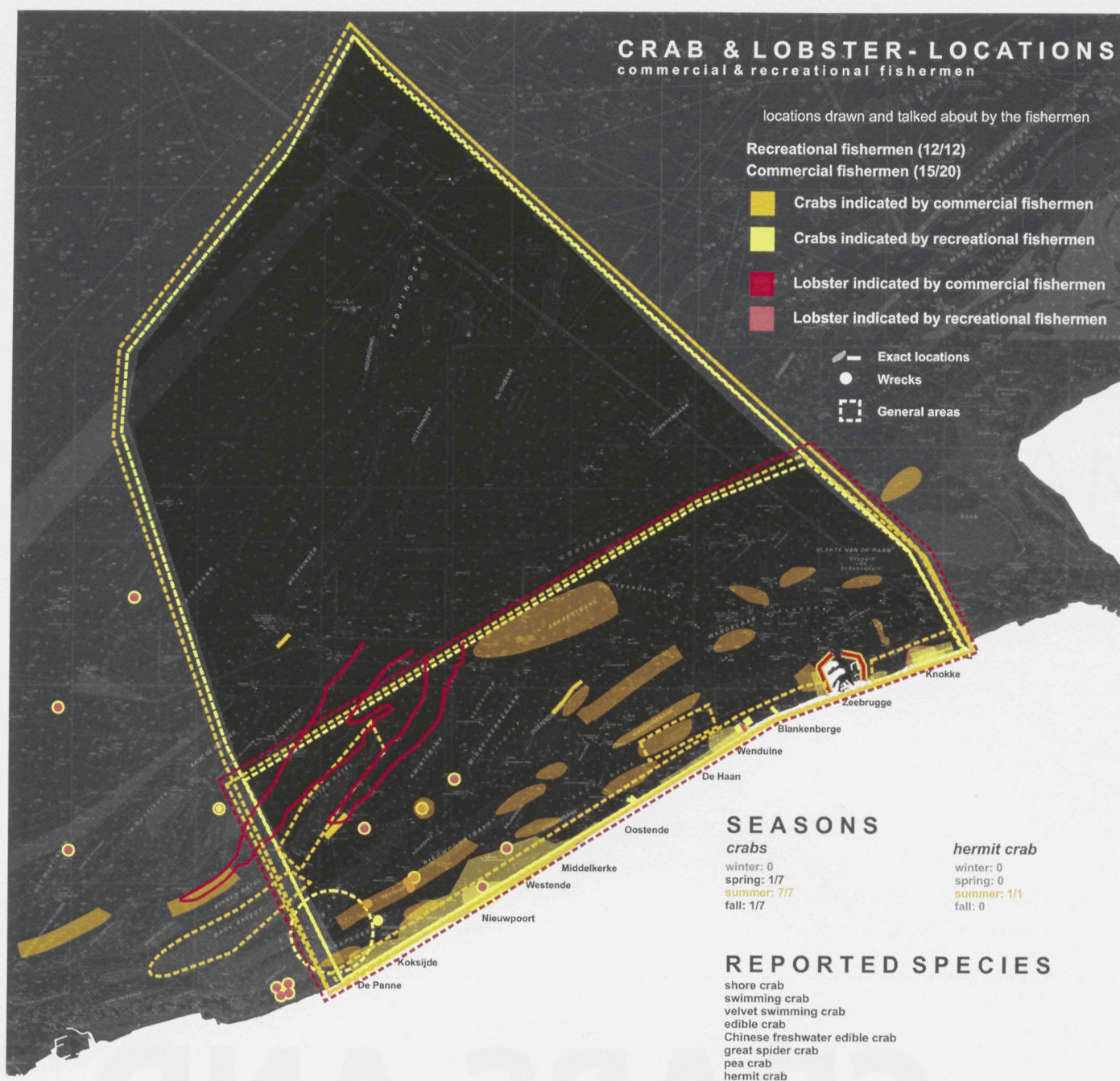
CRABS AND
LOBSTERS



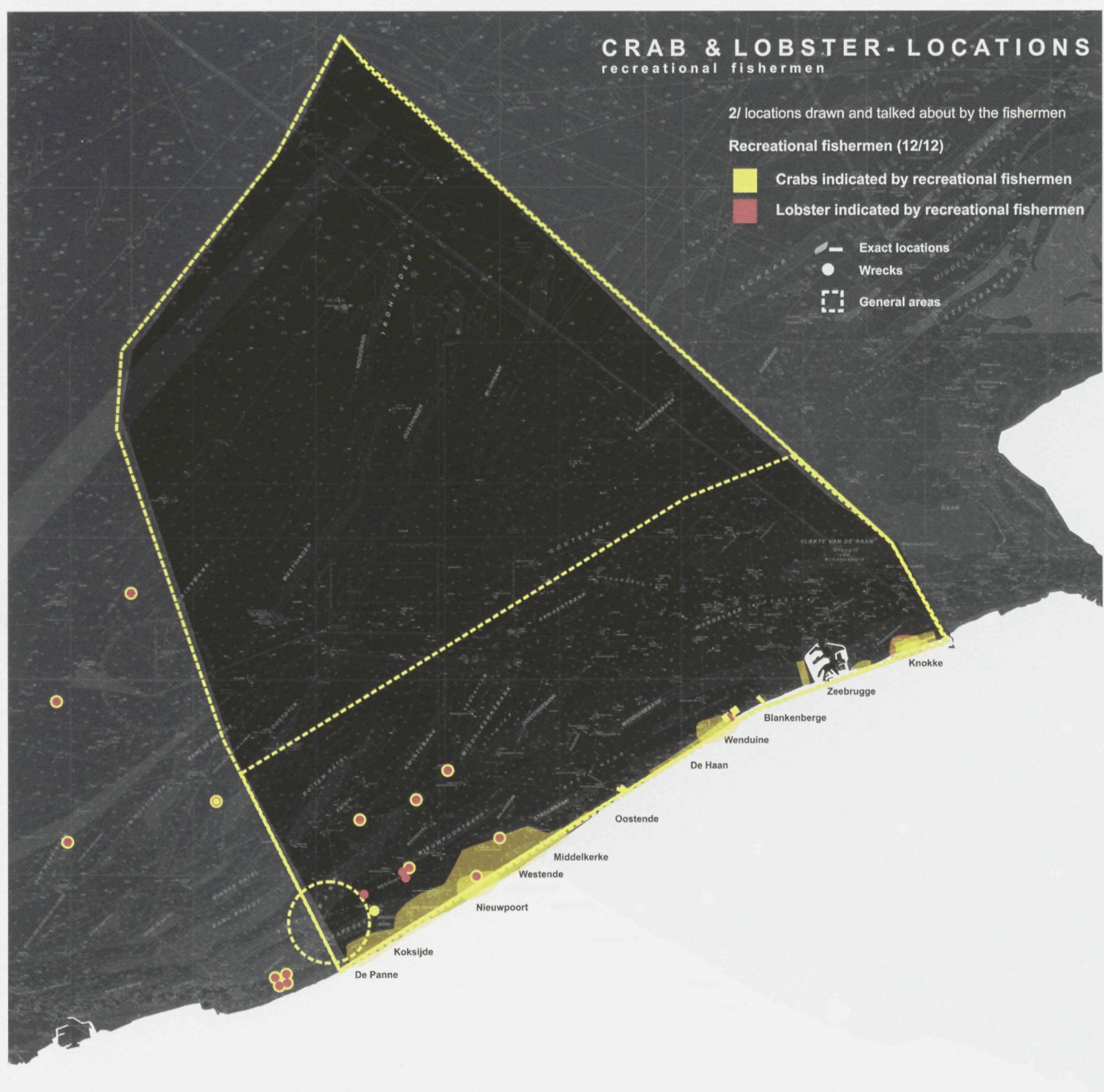
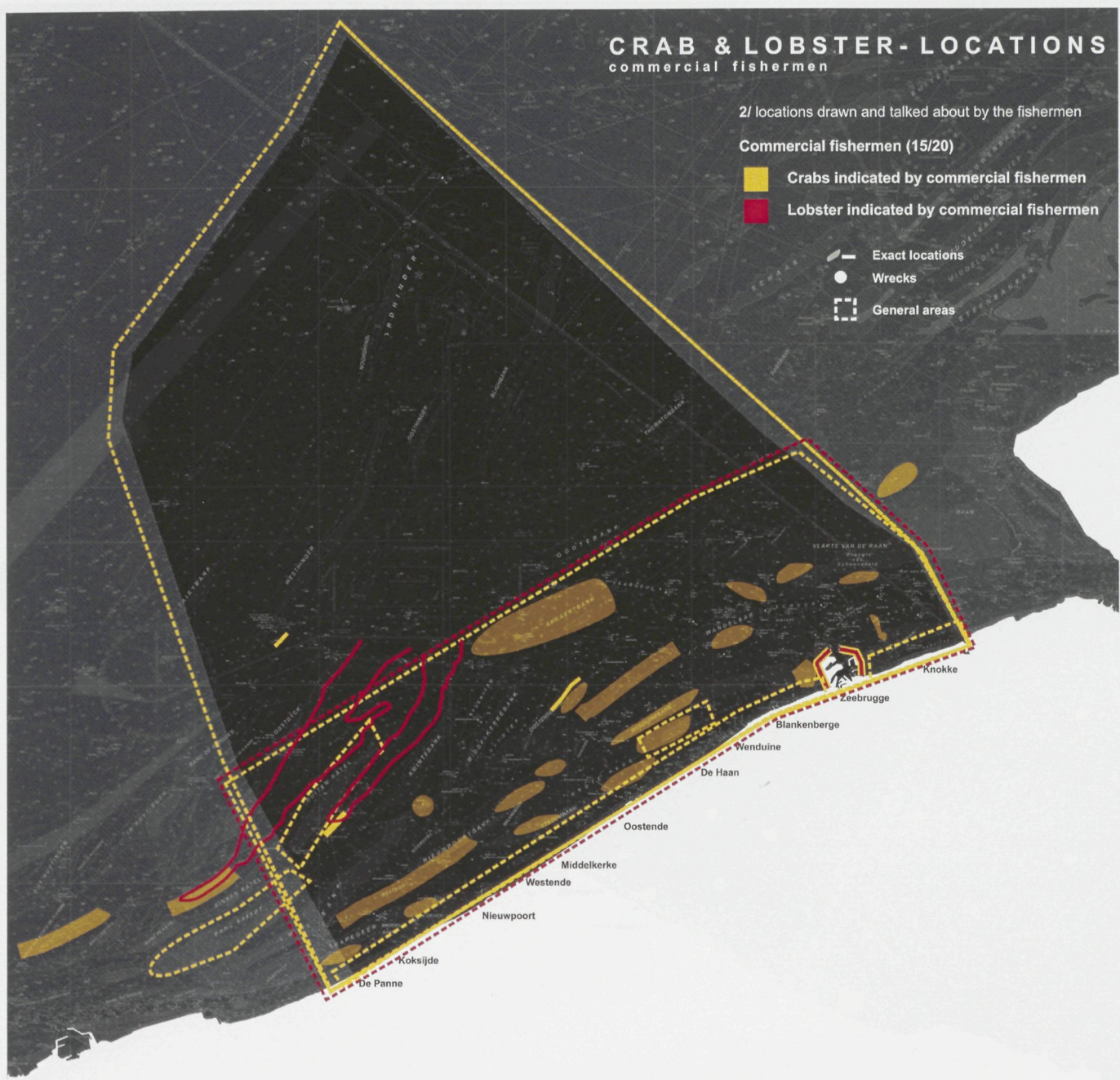
MAPS SERIES XI

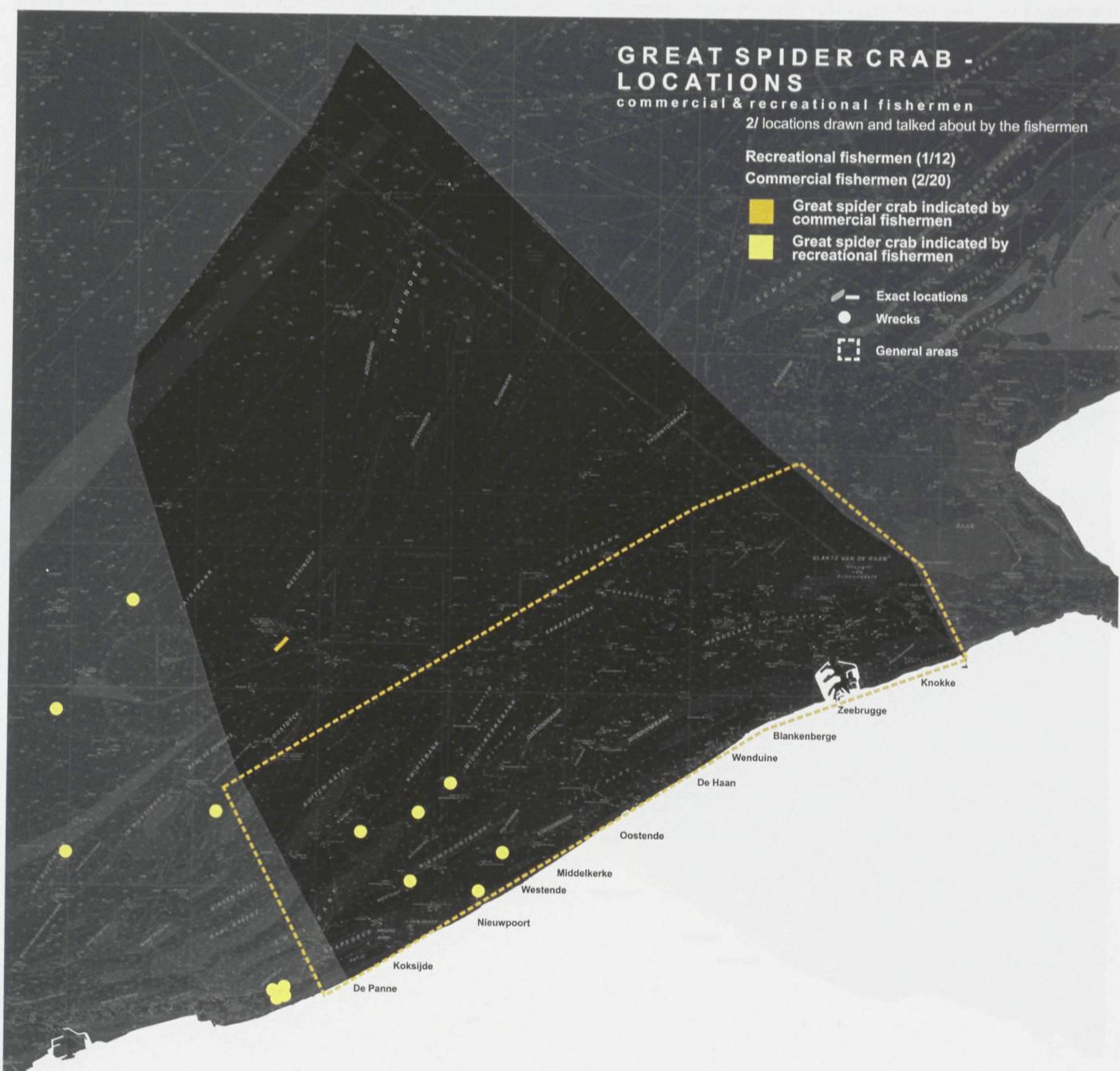
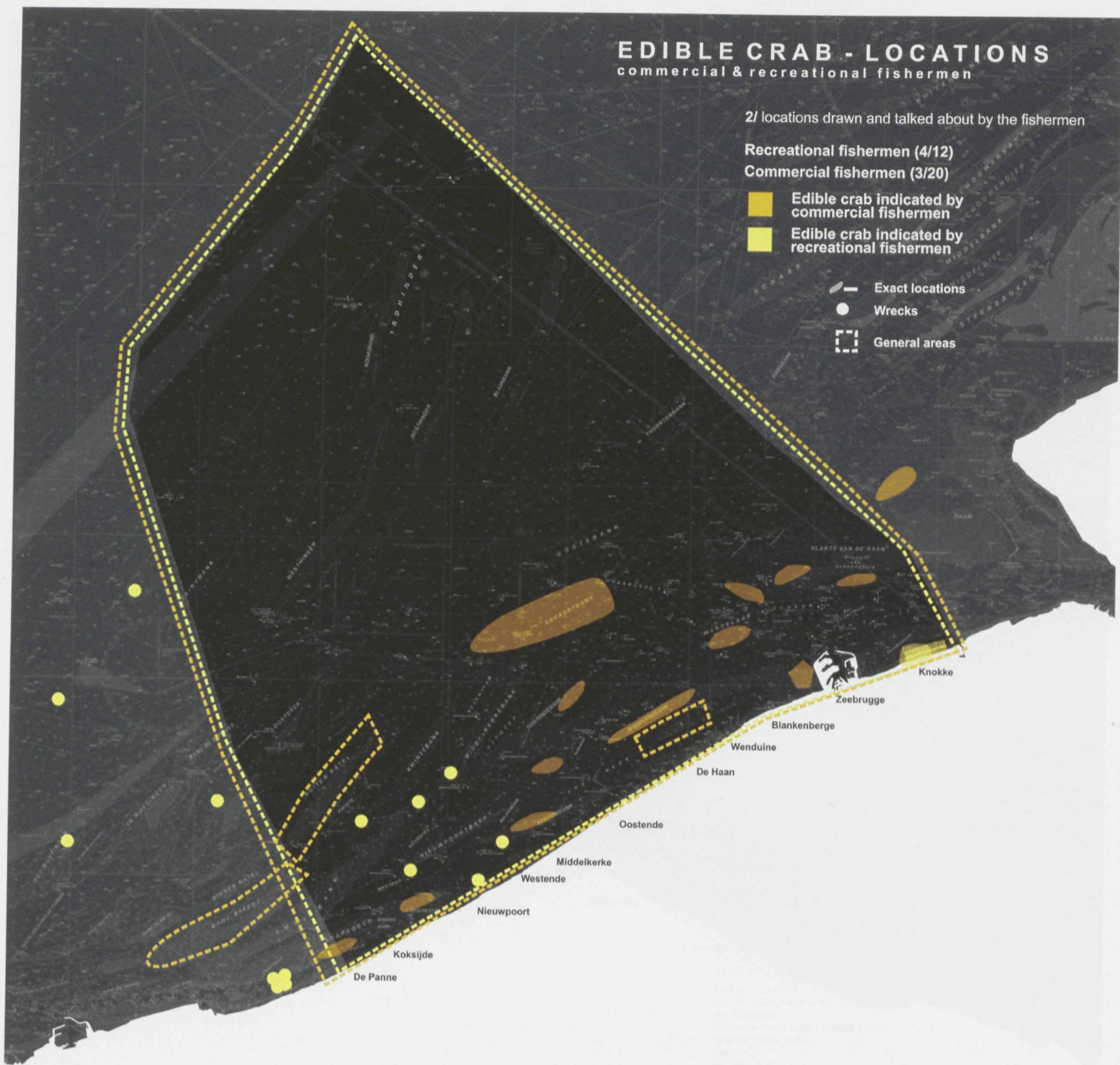
CRABS AND LOBSTERS

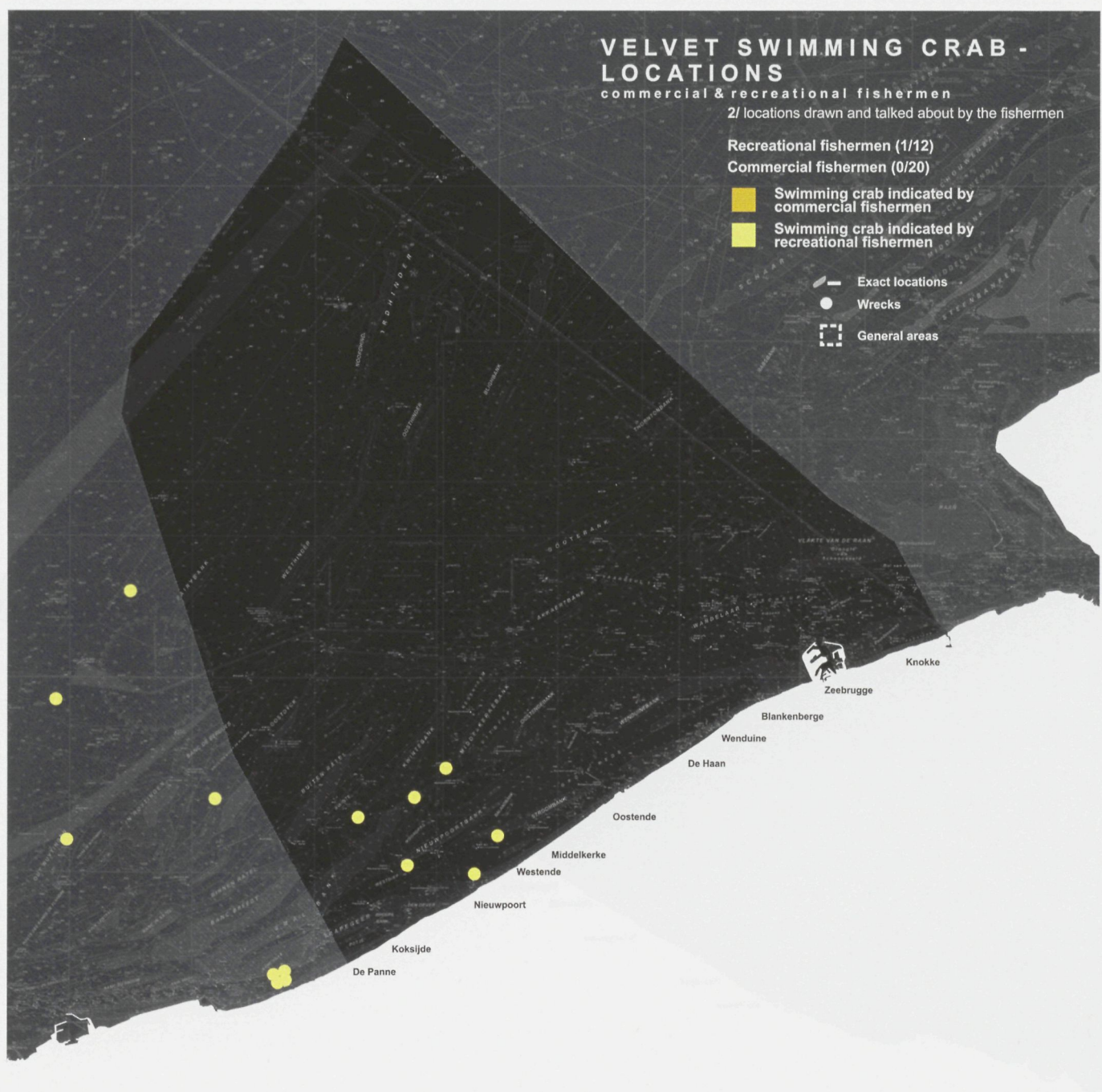
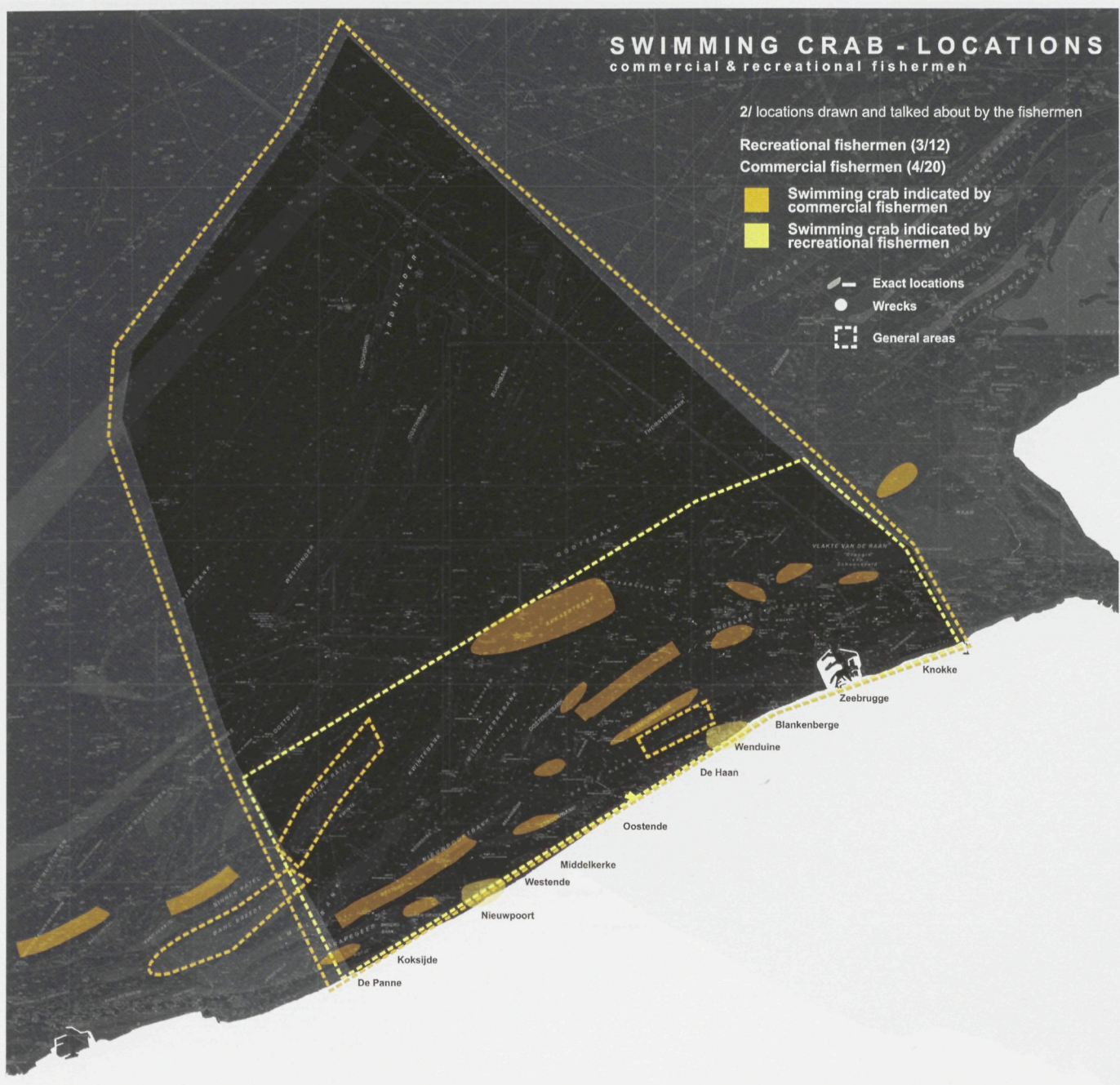
CRAB & LOBSTER - locations
downloaded from the
National Oceanic and Atmospheric Administration



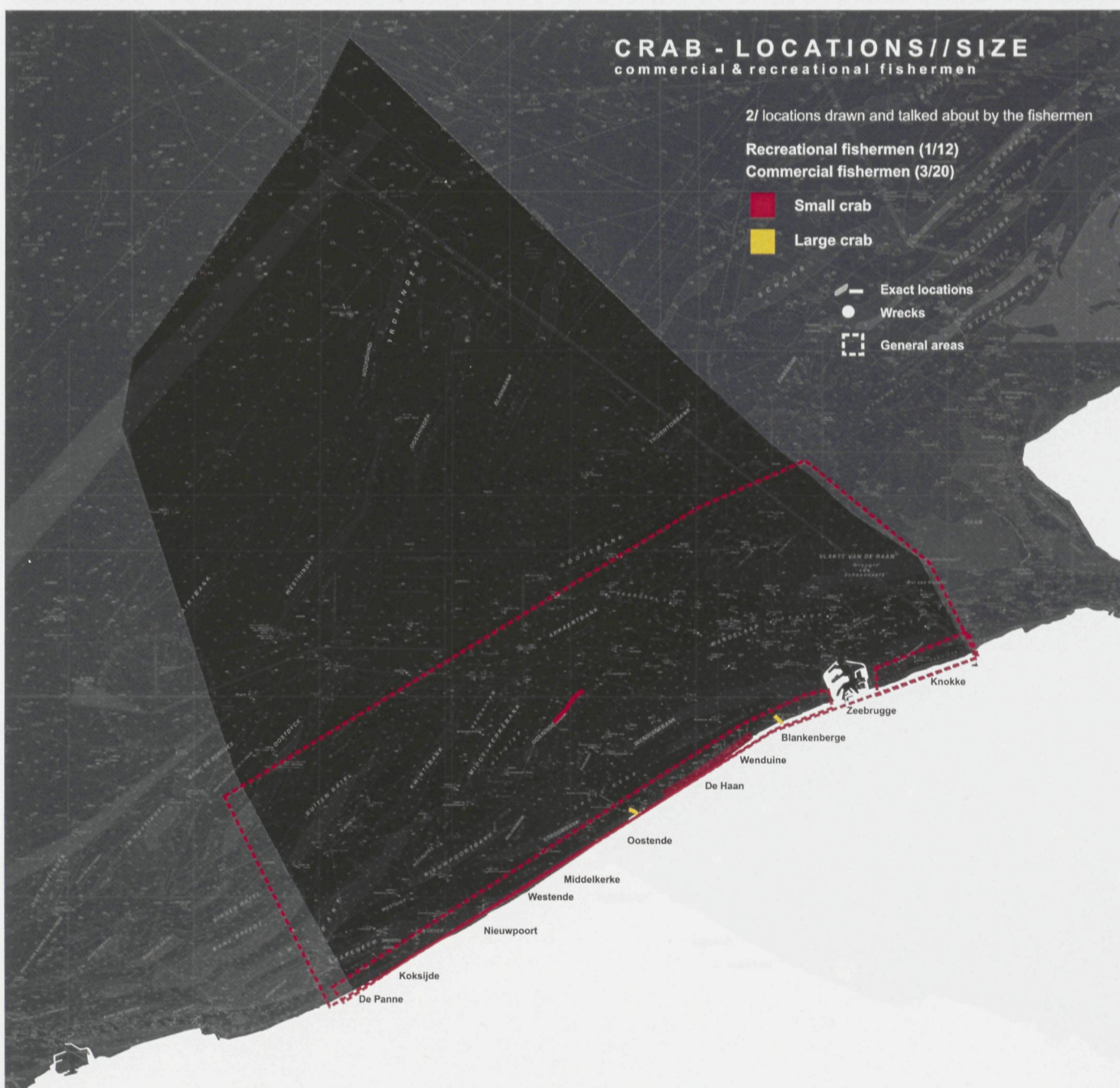
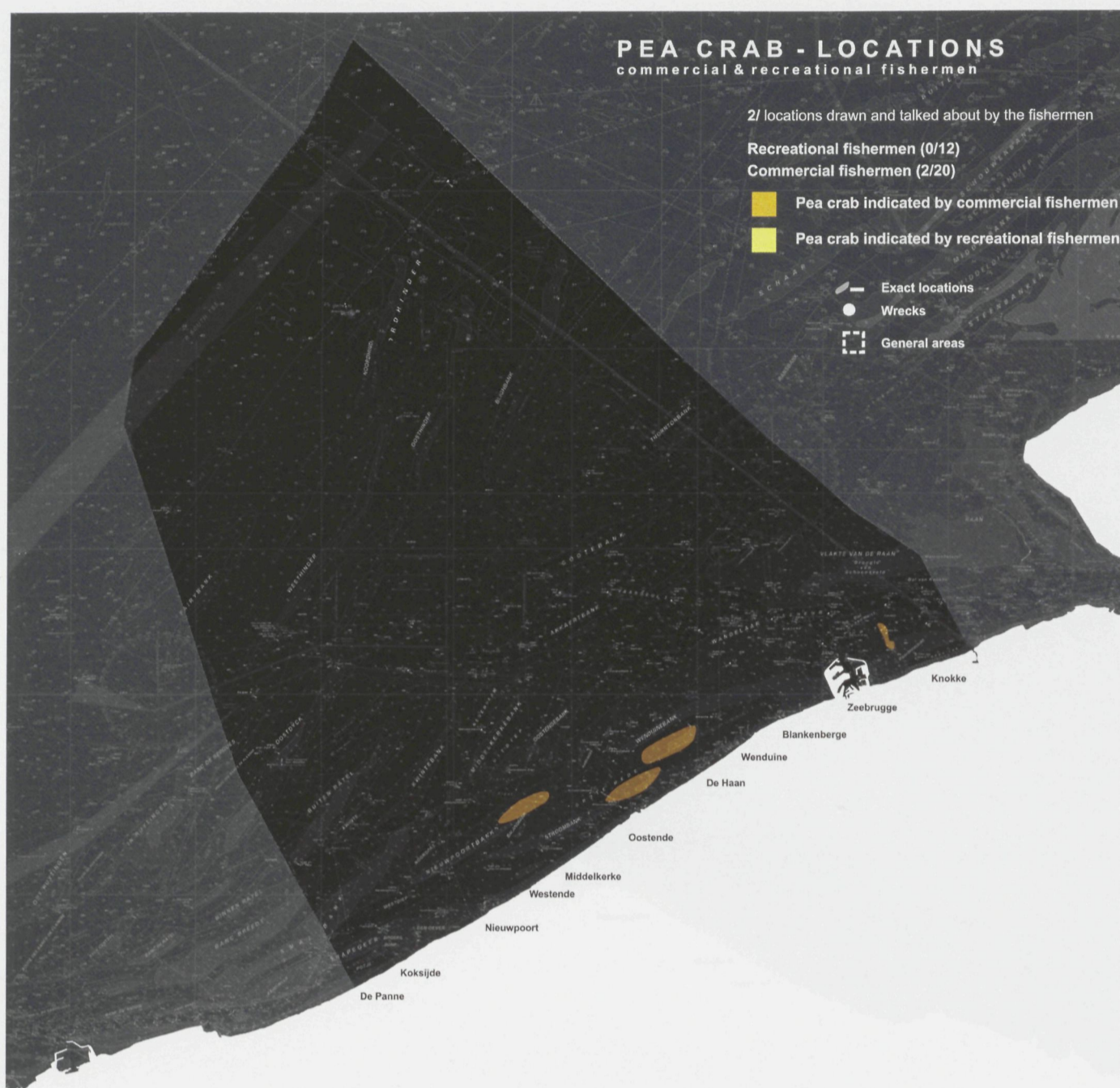
CRAB & LOBSTER - locations
drawn and talked about
commercial & recreational fishermen 1950 - 2010



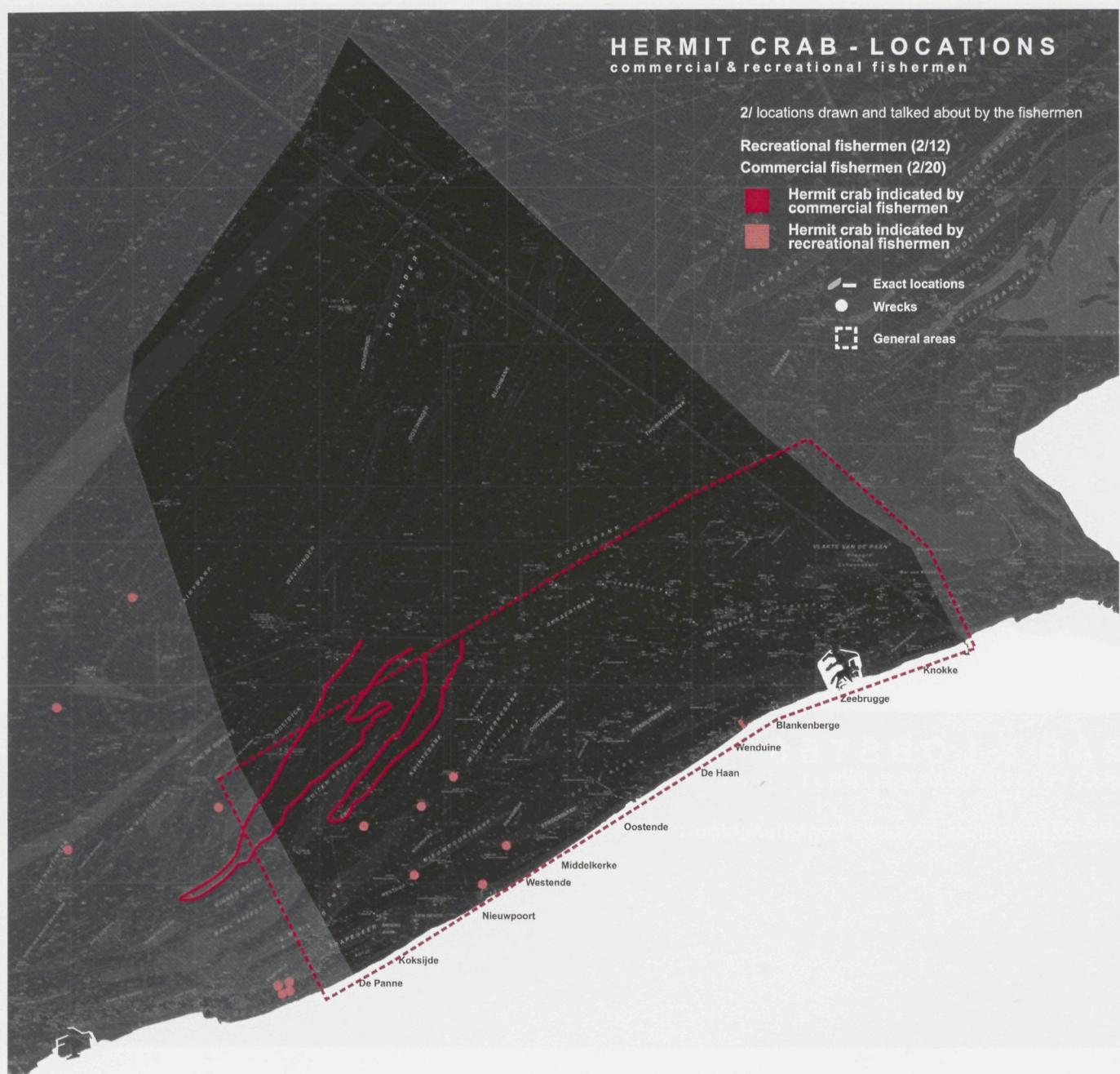




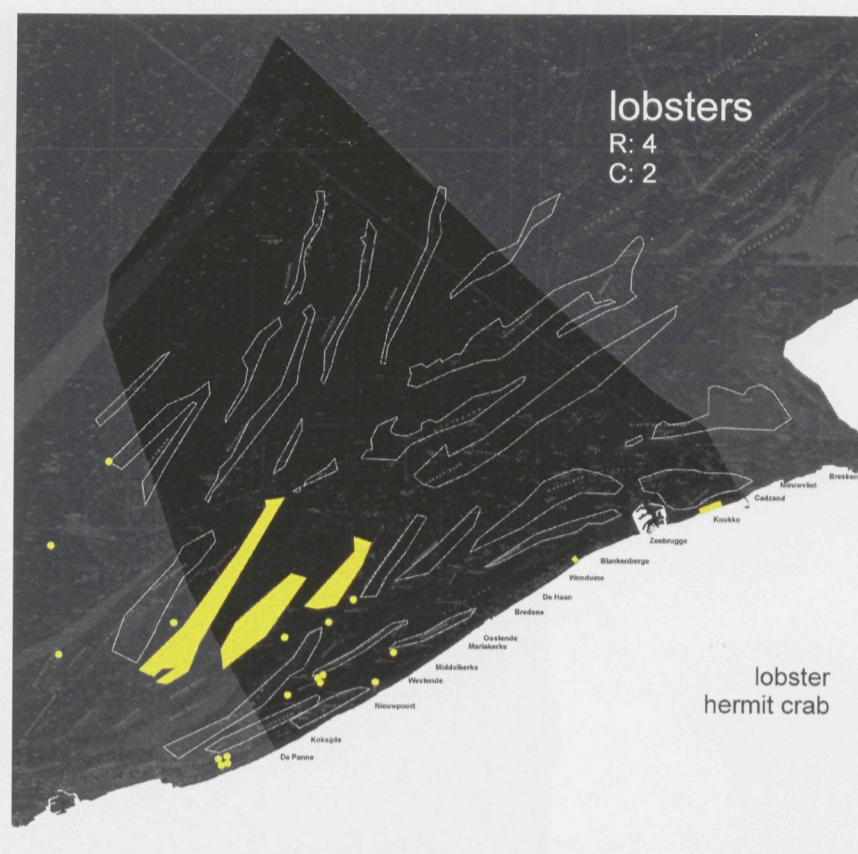
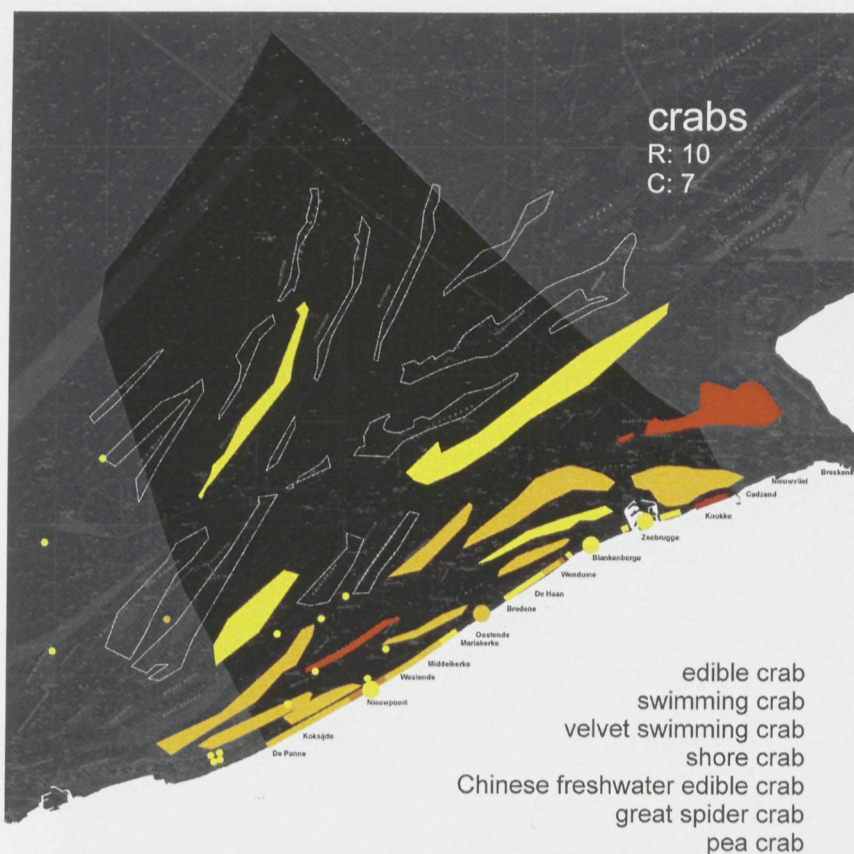
CRAB & LOBSTER - locations
specific species
commercial & recreational fishermen 1950 - 2010



CRAB & LOBSTER - locations
specific species
 commercial & recreational fishermen 1950 - 2010



CRAB & LOBSTER - locations
specific species
commercial & recreational fishermen 1950 - 2010



CRAB & LOBSTER - LOCATIONS

commercial & recreational fishermen 1960-2010

banks / beach ports indicated by fishermen

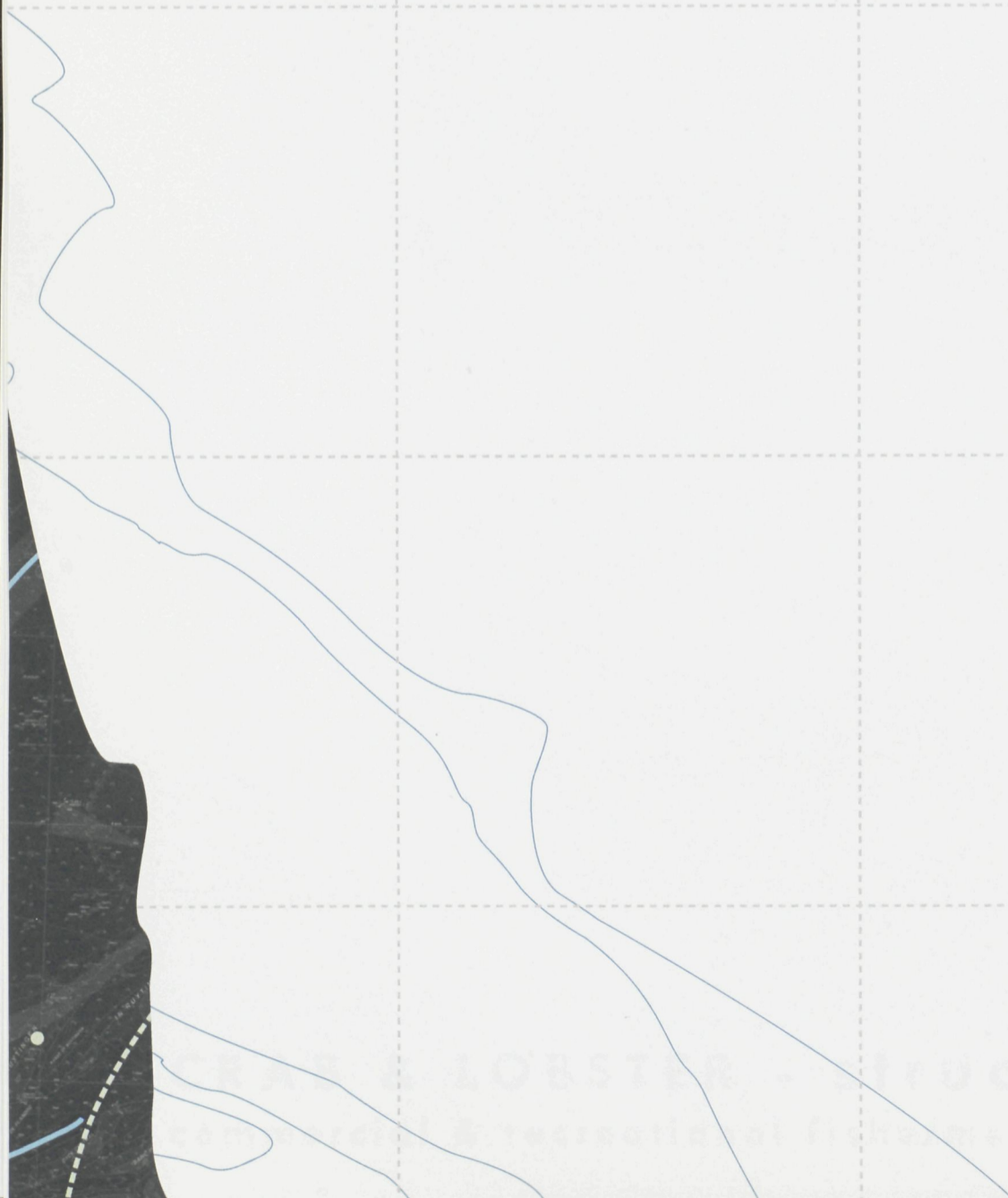
number of fishermen on same bank/beach/port:



LECOFISH SEPTEMBER 2011

MAPS SERIES XII

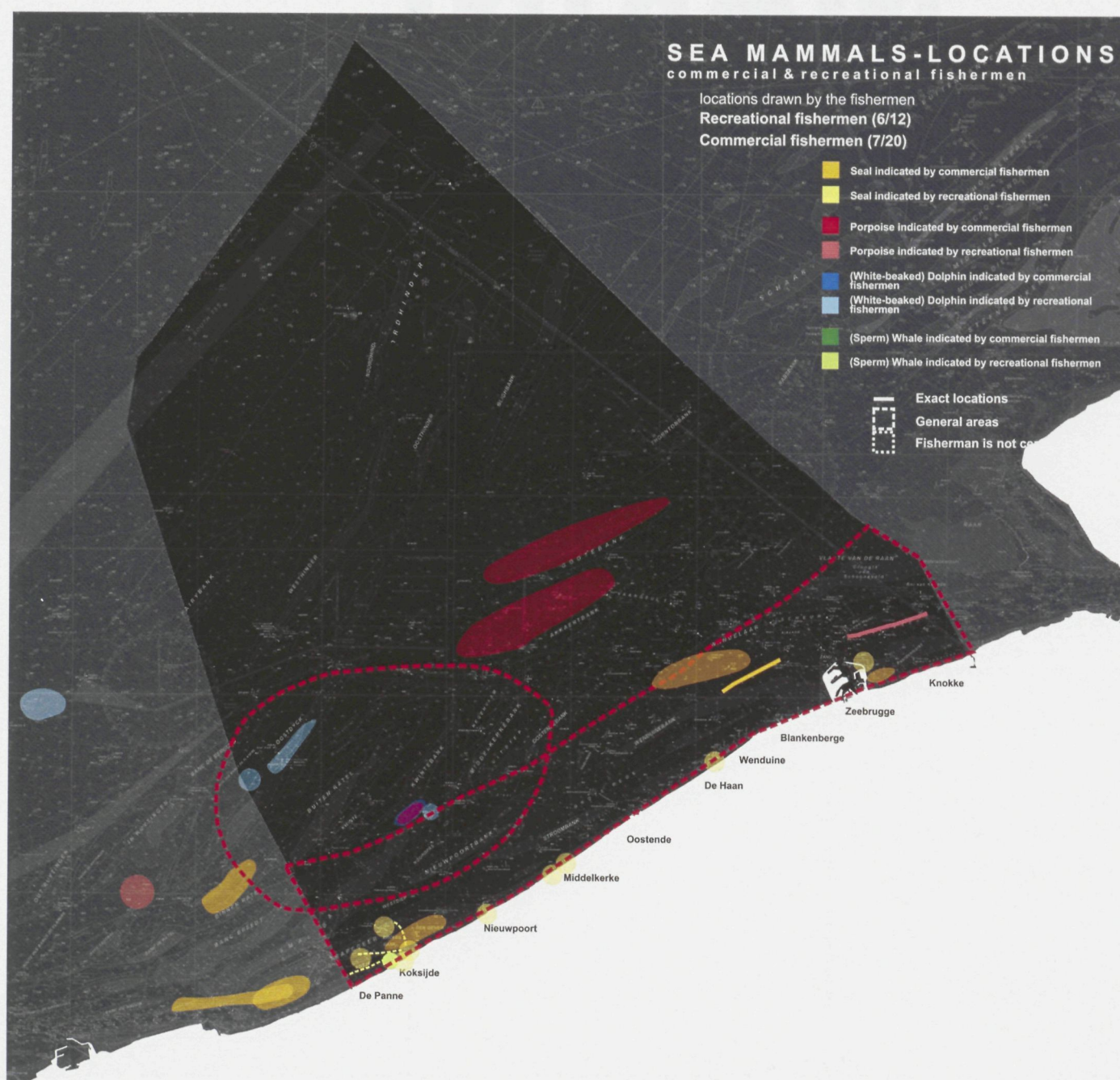
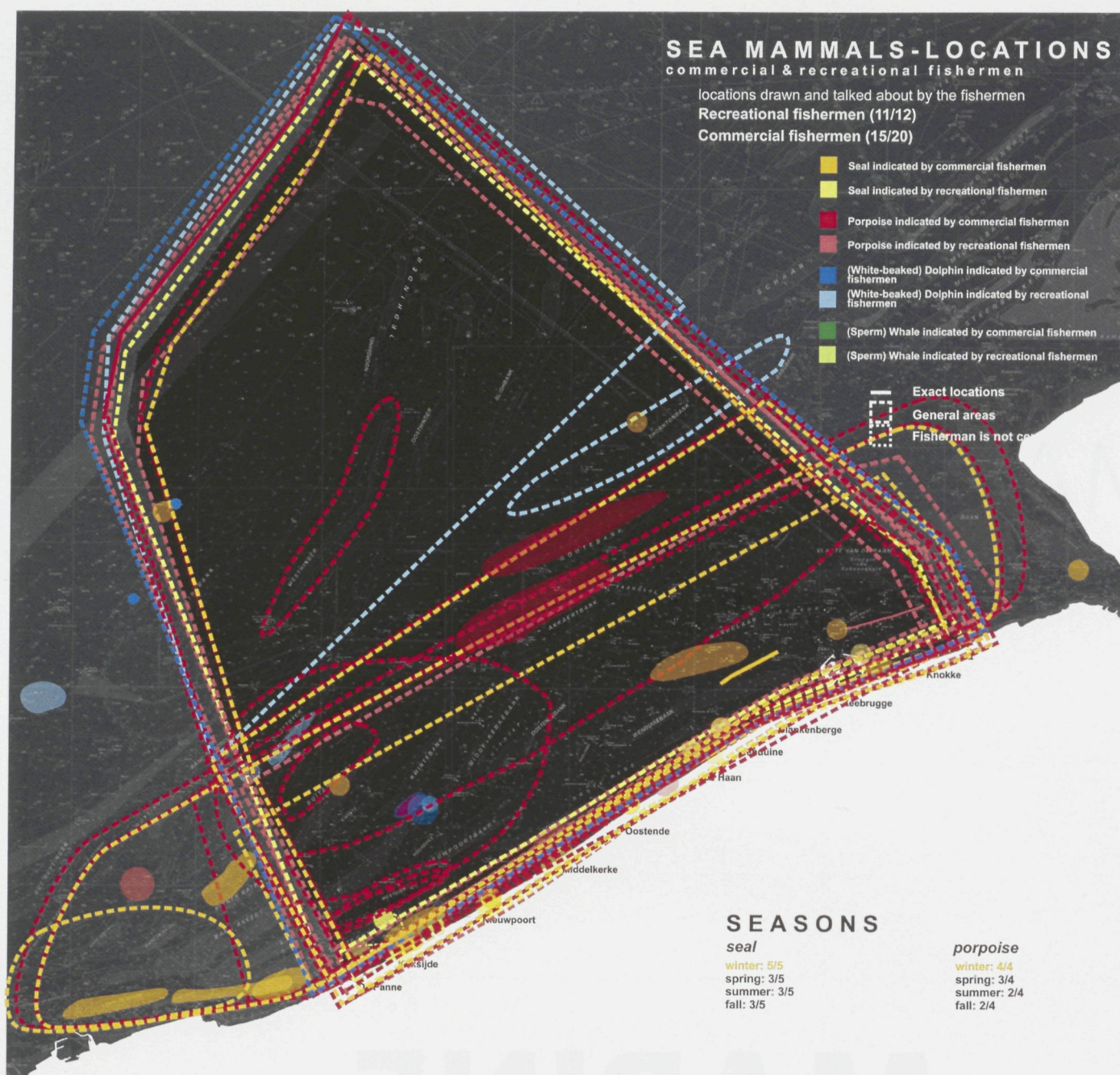
MARINE
MAMMALS

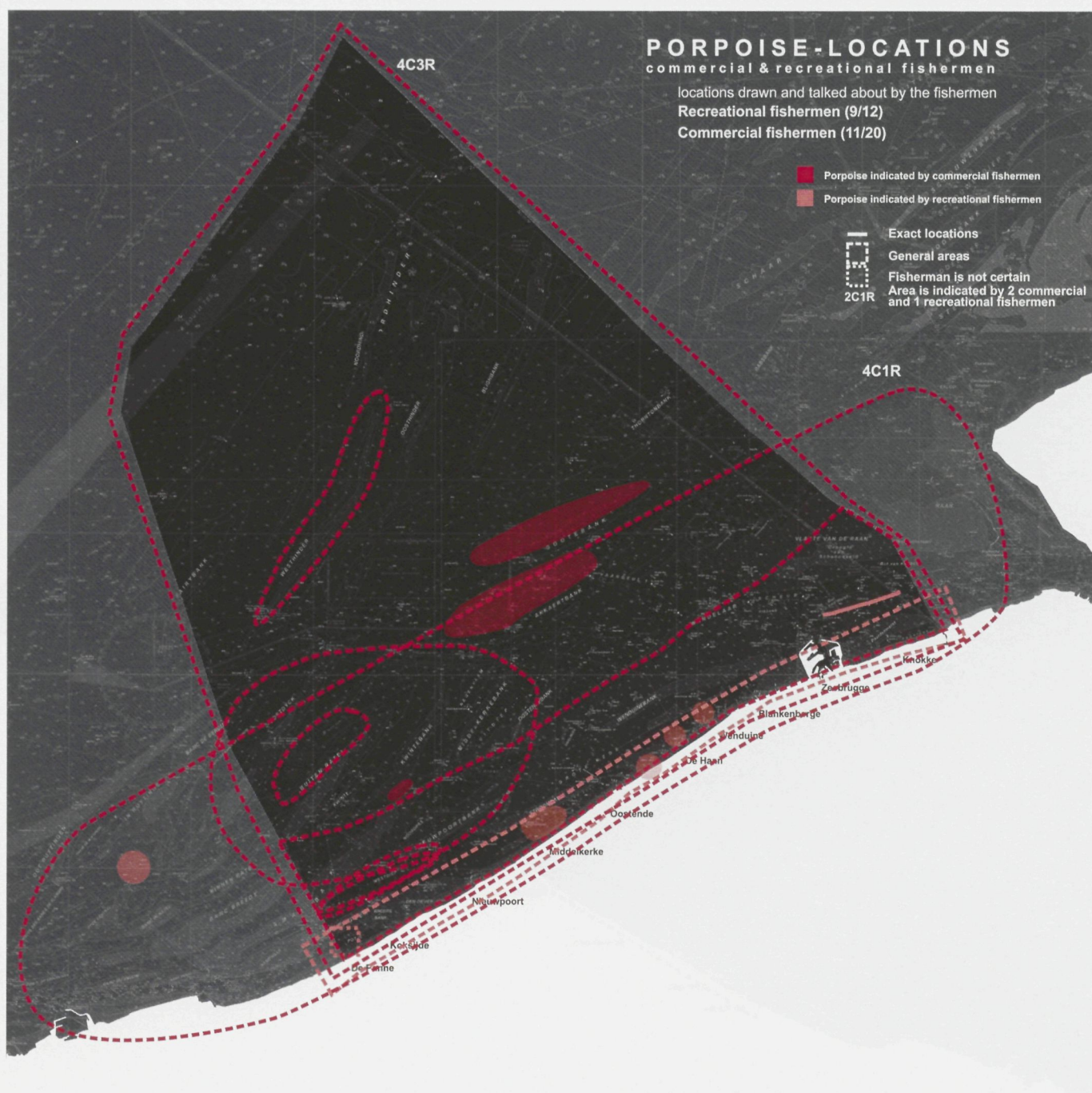
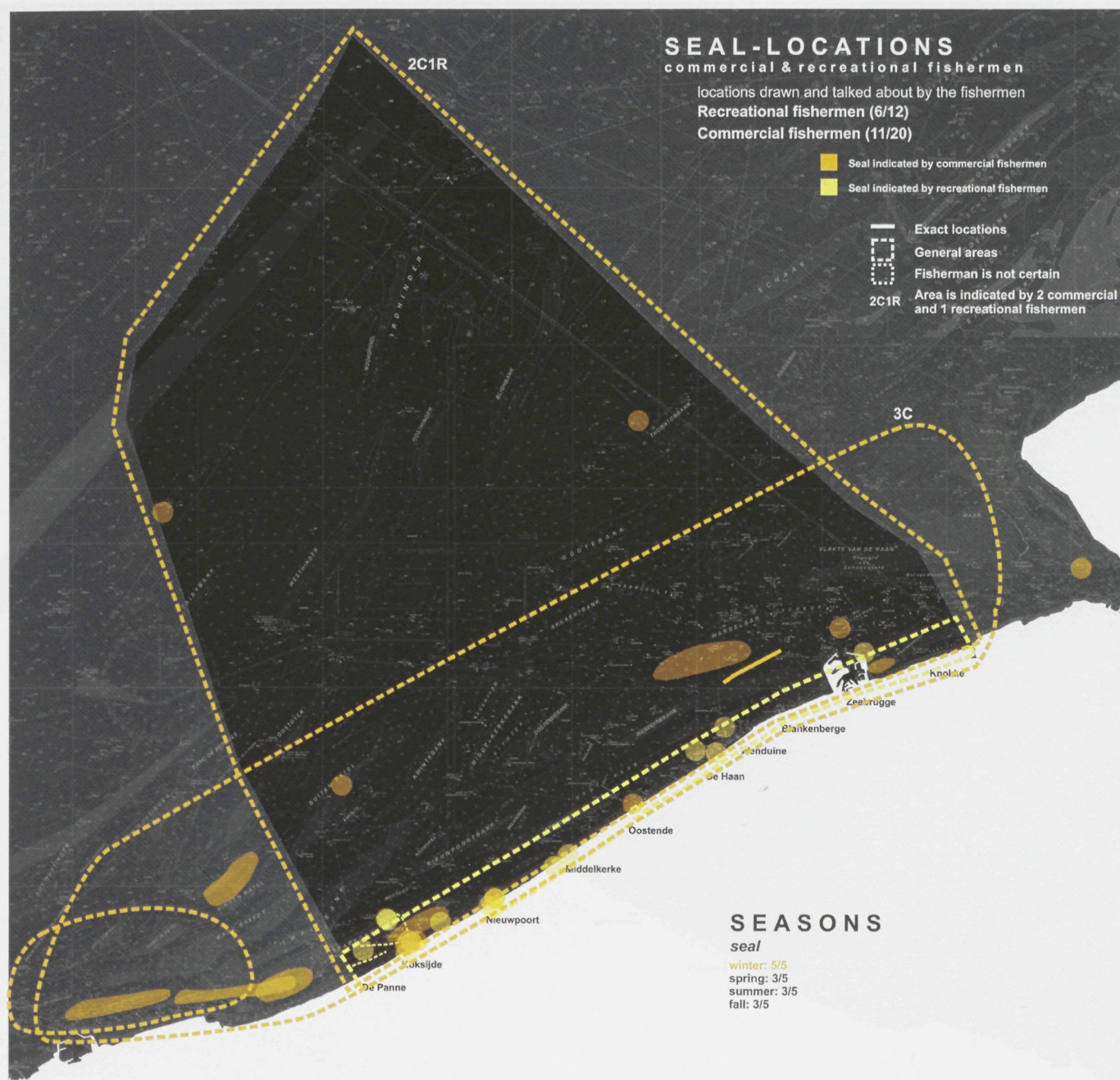


CRAB & LOBSTER - structure maps
containing a regression of fisherman 1930-2010

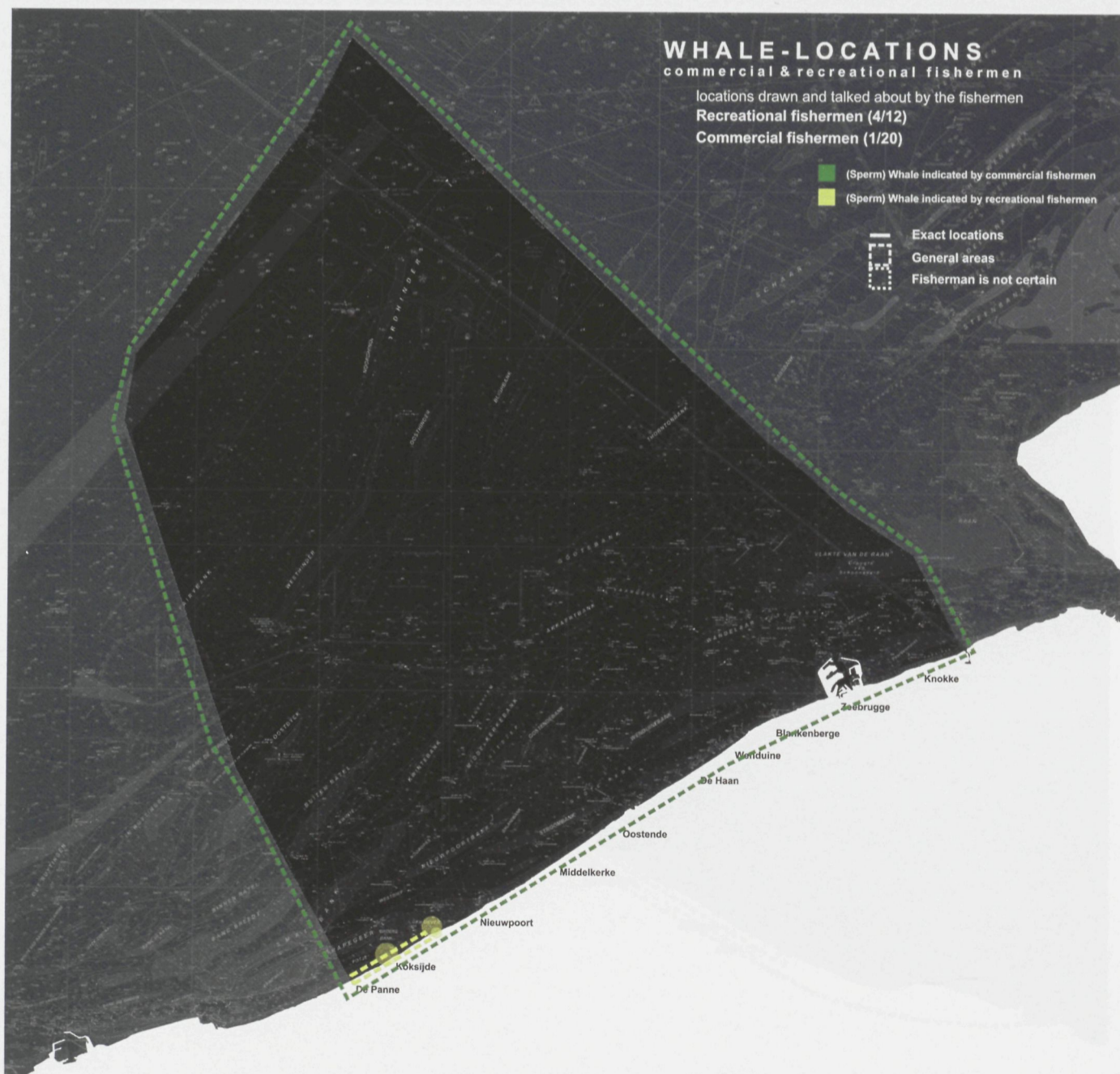
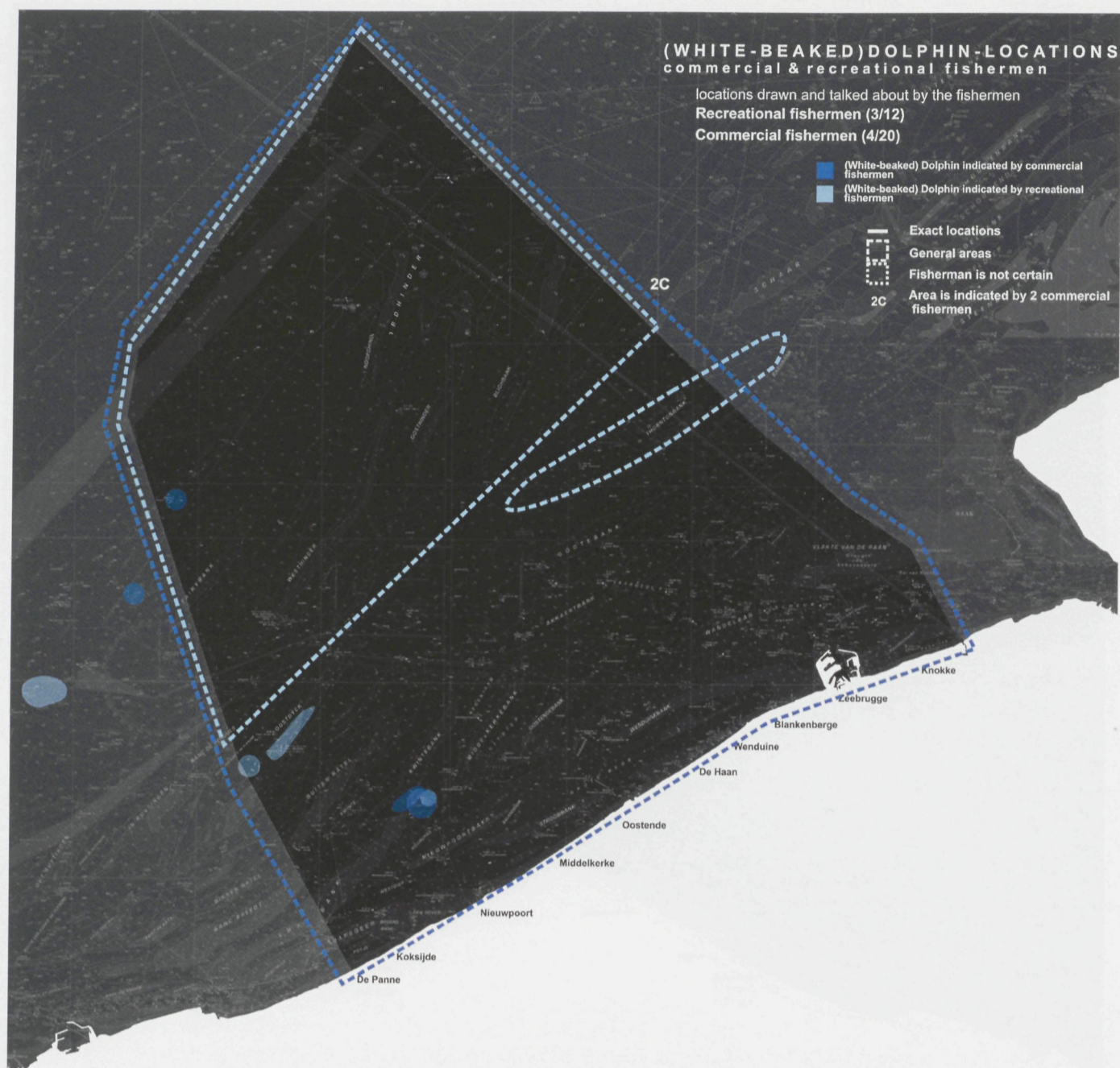
MAPS SERIES XII

MARINE MAMMALS





MARINE MAMMALS - locations
specific species
 commercial & recreational fishermen 1950 - 2010





MARINE MAMMALS - locations
specific species

commercial & recreational fisheries 1950-1970

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