

# Conservation and development of Wadden Sea salt marshes as a long-term adaptation strategy

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# Delta Programme Wadden region

Advice **Delta Committee 2008** → recommended a tenfold increase in the flood safety level while also emphasizing the need for development of flood protection along with climate change and ecological processes

**Delta Programme** → in search for measures

## Objectives **Delta Programme Wadden region:**

To explore possibilities to ensure flood protection in the Wadden area in the long term taking into account both nature and landscape values

- Mainland
- Wadden barrier islands







# Task to improve flood protection

Flood defences along Wadden Sea coast: several stretches in Wadden area do not meet current standards



# Dikes along the Wadden Sea coast



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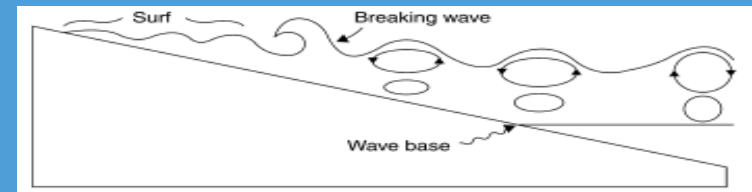
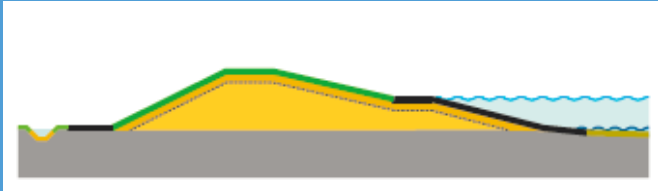


# Salt marshes along the coast



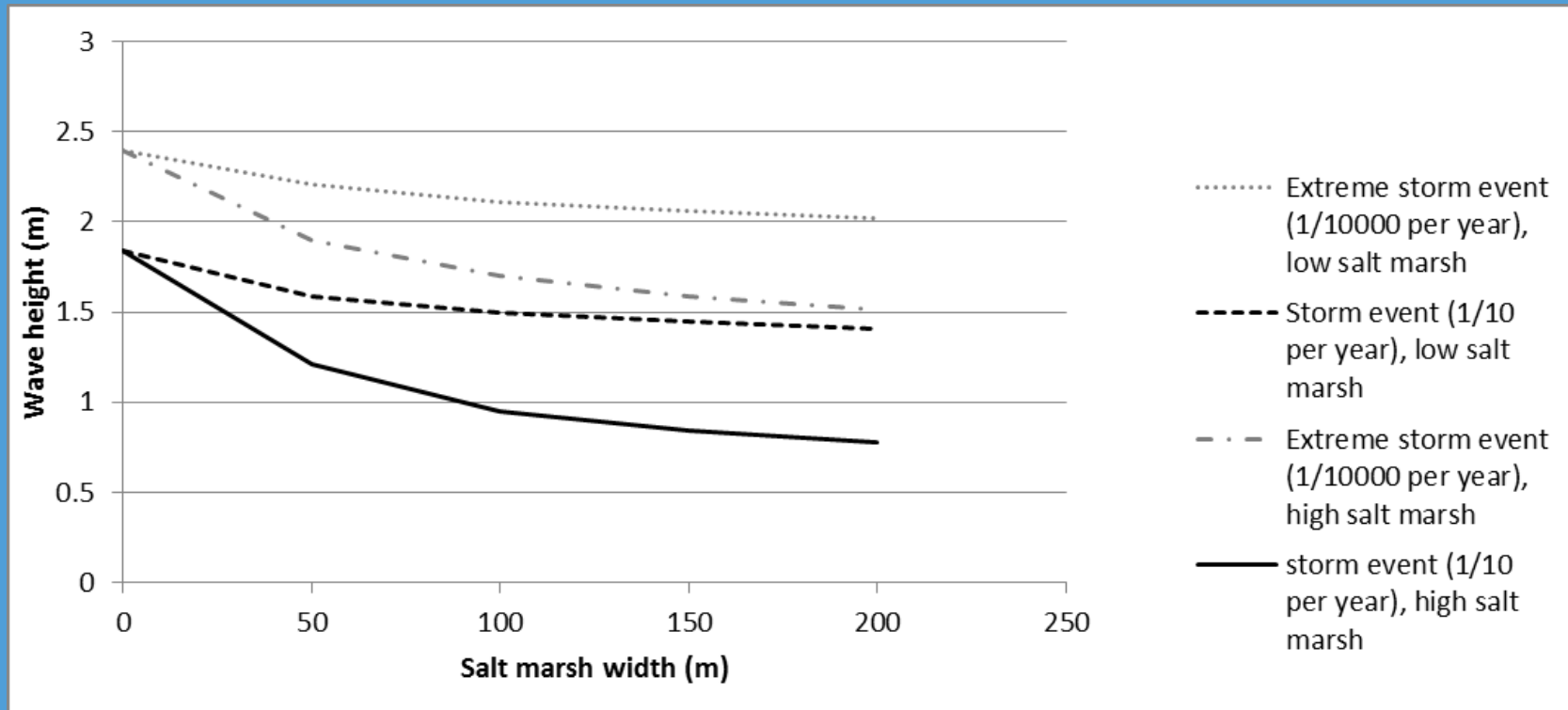
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# Wave damping by salt marshes



- slope of the coastal profile
- water depth above the salt marsh
- width of the salt marsh zone
- surface topography
- vegetation characteristics

# Modelled wave height

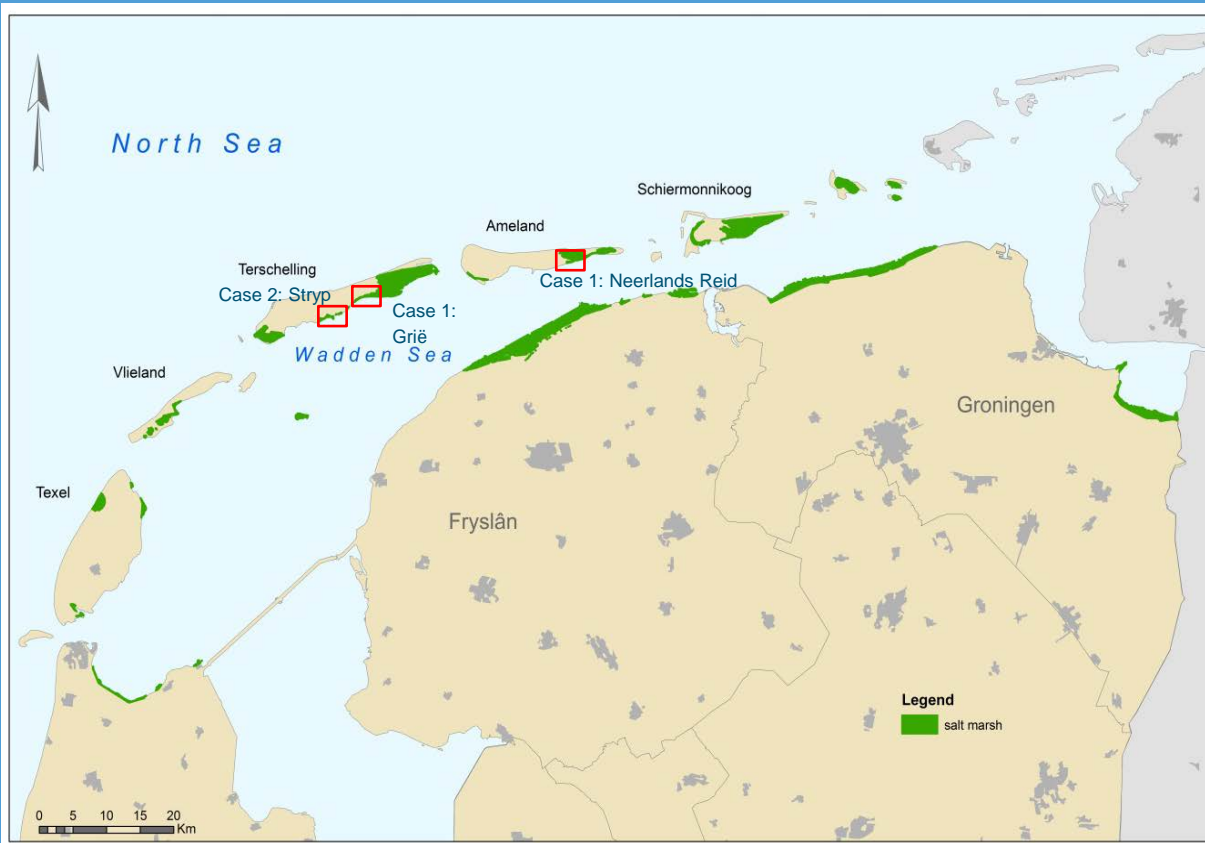


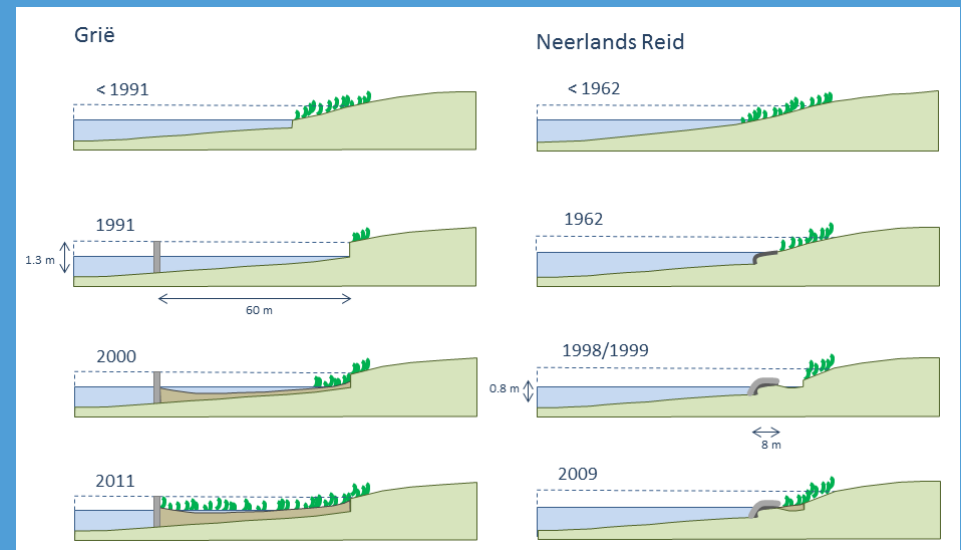
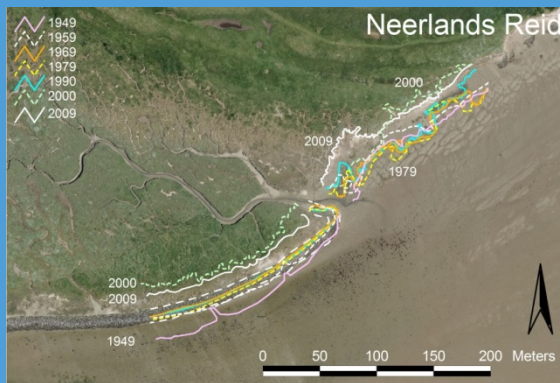
*Modelled wave height over a foreshore (1 m +NAP and 2.3 m +NAP) under extreme storm conditions (1/10 and 1/10,000 per year) (based on Venema et al., 2012).*





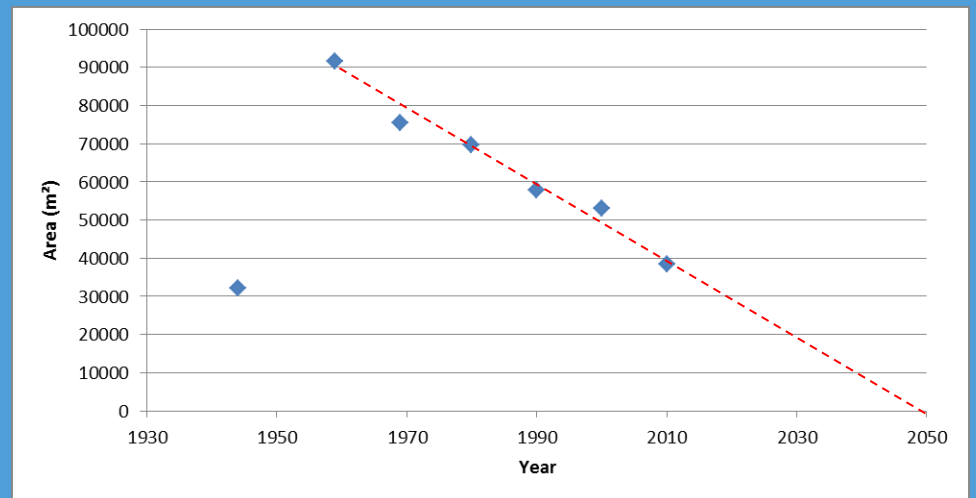
# Case studies





Grië: erosion edge -1.3 m/y; after dam -0.2 m/y

Neerlands Reid: erosion -0.7 m/y; after erosion protection + 0.7 m/y

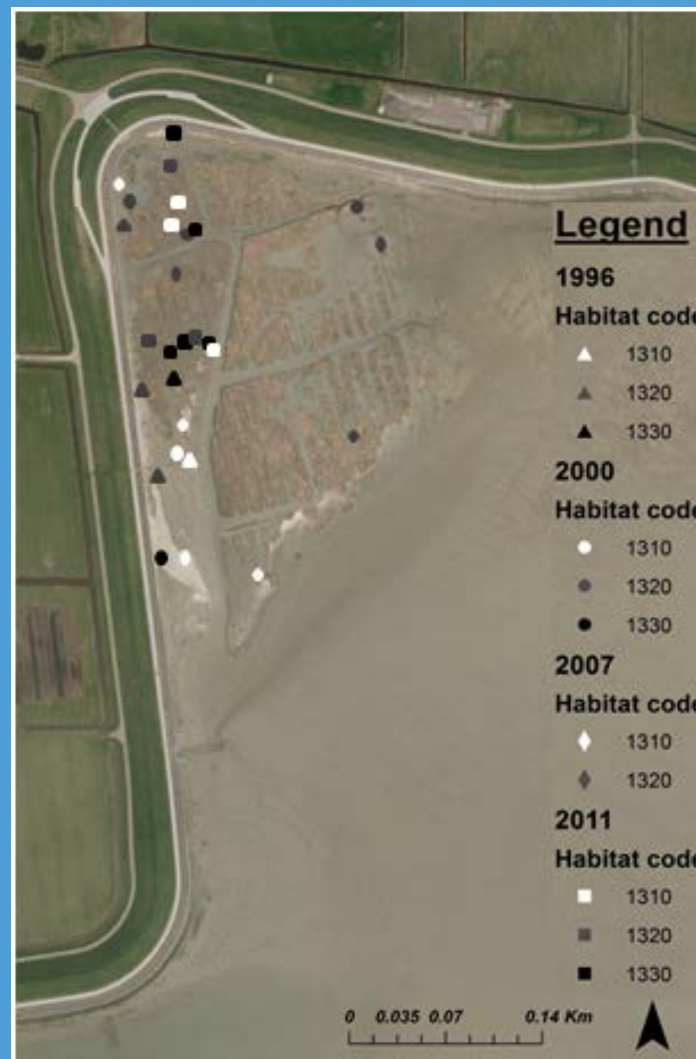






Syntaxa	Syntaxa code	Habitat code	G1	G2	G3	G4	G5	G6	N1	N2	N3	N4
<i>Spartinetum townsendii</i>	24AA02	1320	+			+		+	+	+		+
<i>Salicornietum dolichostachyae</i>	25AA01	1310		+	+				+	+		
<i>Salicornietum brachystachyae</i>	25AA02	1310	+	+		+	+	+		+	+	+
<i>Suaedetum maritimae</i>	25AA03	1310								+		
<i>Puccinellietum maritimae</i>	26AA01	1330							+			+
<i>Plantagini-Limonietum</i>	26AA02	1330						+				
<i>Halimionetum portulacoidis</i>	26AA03	1330				+	+				+	+
<i>Juncetum gerardi</i>	26AC01	1330							+			
<i>Artimisietum maritimae</i>	26AC05	1330							+	+	+	
<i>Atriplici-Elytrigietum pungentis</i>	26AC06	1330	+	+	+	+	+	+	+	+	+	+
<i>RG Scirpus maritimus (Asteretea tripolii)</i>	26RG01	1330							+			



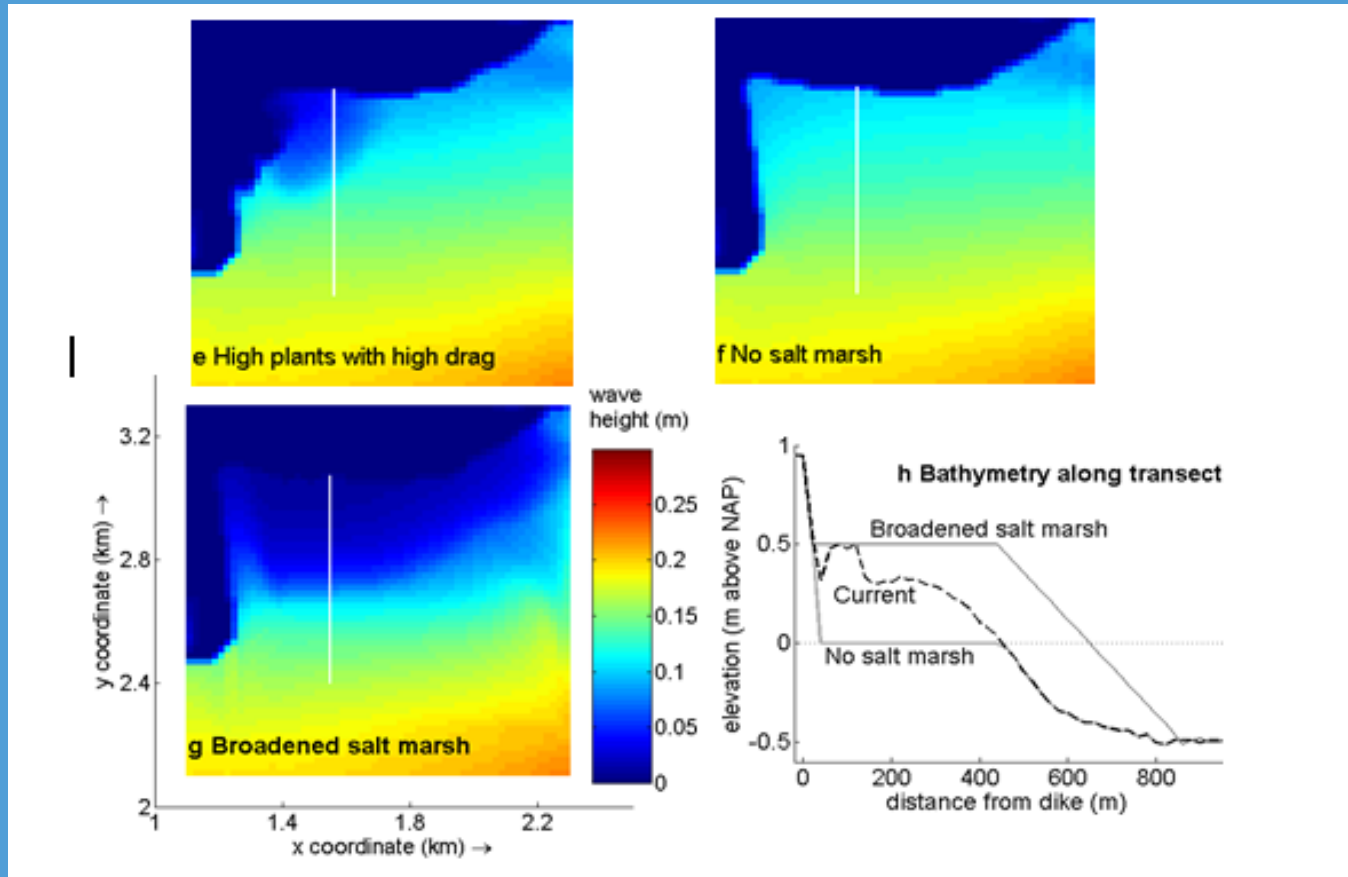




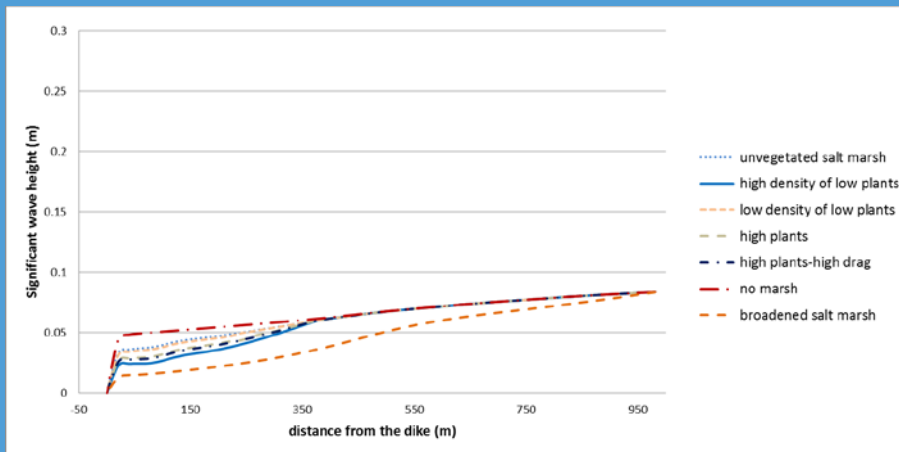
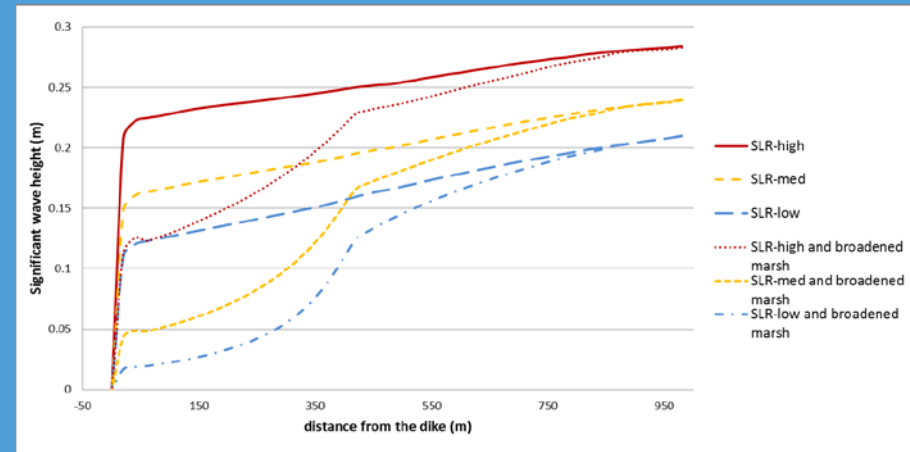
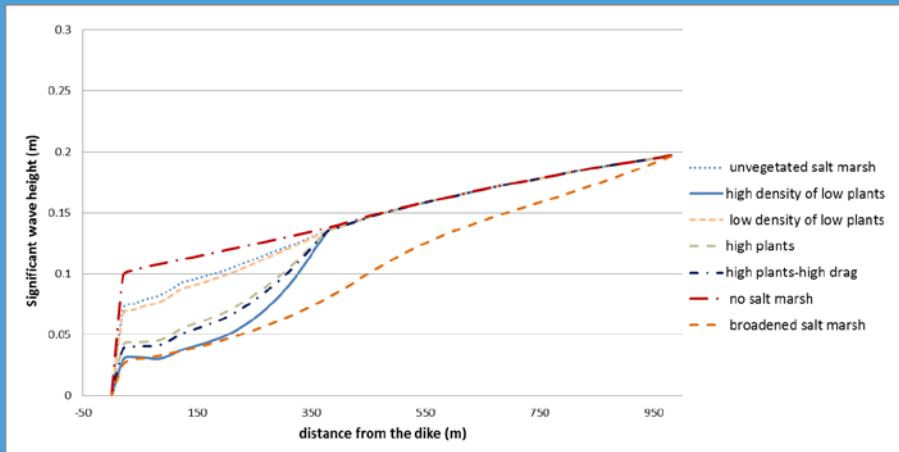




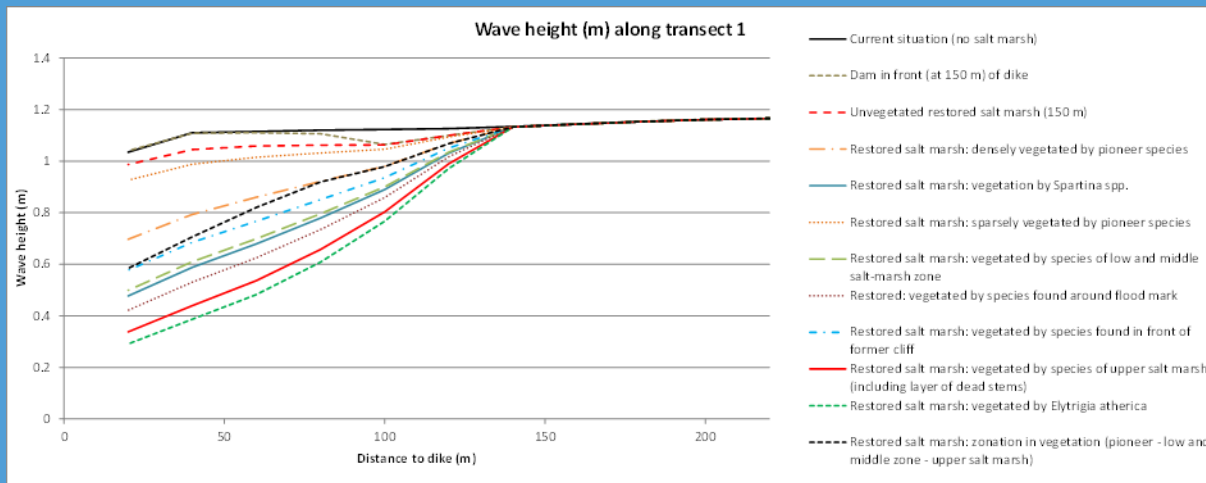
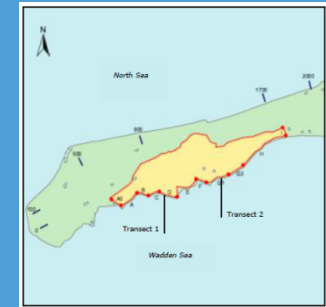
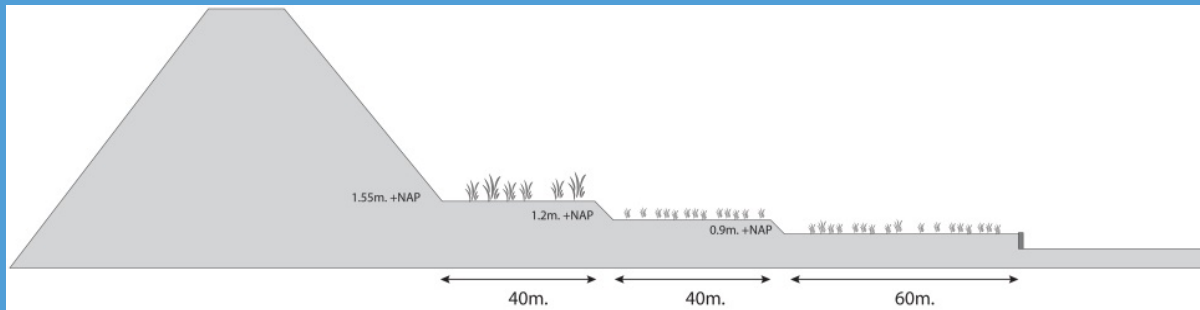
# Modelled wave damping for different situations



# Modelled wave damping

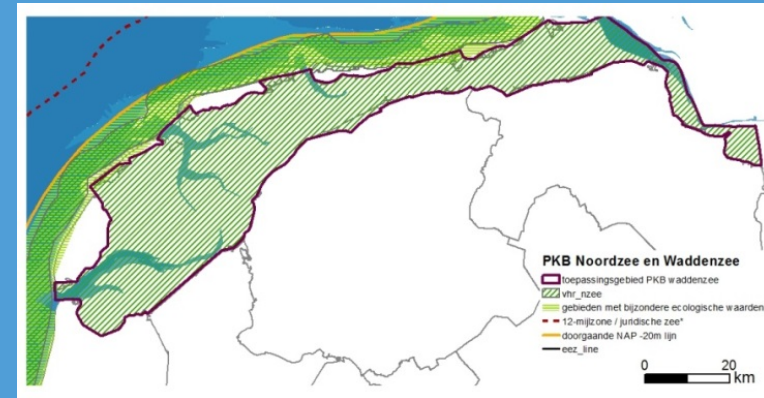


# Modelled wave damping over a schematized salt marsh





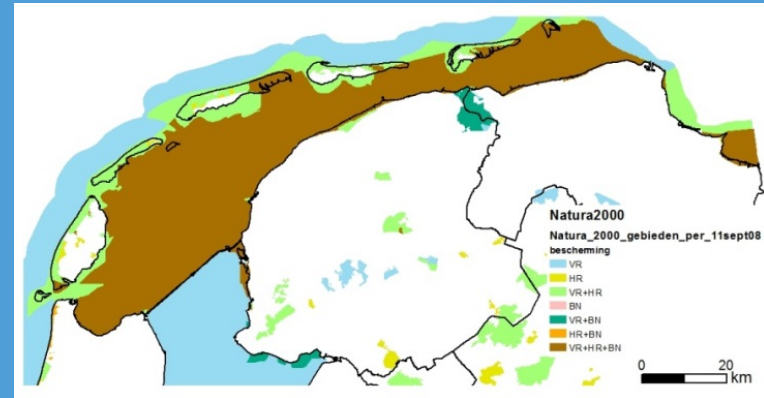
# Other values

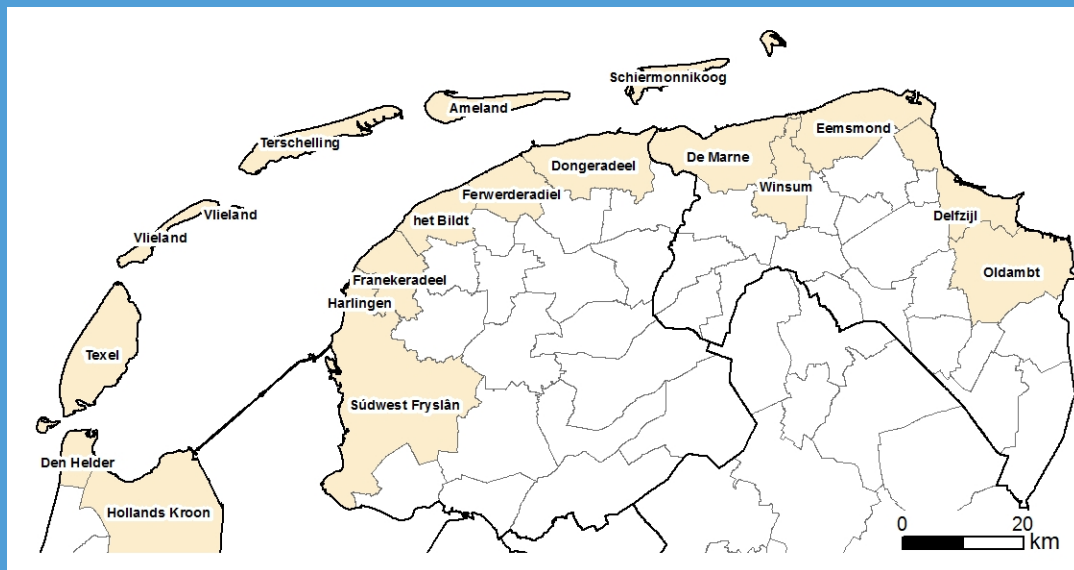


**tabel 10: Aantallen wadlopers en deelnemers aan andere tochten**

jaar	Regulier wadlopen	Natuureducatieve tochten
2001	27.671	46.230
2002	30.253	35.963
2003	29.489	50.851
2004	26.182	51.524
2005	21.088	-
2006	22.458	53.847
2007	24.964	44.033

Bron: [www.waddenzee.nl](http://www.waddenzee.nl)







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Thank you for  
your attention

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