

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

Jantsje van Loon-Steensma (Wageningen UR); Zhan Hu (Delft University of Technology); Pieter Slim (Alterra)



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





North Sea

Task to improve flood protection

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



Source: Deltares

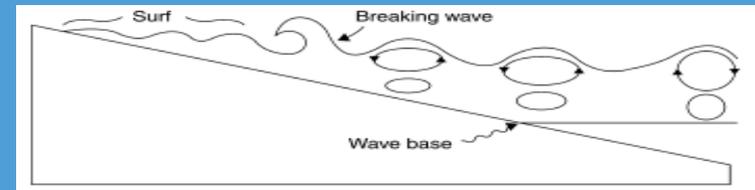
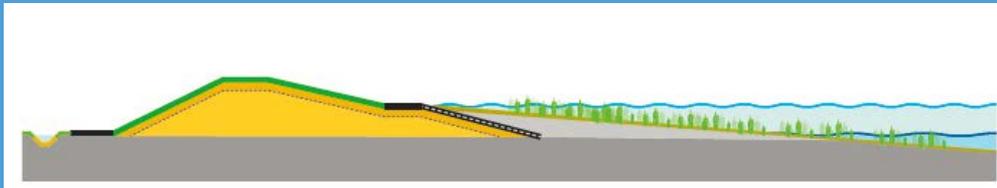
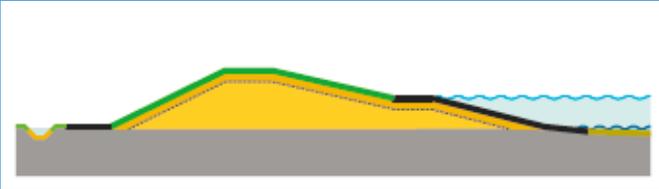
Dikes along the Wadden Sea coast



Salt marshes along the coast



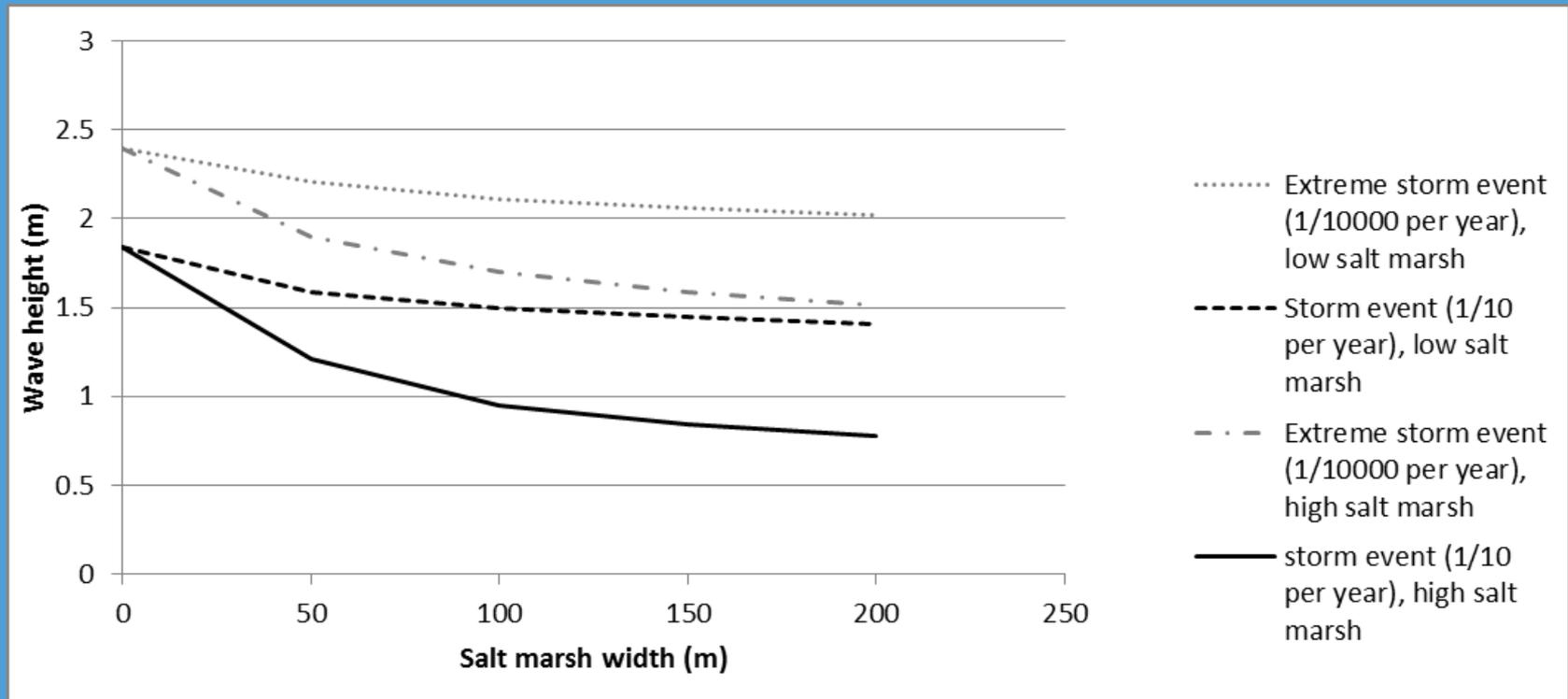
Wave damping by salt marshes



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



Modelled wave height

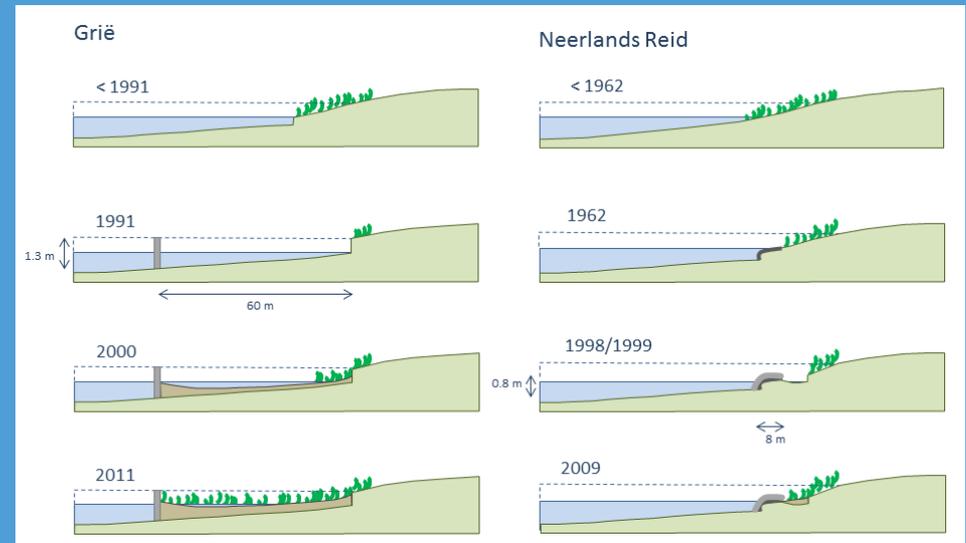
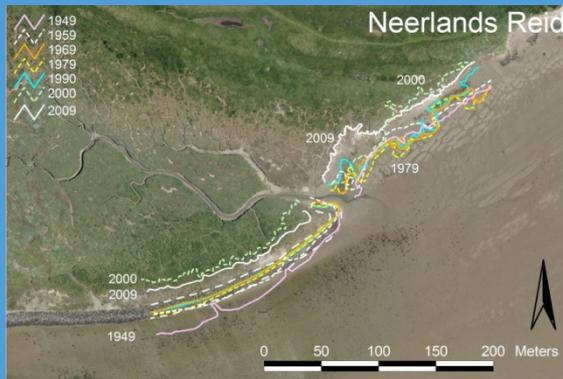


Modelled wave height over a foreshore (1 m +NAP and 2.3 m +NAP) under extreme storm conditions (1/10 and 1/10,000 per year) (based on Venema et al., 2012).



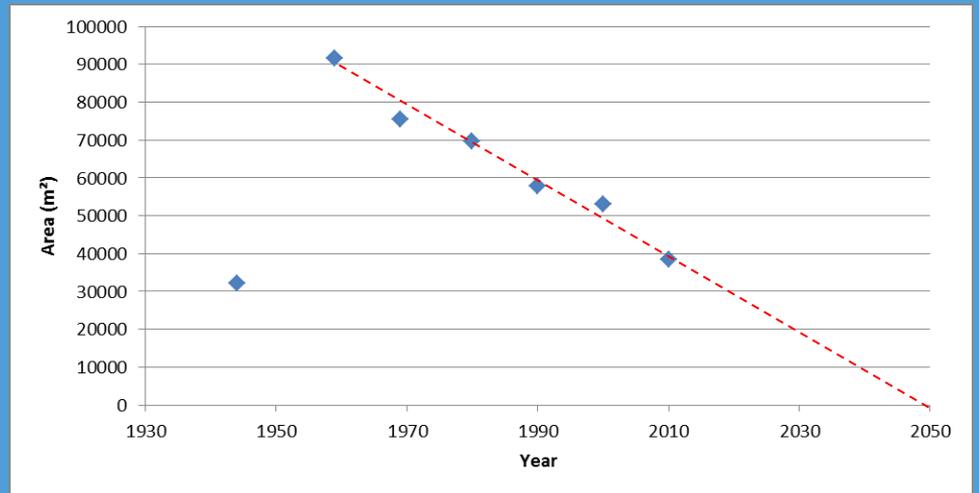
Case studies





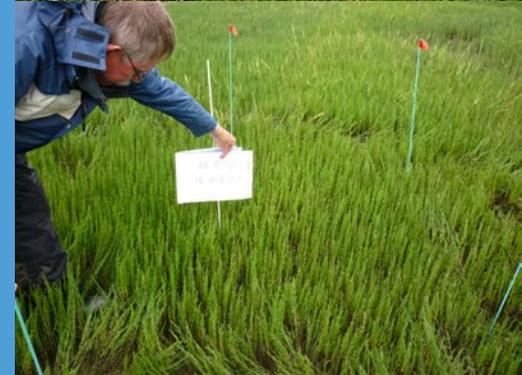
Grië: erosion edge -1.3 m/y; after dam -0.2 m/y

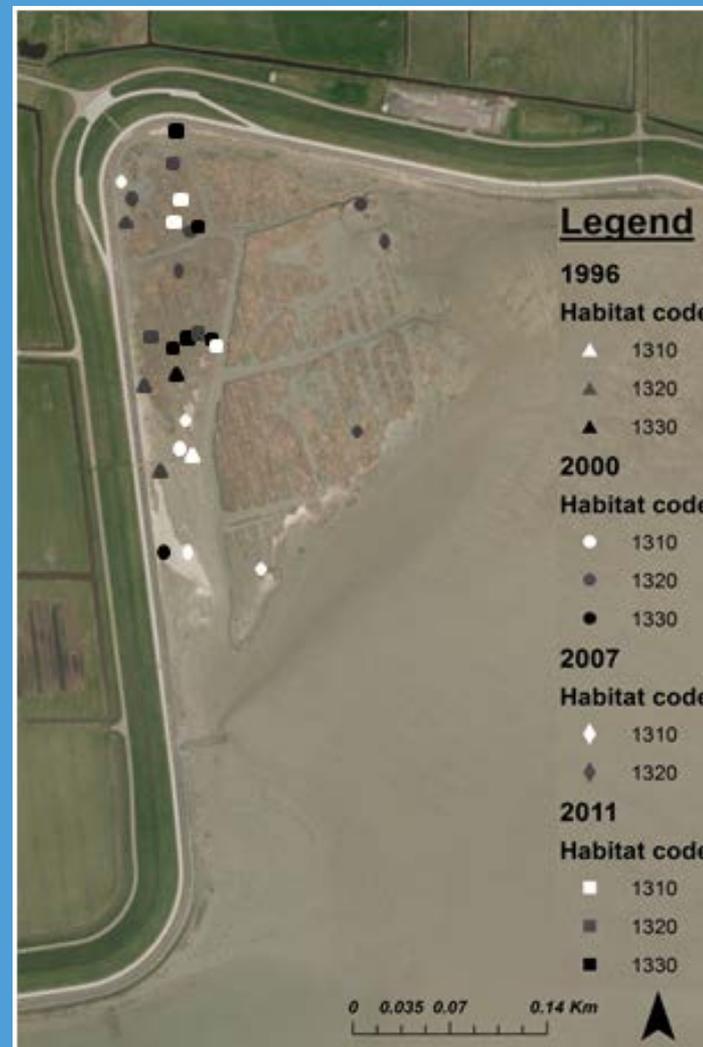
Neerlands Reid: erosion -0.7 m/y; after erosion protection + 0.7 m/y





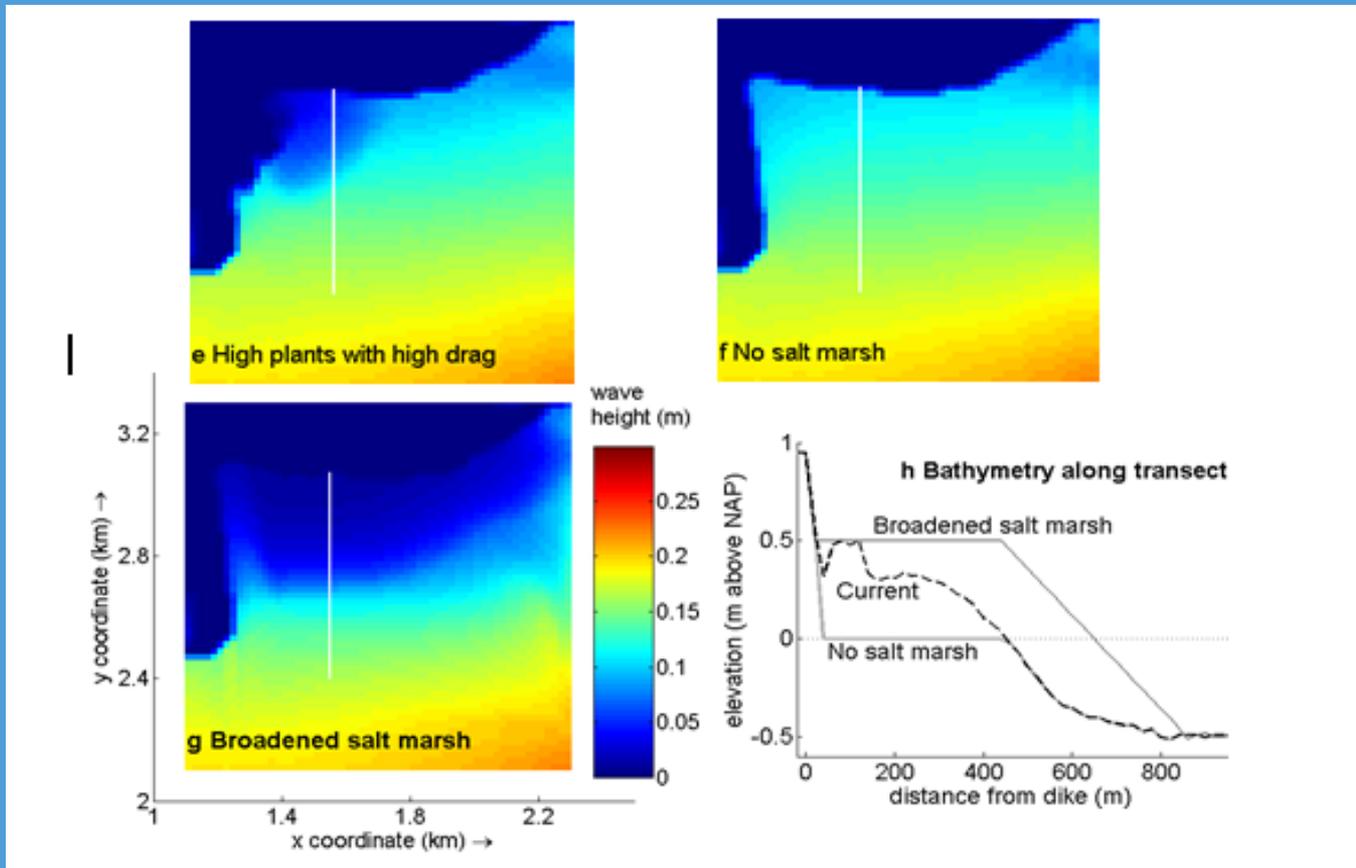
Syntaxa	Syntaxa code	Habitat code	G1	G2	G3	G4	G5	G6	N1	N2	N3	N4
Spartinetum townsendii	24AA02	1320	+			+		+	+	+		+
Salicornietum dolichostachyae	25AA01	1310		+	+				+	+		
Salicornietum brachystachyae	25AA02	1310	+	+		+	+	+		+	+	+
Suaedetum maritimae	25AA03	1310								+		
Puccinellietum maritimae	26AA01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



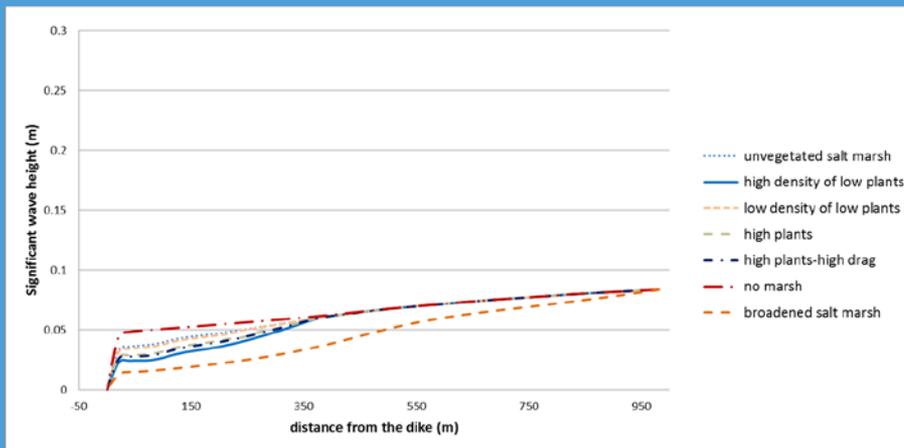
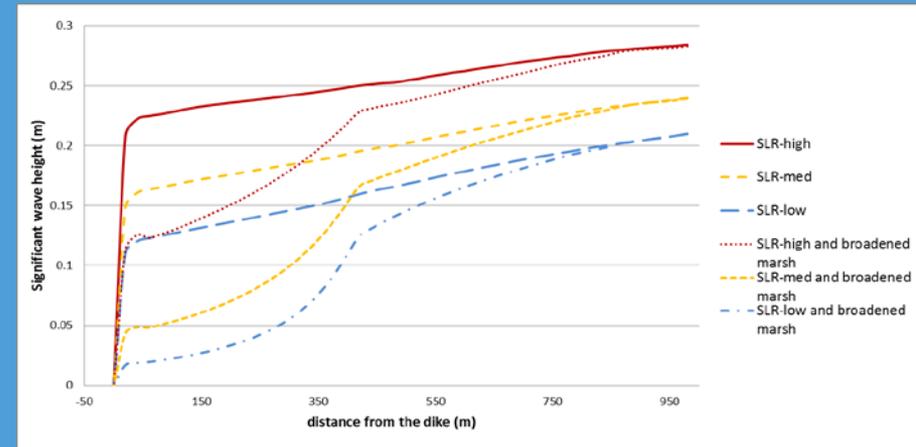
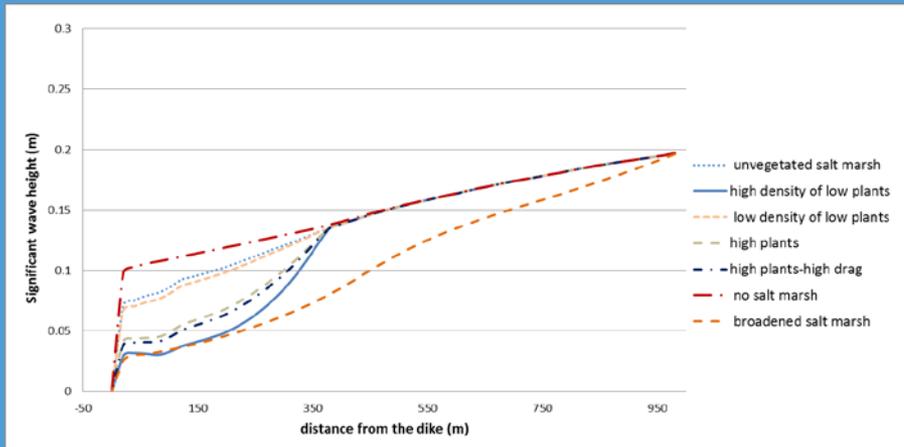




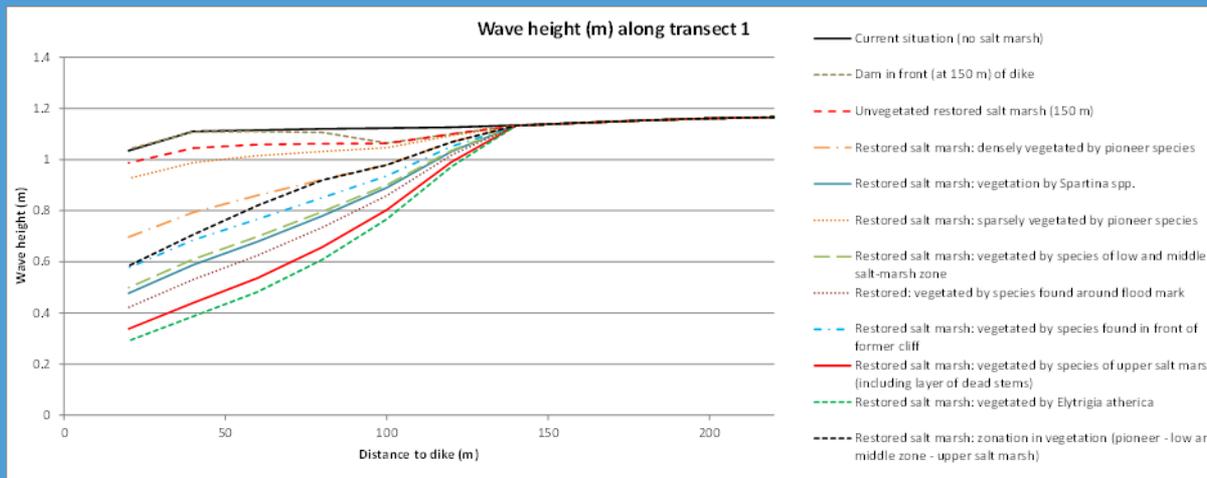
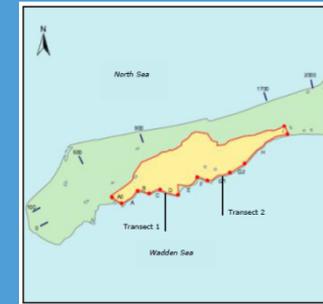
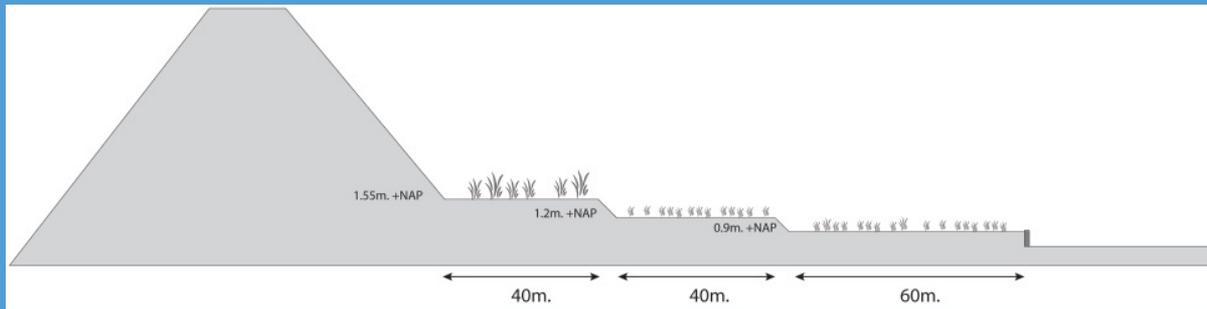
Modelled wave damping for different situations



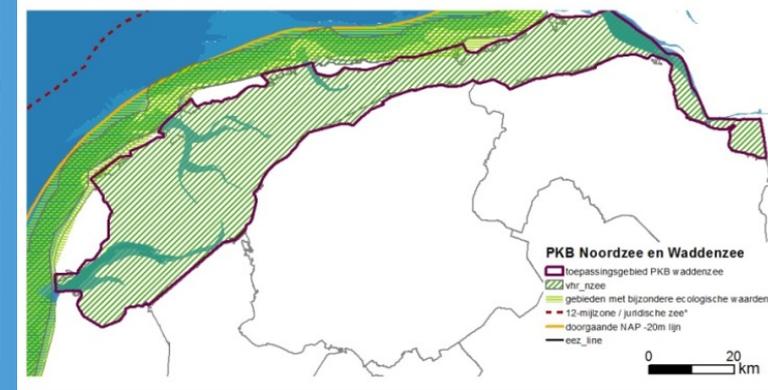
Modelled wave damping



Modelled wave damping over a schematized salt marsh



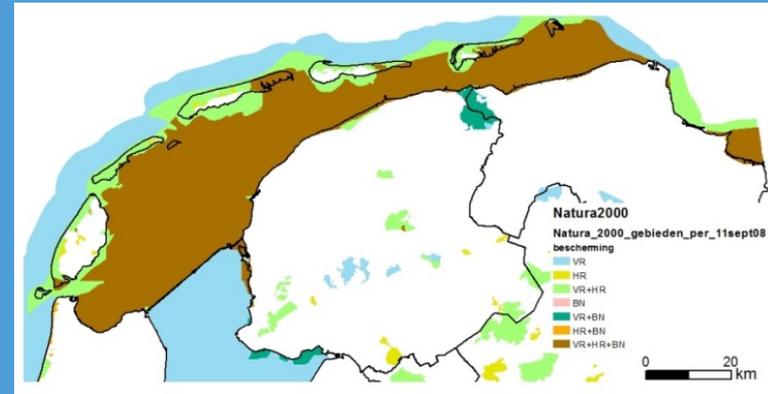
Other values

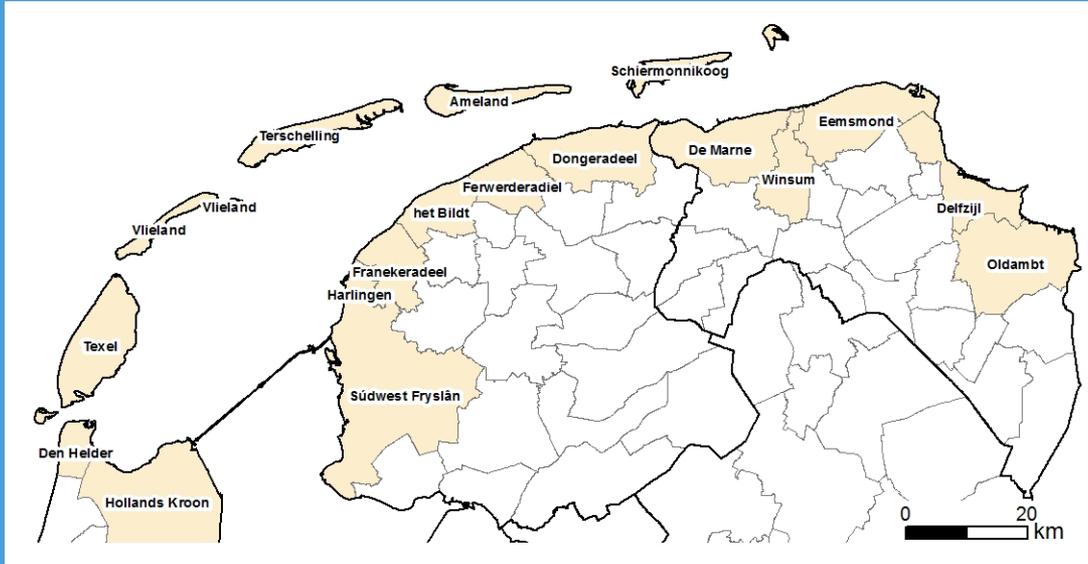


tabel 10: Aantallen wadlopers en deelnemers aan andere tochten

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





Thank you for
your attention



WAGENINGEN **UR**
For quality of life