

**Remote monitoring of reed expansion on the coasts
of the Baltic sea and on the shores of large shallow
lakes**

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Reed belt at lake Võrtsjärv, Central Estonia, august 2007



Reed belt at the Baltic sea coast, Western Estonia, July 2012



Reed belt at the Baltic sea coast, Western Estonia, July 2012



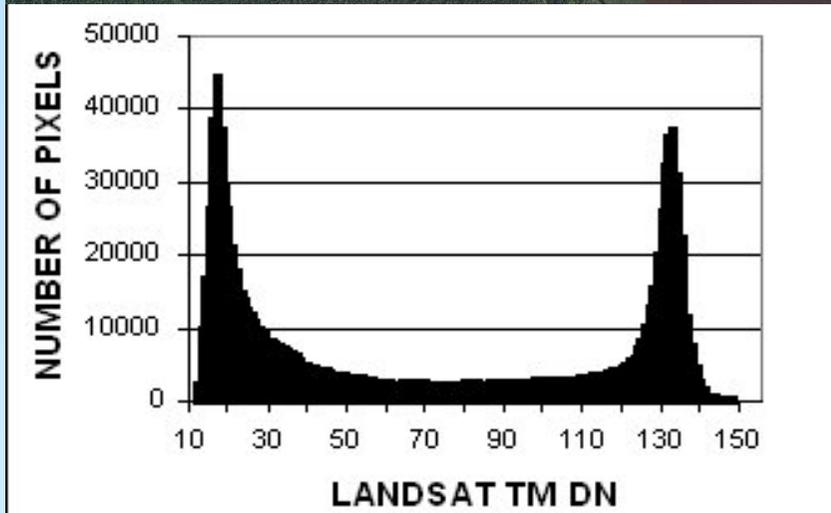
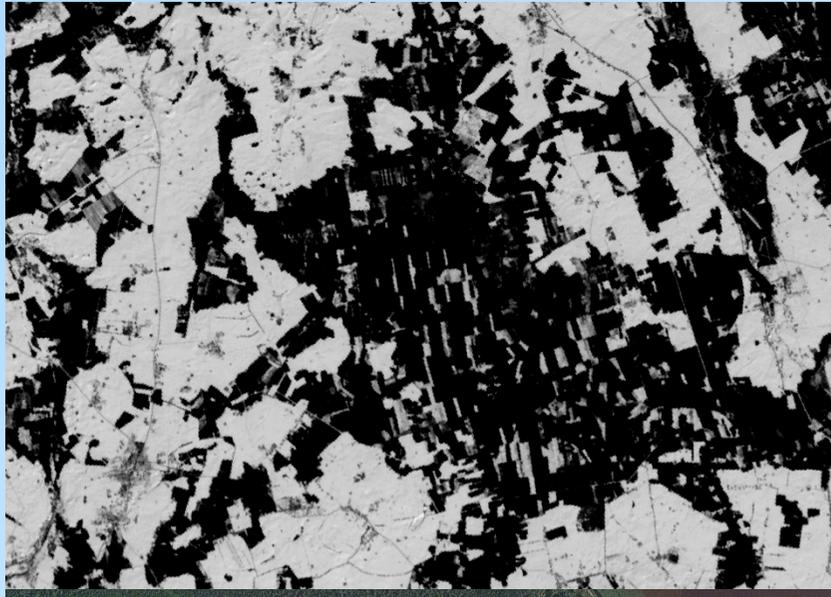
Baltic Sea coast close to Ventspils, Latvia, May 2012.

03. July 2005

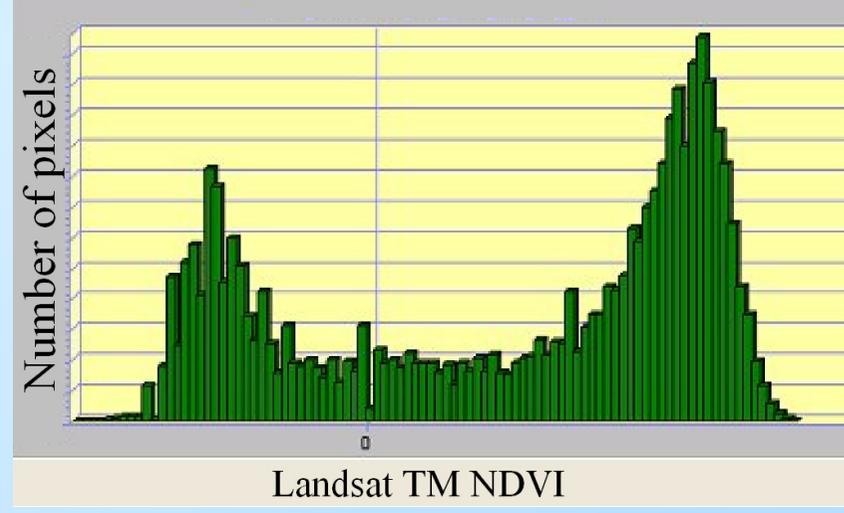
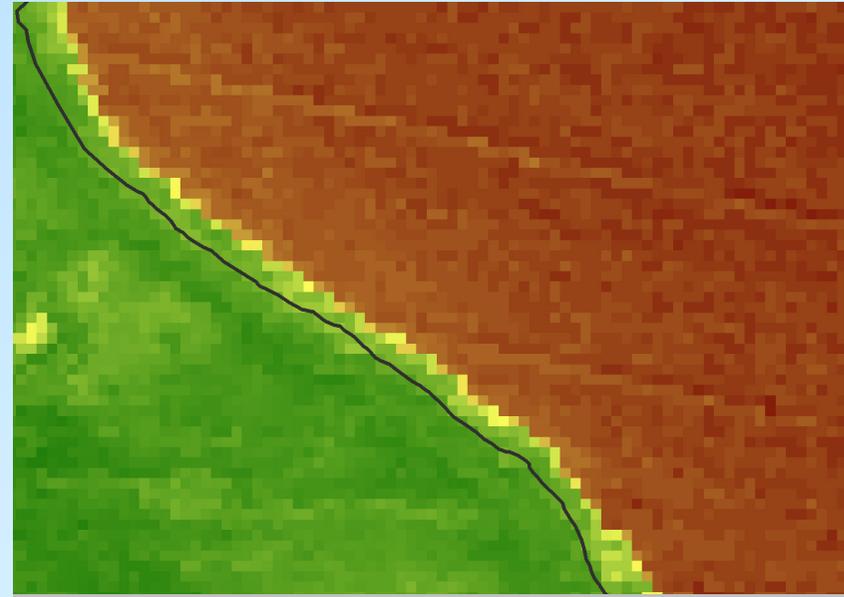
21. May 2005

Basic Map orthophoto





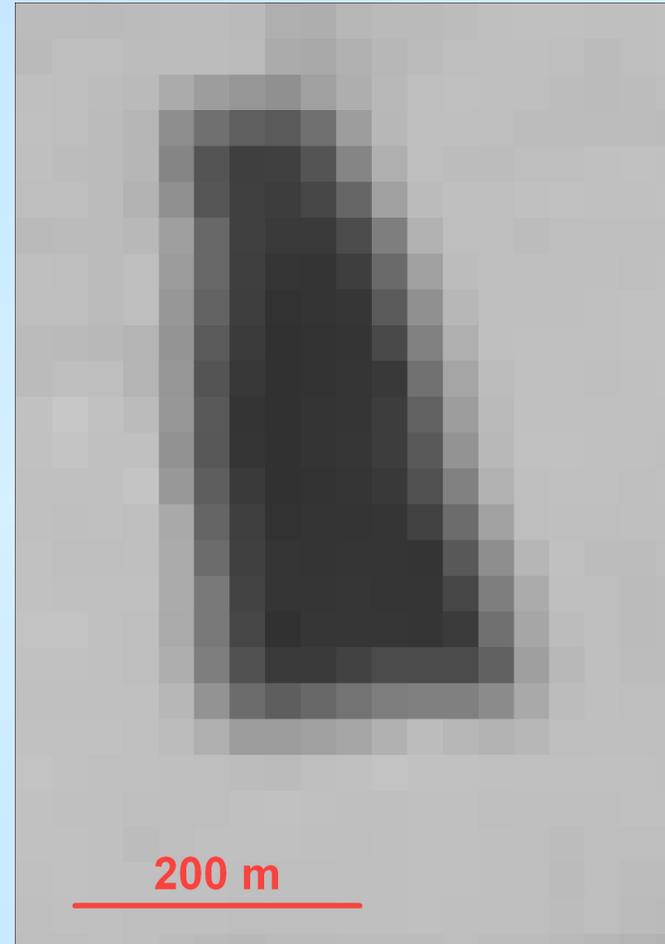
National Basic Map Orthophoto
03.07.2005



Landsat TM satellite image 09.08. 2007
Vegetation Index NDVI color code



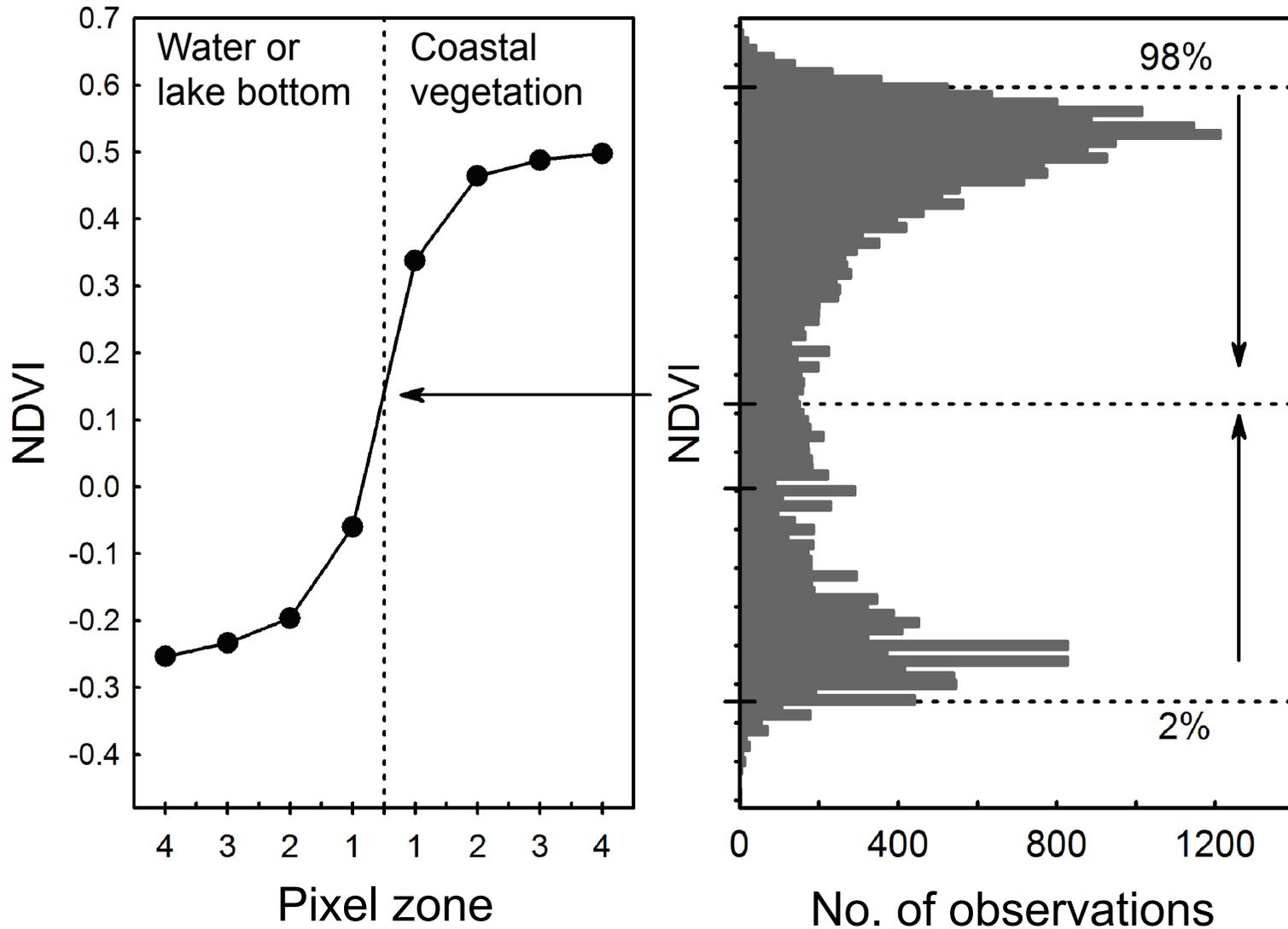
A forest patch on a National Basic Map orthophoto



The same patch on a Landsat TM satellite image,
30 m nominal pixel size

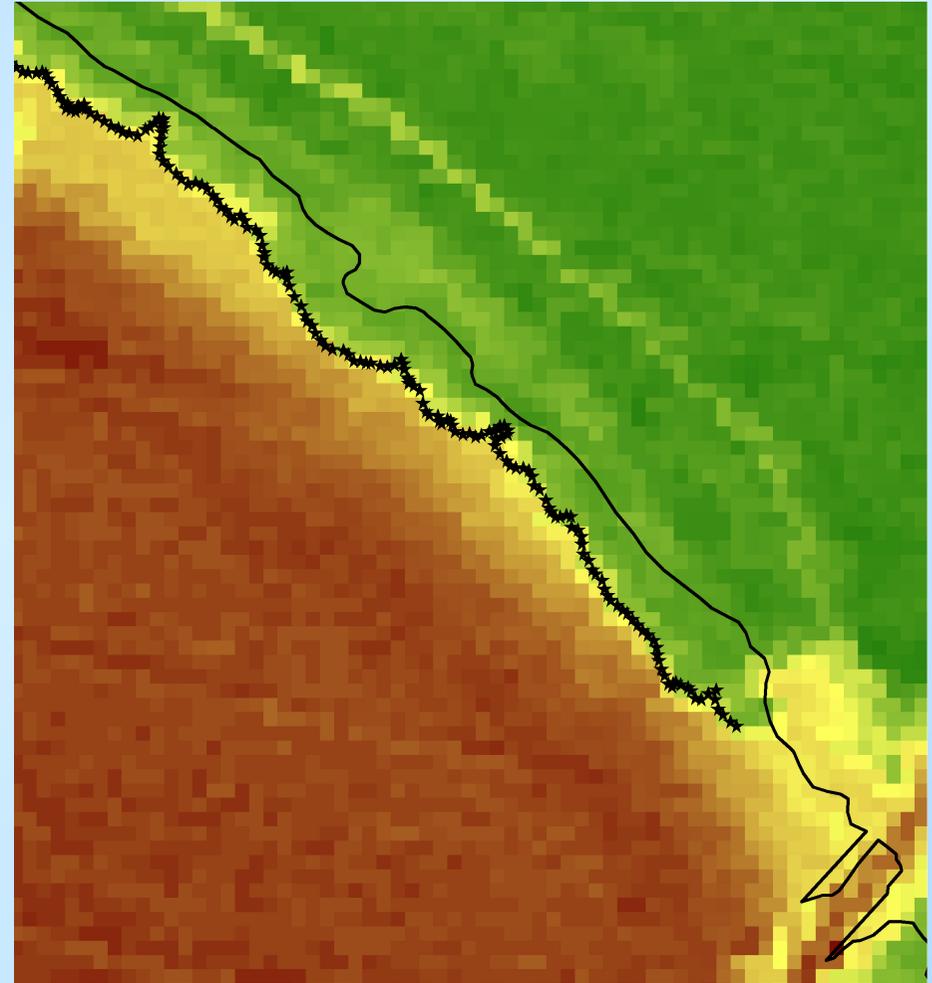


Determining the threshold in coastal vegetation mapping

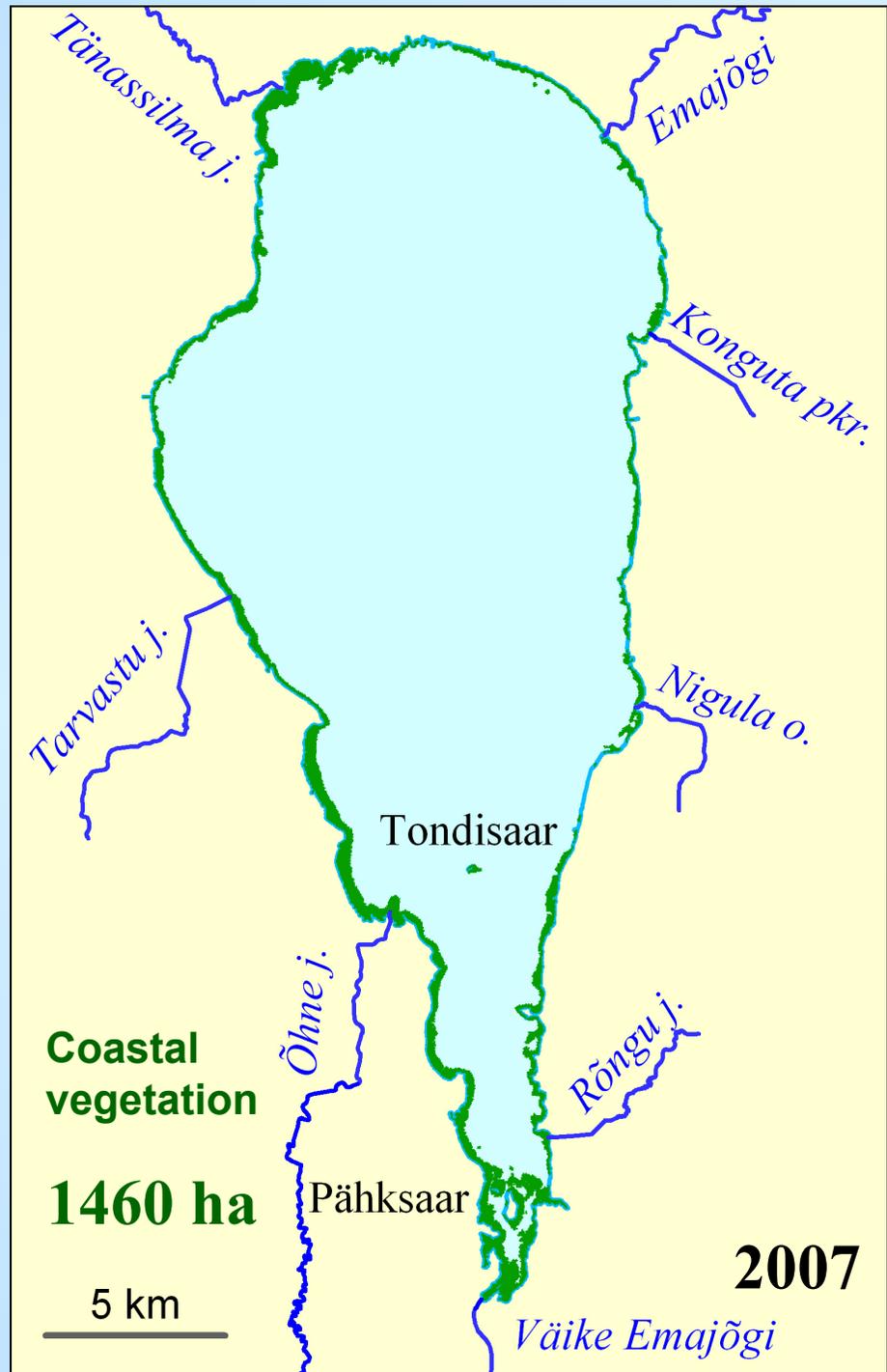
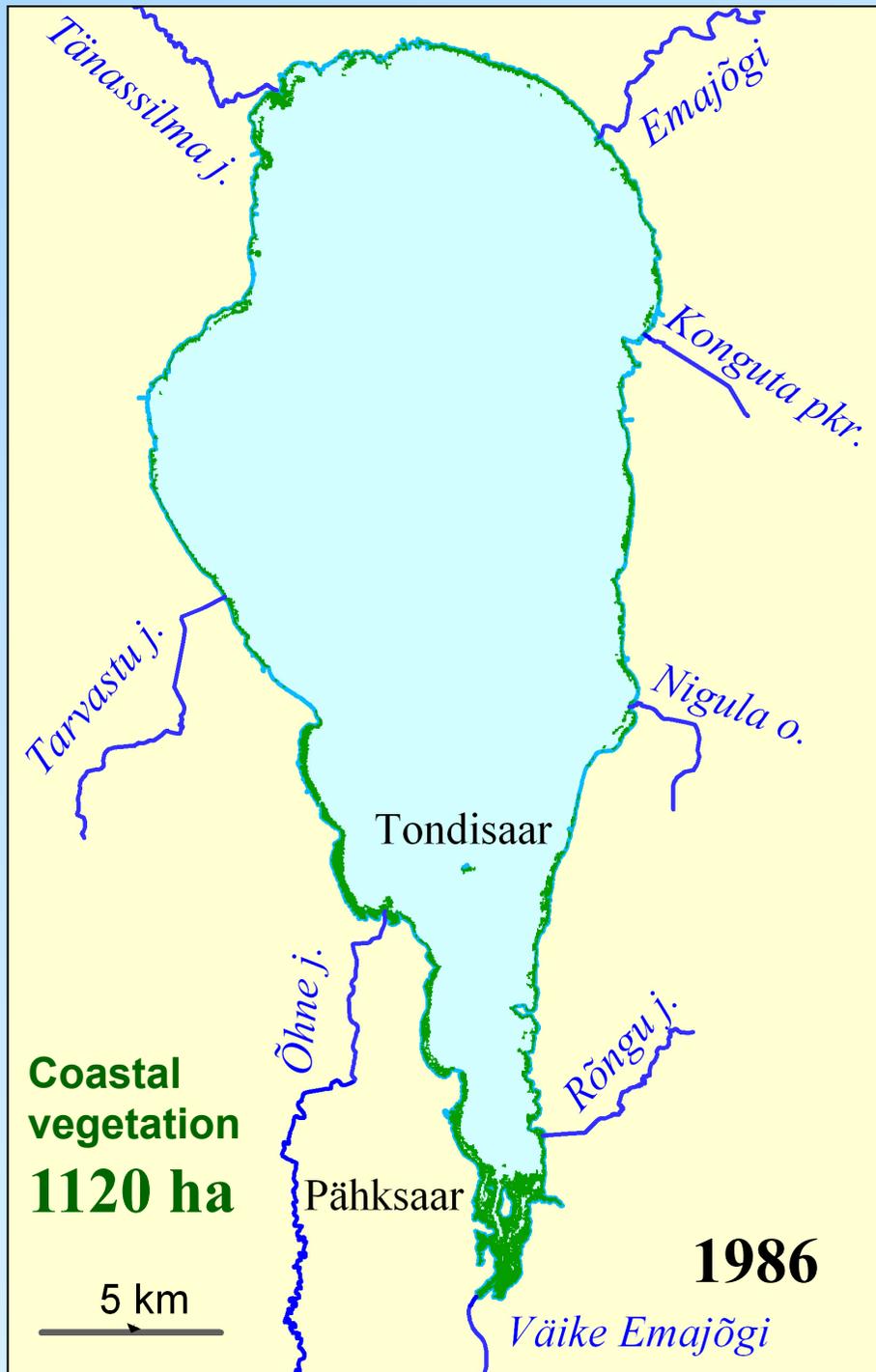


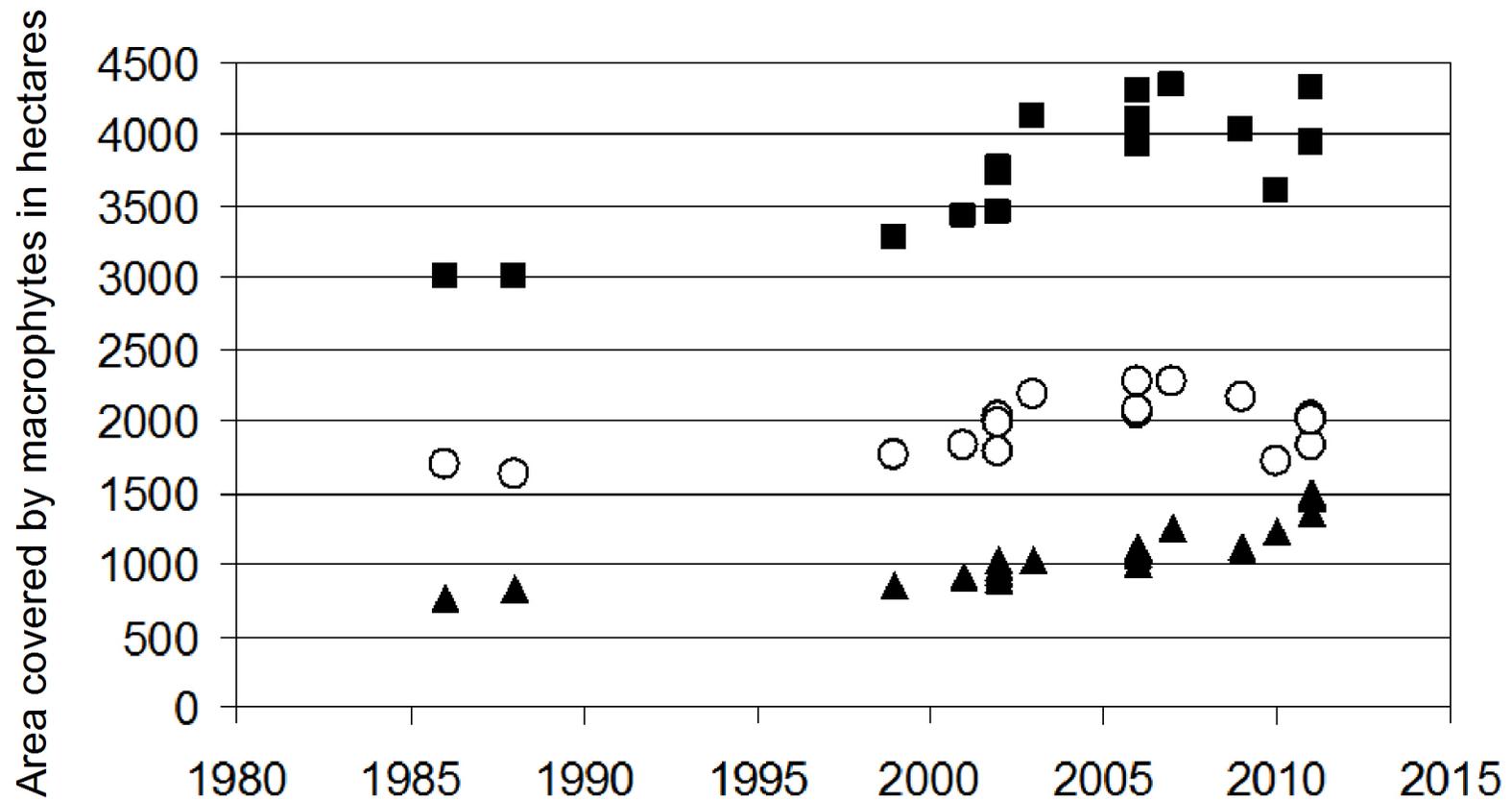


National Basemap Orthophoto



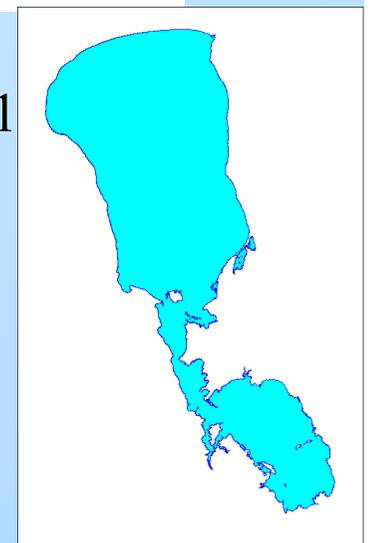
Landsat TM satellite image 09.08. 2007,
Vegetation index NDVI color code.





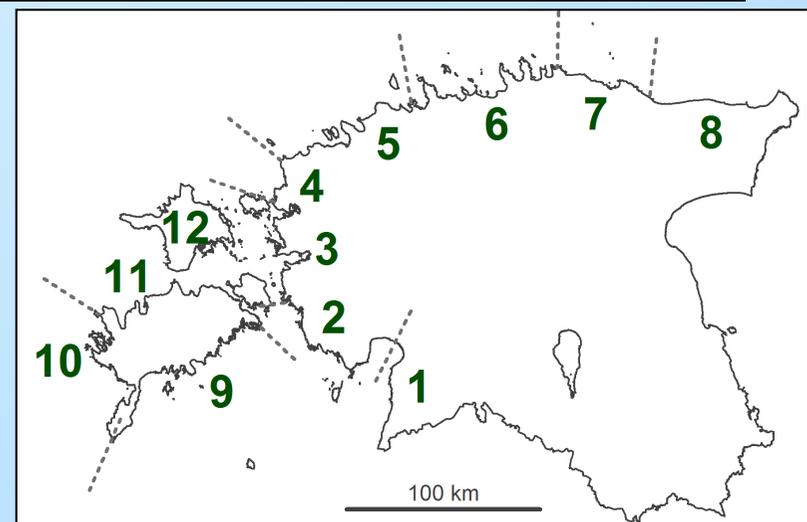
Area covered by coastal macrophytes in Lake Peipsi from 1986 to 2011

- ☐ - the whole lake
- - Lake Pihkva (*Southern part of the lake*)
- ▲ - Lake Peipsi (*sensu strictu, Northern part of the lake*)

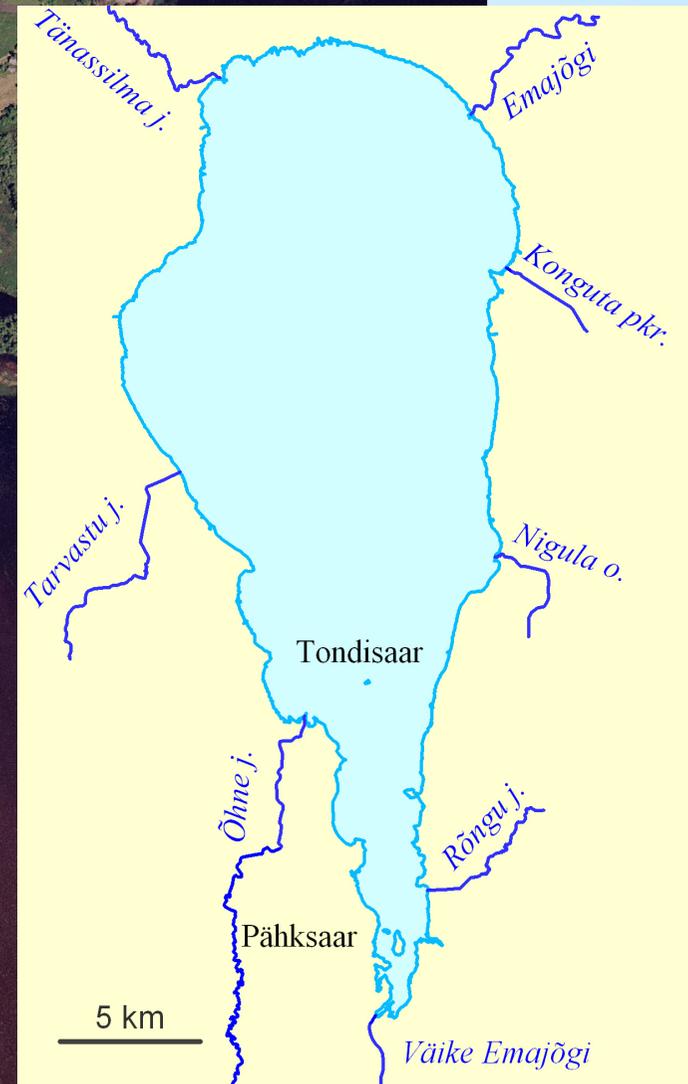


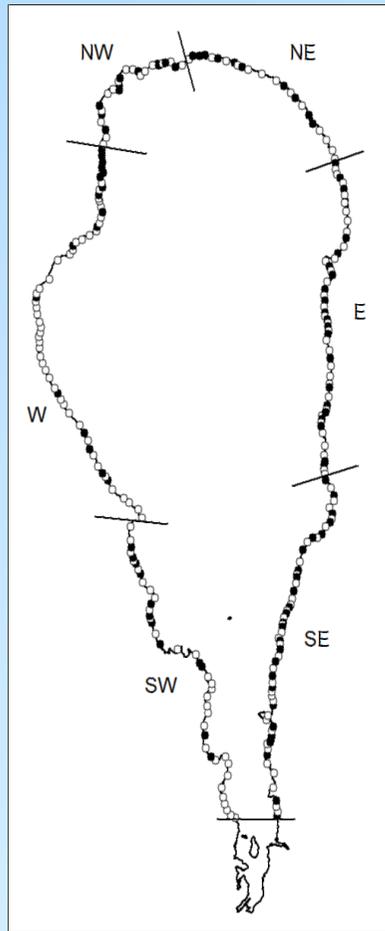
Nr	Year	1986	1999	2002	2006	2007	2009	2010	2011
	Coastal section								
1	Häädemeeste-Tahkuranna	104	209	184	286	234	249	280	332
2	Tõstamaa - Varbla	433	590	587	755	738	818	727	720
3	Väinamere	452	754	748	1063	1049	1205	1182	1167
4	Noarootsi - Riguldi	12	47	46	77	78	95	115	129
5	Nõva - Pakri - Türisalu	43	147	116	171	146	209	151	155
6	Kuusalu - Võsu	257	417	482	469	395	431	394	388
7	Mahu rand	54	114	64	76	62	53	88	90
8	Purtse - Narva-Jõesuu	0	0	0	0	0	0	0	0
9	Saaremaa lõunarannik	334	587	559	714	791	862	768	755
10	Saaremaa läänerannik	363	231	212	512	499	644	639	623
11	Saaremaa põhjarannik	123	258	290	408	436	509	550	590
12	Hiiumaa	257	489	501	821	782	941	1006	1009
Total		2432	3841	3788	5351	5210	6016	5899	5959

Dynamics of coastal reed patches at the Estonian Baltic Sea coast.

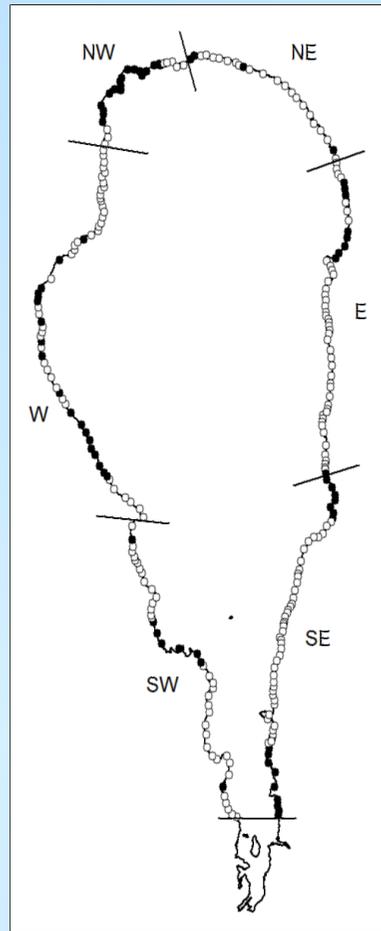


Possible factors
influencing the width
of the reed belt

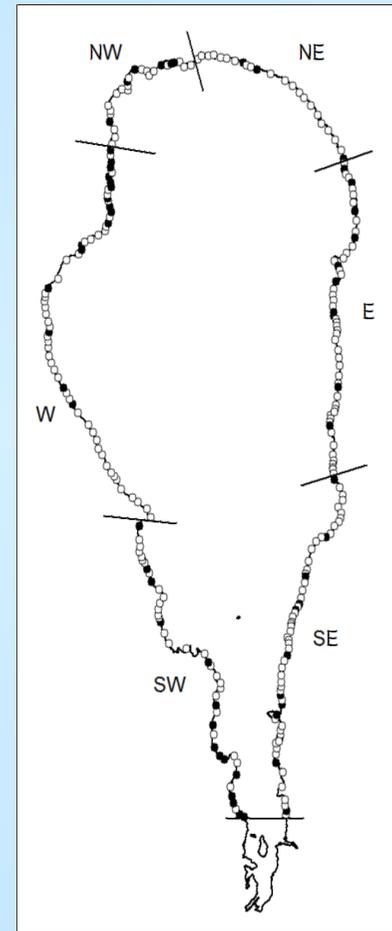




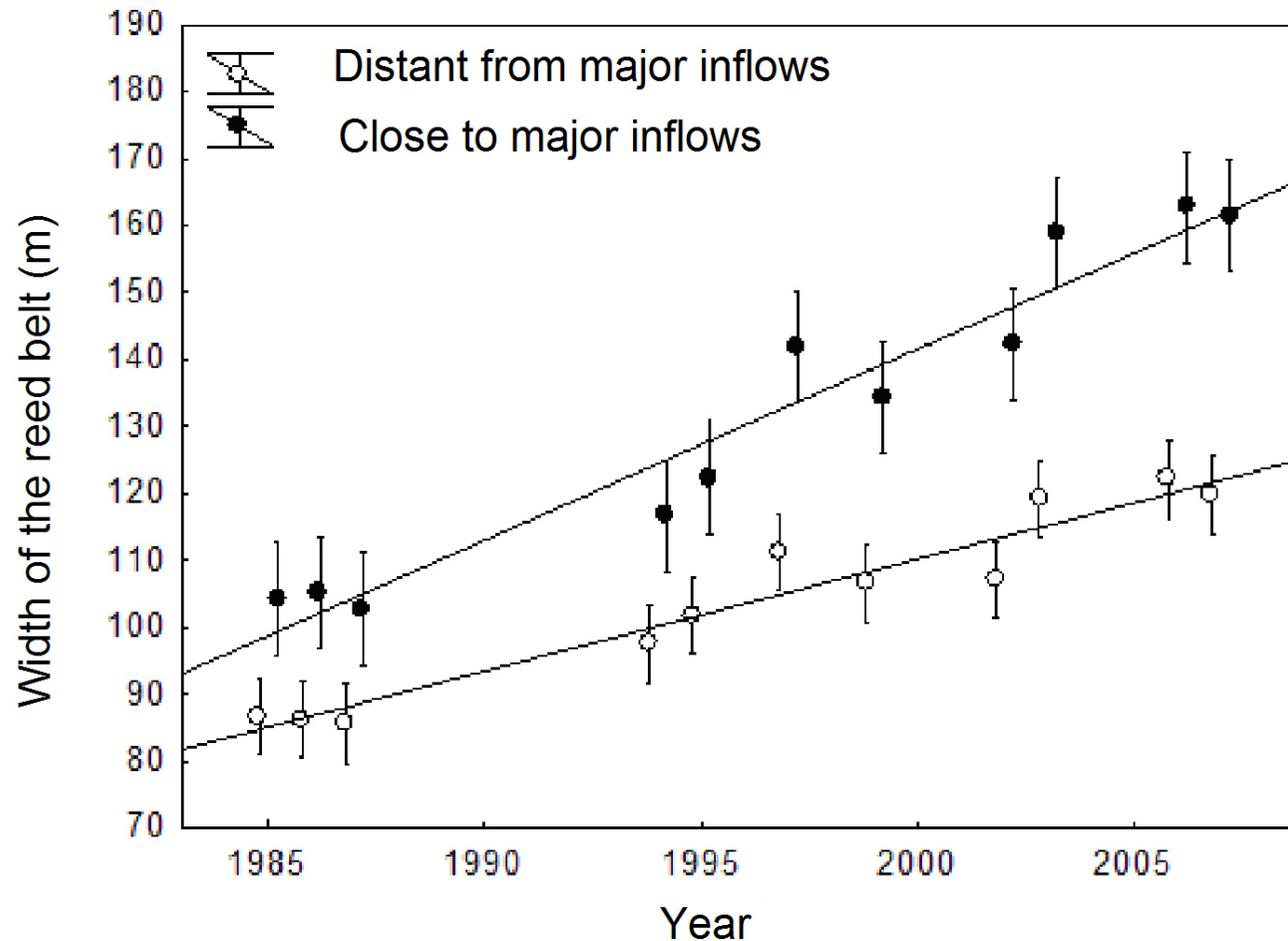
Management
 ○ No disturbance
 ● Active management



Large inflow
 ○ No inflow
 ● Inflow region

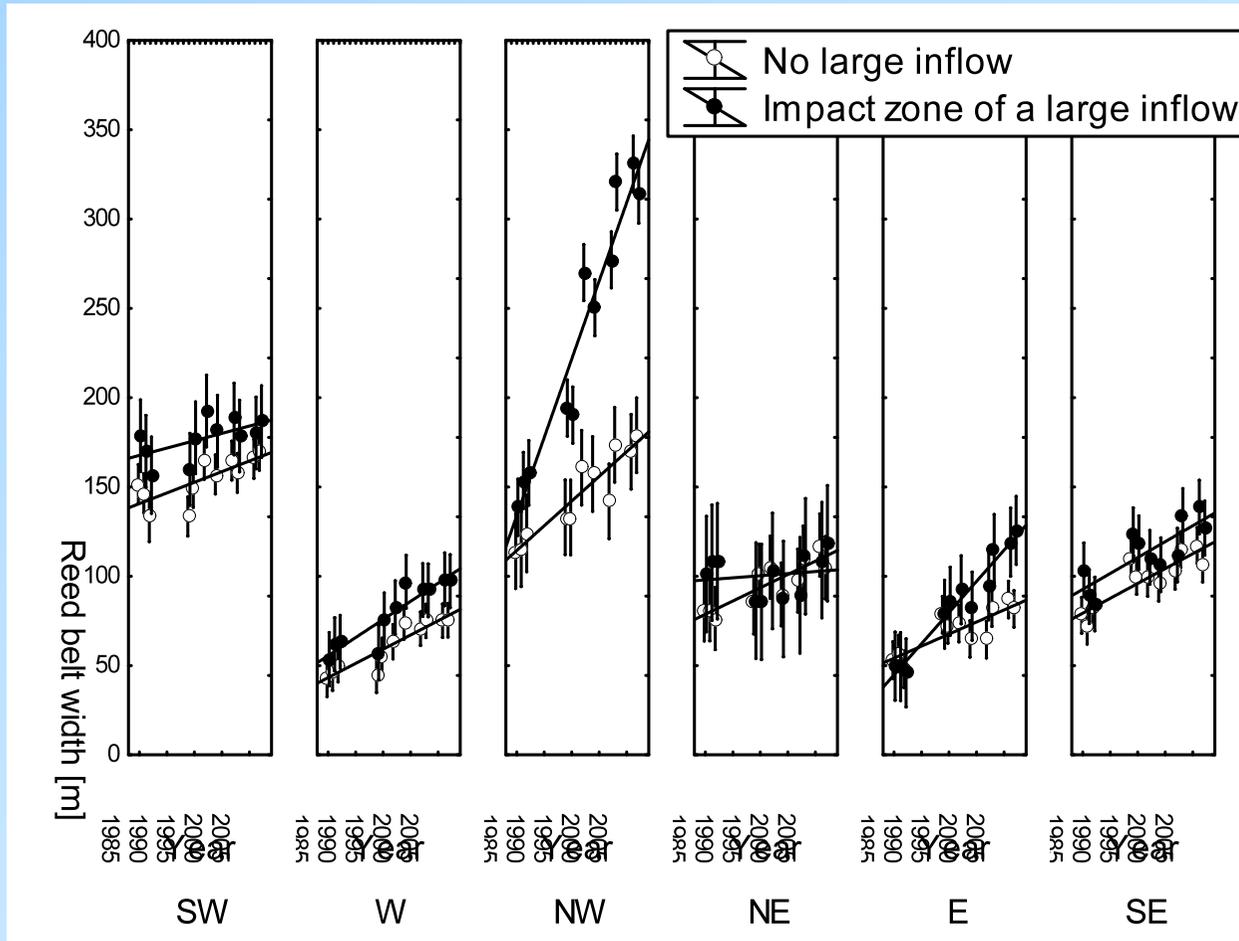


Small inflow
 ○ No inflow
 ● Small inflow



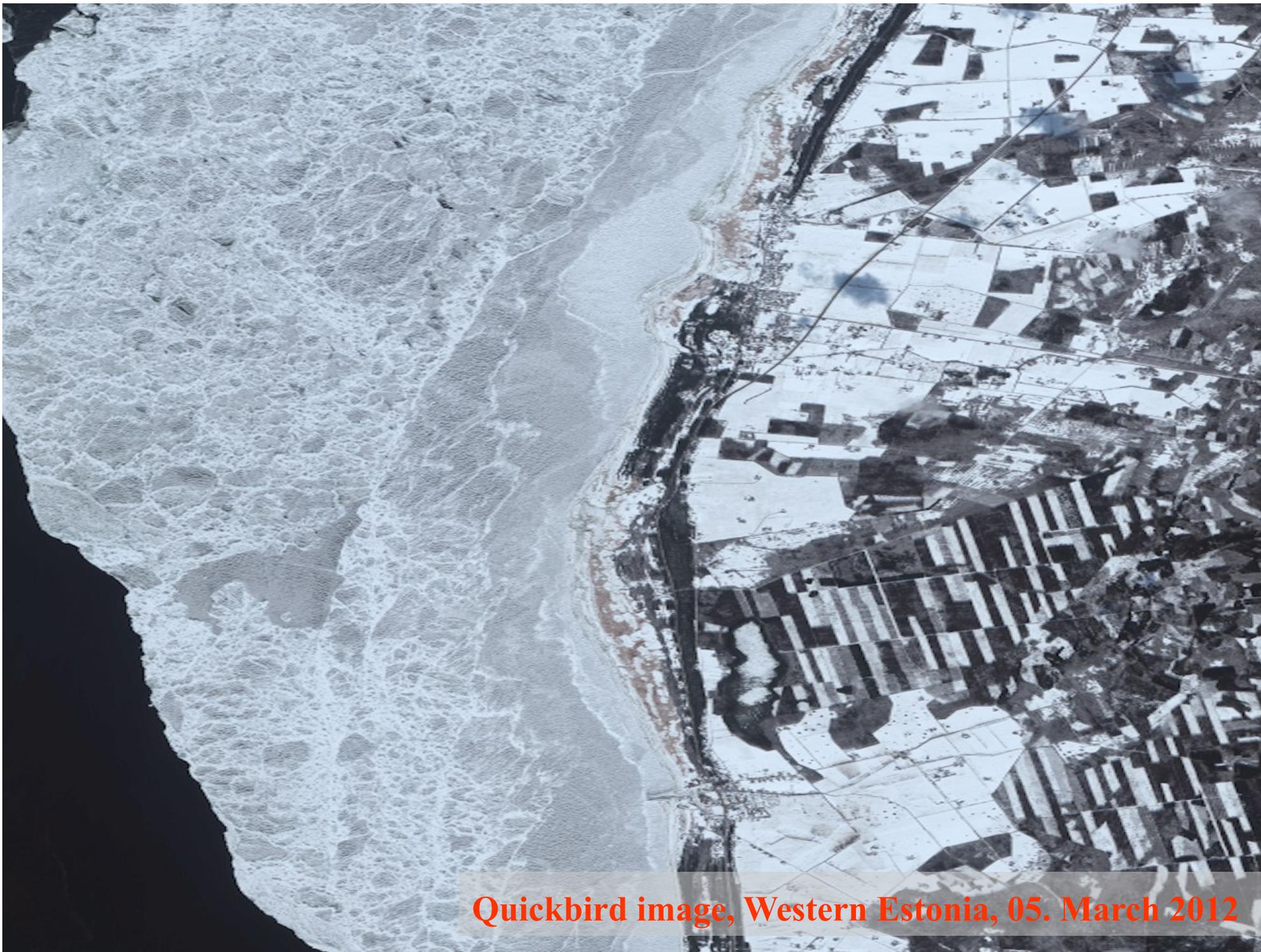
Changes in the width of the coastal macrophyte belt at Lake Vörtsjärv relative to the distance to major inflows from 1985 to 2007.

Liira J., Feldmann T., Mäemets H. and Peterson U. 2010. Two decades of macrophyte expansion on the shores of a large shallow northern temperate lake – A retrospective series of satellite images, Aquatic Botany, 93, 207 – 215.



Changes in the width of the reed belt in different parts of Lake Võrtsjärv from 1985 to 2007.





Quickbird image, Western Estonia, 05. March 2012





Photo: Jaan Liira