

Ruumiline planeerimine madalas rannikumeres ning kaugseire võimalustest rannikumere uurimisel

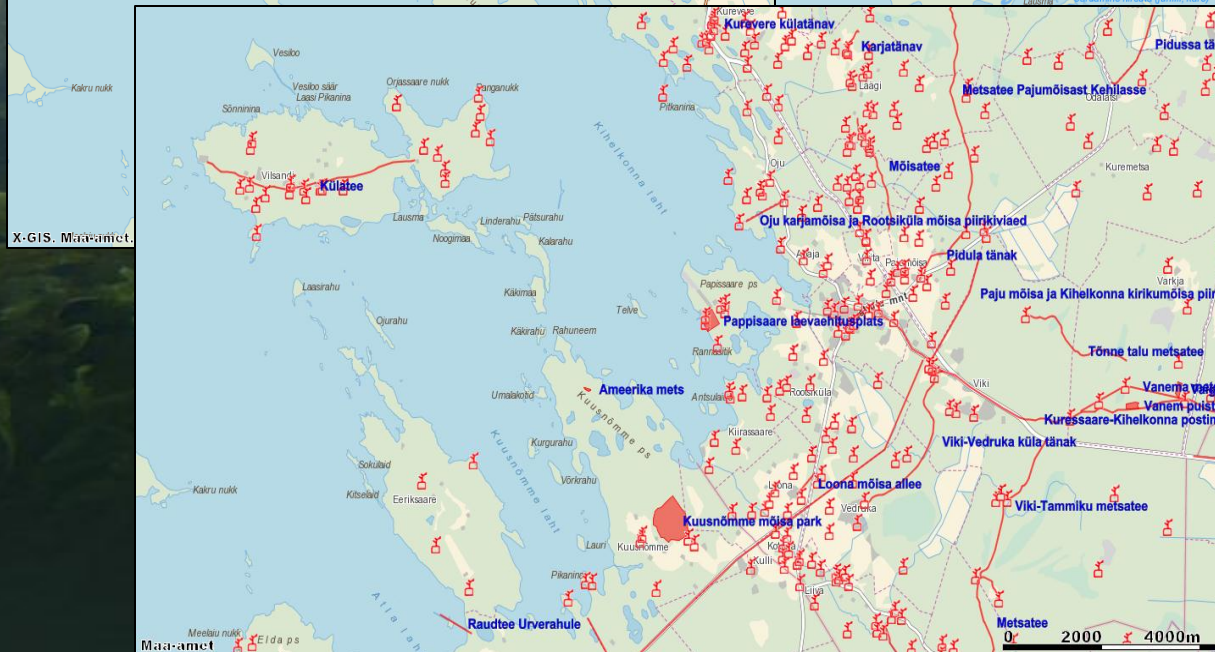
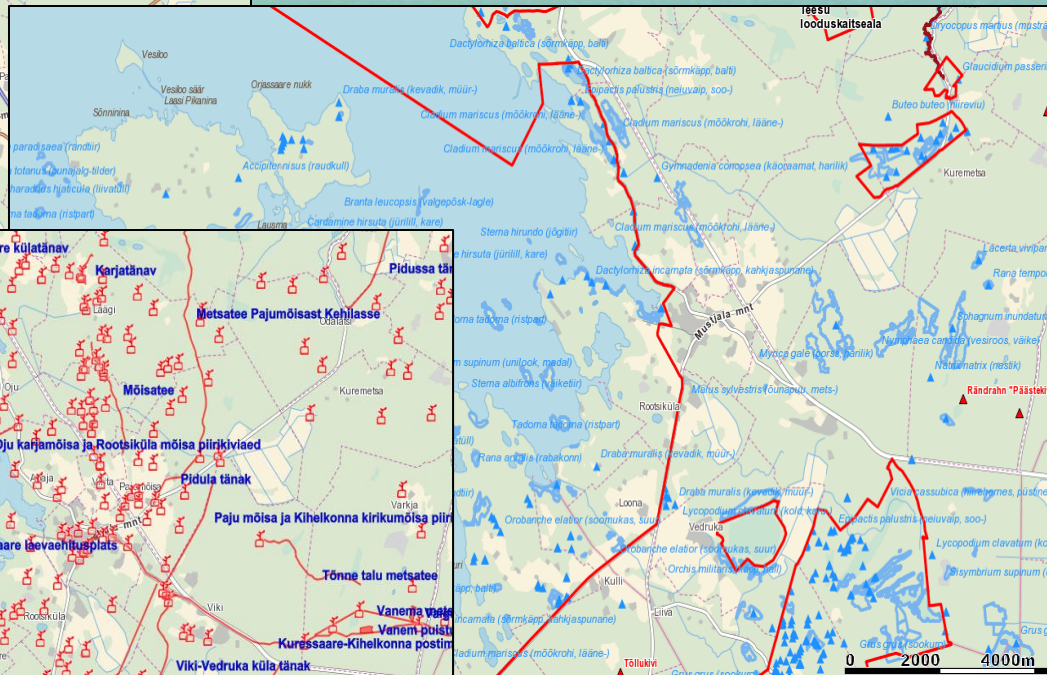
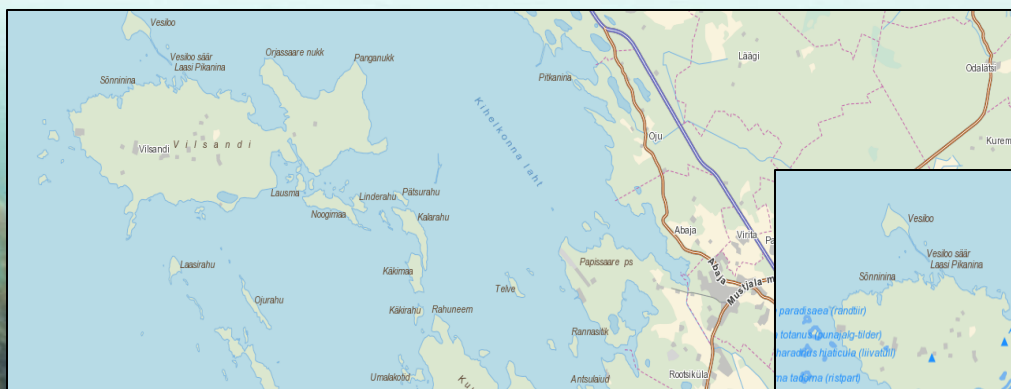


CENTRAL BALTIC
INTERREG IV A
PROGRAMME
2007-2013



EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND
INVESTING IN YOUR FUTURE

Ruumiline planeerimine maismaal



An underwater photograph showing a dense field of green seaweed on the seabed. The water is clear and blue, with a wavy surface visible at the top. The text is overlaid on the image.

Ruumiline planeerimine rannavetes

- * Transport**
- * Kalandus**
- * Turism**
- * Energeetika**
- * Keskkond**

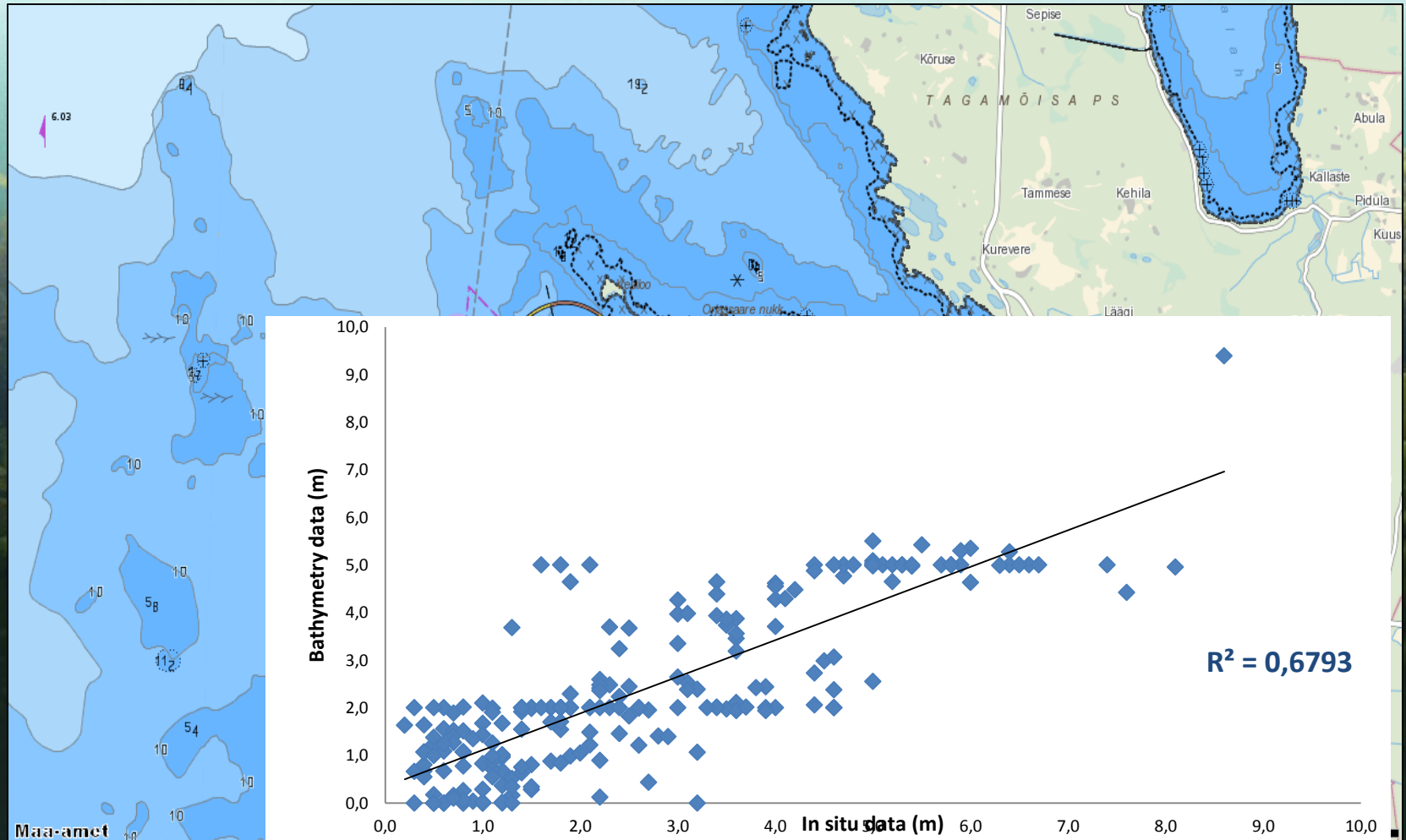
The map displays the Vilsandi National Park area in Estonia. Key features include:

- Islands and Water Bodies:** Vilsandi, Lausmaa, Kõrge, and other islands are shown. Water bodies include Kiikla laht and Kuusnõmme laht.
- Infrastructure:** Roads (e.g., 78, 2102, 2103) and a railway line are depicted.
- Scale and Orientation:** A scale bar indicates distances up to 3000m. The map is oriented with North at the top.
- Legend:** A legend at the bottom left identifies symbols for "X-GIS. Maa-amet. Koik õigused kaitstud." (X-GIS. Land Board. All rights reserved).





Ruumiline planeerimine rannavetes



MIKS?

- * Ruumiliseks planeerimiseks on vaja palju erinevaid lähteandmeid
- * Merel on nende andmete kogumine eriti kallis ja aeganõudev

HISPARES

Madalate vete ruumiline planeerimine suure ruumilise lahutusega kaugseiremeetodite abil

Projekti eesmärgiks on töötada välja kaugseirel, ruumilisel modelleerimisel ning *in situ* mõõtmistel põhinev metoodika ruumiliseks planeerimiseks (ja keskkonnaseireks) vajalike andmete kogumiseks.

HISPARES

Interreg IIVa Kesk-Läänemere programm Saarestike ja saarte alamprogramm

Prioriteet: Ohutu ja tervislik keskkond



Eesti
Mereinstituut
Tartu Ülikool



Rootsi
Kaitseuuringute
Instituut

HISPARES

2010-2012

Eelarve
ERDF

929 000 €
753 650 €

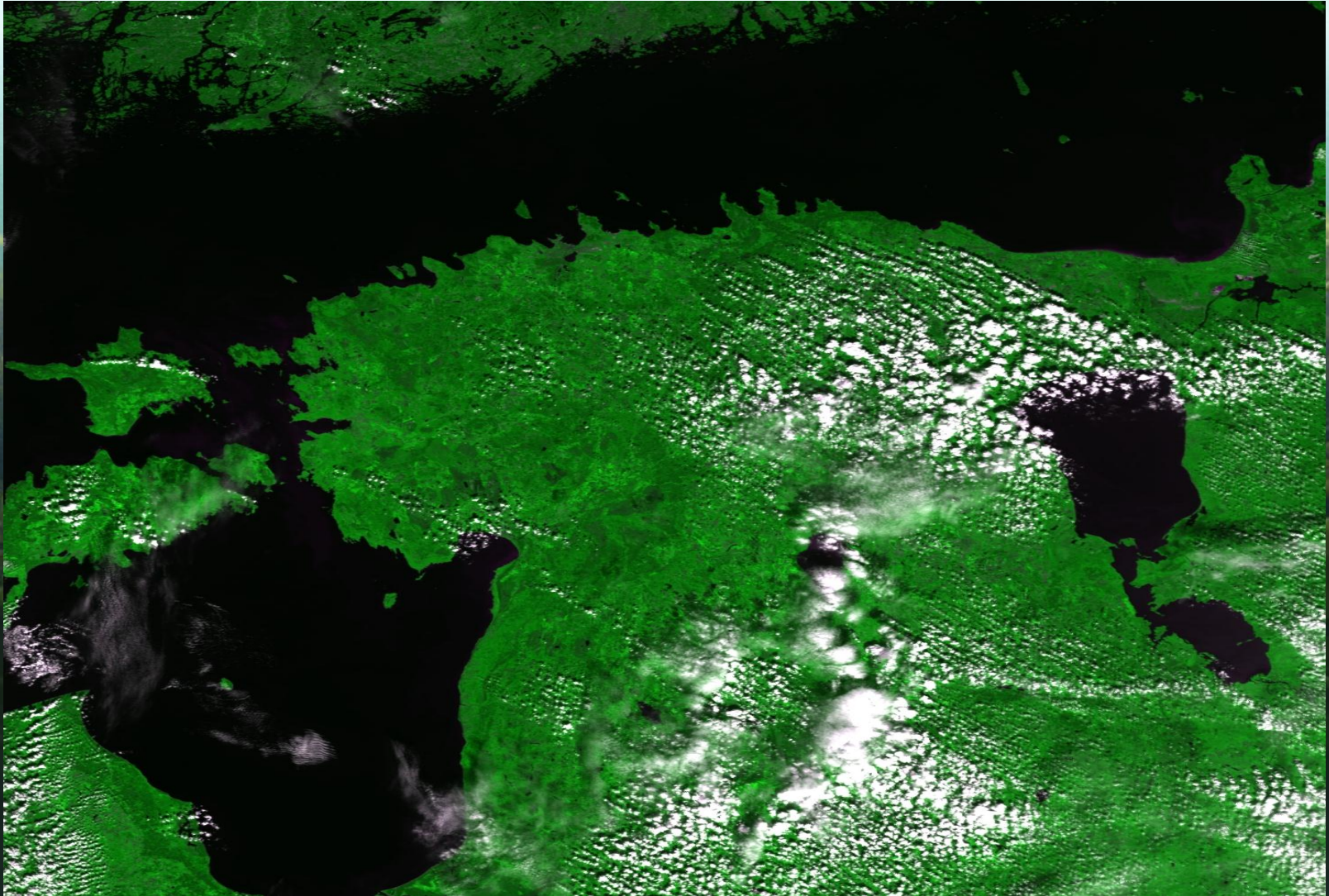


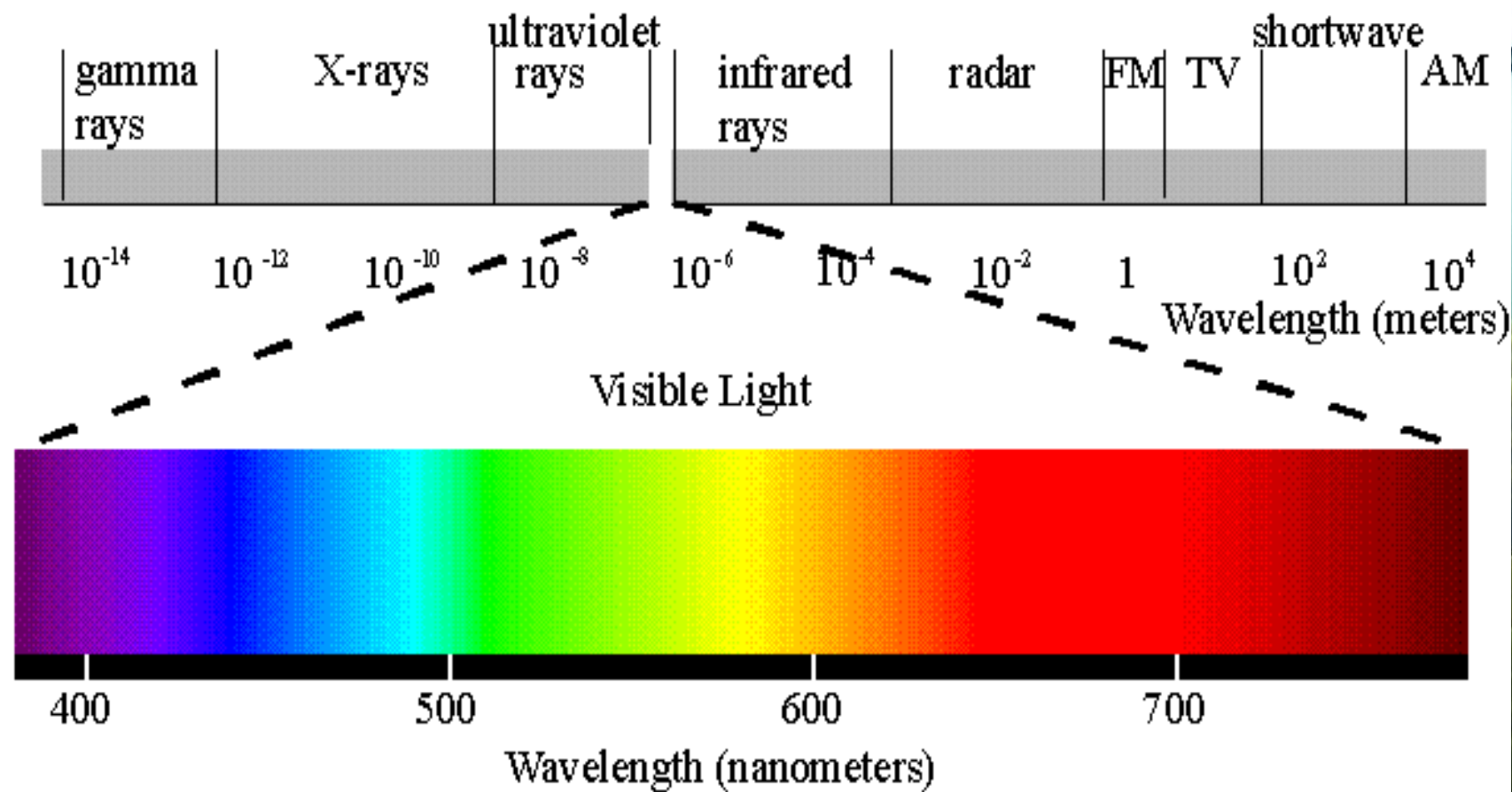
Eesti
Mereinstituut
Tartu Ülikool



Rootsi
Kaitseuuringute
Instituut

Kaugseire võimalustest rannikumere uurimisel





Lühilaineline kiirgus

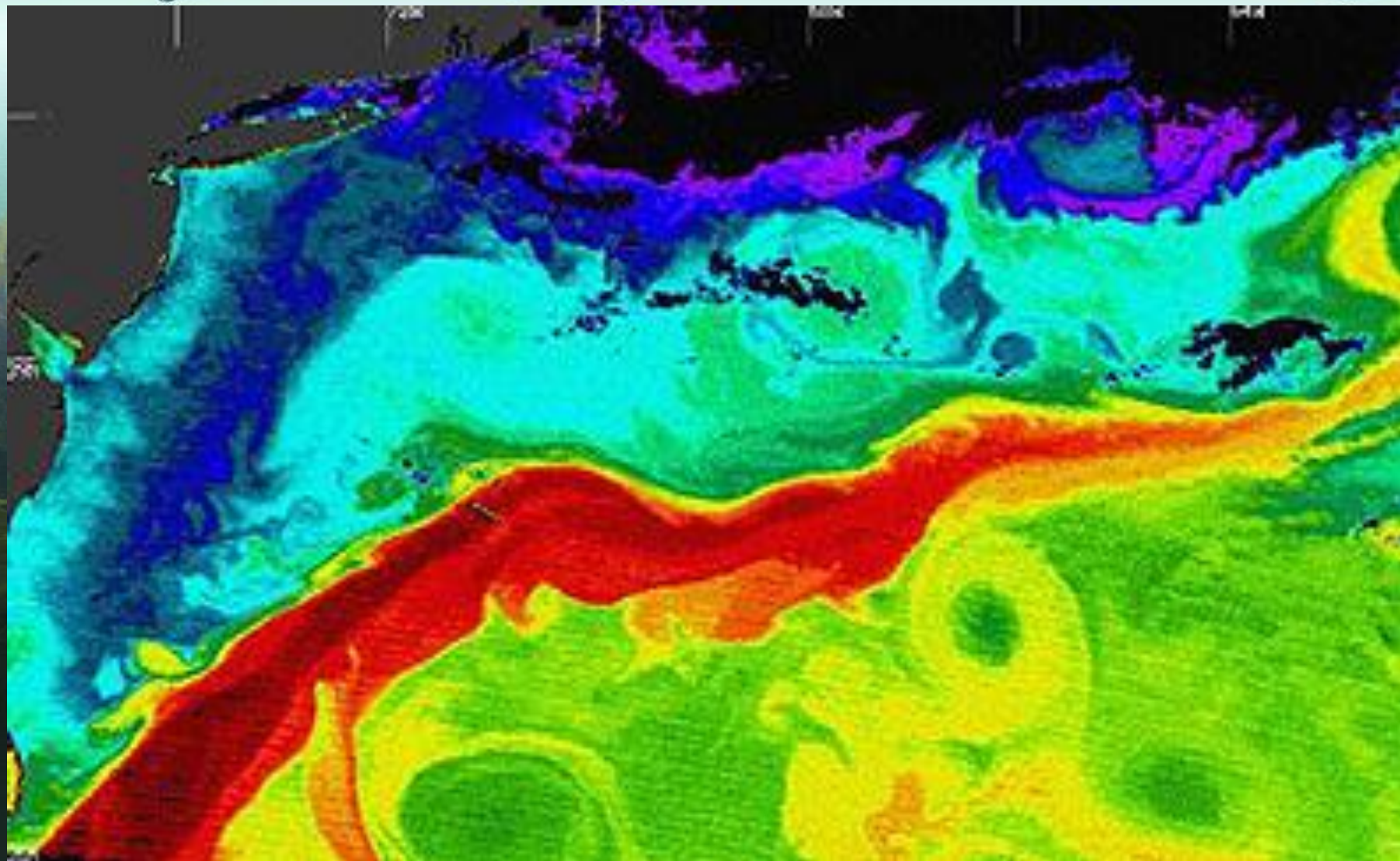
Pikalaineline kiirgus

Vee kaugseire

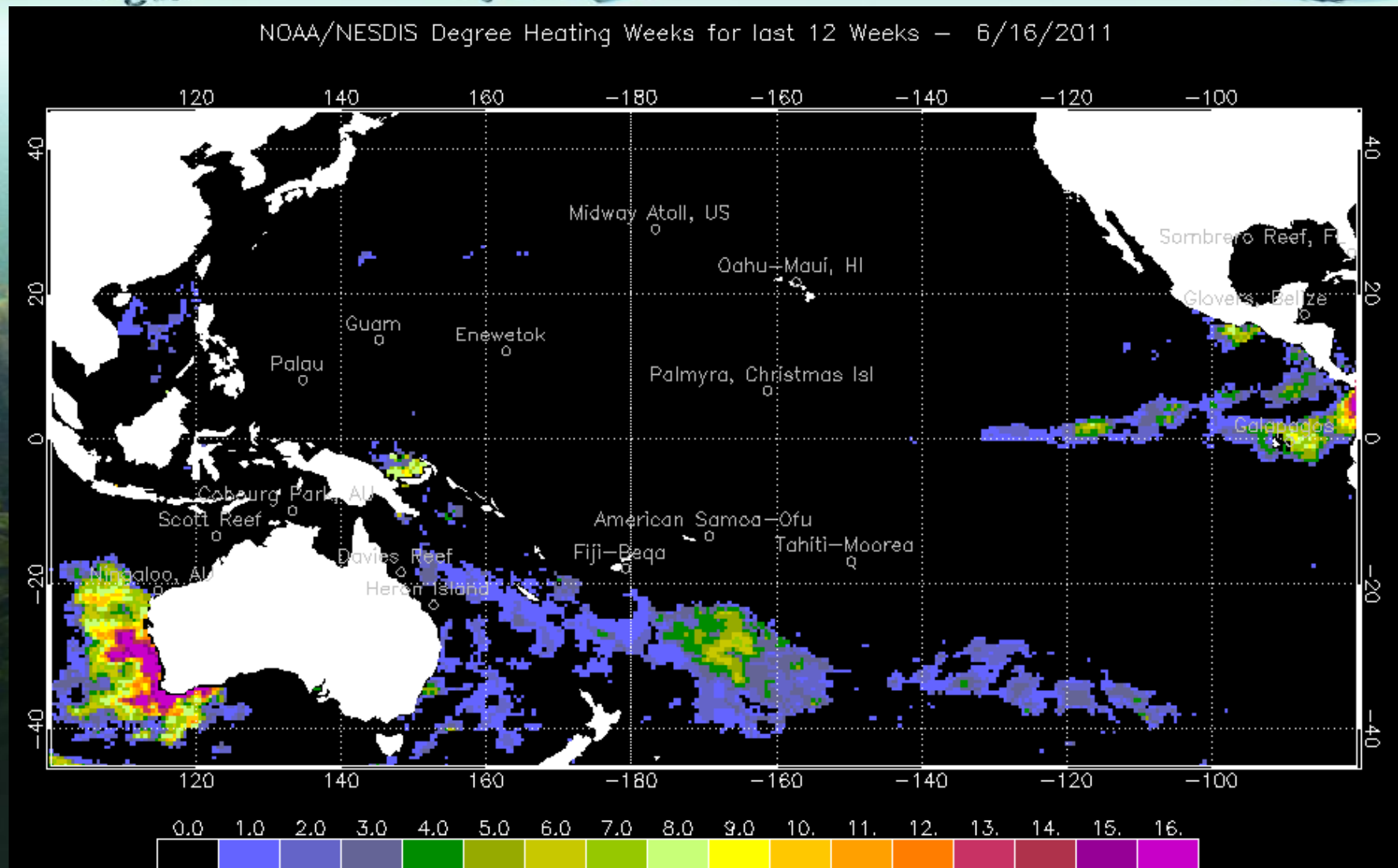
* Infrapuna ja mikrolaine → mikromeetrid



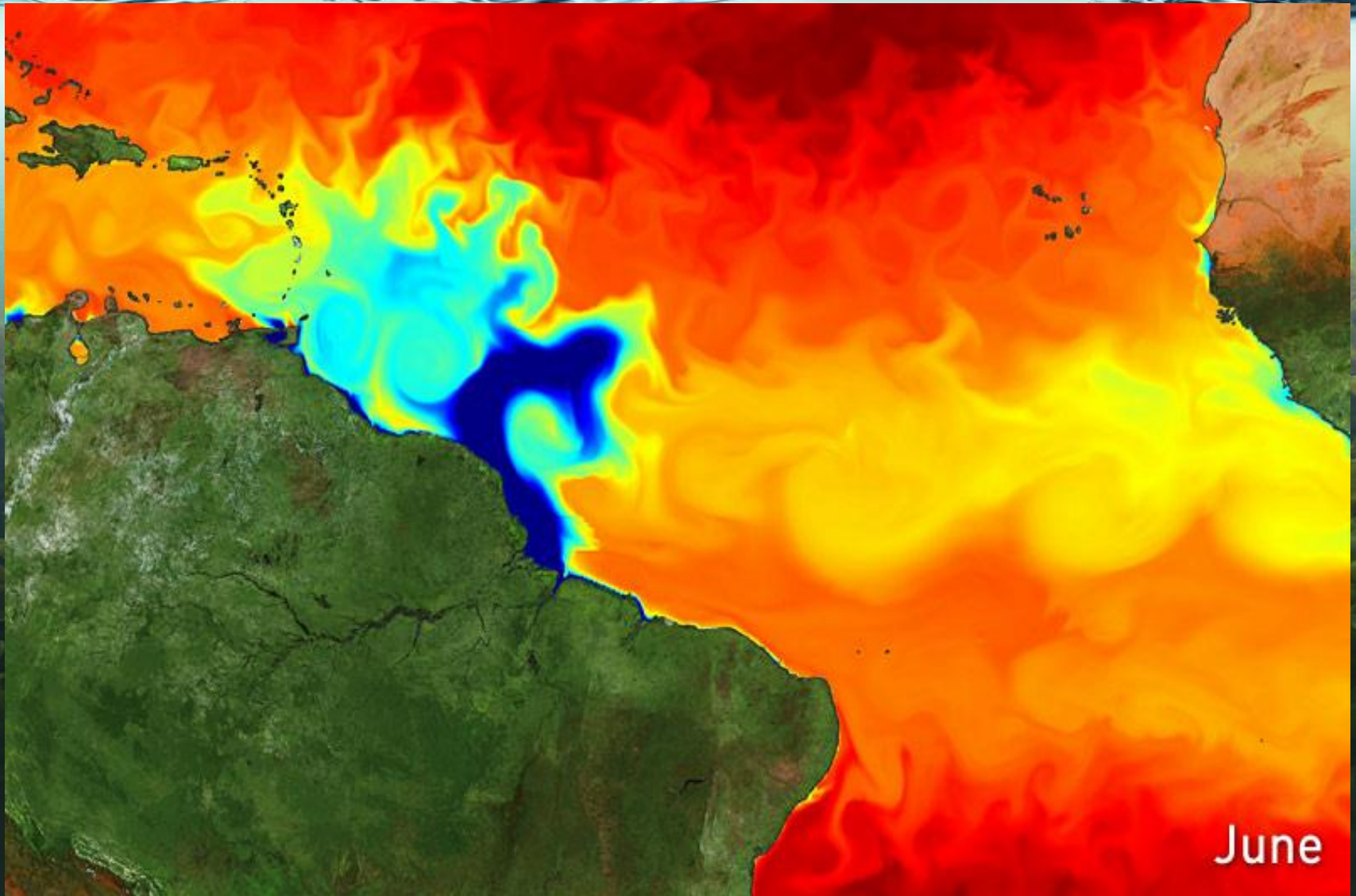
Golfi hoovus MODIS'e pildil



Keskmisest kõrgem pinnatemperatuur



Soolsus

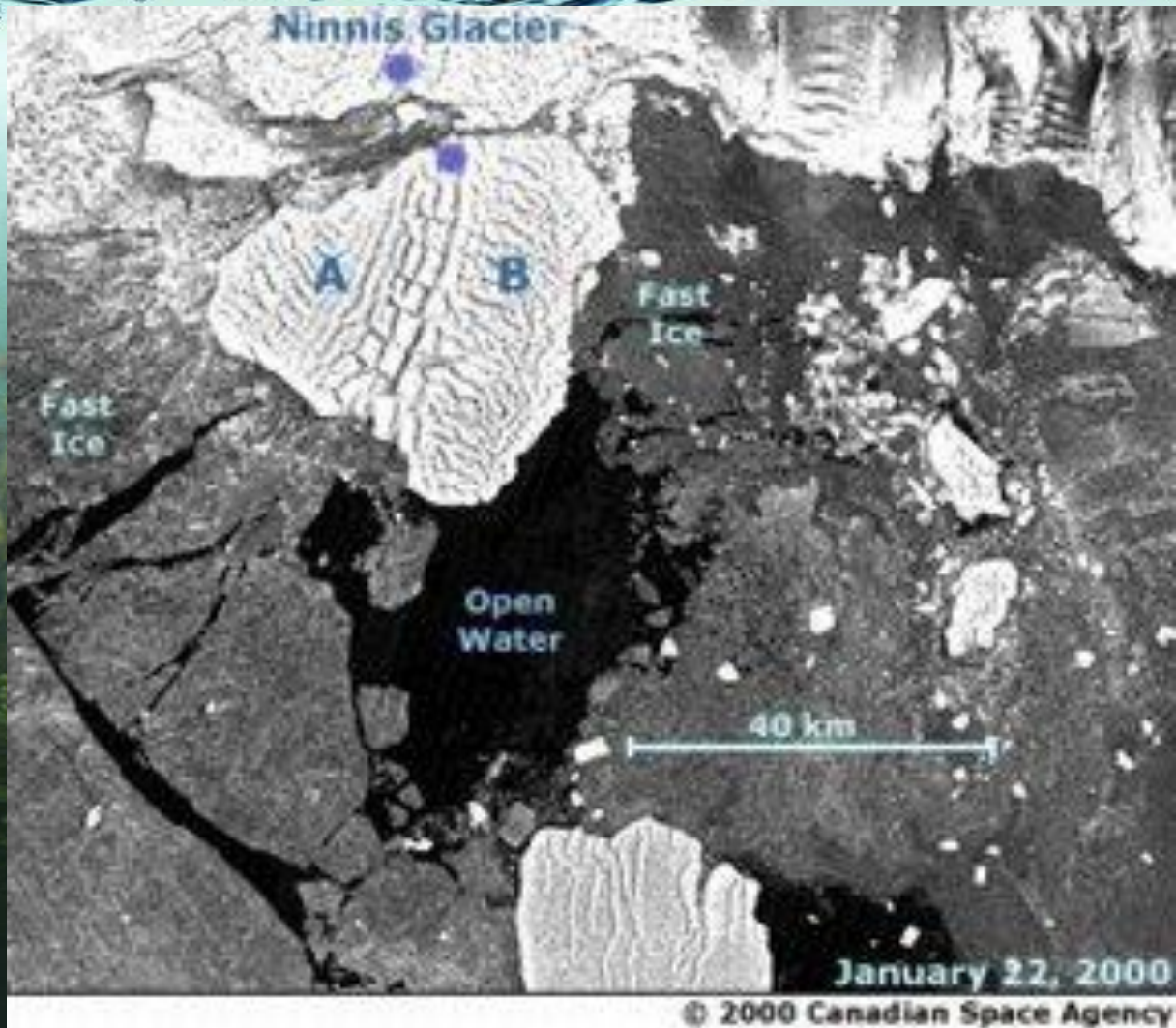


Vee kaugseire

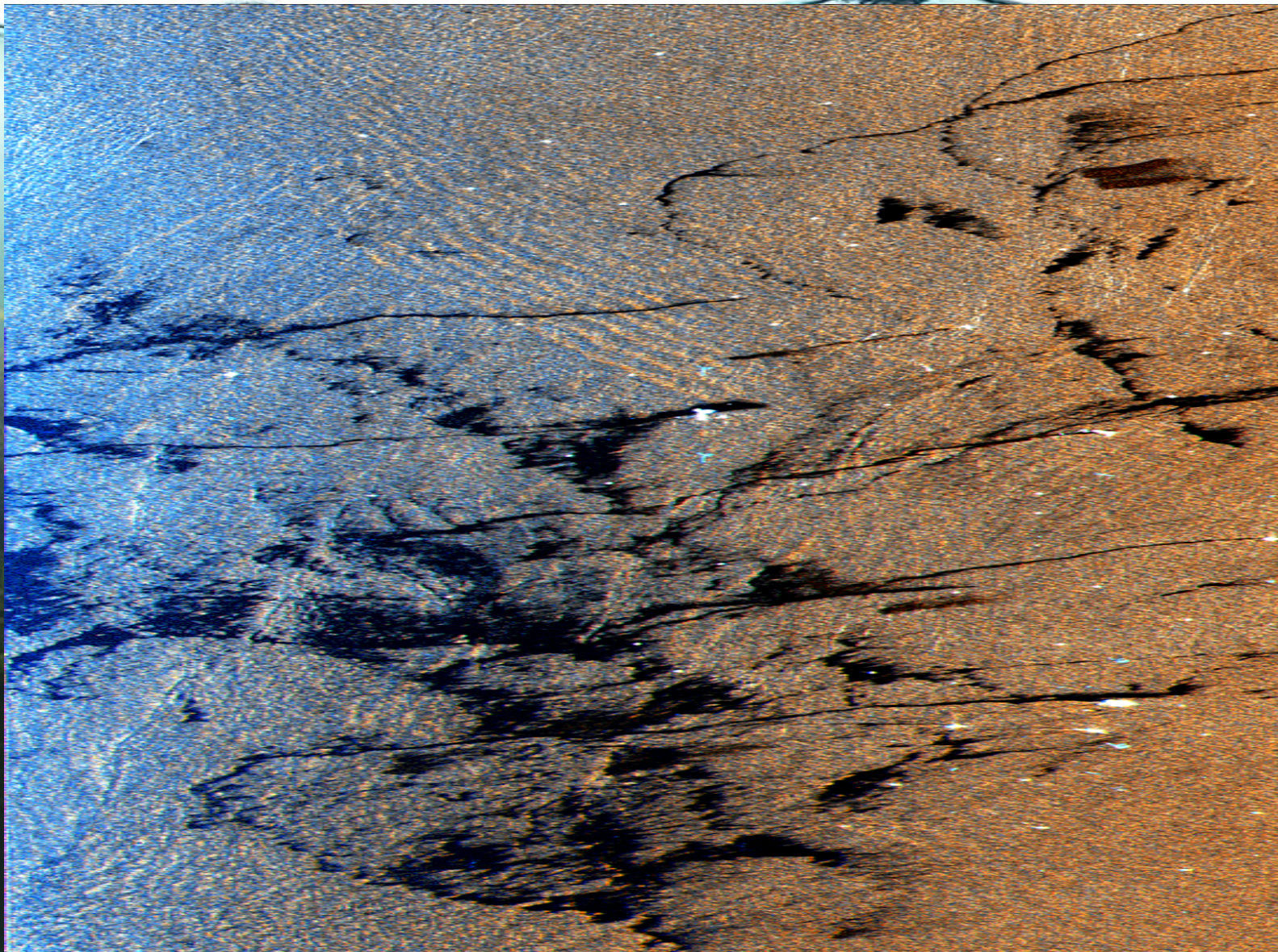
* Infrapuna ja mikrolaine → mikromeetrid

* Radar → millimeetrid

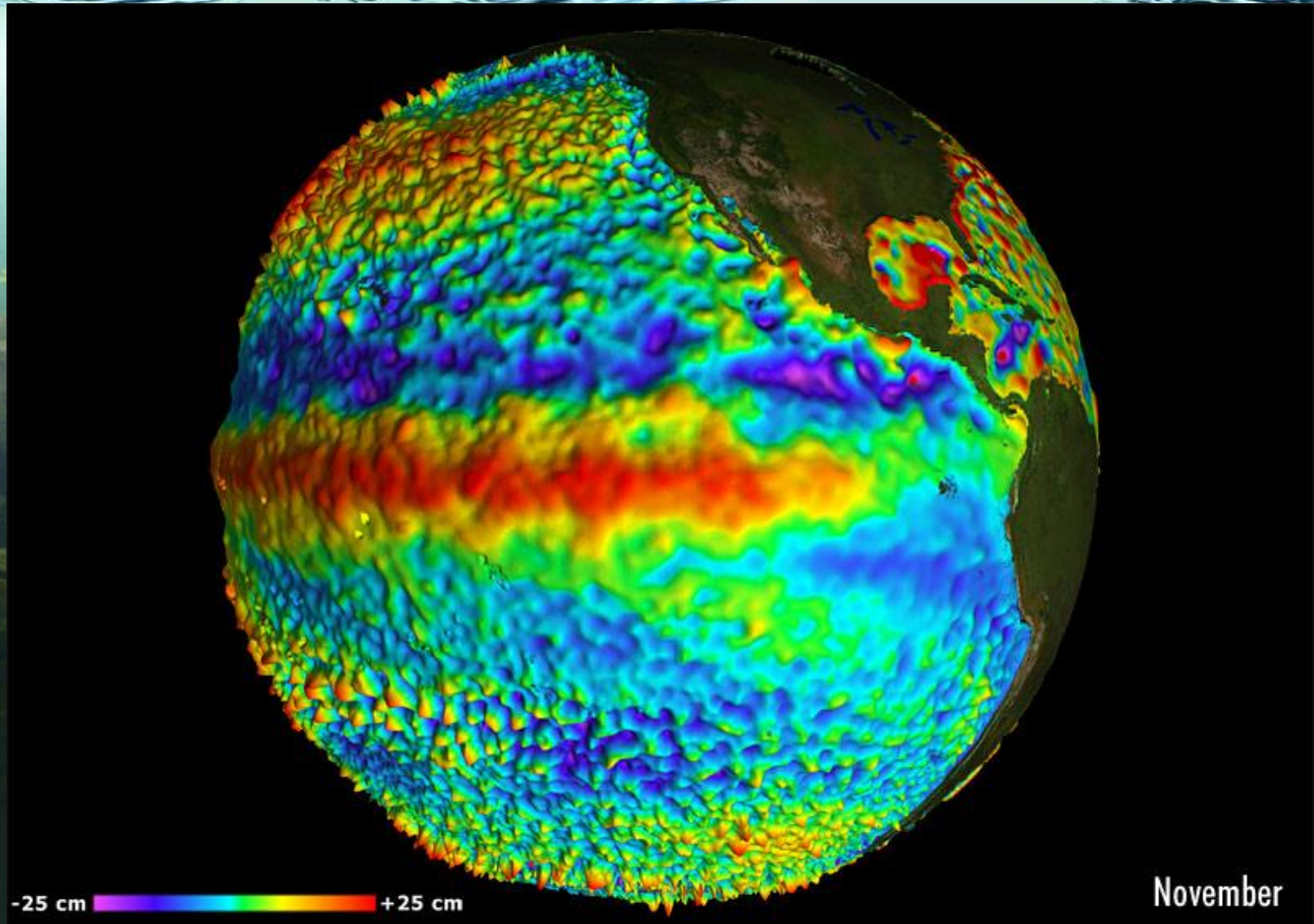
Jää kaardistamine



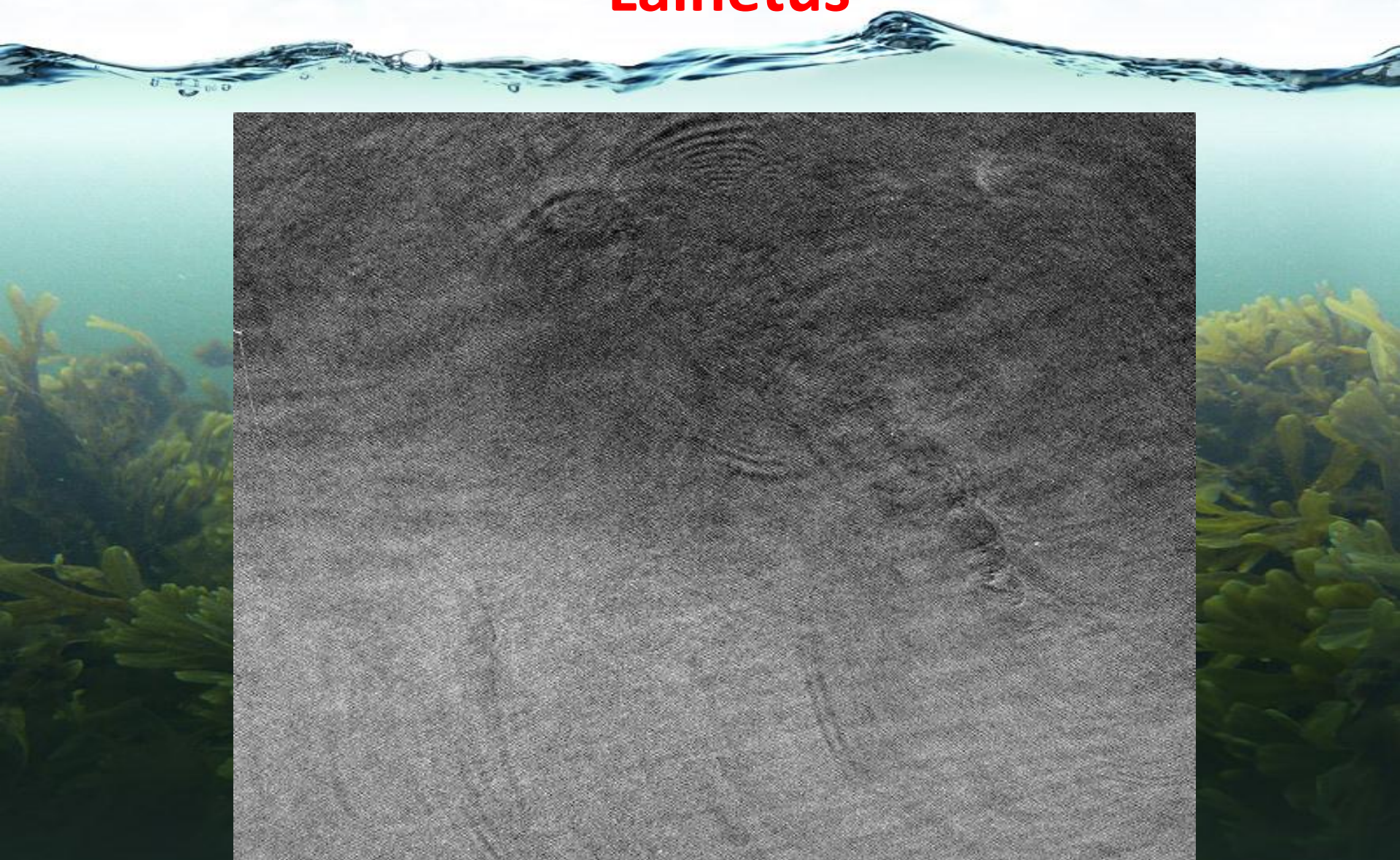
Õlireostuse avastamine



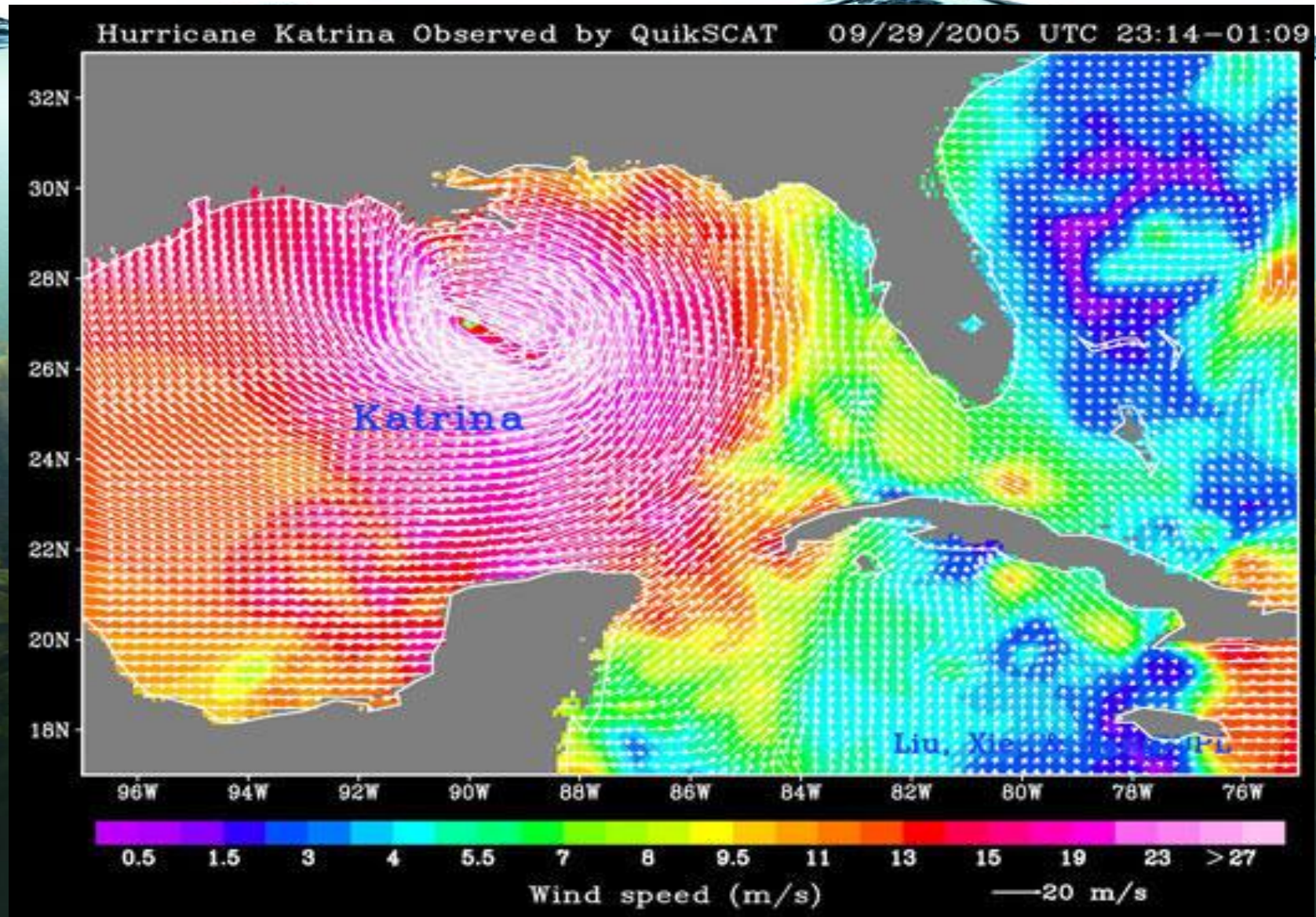
Merepinna kõrgus



Lainetus



Tuul



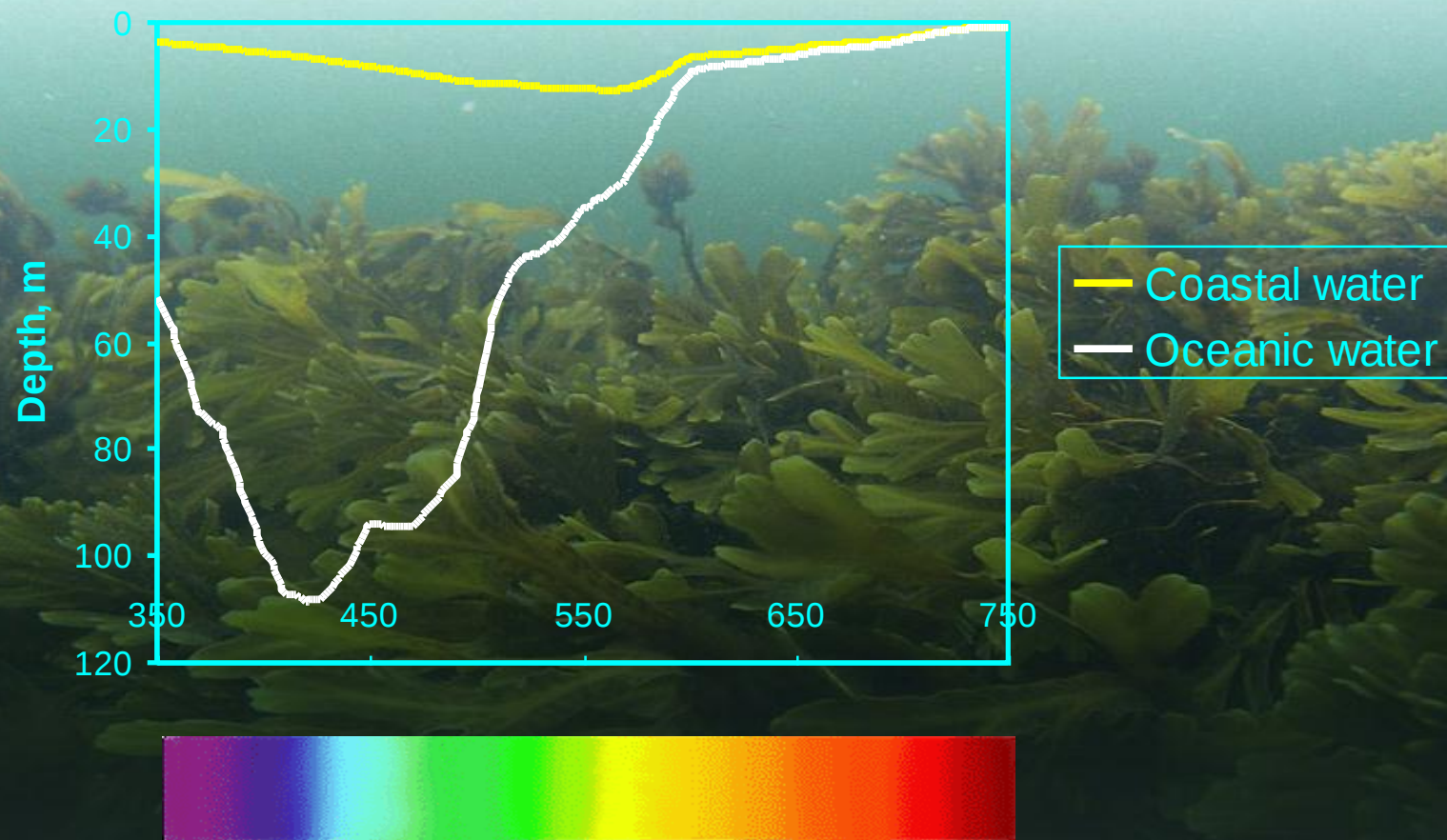
Vee kaugseire

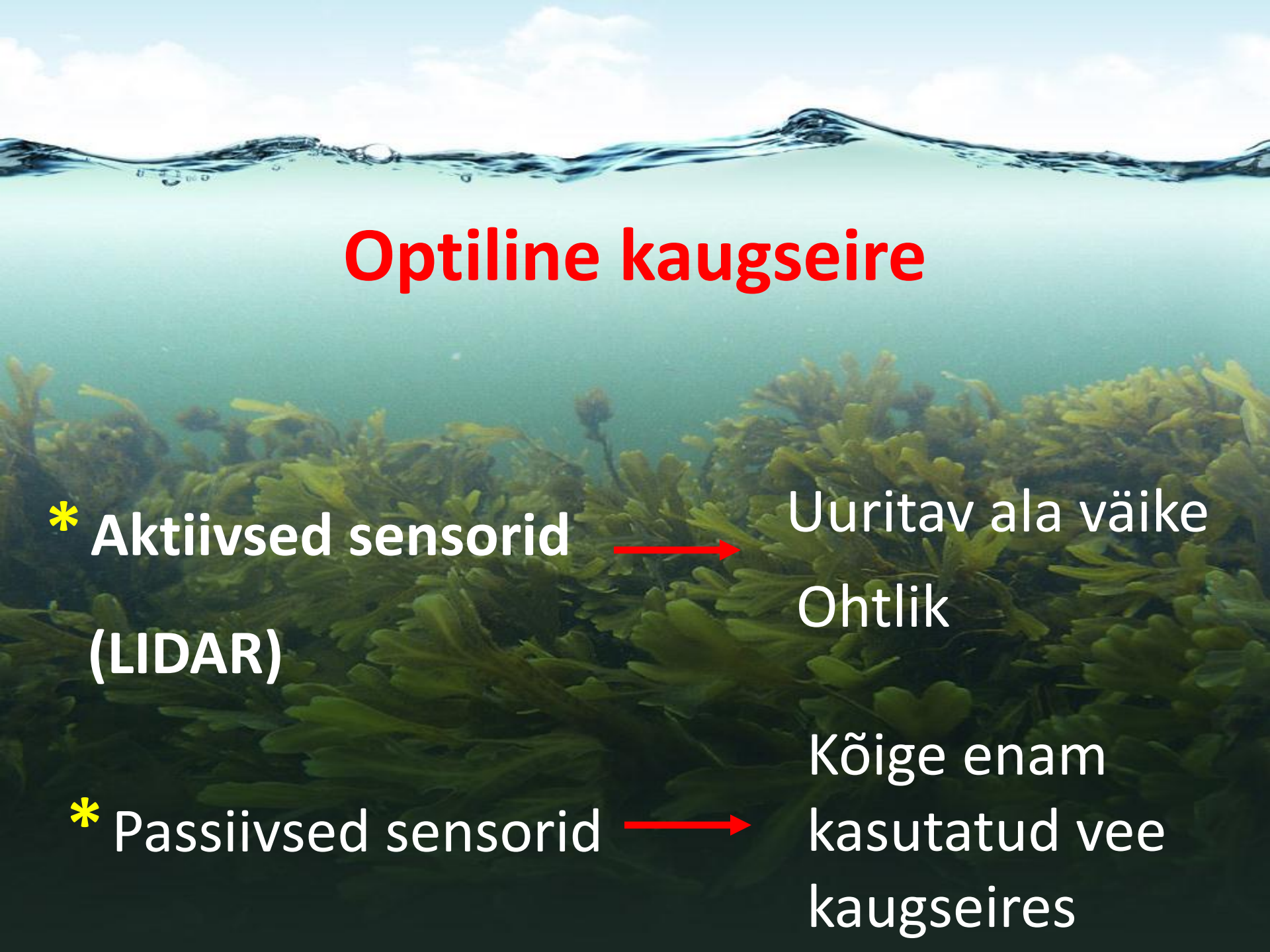
* Infrapuna ja mikrolaine → mikromeetrid

* Radar → millimeetrid

* Optilised sensorid → > 100 m

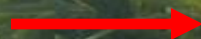
Sügavus milleni jõuab valgus vees





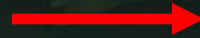
Optiline kaugseire

* **Aktiivsed sensorid**
(LIDAR)

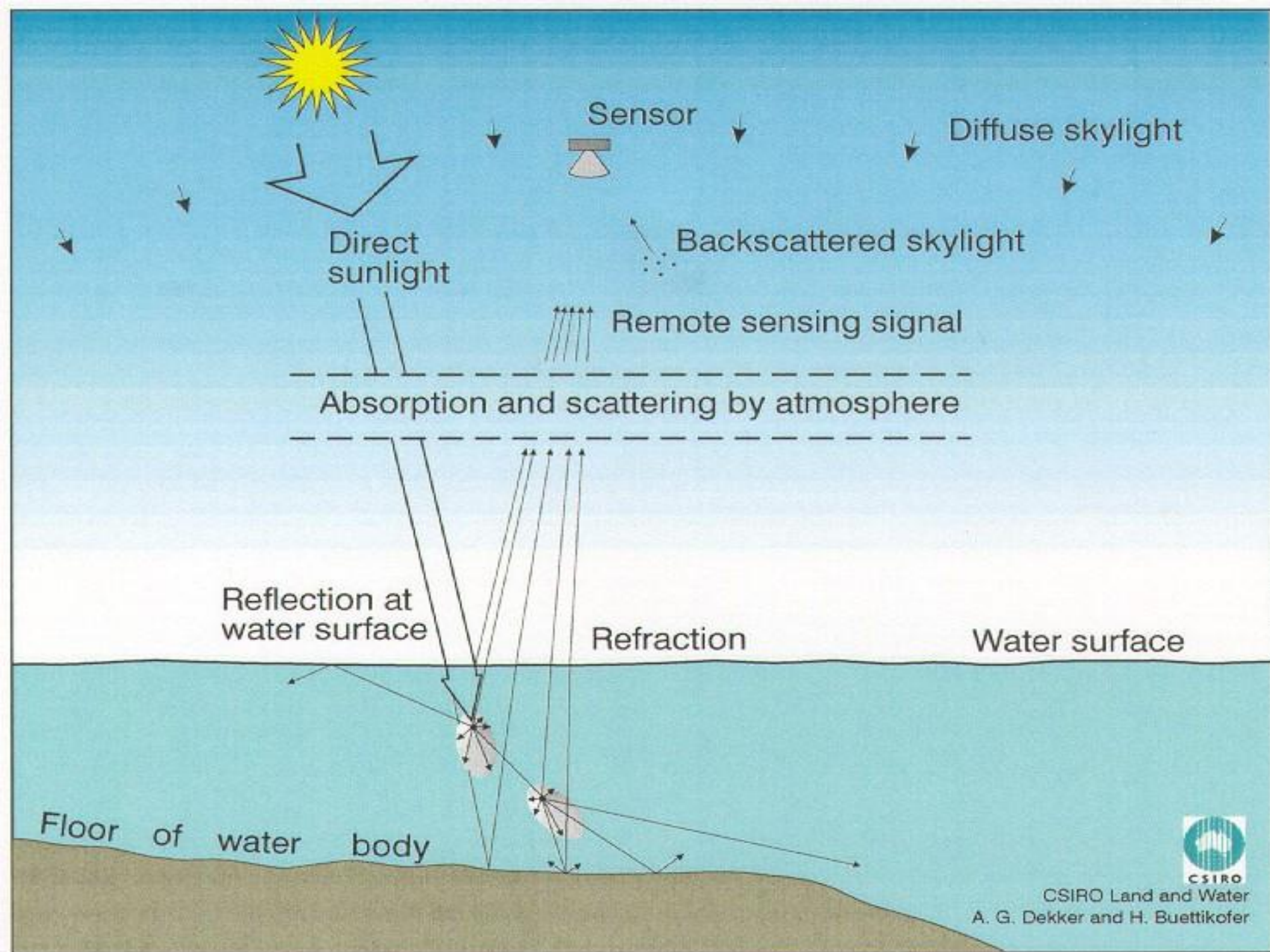


Uuritav ala väike
Ohtlik

* **Passiivsed sensorid**



Kõige enam
kasutatud vee
kaugseires



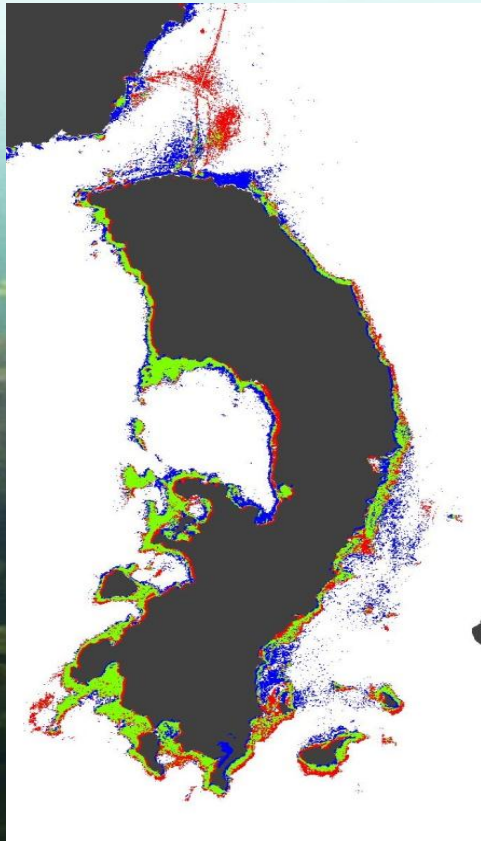


- * Suured alad
- * Kiire
- * Odav

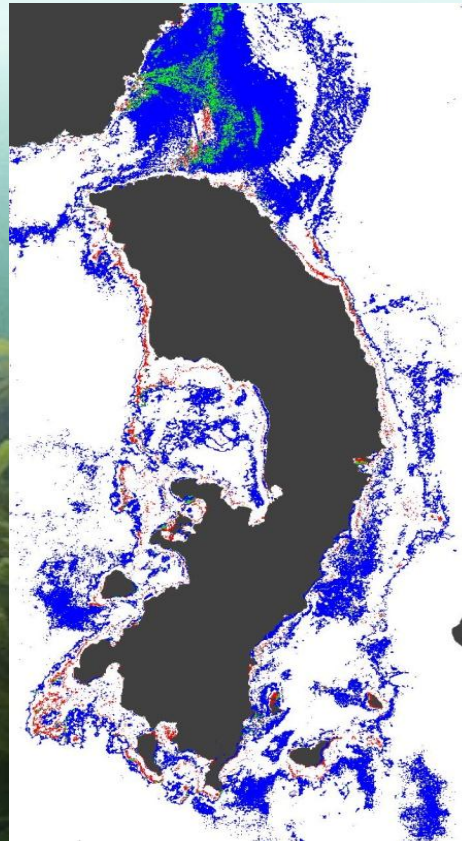
Vee kaugseire

- * Põhjataimestiku kaardistamine
- * Sügavuse kaardistamine madalatel rannikualadel
- * Muutuste jälgimine

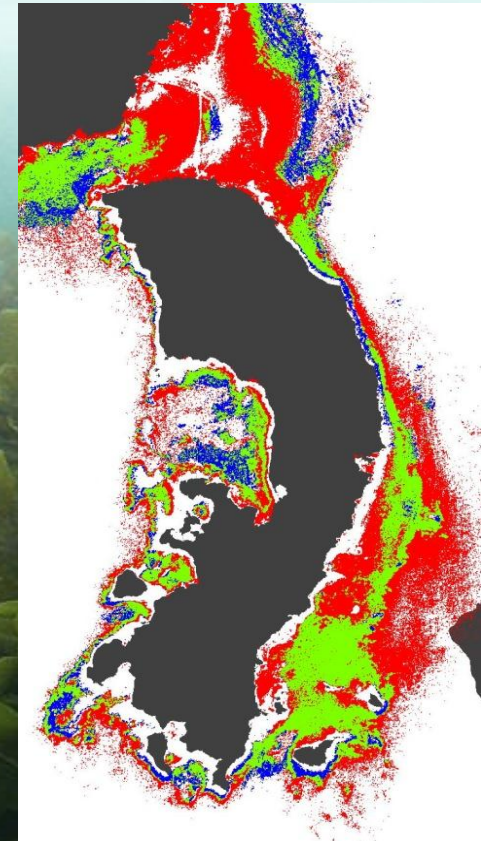
Muutused põhjataimestikus 2008-2011



Rohevetikad



Liiv



Kõrgem taimestik

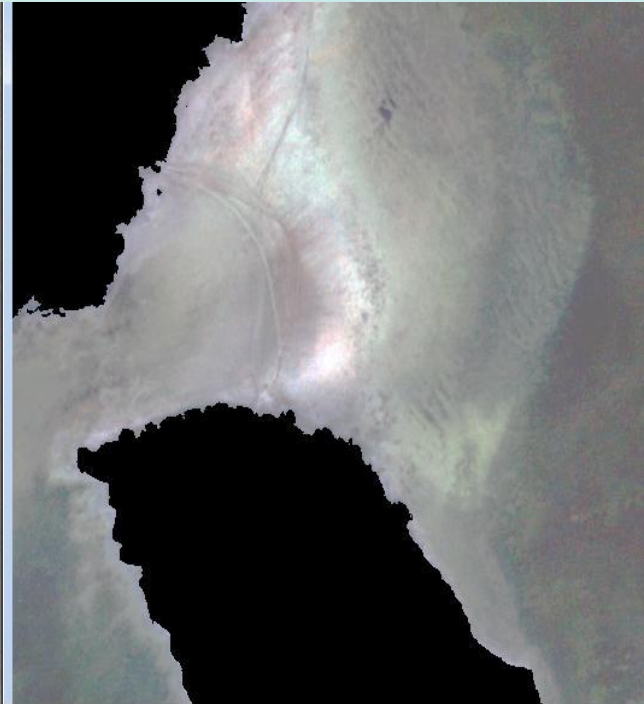
Roheline – muutuseta, sinine – ainult 2011, punane – ainult 2008



2005



2008

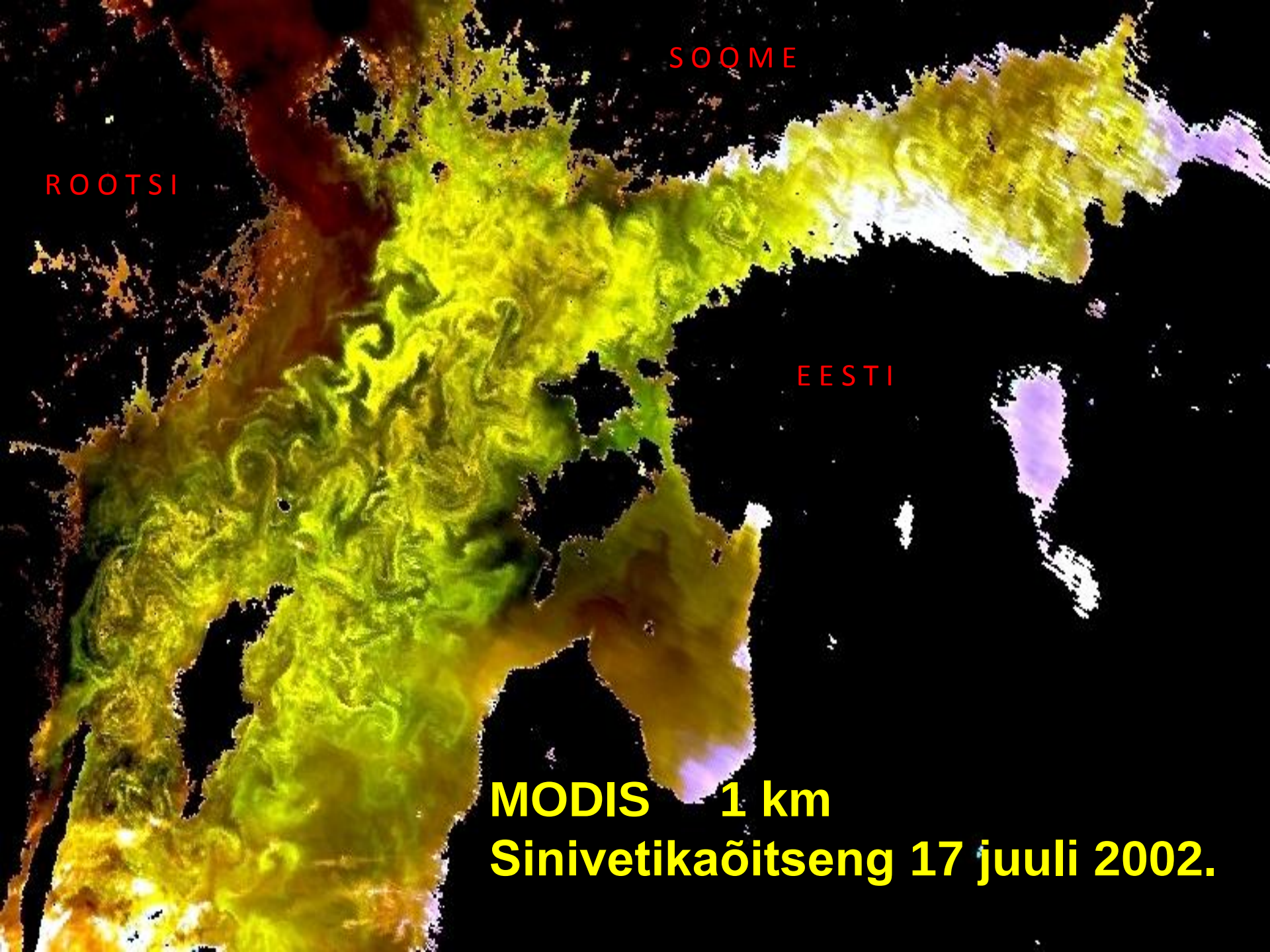


2011

Vee kaugseire

* Füttoplanktoni biomass





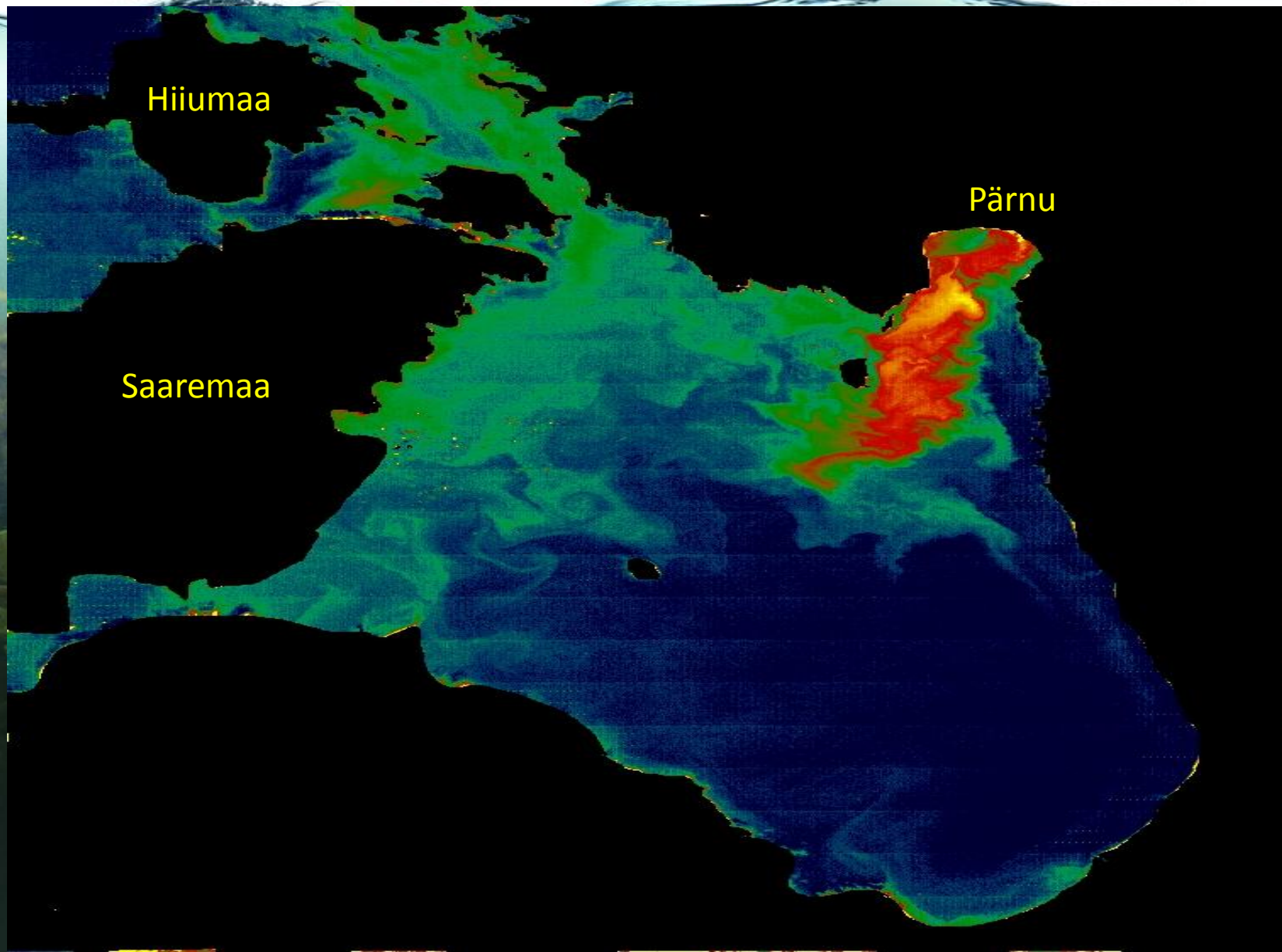
ROOTSI

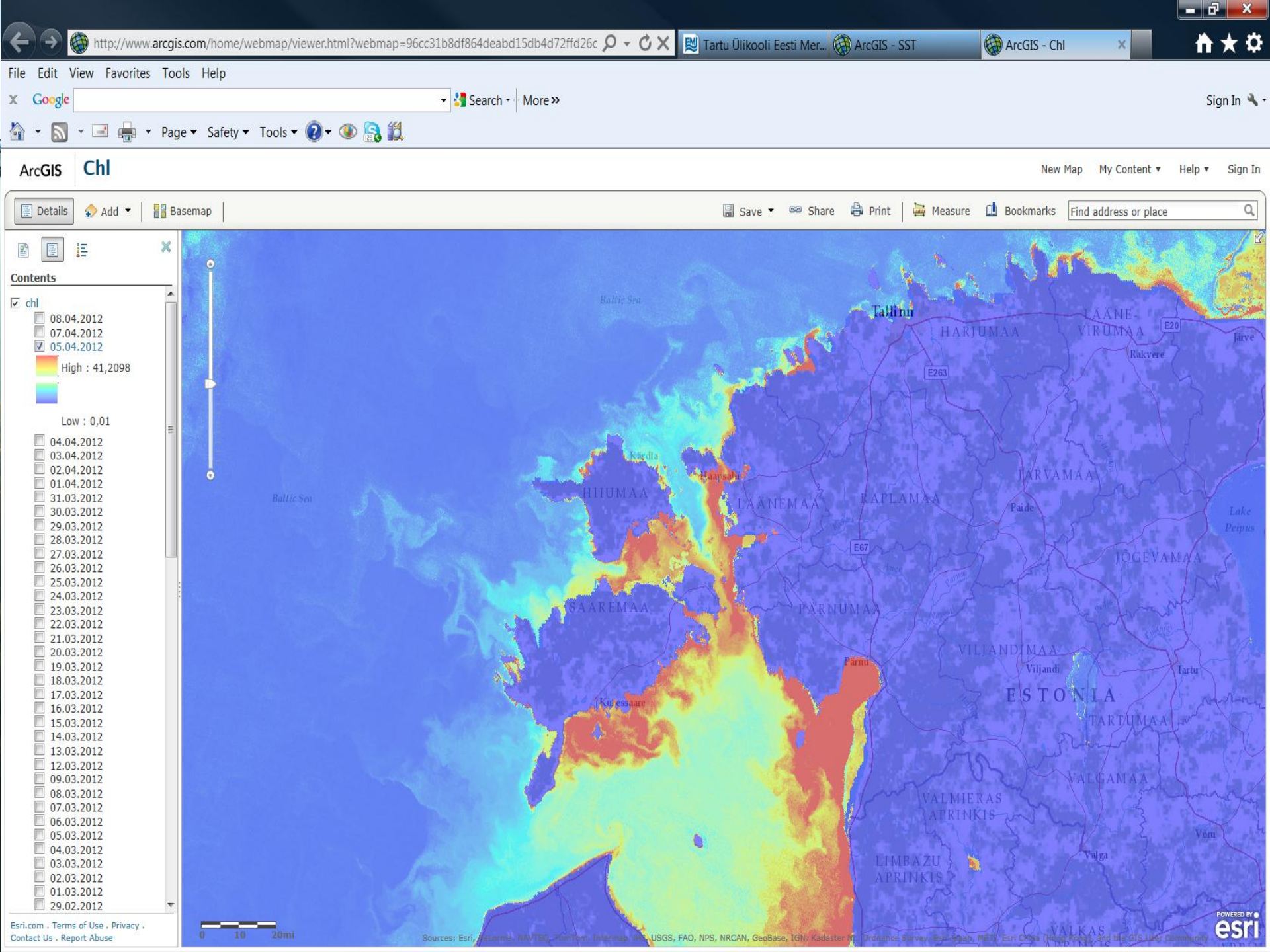
SOOME

EESTI

MODIS 1 km
Sinivetikaõitseng 17 juuli 2002.

Hilissügisene sinivetikaõitseng

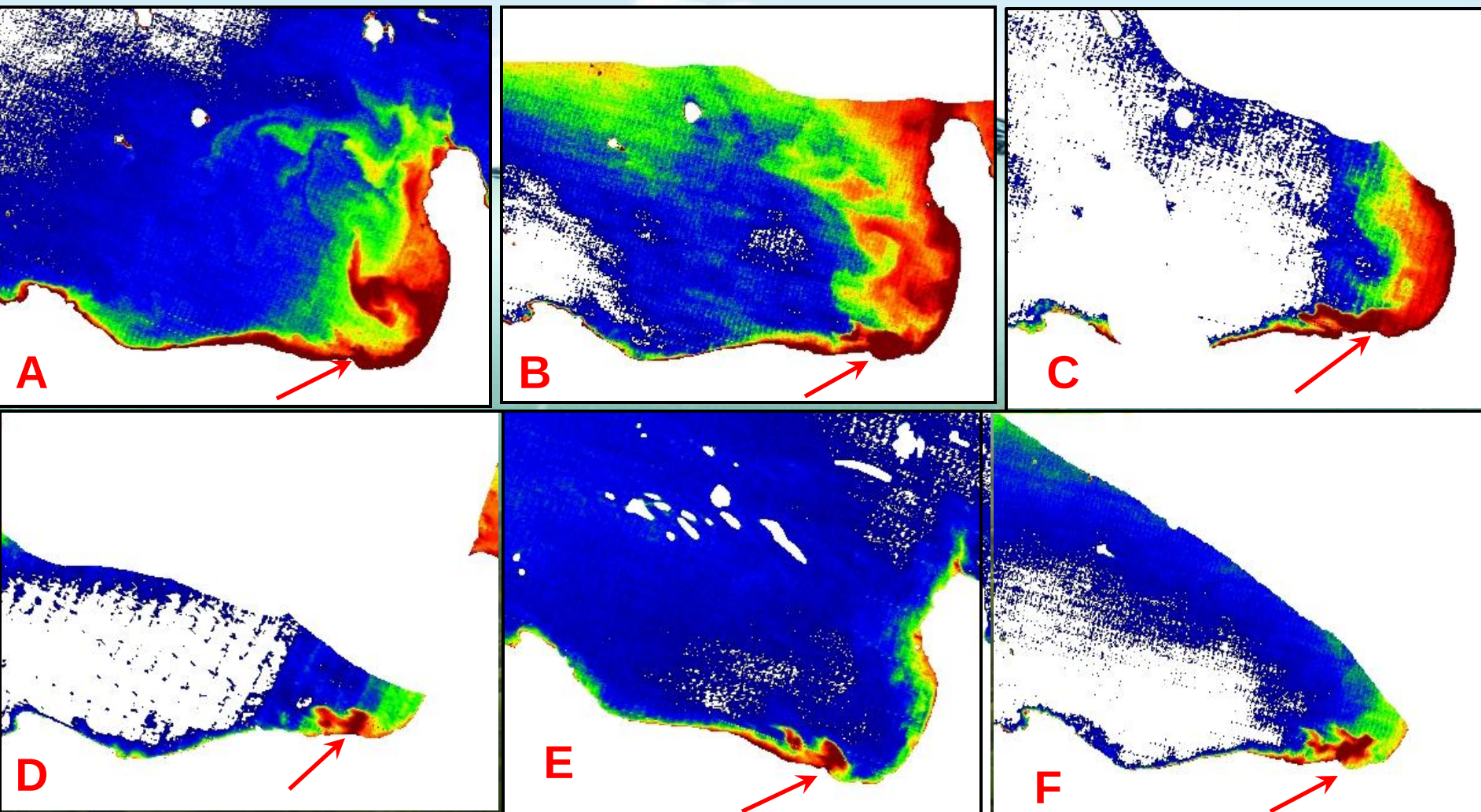




Vee kaugseire

- * Füttoplanktoni biomass

- * Tahkete osakeste hulk vees



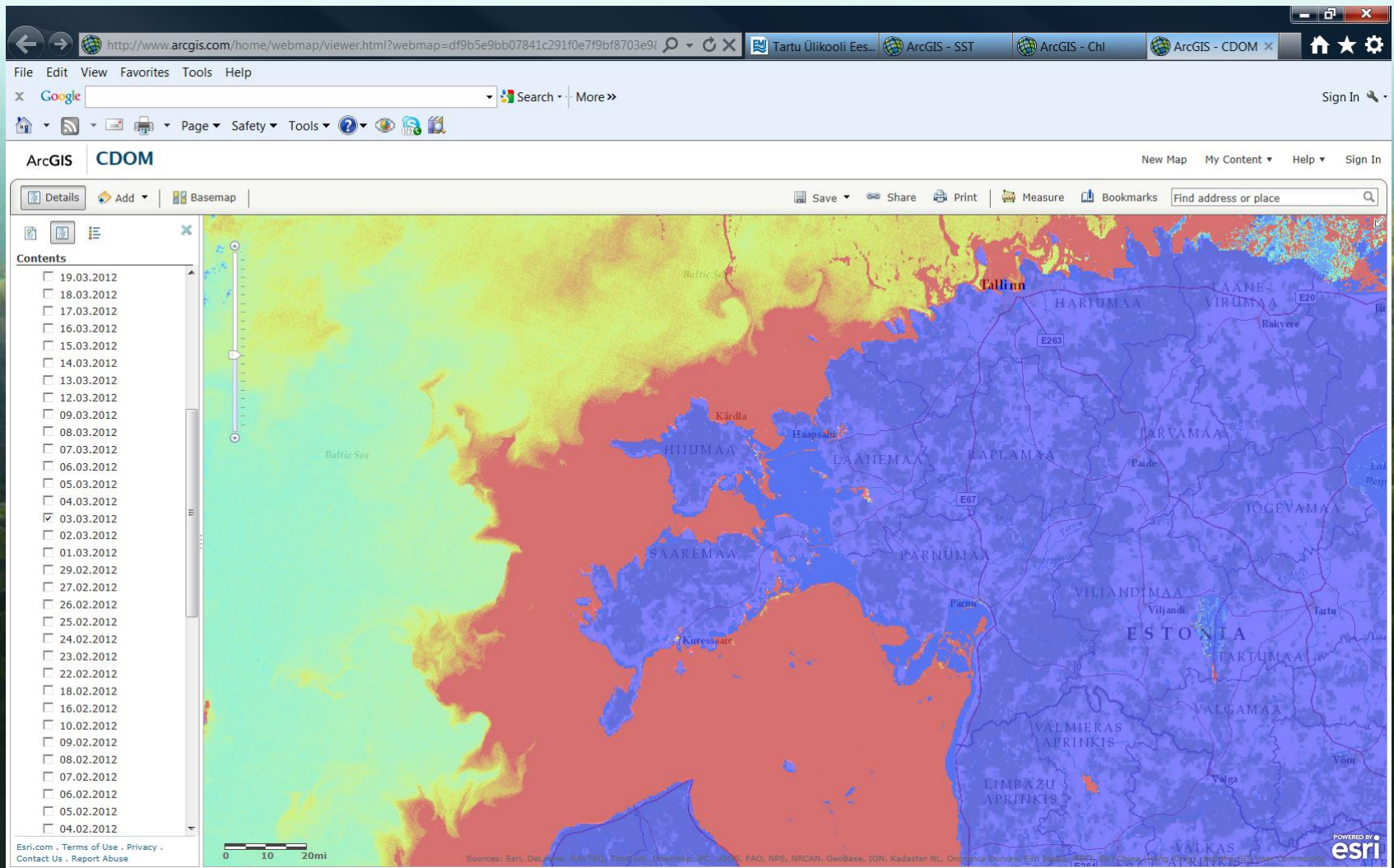
Heljumi kontsentratsioon Narva lahes

(A) September 11; (B) September 13; (C) September 16;
(D) September 17; (E) September 21; (F) September 22.

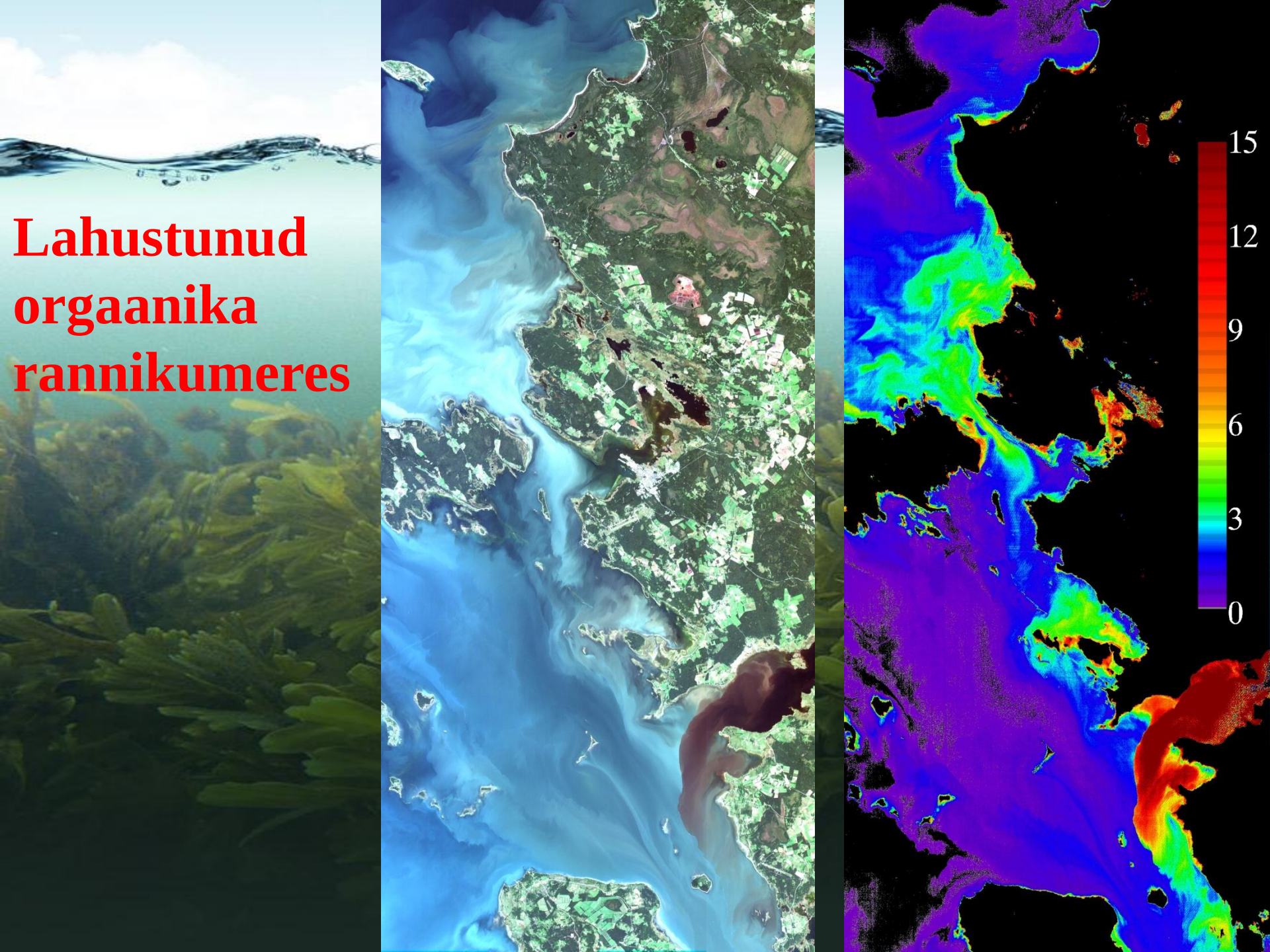
Vee kaugseire

- * **Fütoplanktoni biomass**
- * **Sügavuse kaardistamine madalatel rannikualadel**
- * **Lahustunud orgaaniliste ainete hulk**

Lahustunud orgaaniline aine



Lahustunud orgaanika rannikumeres

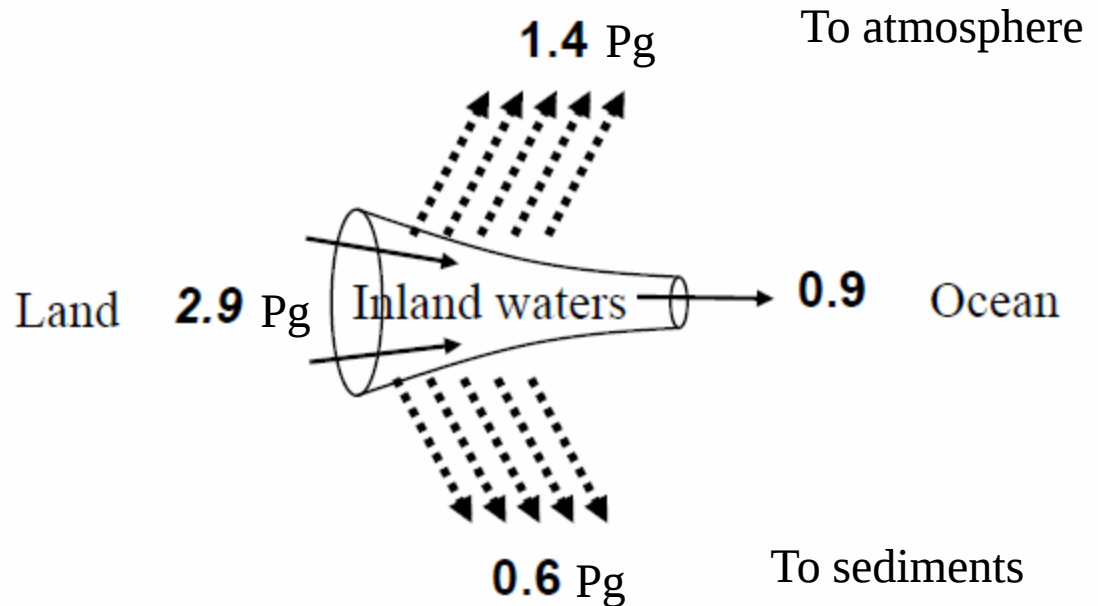


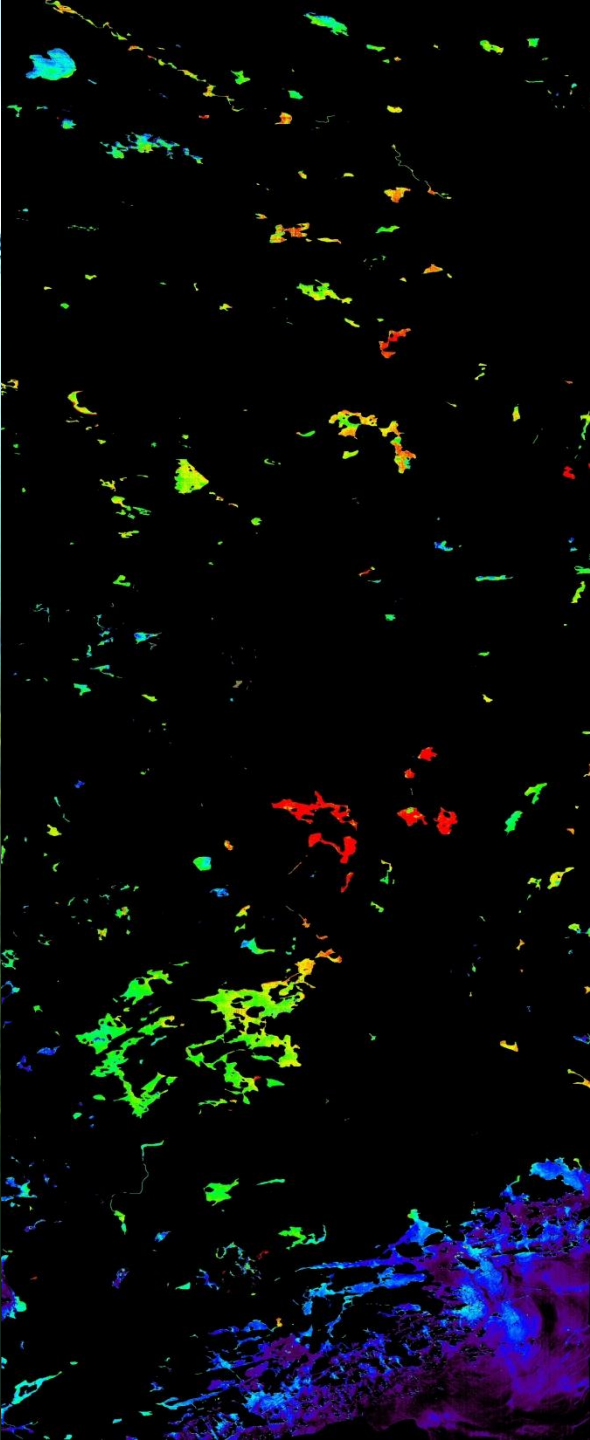
Järvede roll globaalses süsinikuringes

IPCC
mudelid

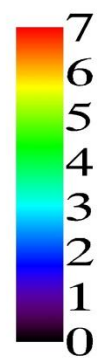
Uuemad
andmed
(Tranvik et al.
L&O 2009)

Land **0.9** → Inland waters → **0.9** Ocean



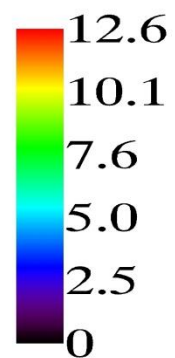


CDOM



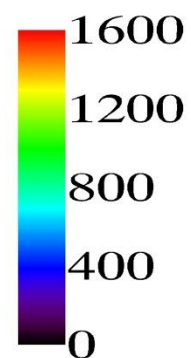
m⁻¹

DOC



ppm

pCO₂



μatm



An underwater photograph showing a dense field of green seaweed at the bottom. The water is clear and blue, with a wavy surface visible at the top. The text "Täna tähelepanu eest!" is overlaid in the center in a bold, red, sans-serif font.

**Täna
tähelepanu
eest!**