



UNIVERSITY OF TARTU

Veekogude kaugseire **(Tartu Ülikooli Eesti** **Mereinstituudi kaugseire** **osakonnas)**

Tiit Kutser

Kes me oleme?

**Tartu Ülikooli Eesti Mereinstituudi
kaugseire ja mereoptika osakond**

2 juhtivteadurit

4 vanemteadurit

1 teadur

1 järeldoktor

2 laboranti

Tööriistad

Mere kaugseire sensorid (250-1000 m)

MERIS 2002-2012

OLCI (2014?)

MODIS

Keskmise ruumilise lahutusega (10-30 m)

Landsat 8

veebruar 2013

Sentinel 2

2014?

Hyperion

Suure ruumilise lahutusega (1,8 - 4 m)

WorldView-2

QuickBird

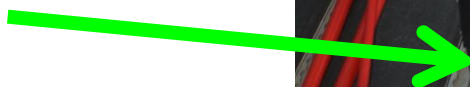
Lennukil paiknev spektromeeter

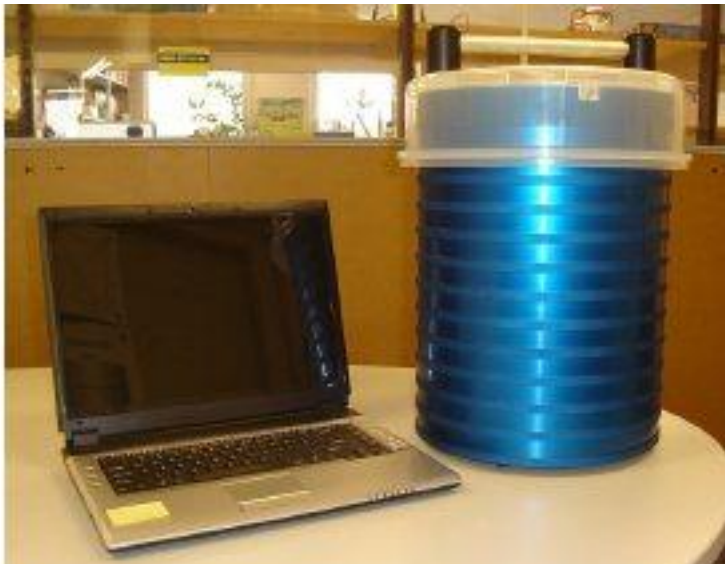


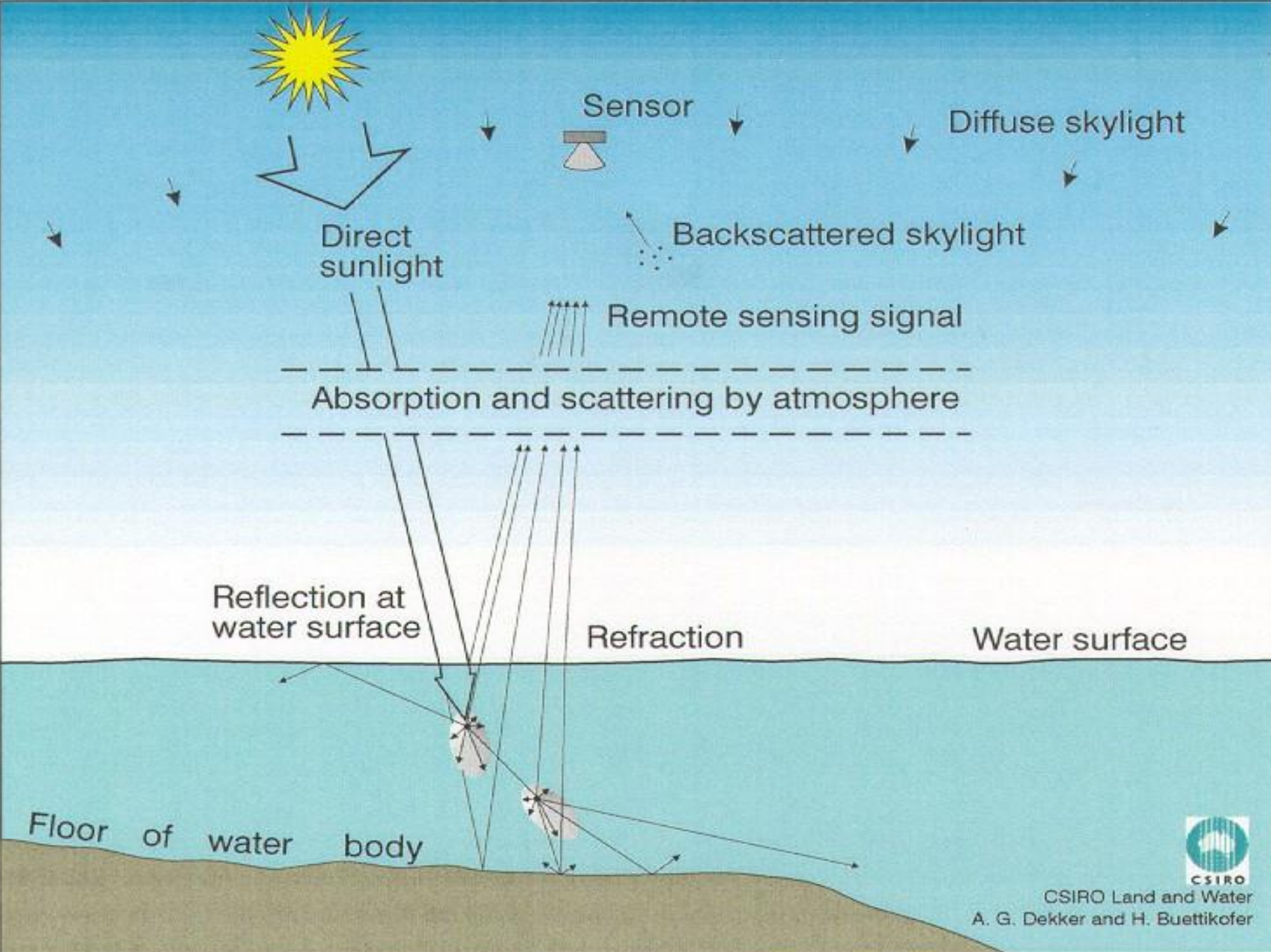
HySpex

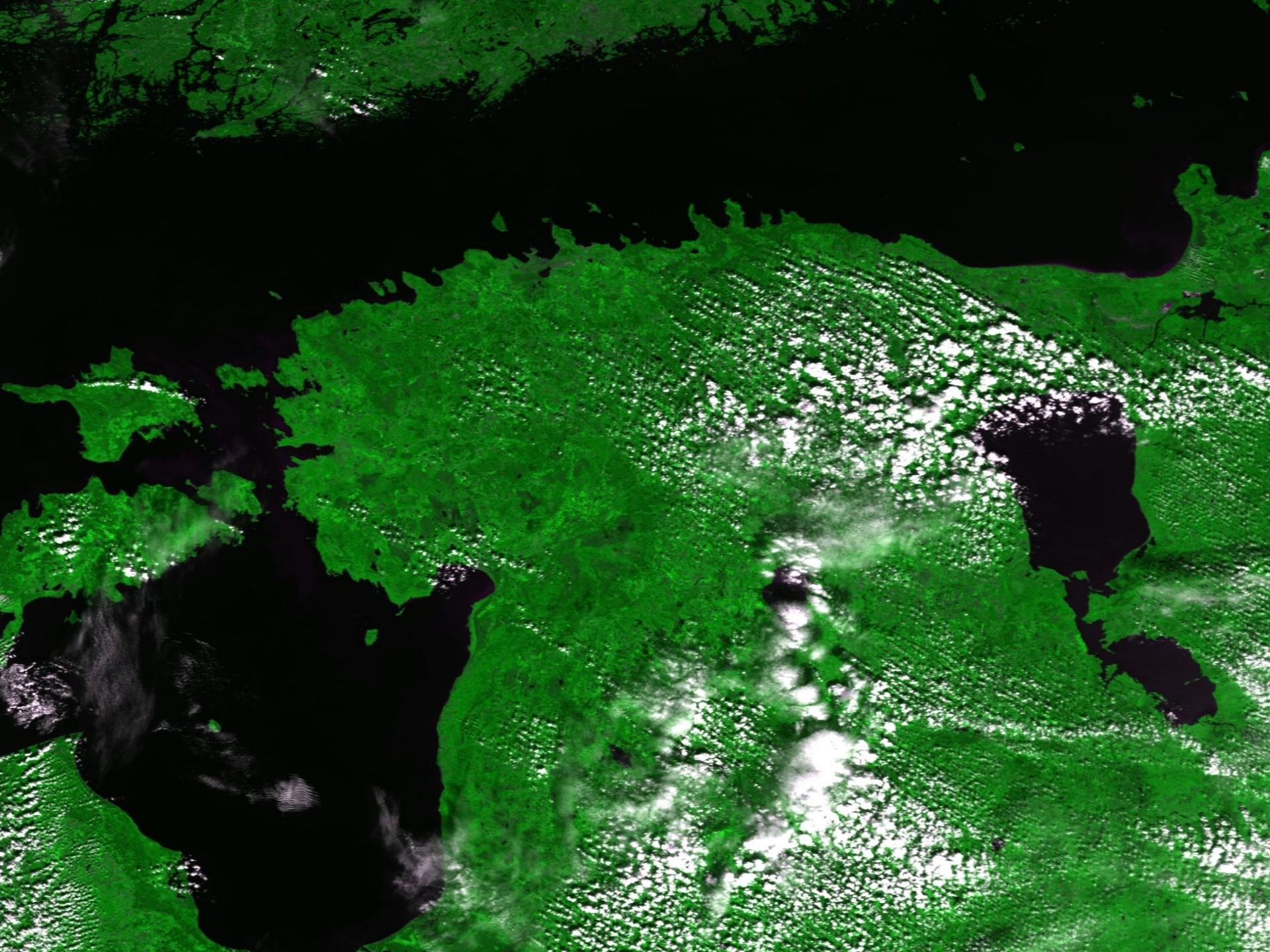
410-990 nm

2,5 nm lahutusega









Rakendused

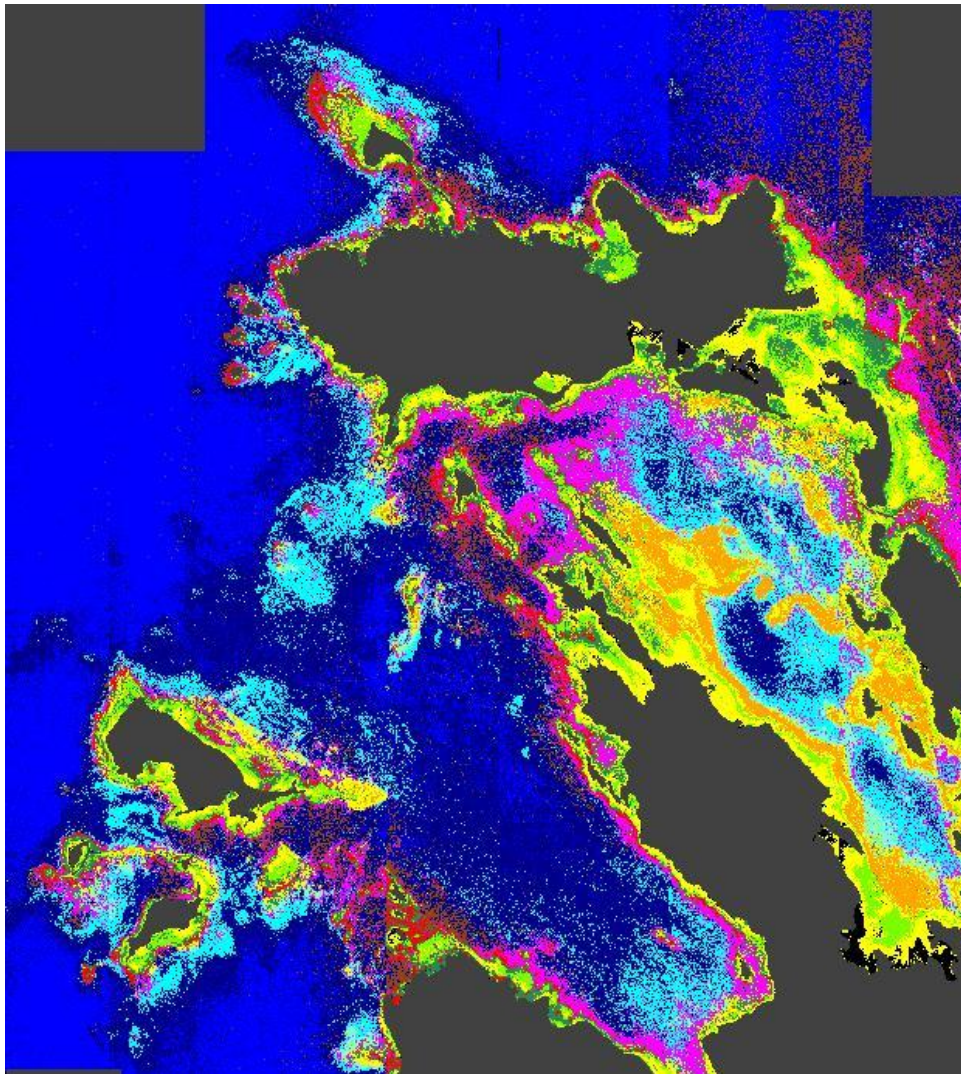
Madala vee kaugseire

Põhjataimestiku katvus ja liigiline koosseis

Vee sügavus

www.hispares.eu

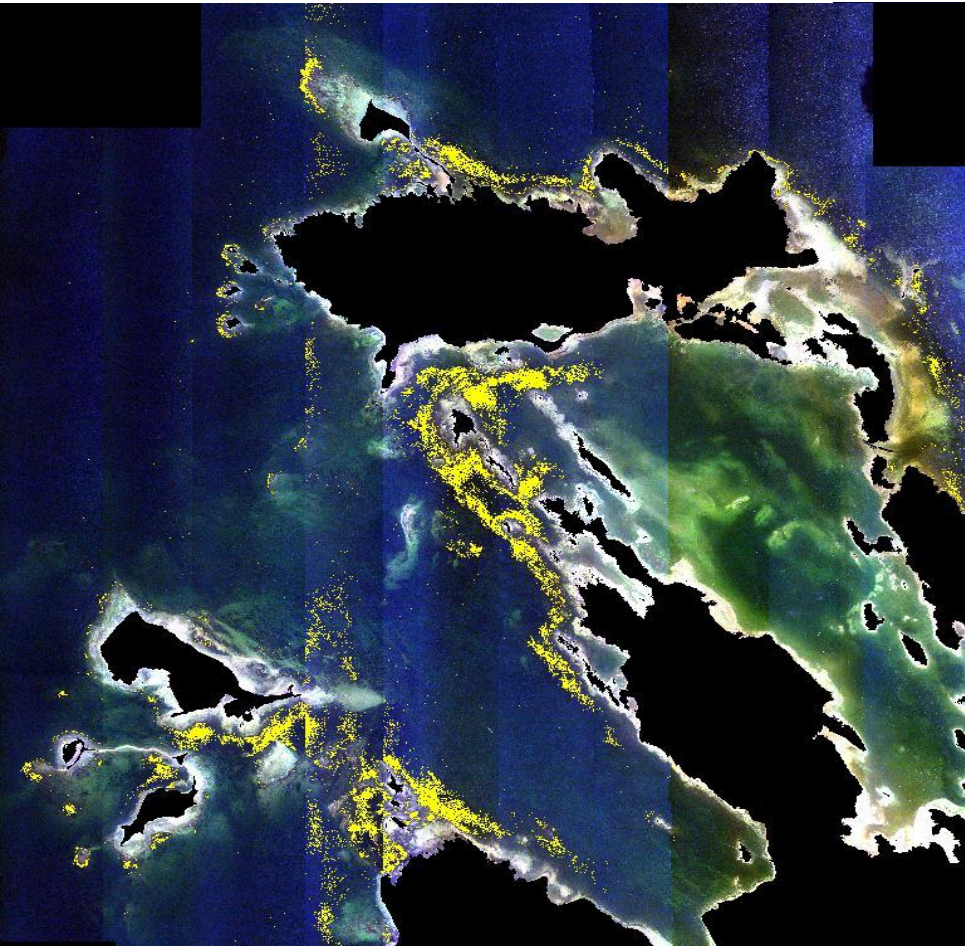
Põhjataimestiku kaardistamine



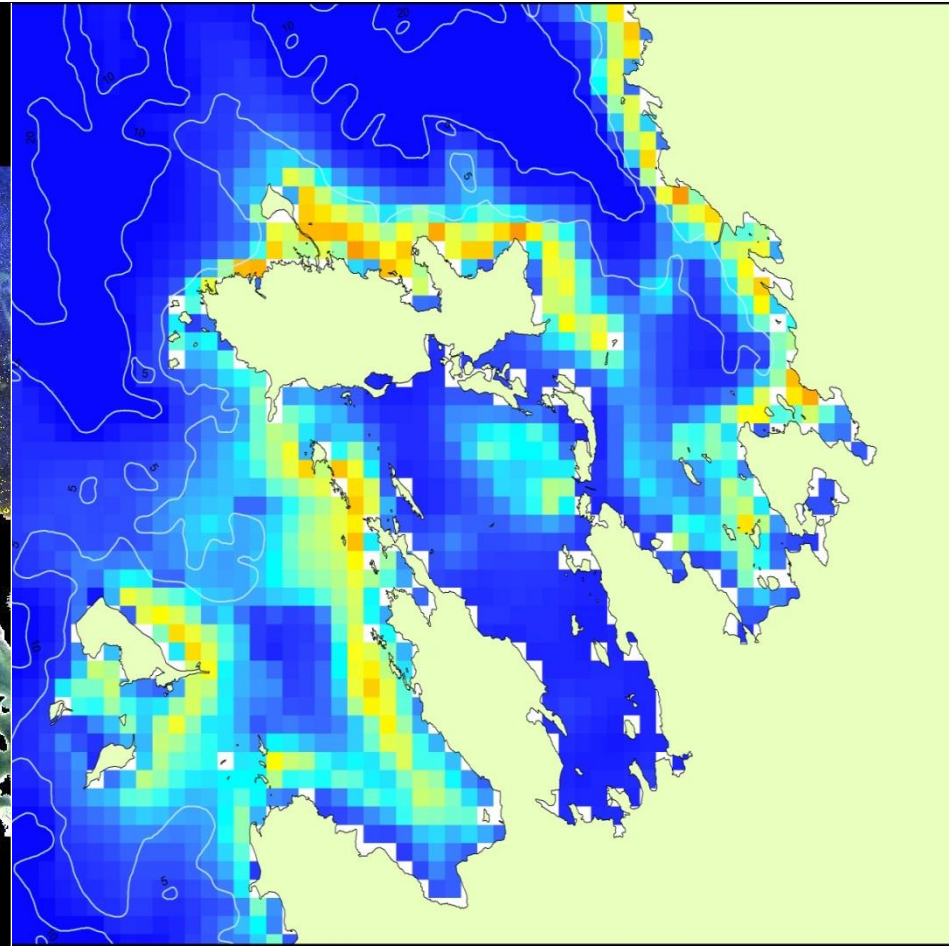
- Masked pixels
- Brown algae <2m
- Bare substrate <2m
- Hard bottom and filamentous green algae <2m
- Dense higher vegetation <2m
- Higher vegetation on bright bottom
- Charophytes <2m
- Red algae <2m
- Vegetation >2m
- Bare substrate >2m
- Deep water >6m

Põisadru *Fucus vesiculosus*

Kaugseire

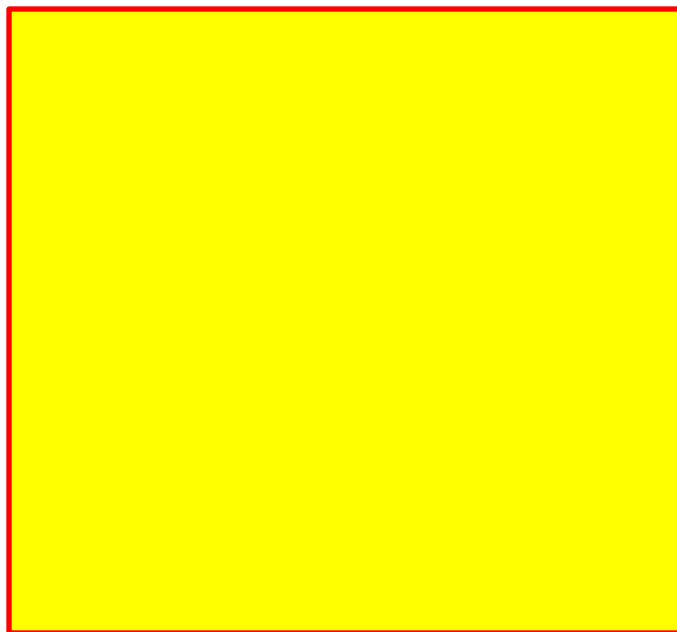


Mudel



Ruumiline lahutus

Mudel



250 m

1 m lahutusega
CASI



250 m

Muutused põhjataimestikus



2005



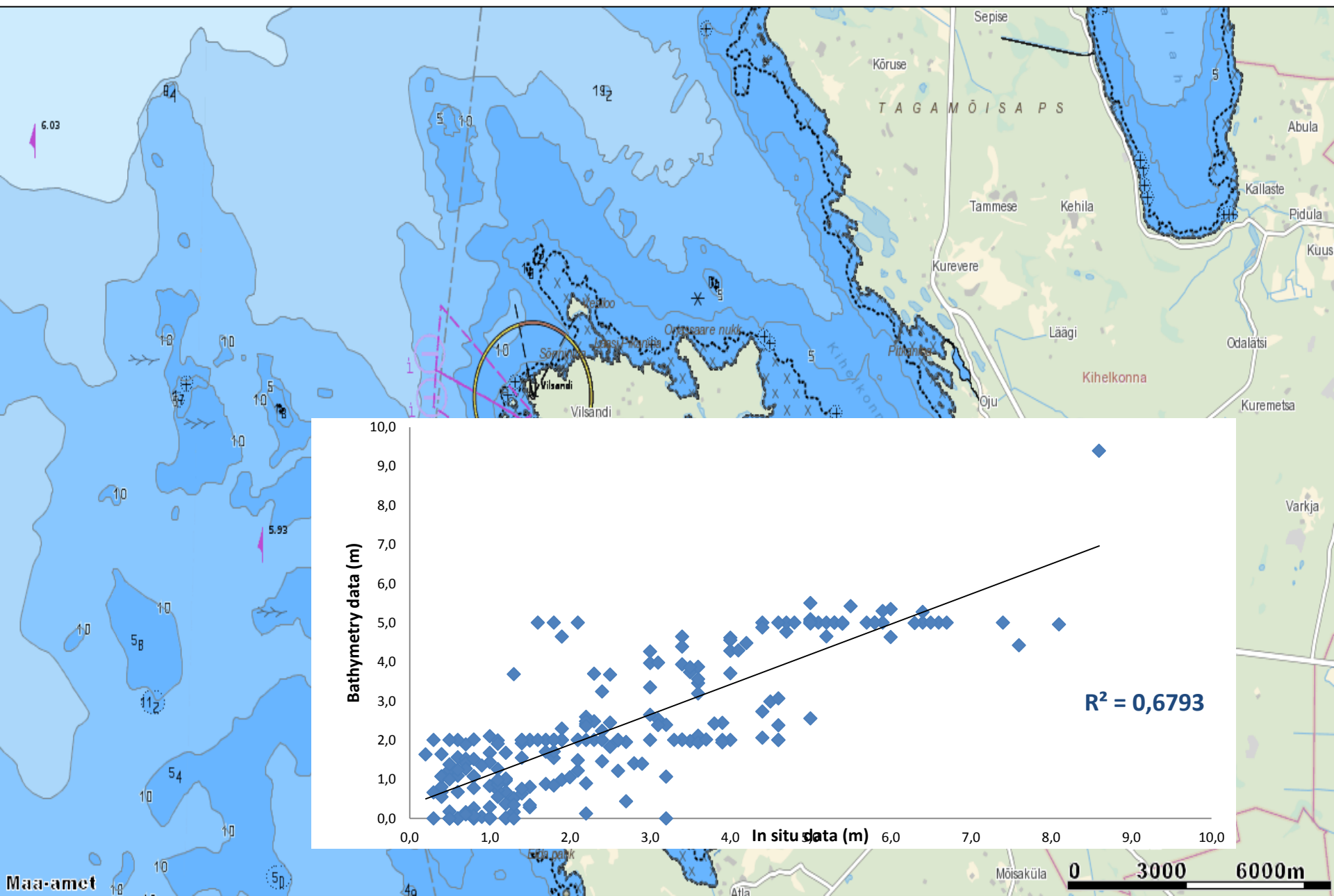
2008

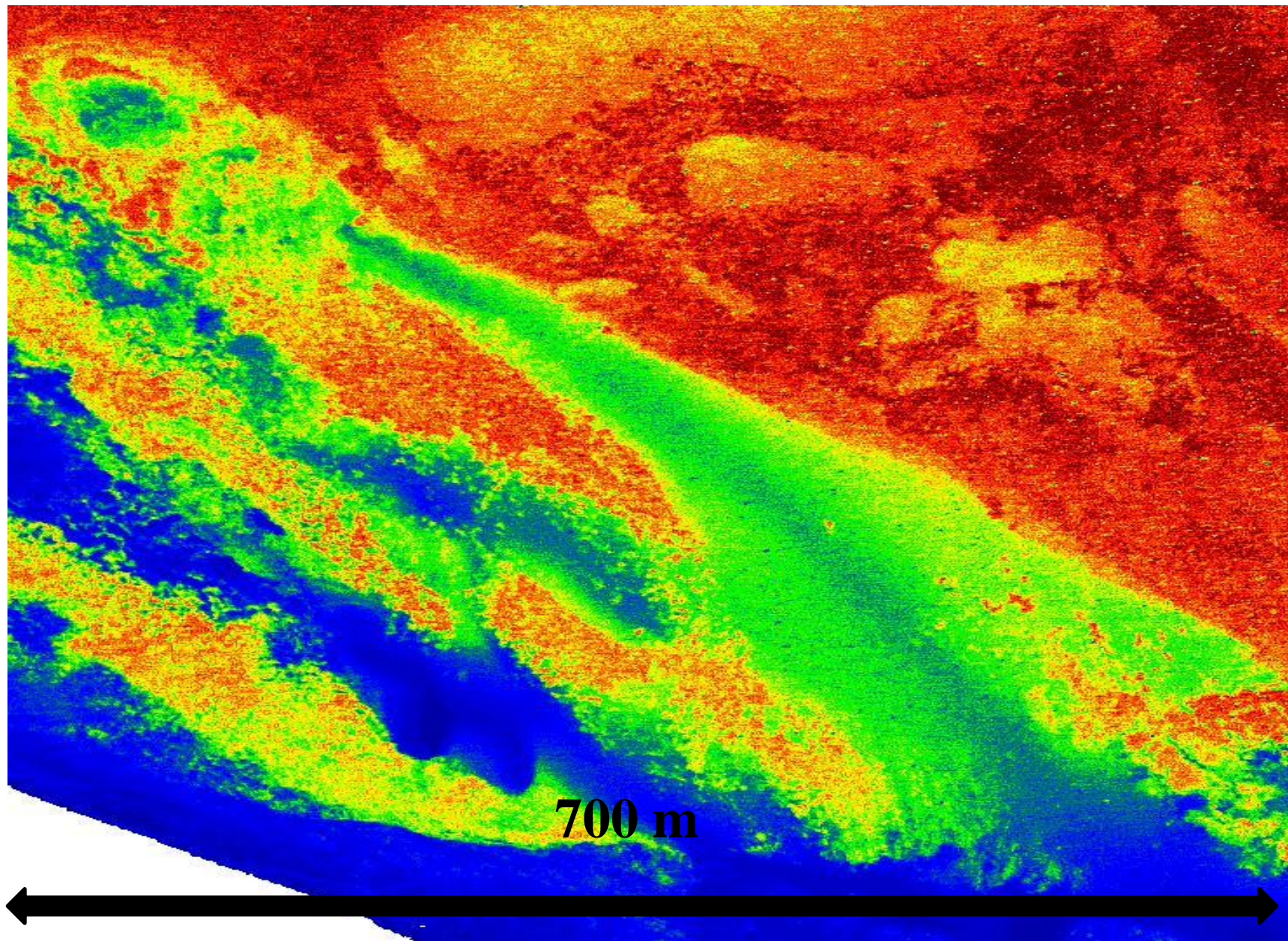


2011

QuickBird 2,4 m lahutusega pildid

Vee sügavuse kaardistamine



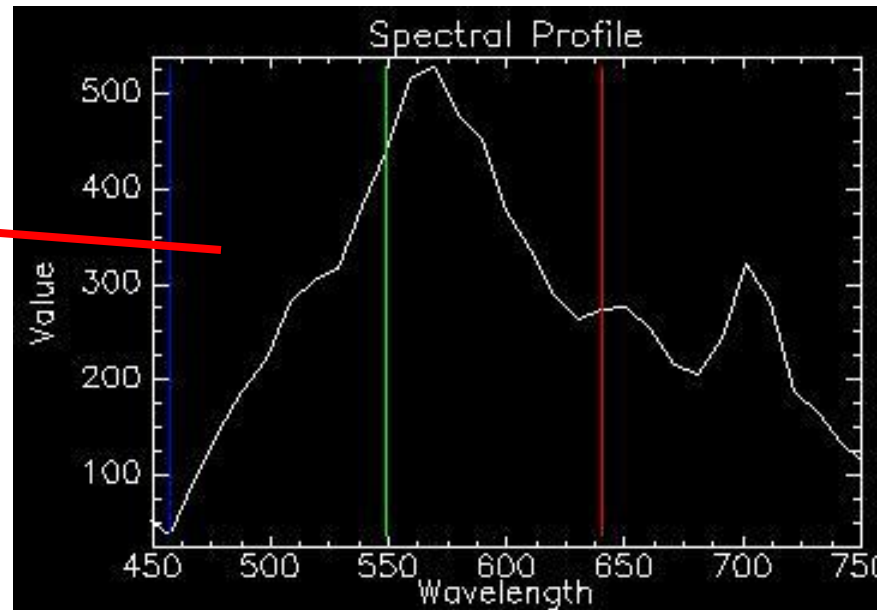
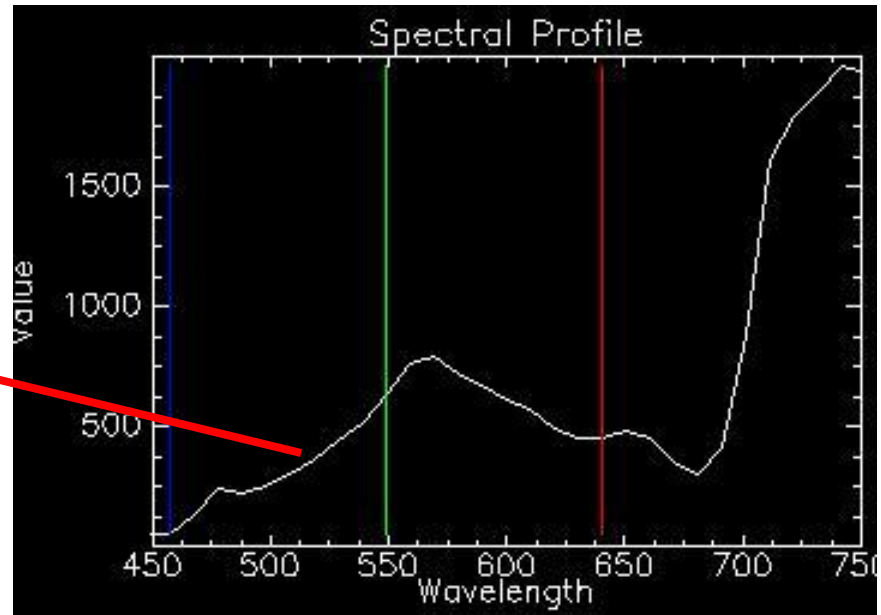
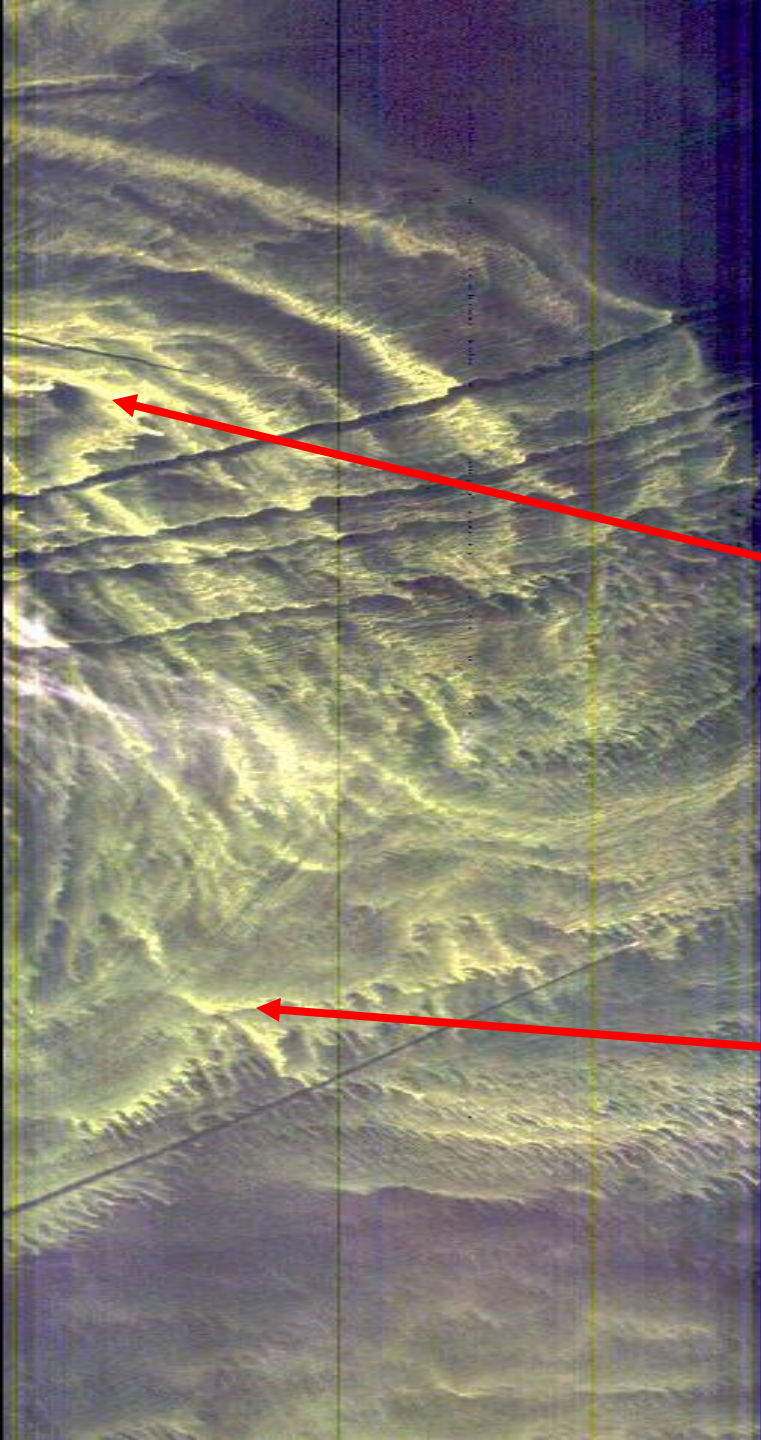




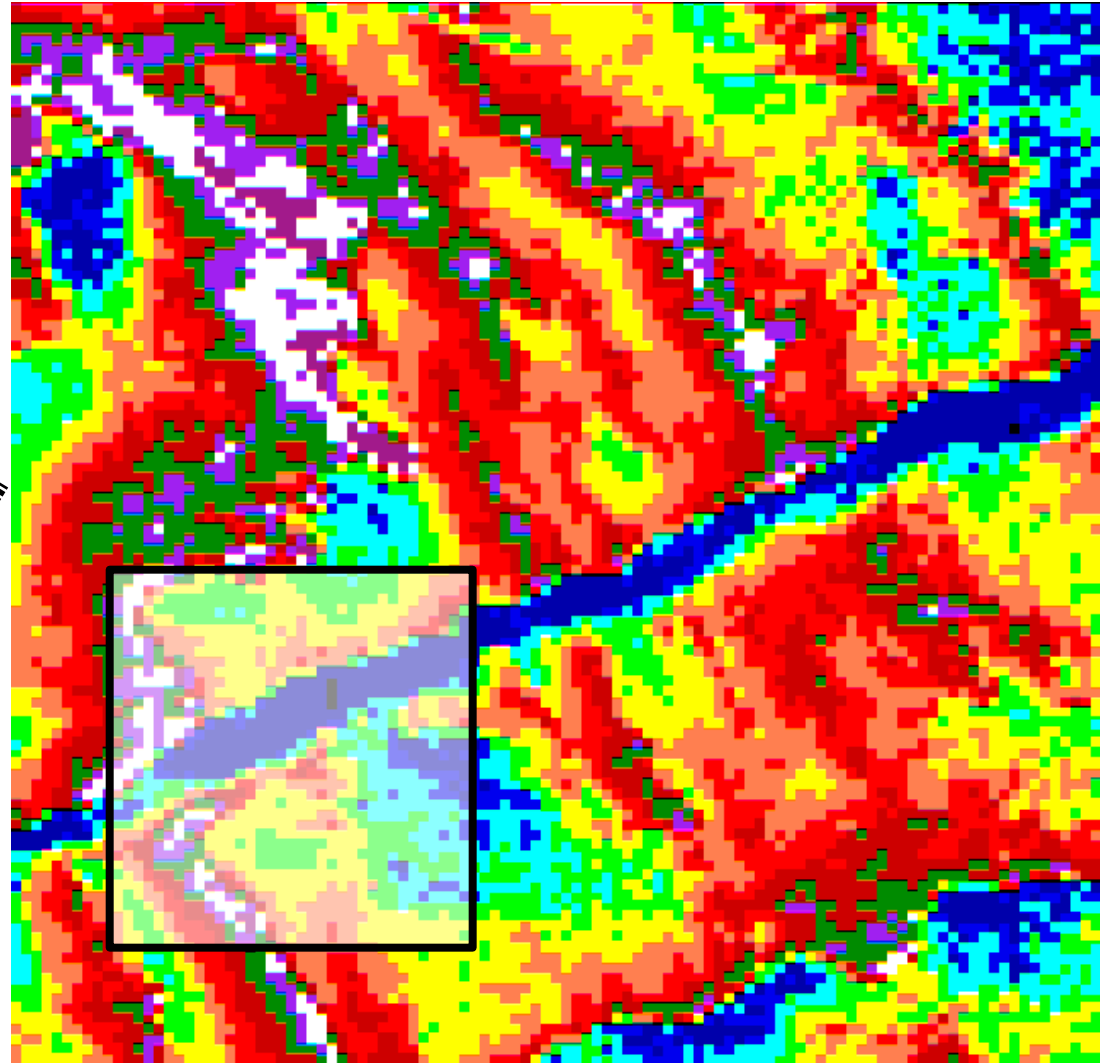
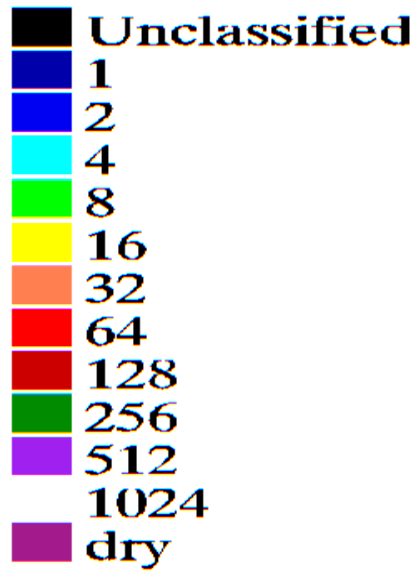
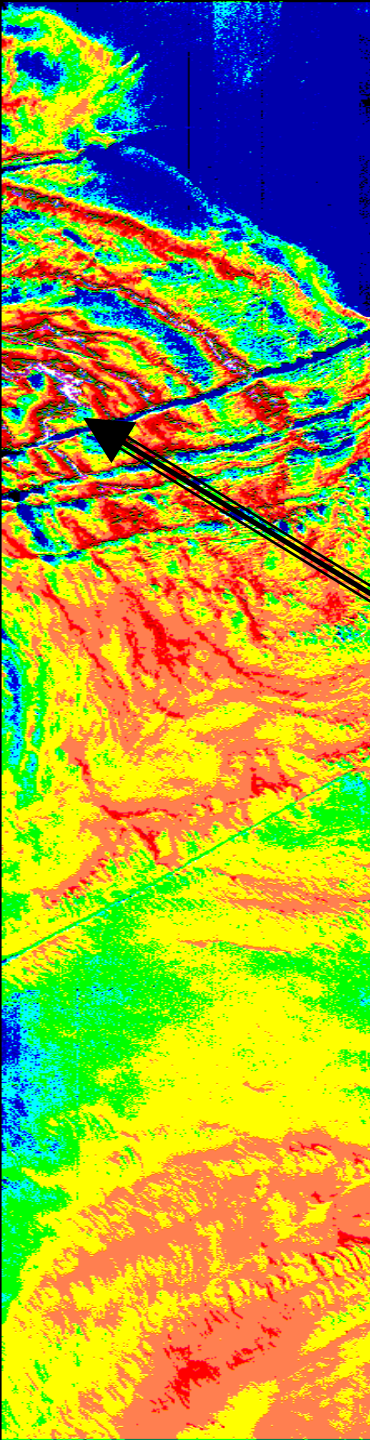
**Vee kvaliteedi
varieeruvus
Väinameres**



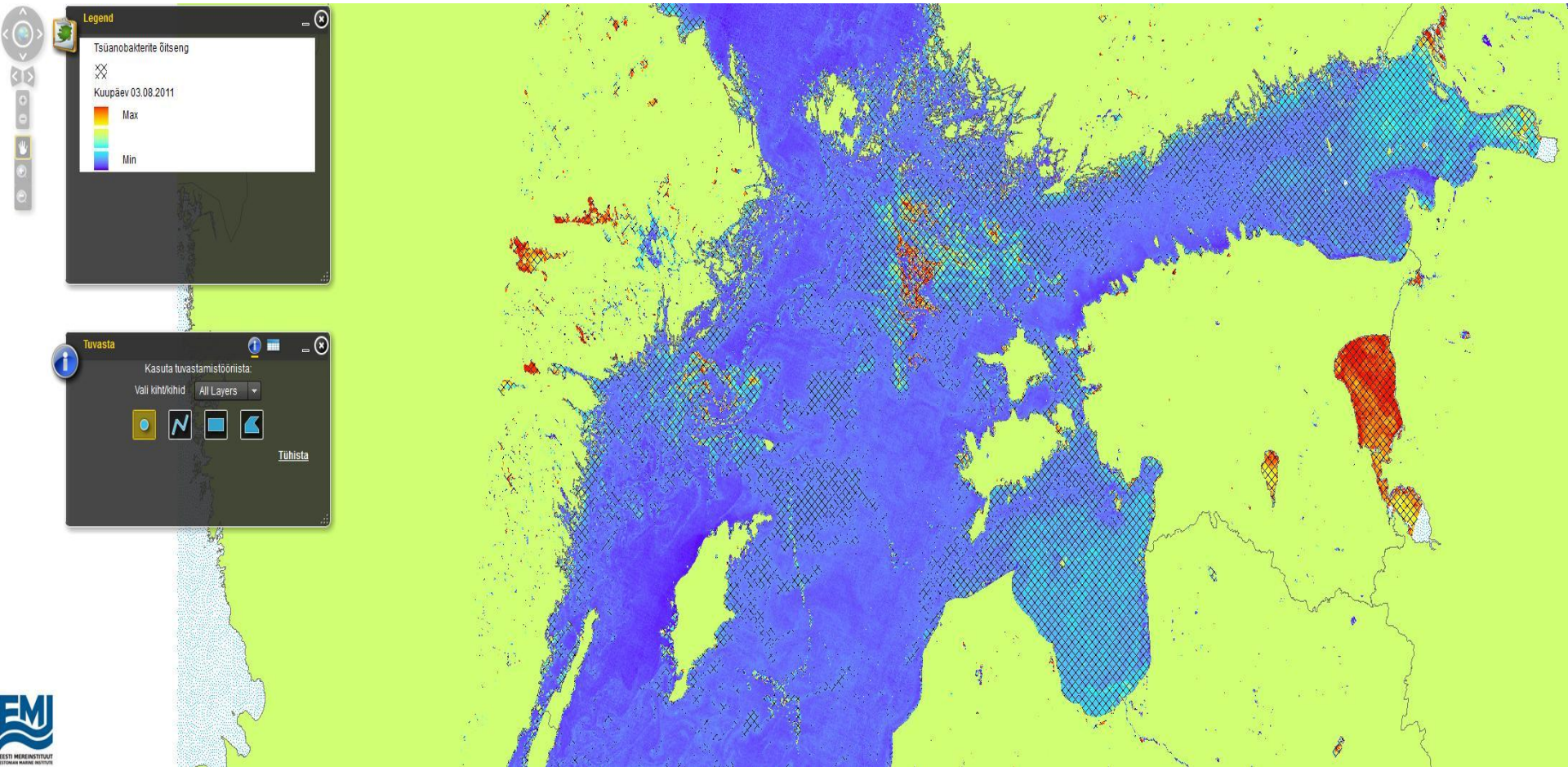
Sinivetikate tuvastamine



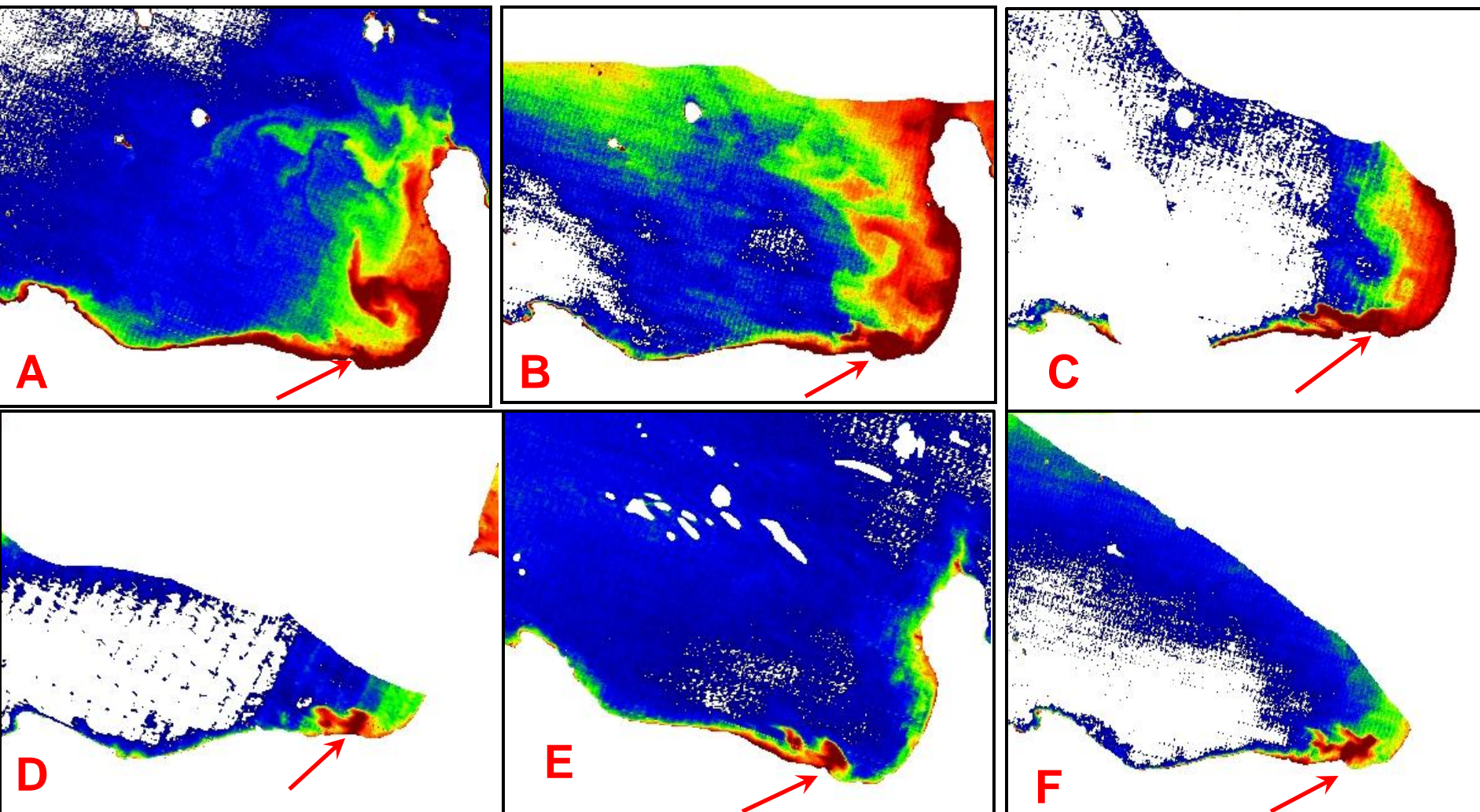
Sinivetikate tuvastamine ja kvantitatiivne seire



Sinikute õitsengu produkt



<http://loch.ness.sea.ee/gisservices/flex3/sinikud/>



Vee hägususe seire

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

Järvede roll globaalses süsinikuringes

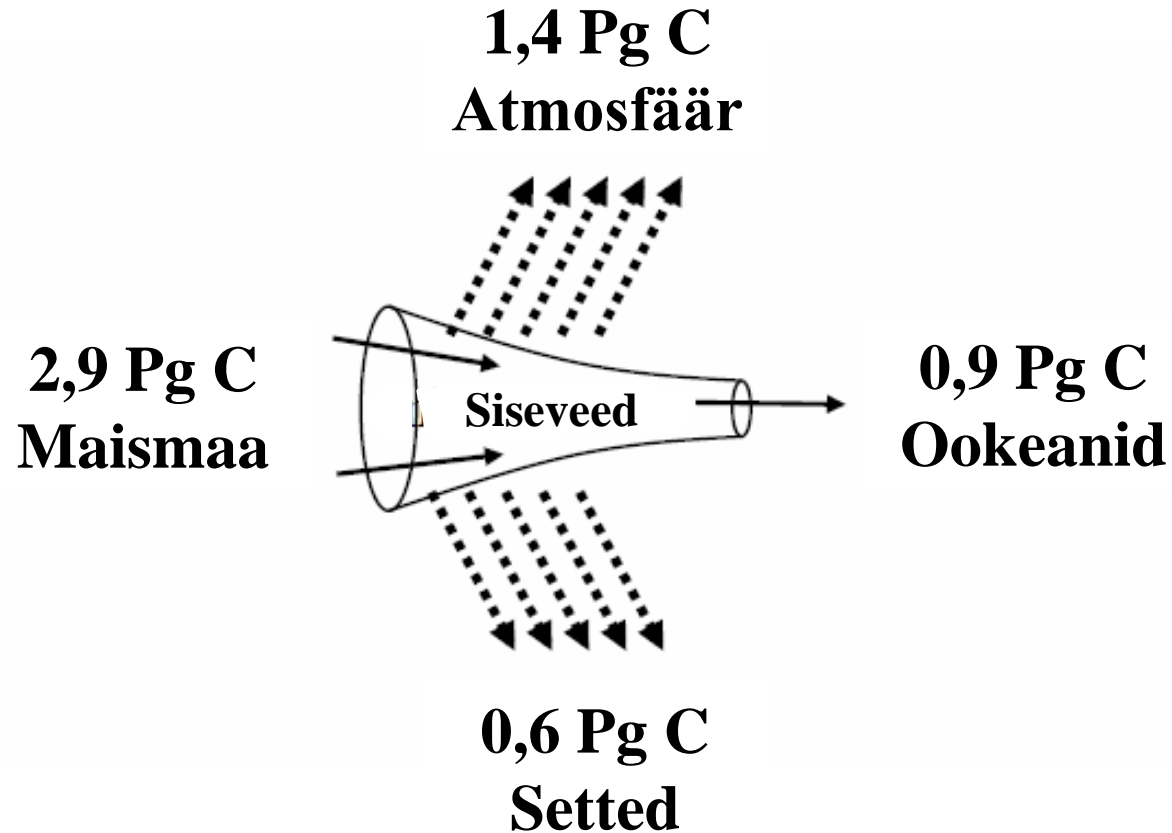
0,9 Pg C
Maismaa



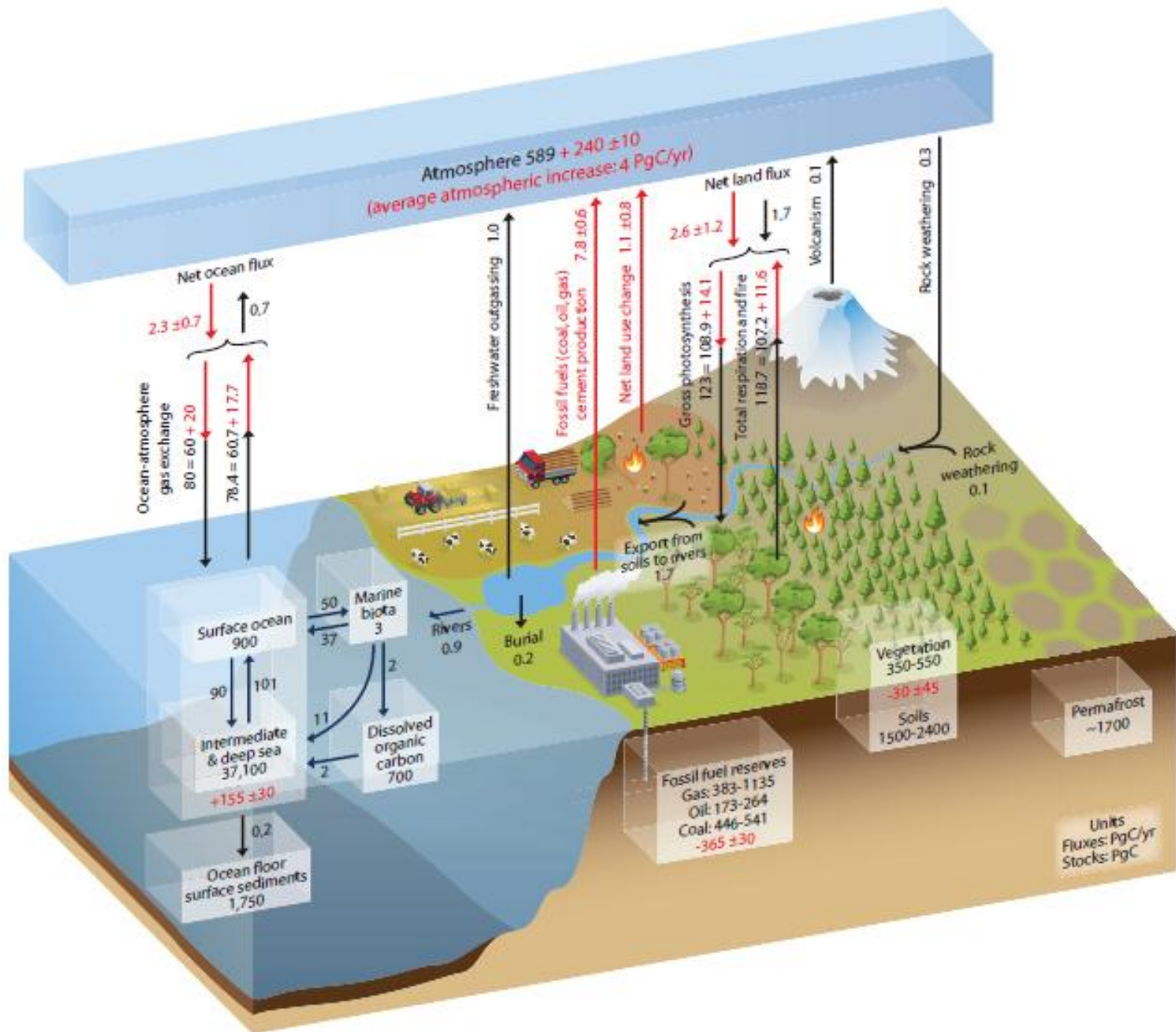
0,9 Pg C
Ookeanid

IPCC mudelid

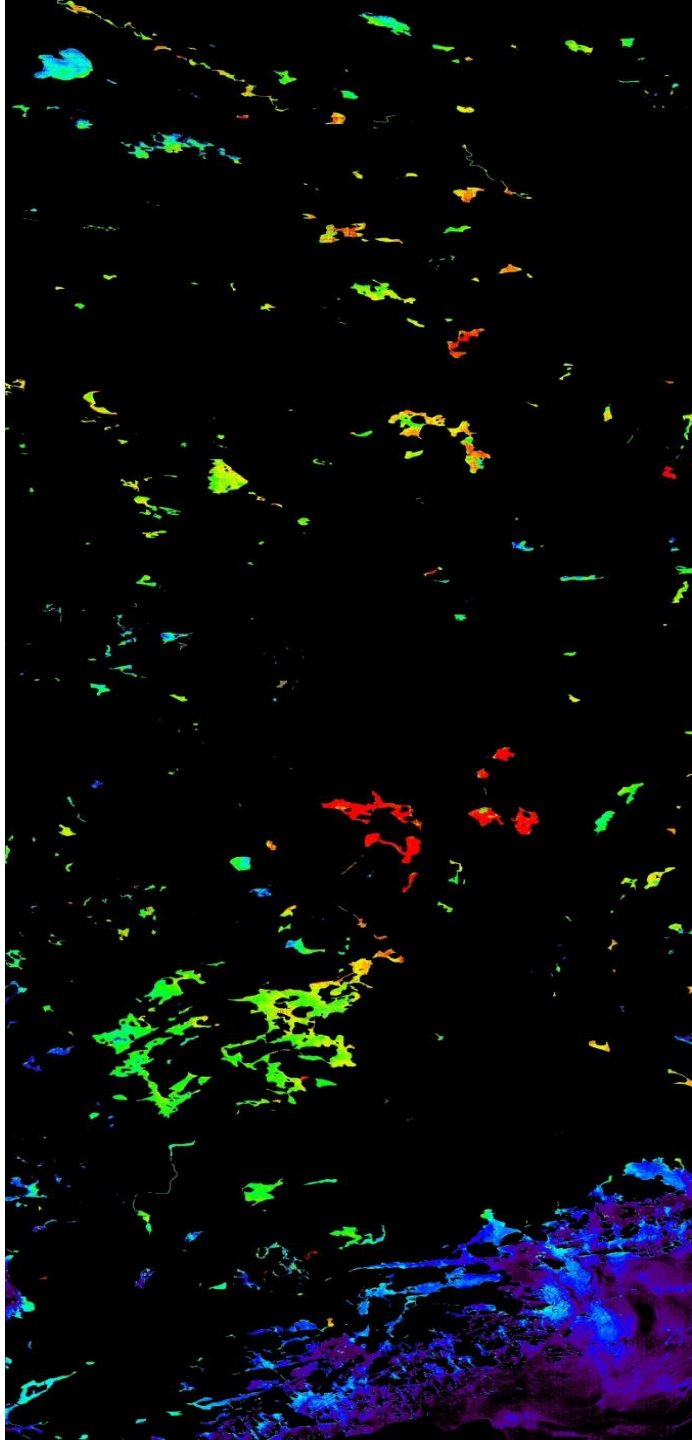
Järvede roll globaalses süsinikuringes



Tranvik et al. L&O 2009



Järvede roll globaalses süsinikuringes

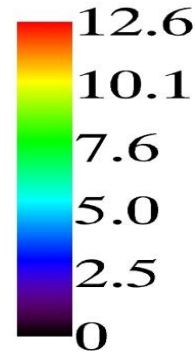


CDOM



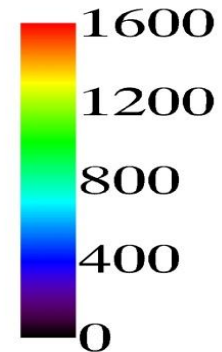
m^{-1}

DOC



ppm

pCO_2



μatm

Landsat 8





Täna tähelepanu eest!