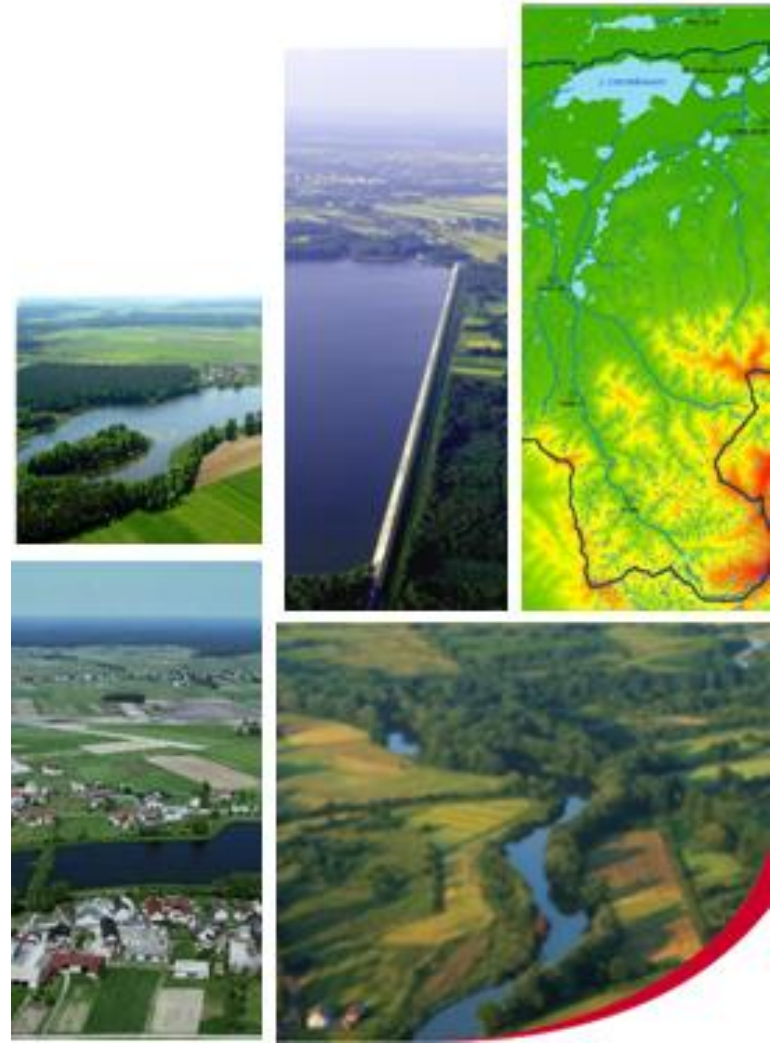
Complex River Basin Information System - CRIS

Hydrodynamics modelling of the Goczalkowice reservoir



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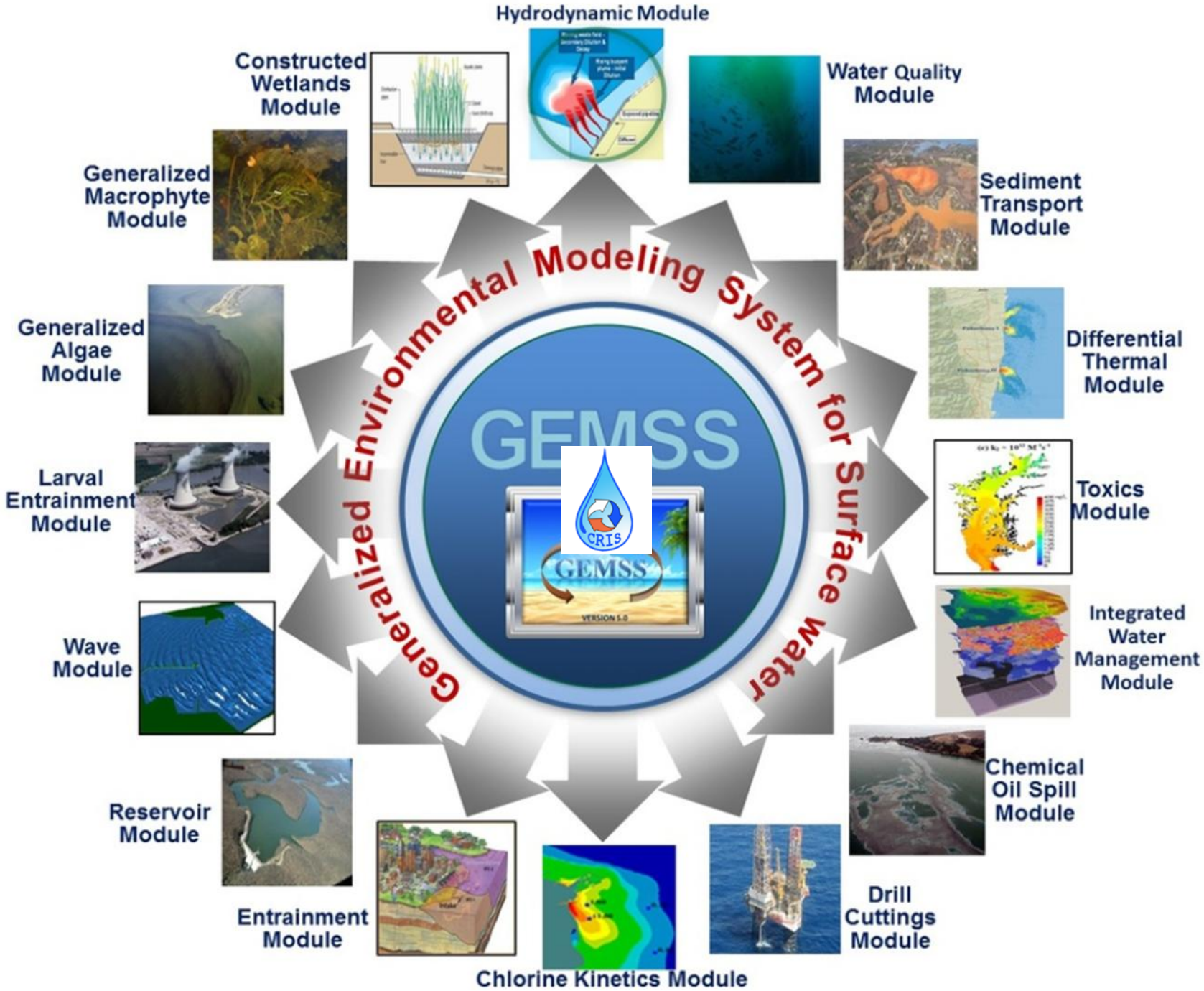
The project *Sustainable water strategy by means of tight-knit approach to water cycle in river catchment* is funded from Norway Grants in the Polish-Norwegian Research Programme operated by the National Centre for Research and Development

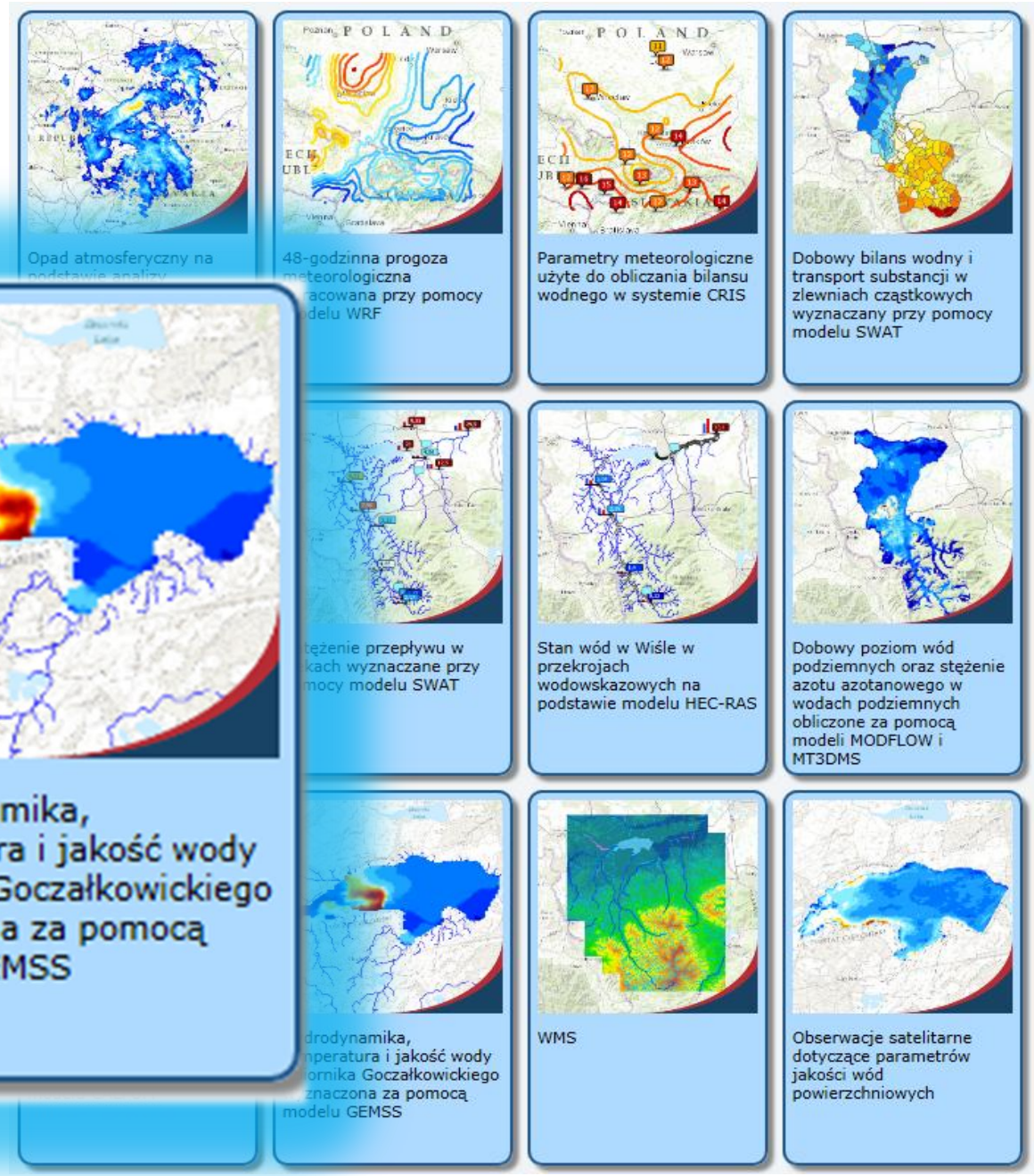
Generalized Environmental Modeling System for Surfacewaters - GEMSS

- Hydrodynamics, 3 dimentional
- Add on modules:
  - Water quality
  - Sediment transport

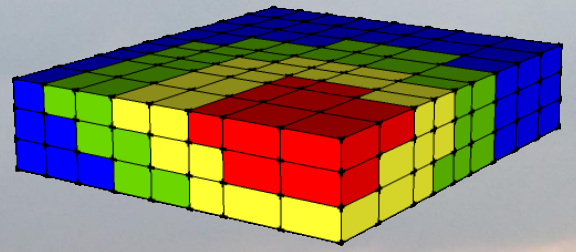
- NB! Toxicity, oil spills, microorganisms

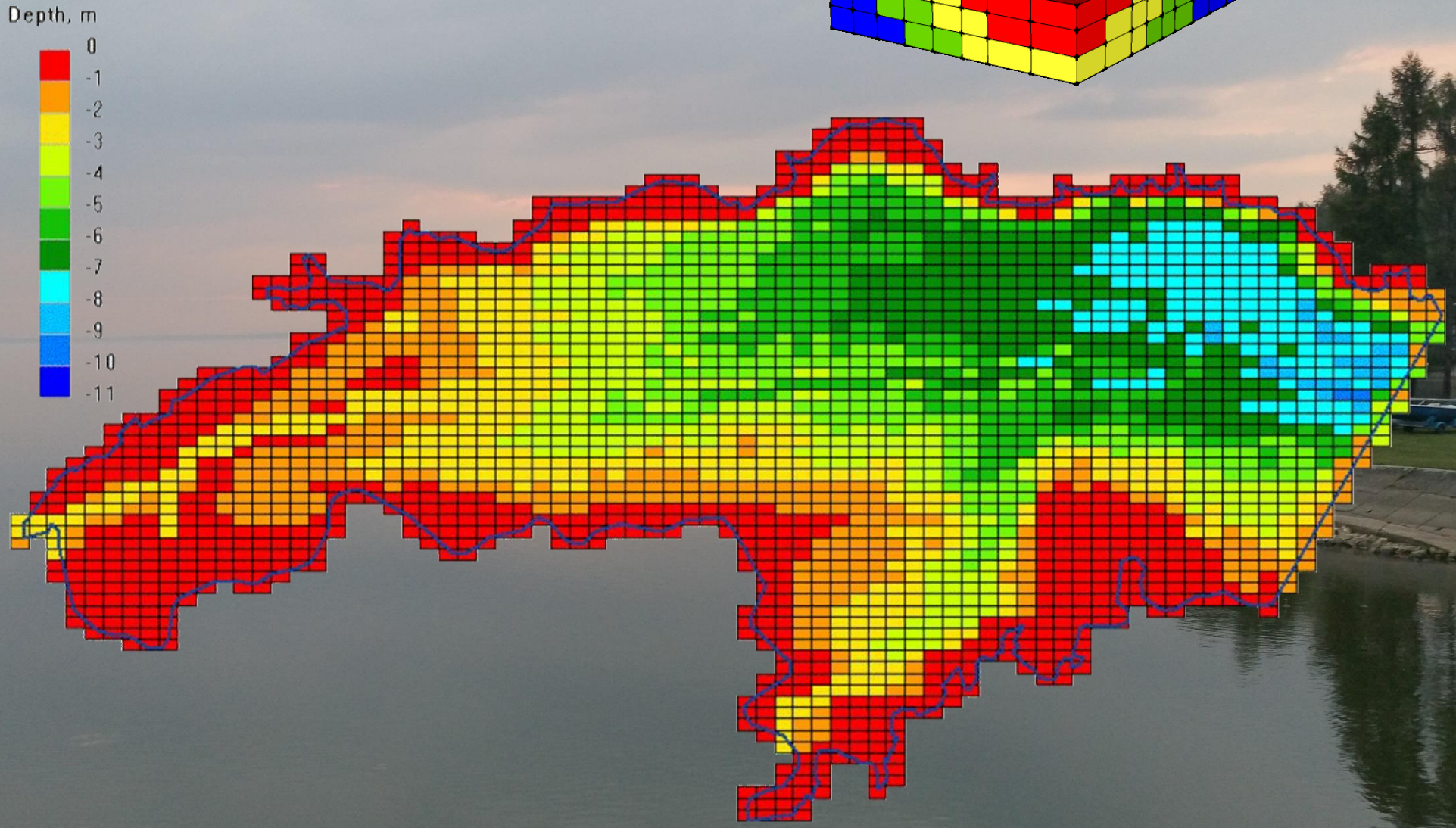

Hydrodynamic Module
Constructed Wetlands Module
Water Quality Module
Generalized Macrophyte Module
Sediment Transport Module
Generalized Algae Module
Differential Thermal Module
Larval Entrainment Module
Toxics Module
Wave Module
Integrated Water Management Module
Chemical Oil Spill Module
Reservoir Module
Drill Cuttings Module
Entrainment Module
Chlorine Kinetics Module
Generalized Environmental Modeling System for Surface Water
GEMSS
CRIS
GEMSS
VERSION 5.0

Lake info


Opad atmosferyczny na
48-godzinna progoza
Parametry meteorologiczne użyte do obliczania bilansu wodnego w systemie CRIS
Dobowy bilans wodny i transport substancji w zlewniach cząstkowych wyznaczany przy pomocy modelu SWAT
Hydrodynamika, temperatura i jakość wody Zbiornika Goczałkowickiego wyznaczona za pomocą modelu GEMSS
Stan wód w Wiśle w przekrojach wodowskazowych na podstawie modelu HEC-RAS
Dobowy poziom wód podziemnych oraz stężenie azotu azotanowego w wodach podziemnych obliczone za pomocą modeli MODFLOW i MT3DMS
WMS
Obserwacje satelitarne dotyczące parametrów jakości wód powierzchniowych

3D

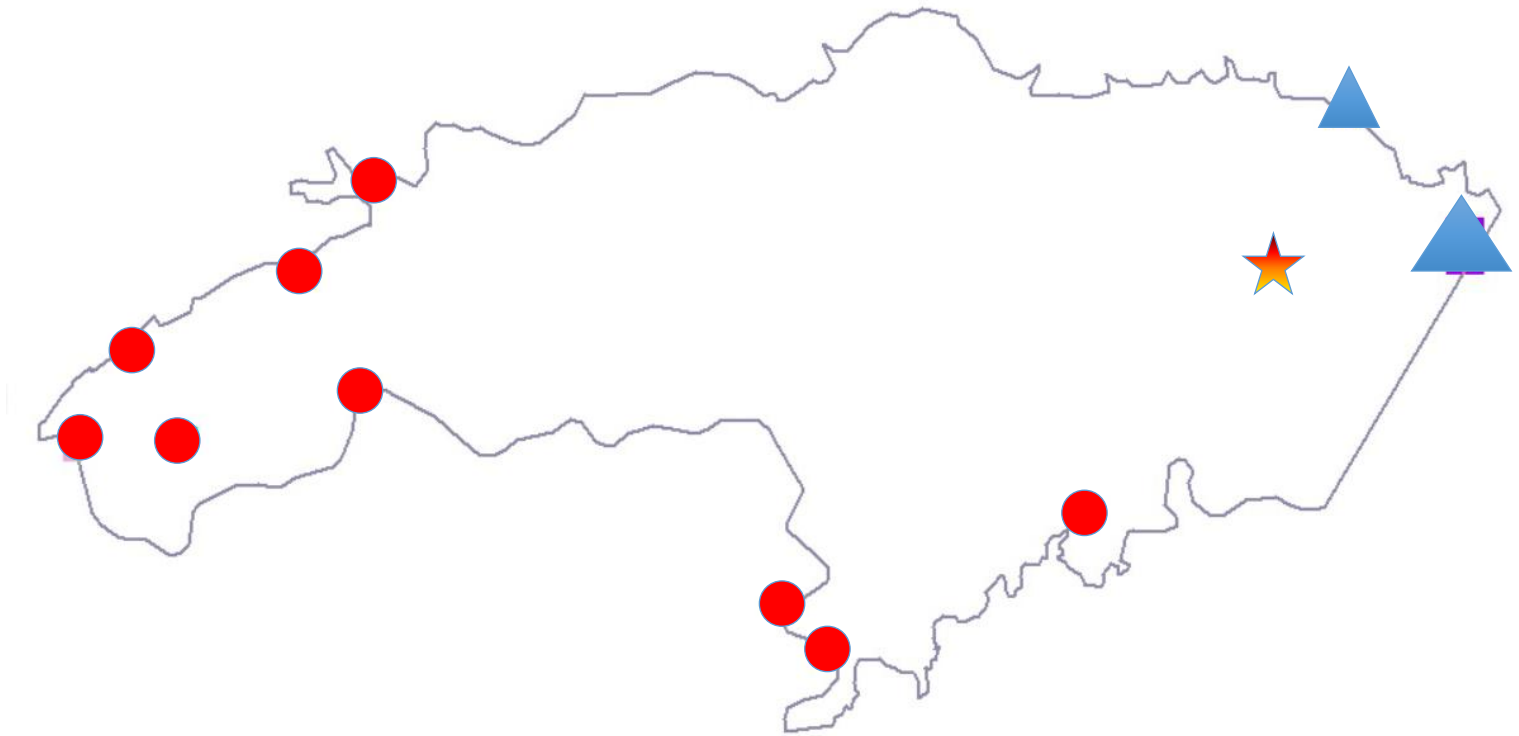




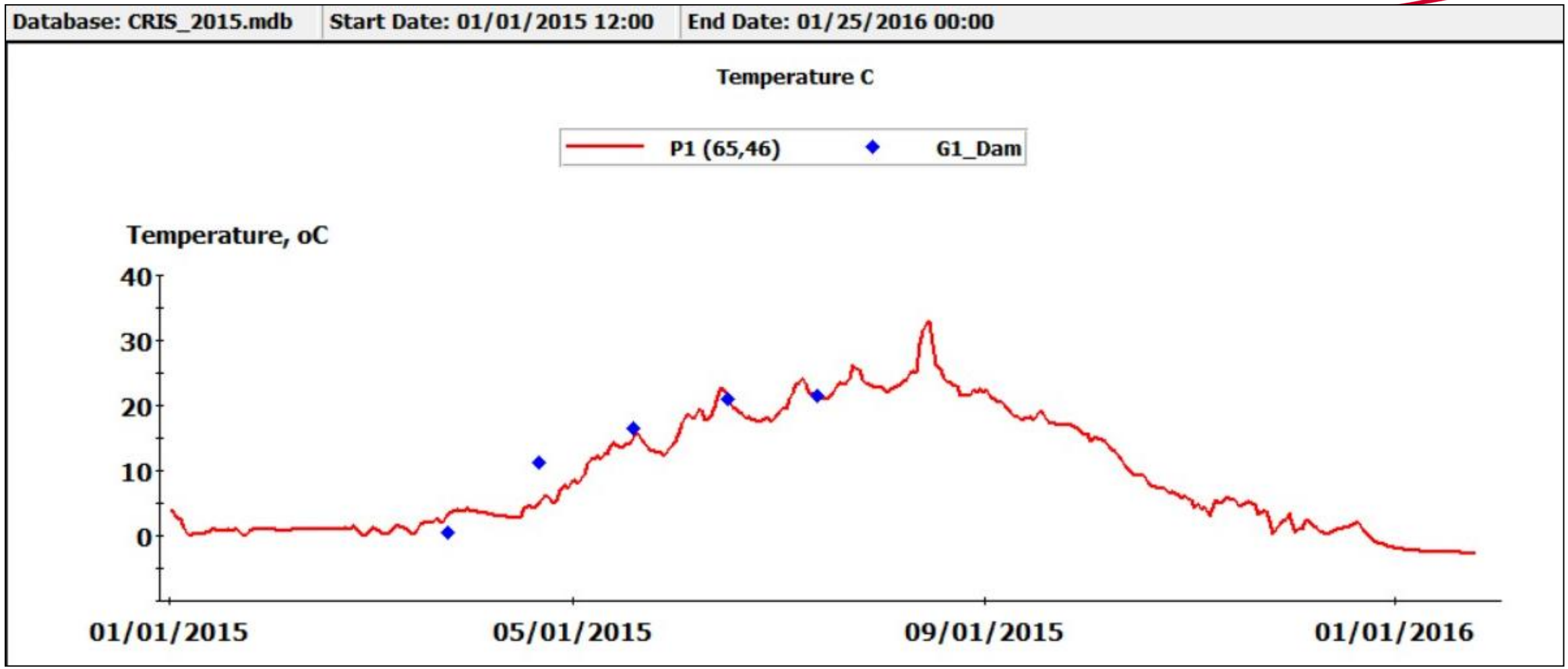
Downstream from SWAT

- Wind, airtemperature, evaporation, precipitation, radiation …
- Waterflow (in and out)
- Nutrients (from agriculture, sewerage, industry…)
- Particles (size fractions)

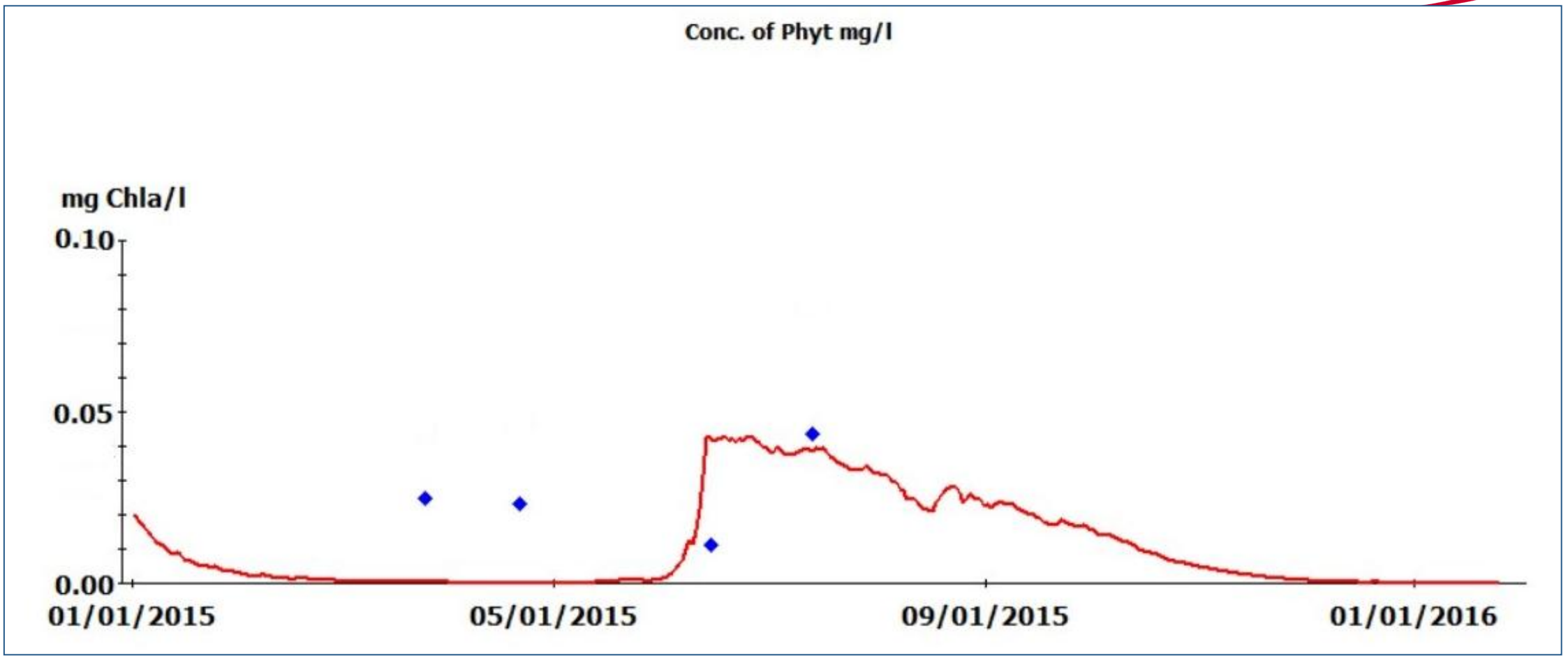
Water, In and Out



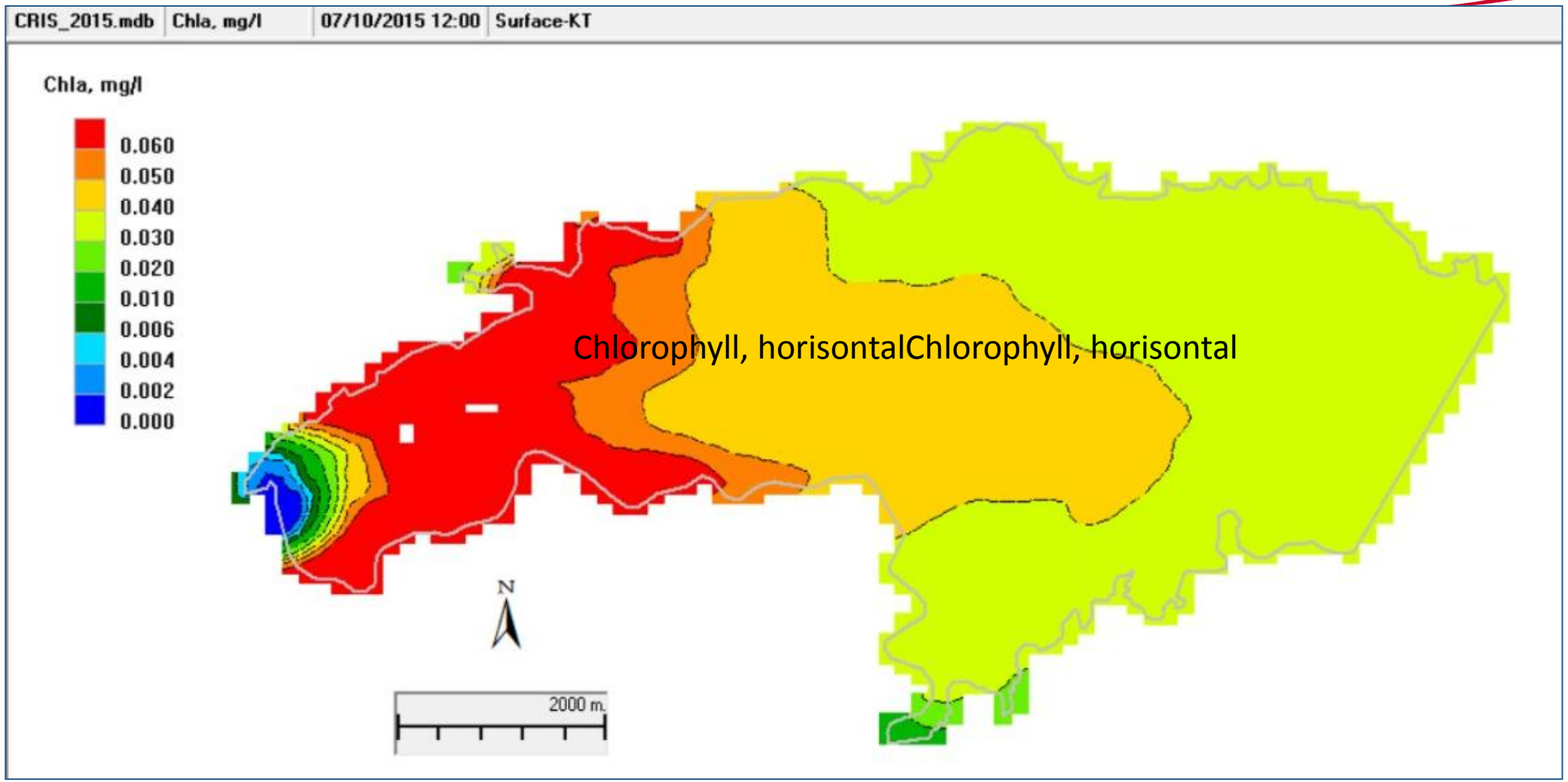
Temperature



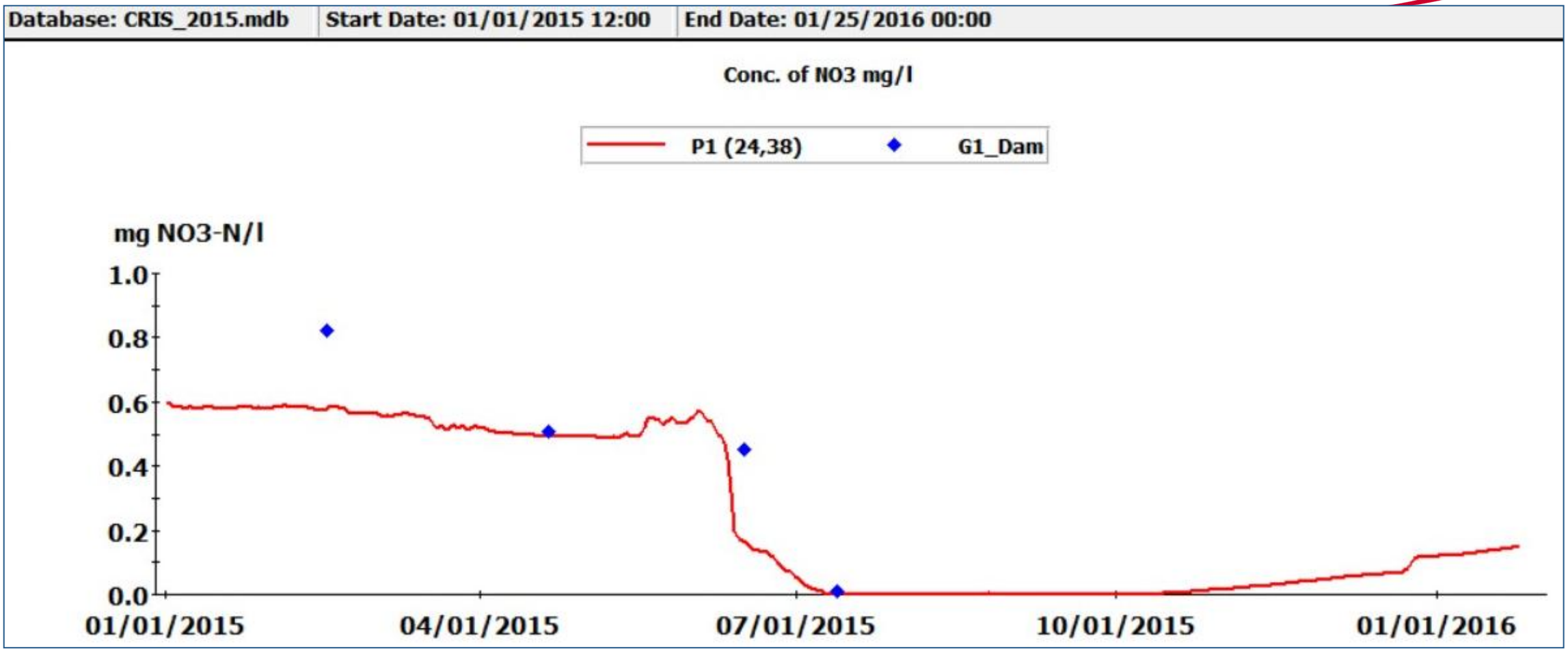
Chlorophyll a



Chlorophyll, horisontal



Nitrogen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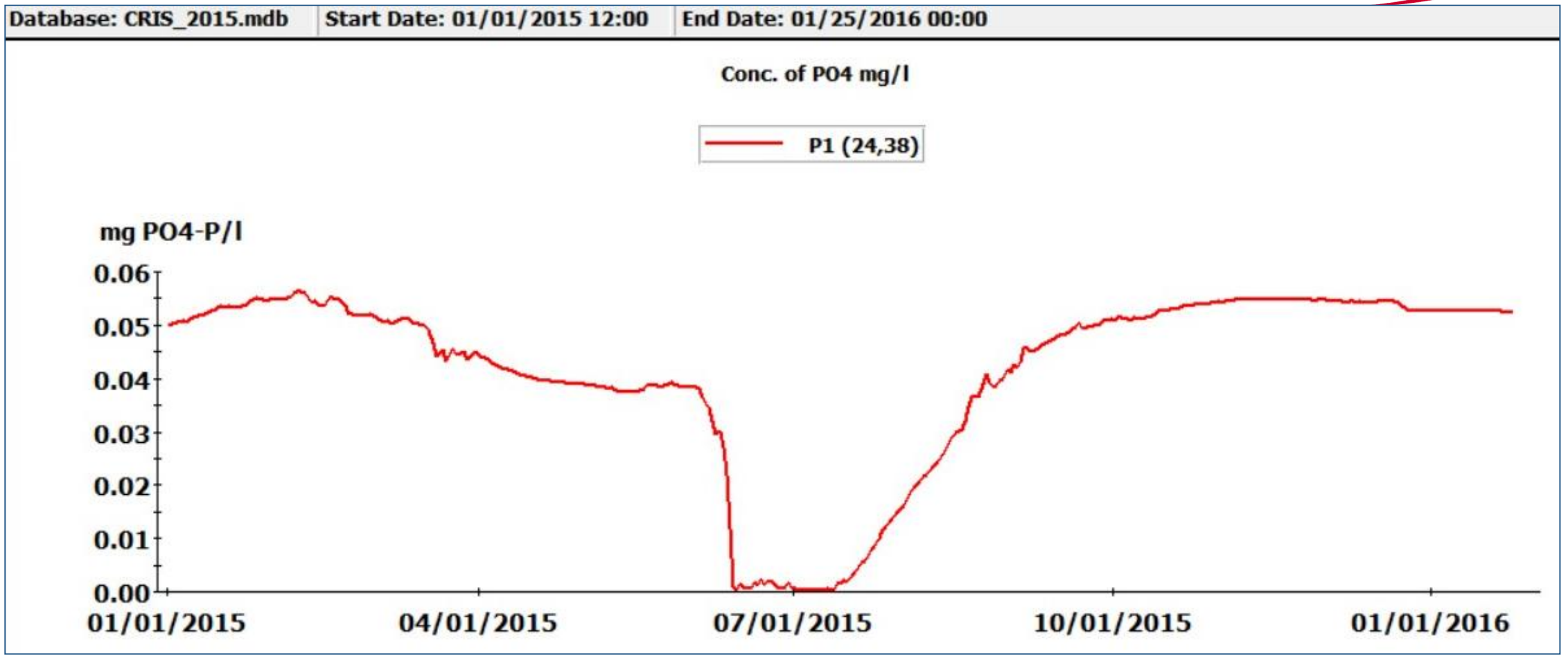
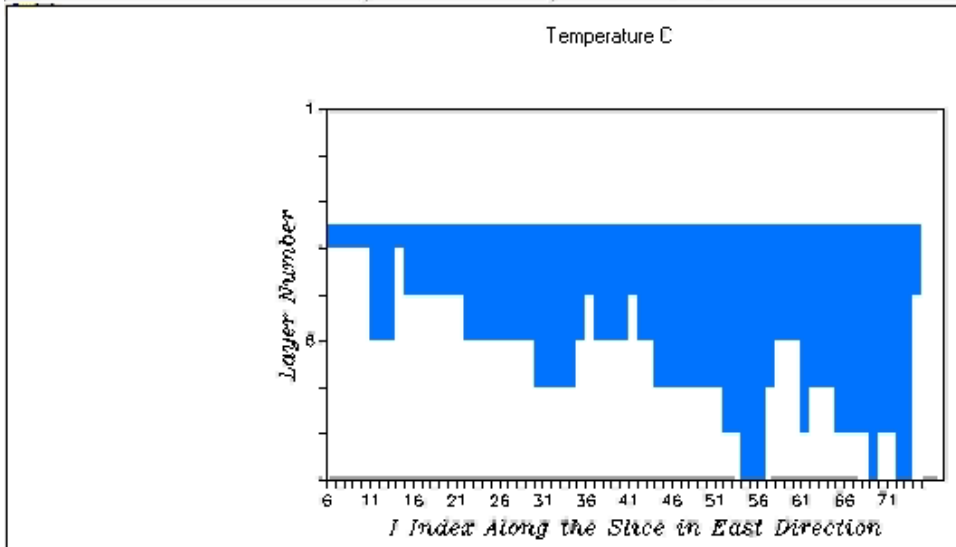
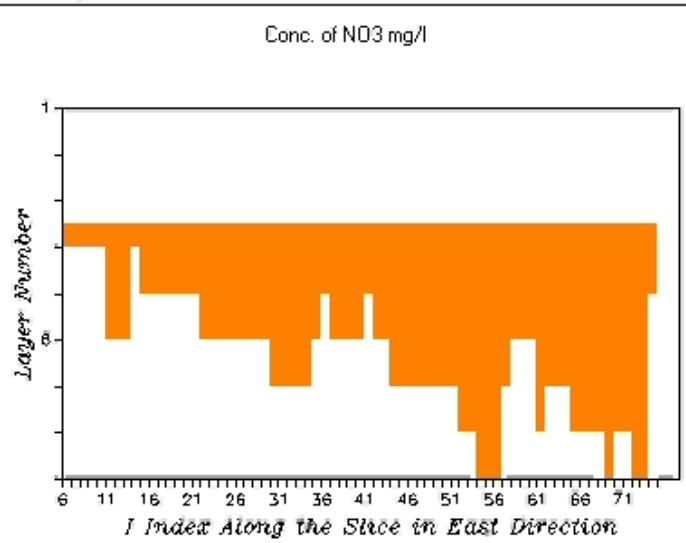
Start Date: 01/01/2015 12:00
End Date: 01/25/2016 00:00
Conc. of NO3 mg/l
P1 (24,38)
G1_Dam
mg NO3-N/l
1.0
0.8
0.6
0.4
0.2
0.0
01/01/2015
04/01/2015
07/01/2015
10/01/2015
01/01/2016

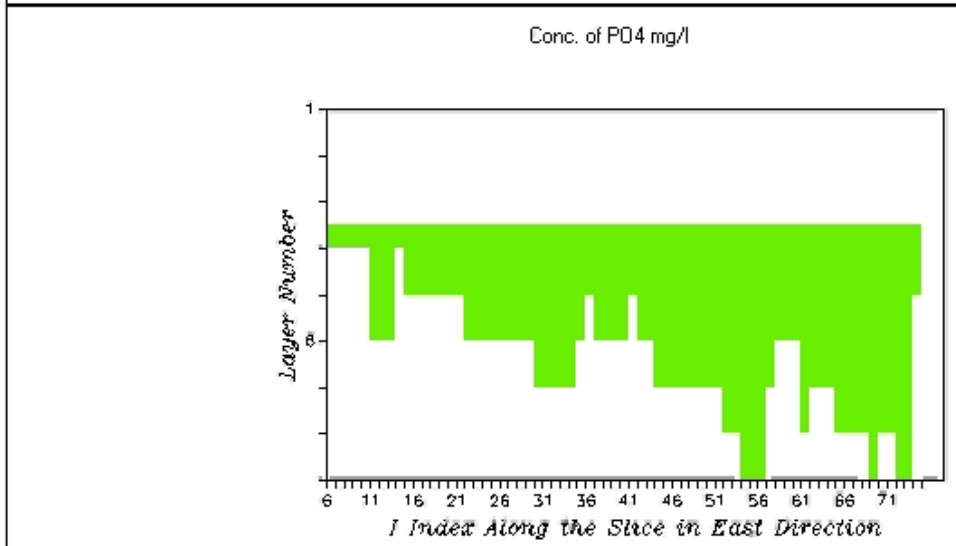
Phosphorus

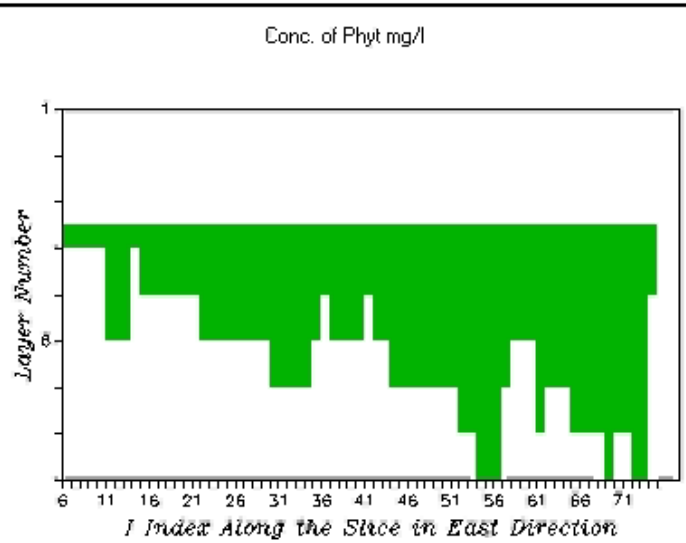

Database: CRIS_2015.mdb
Start Date: 01/01/2015 12:00
End Date: 01/25/2016 00:00
Conc. of PO4 mg/l
P1 (24,38)
mg PO4-P/l
0.06
0.05
0.04
0.03
0.02
0.01
0.00
01/01/2015
04/01/2015
07/01/2015
10/01/2015
01/01/2016

Database: CRIS_2015.mdb | Slice: Slice 2 | Time: 01/01/2015 12:00

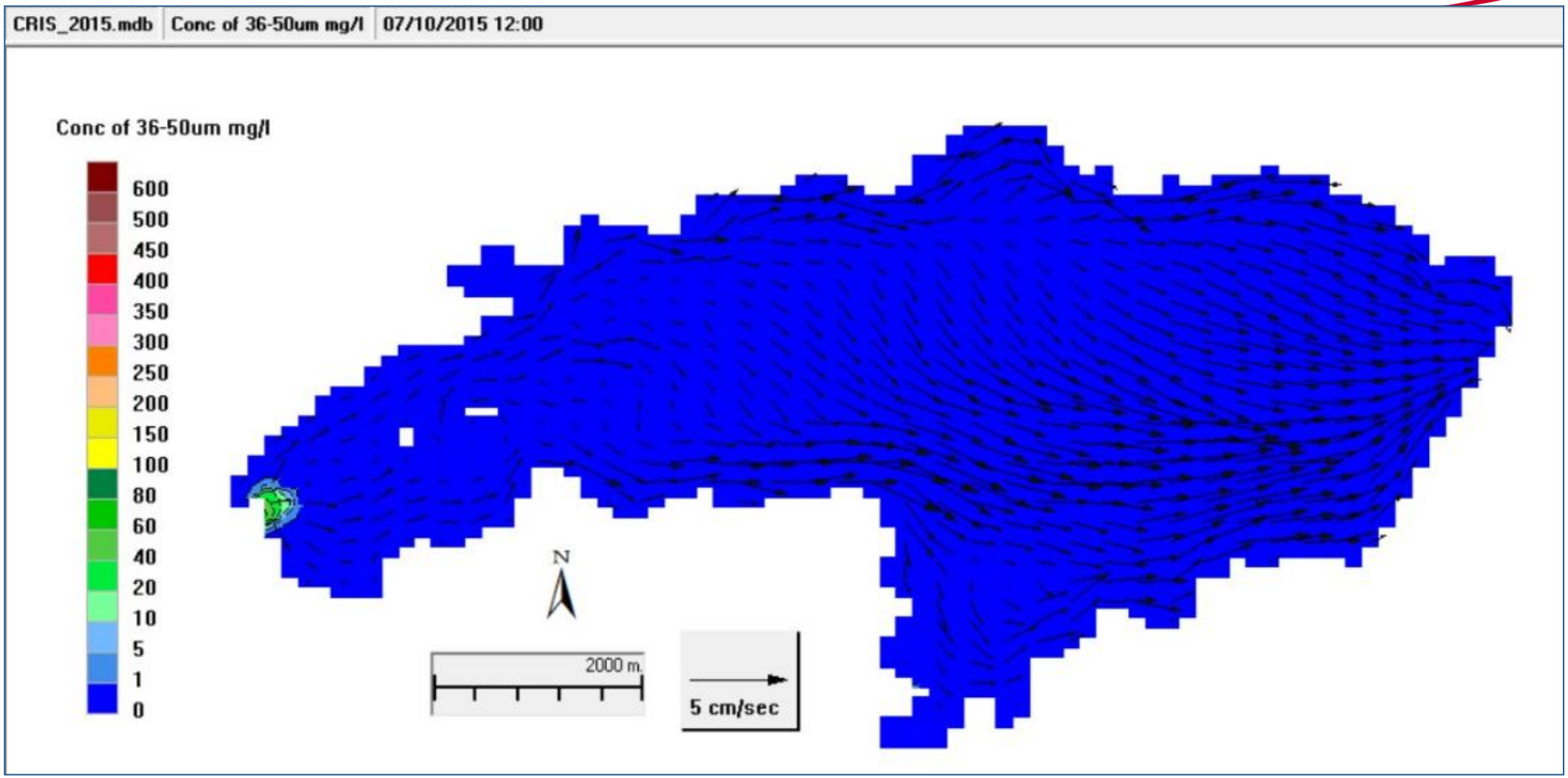




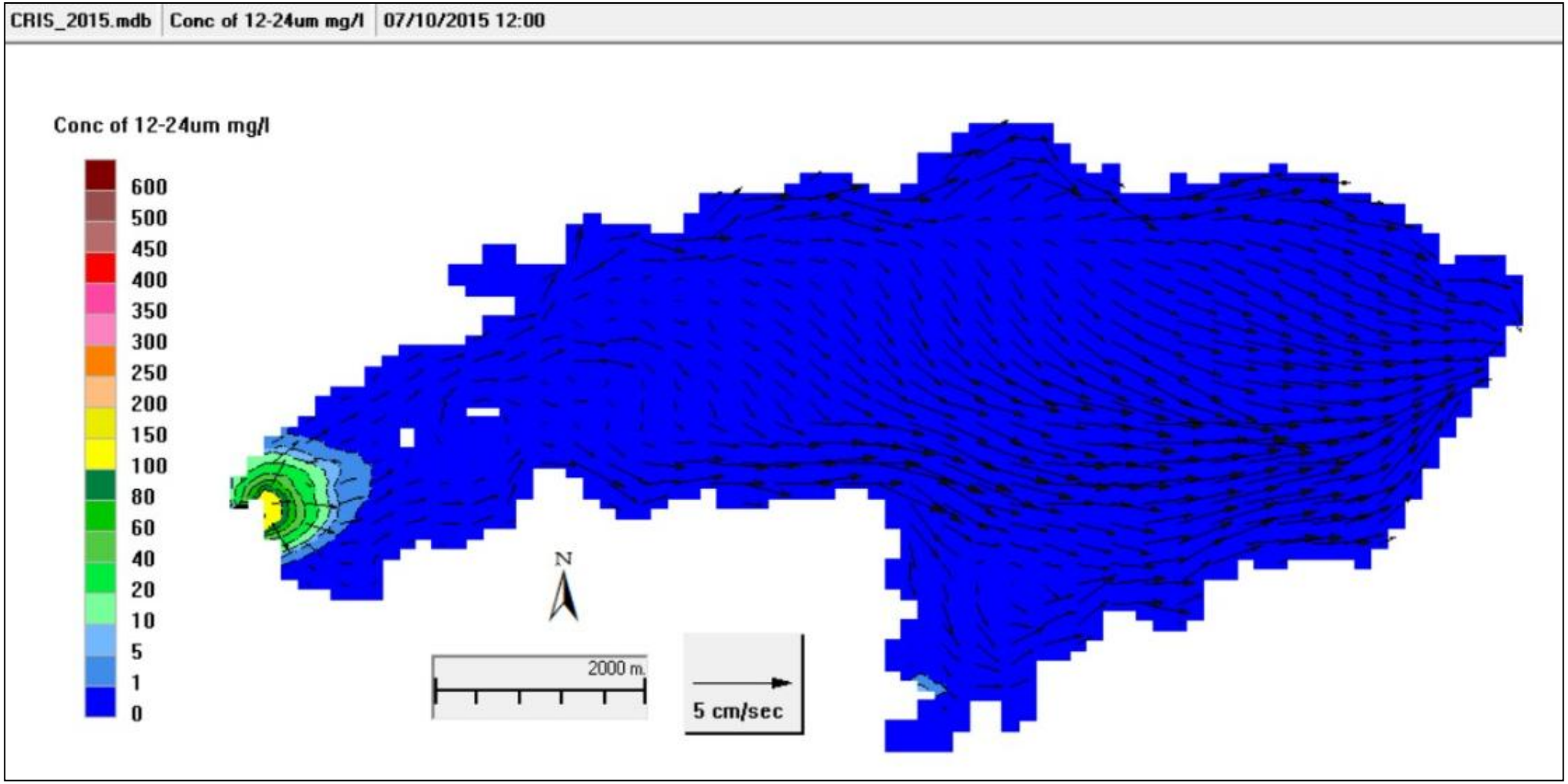




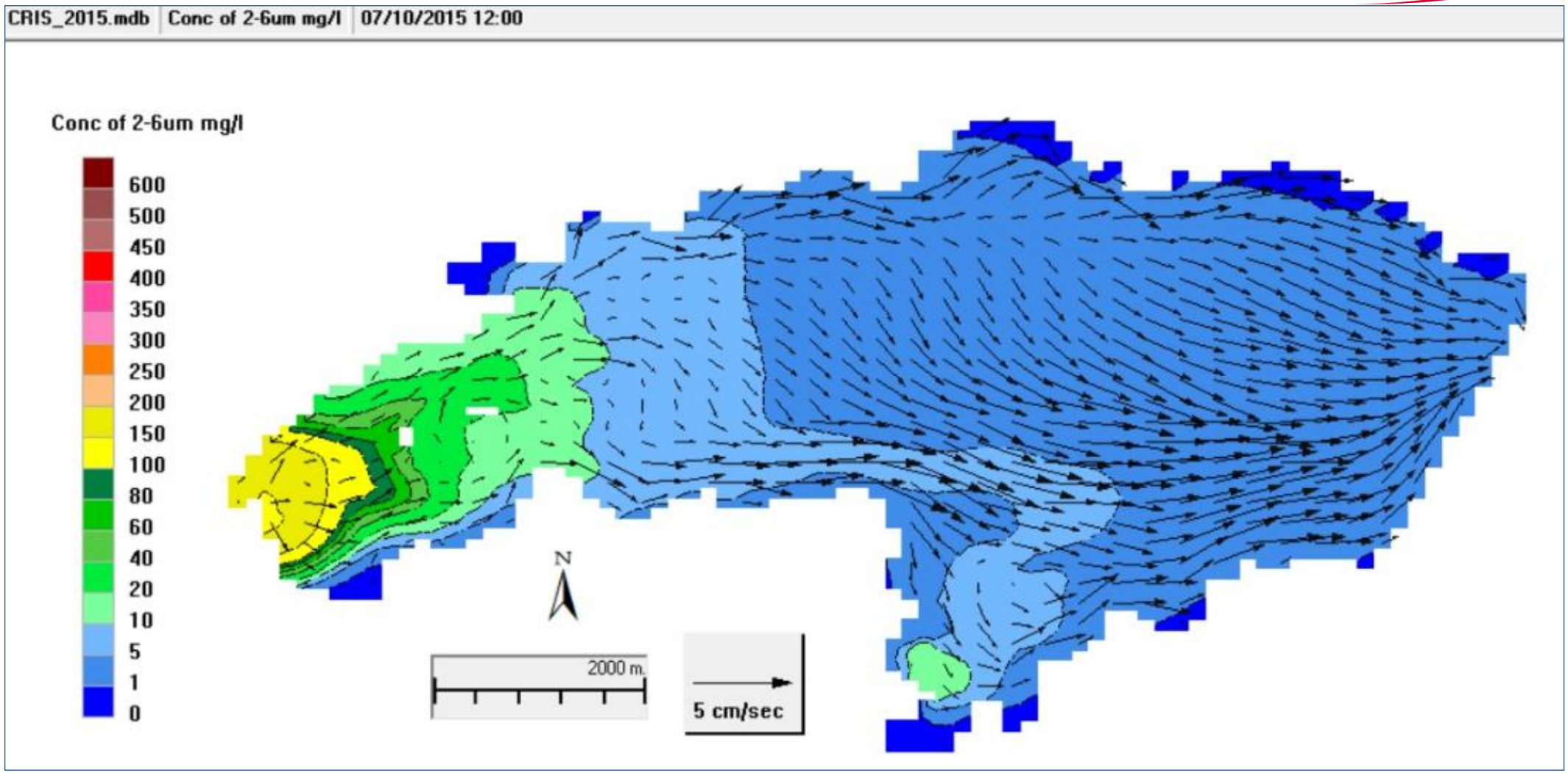
Particles, coarse silt



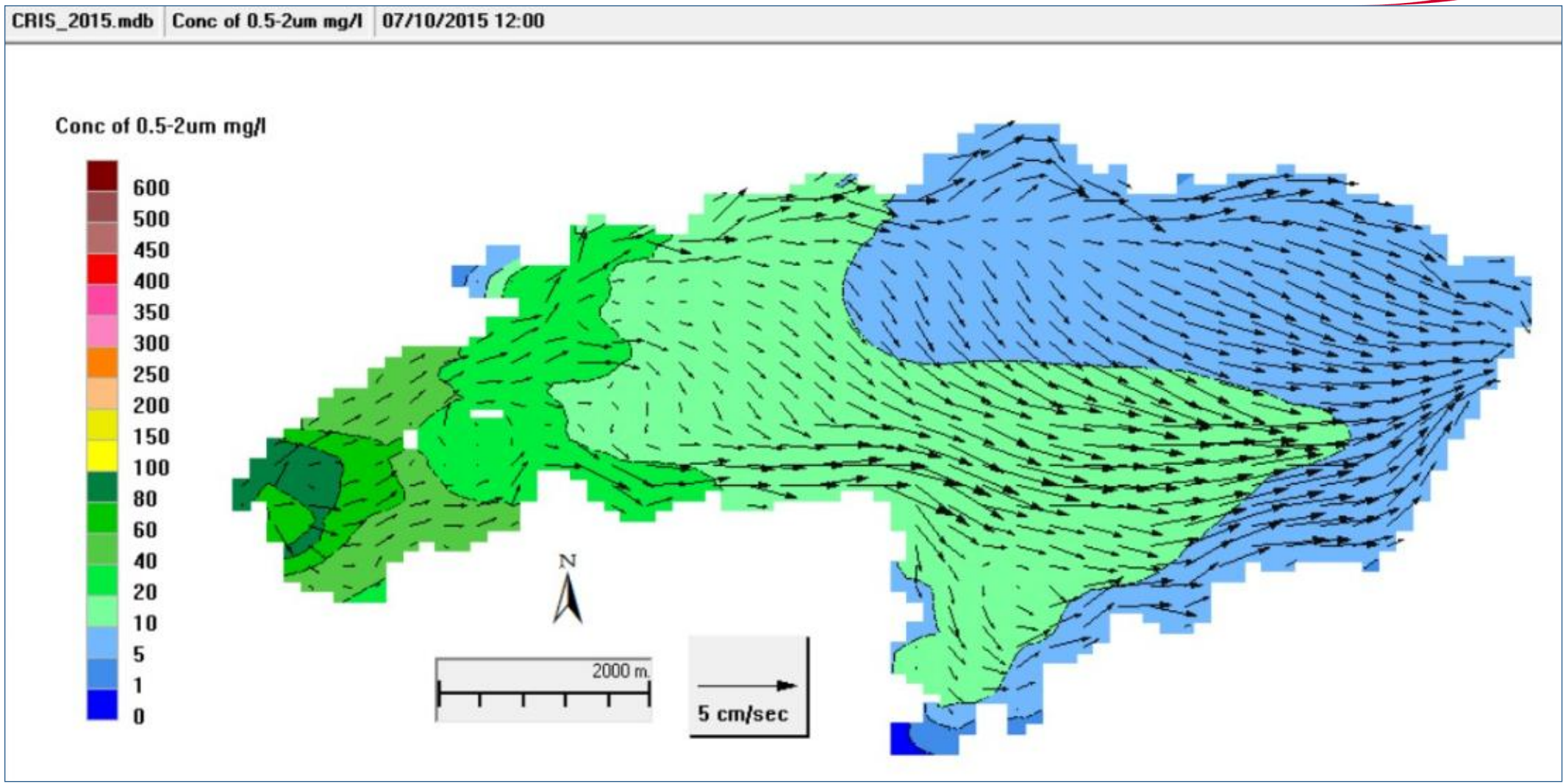
Particles, silt

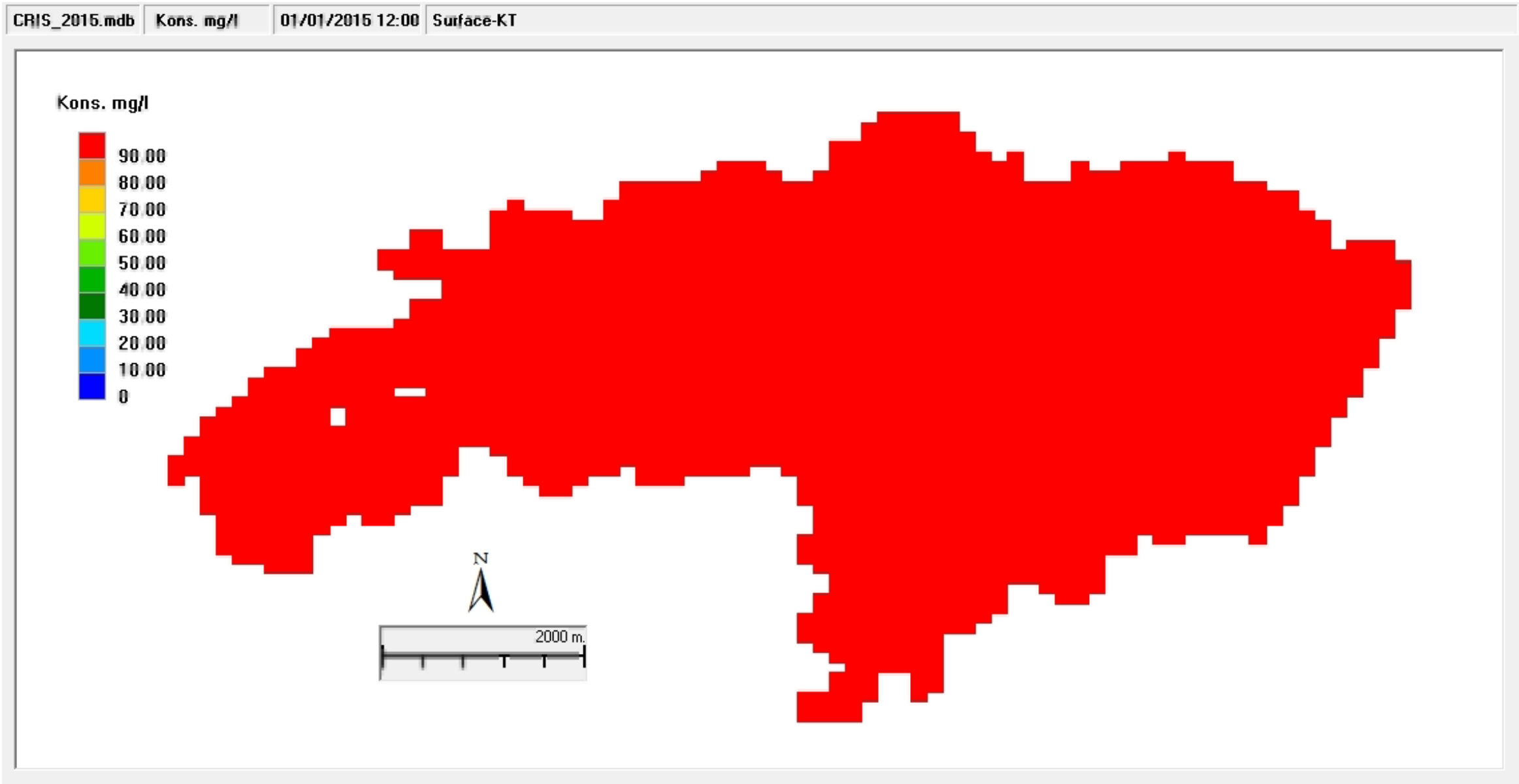


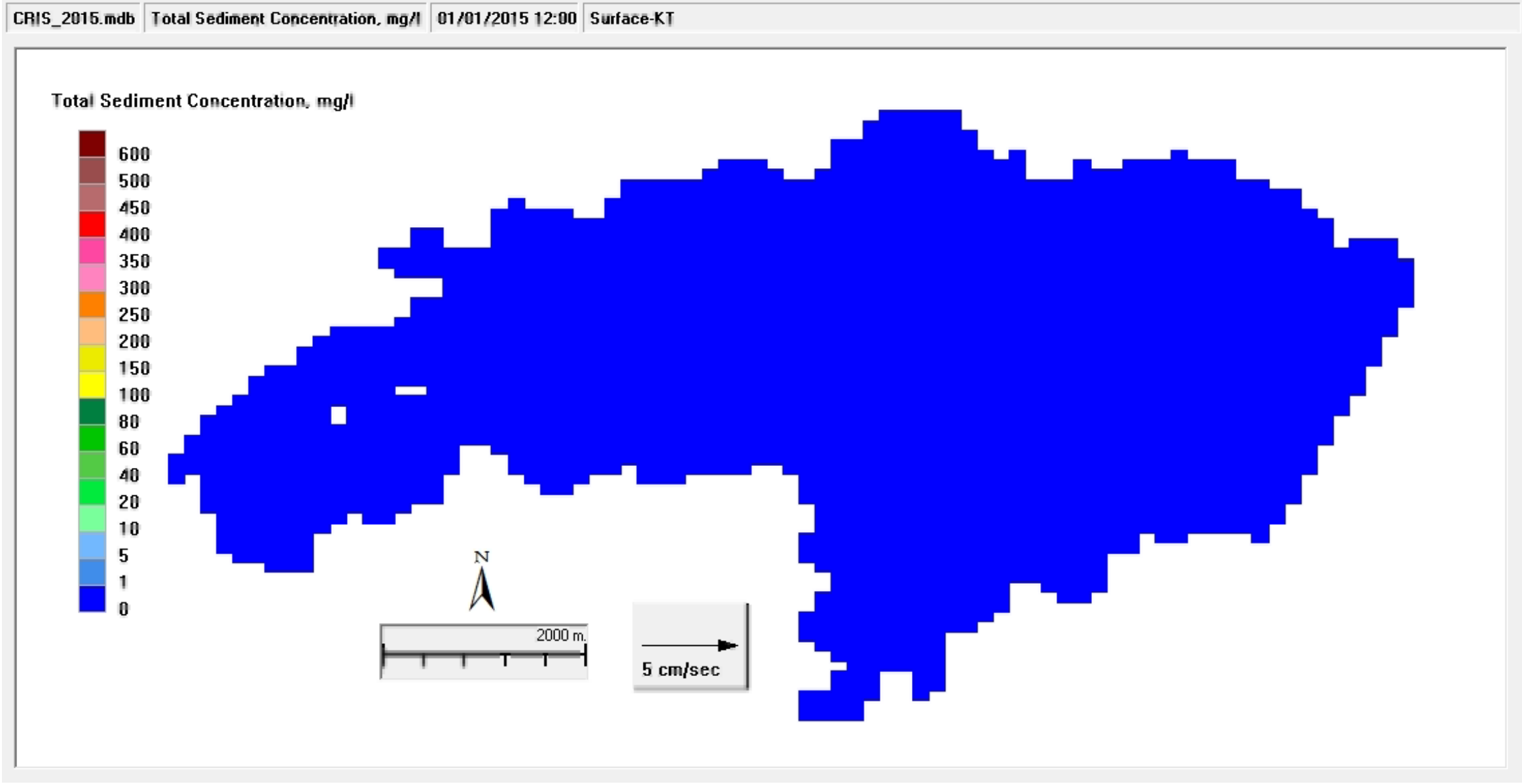
Particles, fine silt



Small particles, clay




CRIS_2015.mdb
Kons. mg/l
01/01/2015 12:00
Surface-KT
Kons. mg/l
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0
N
2000 m.


CRIS_2015.mdb
Total Sediment Concentration, mg/l
01/01/2015 12:00
Surface-KT
Total Sediment Concentration, mg/l
600
500
450
400
350
300
250
200
150
100
80
60
40
20
10
5
1
0
N
2000 m.
5 cm/sec

Utilize the CRIS system?

- Eutrophication abatement planning
  - Ecological status
  - Toxic cyanobacteria
- Risk and Vulnerability Assessment(ROS)
- Accidents
- Climate change - flood episodes, extreme water quality,…
- Further ecological studies

Complex River Basin Information System - CRIS

Thank you for your attention

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