Lake Kinneret

- Latitude: 32°N\Longitude: 35°E
- Altitude: -210 m
- Length: 21 km
- Width: 12 km
- Mean depth: 20 m
- Max depth: 42 m
- Area: 170 km^2
- Volume: 4300 x 10^6 m^3
- Jordan R annual inflow: 310 x 10^6 m^3
- Watershed area: 2730 km

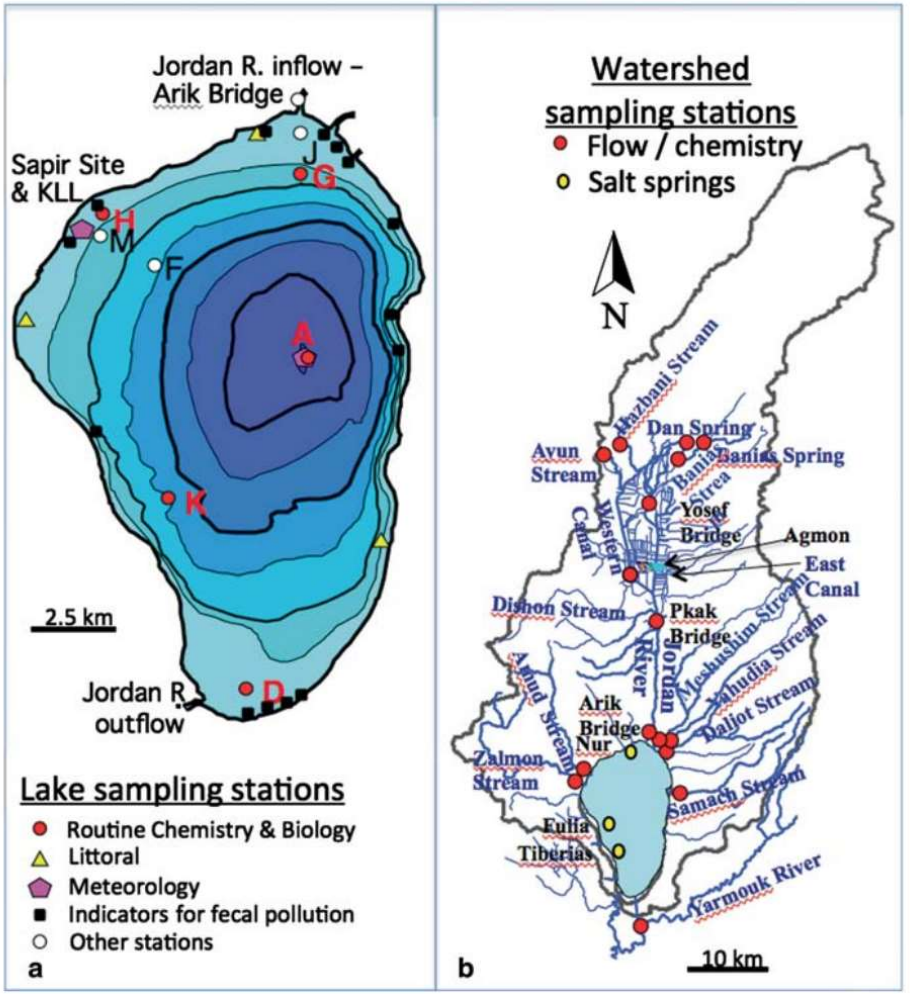
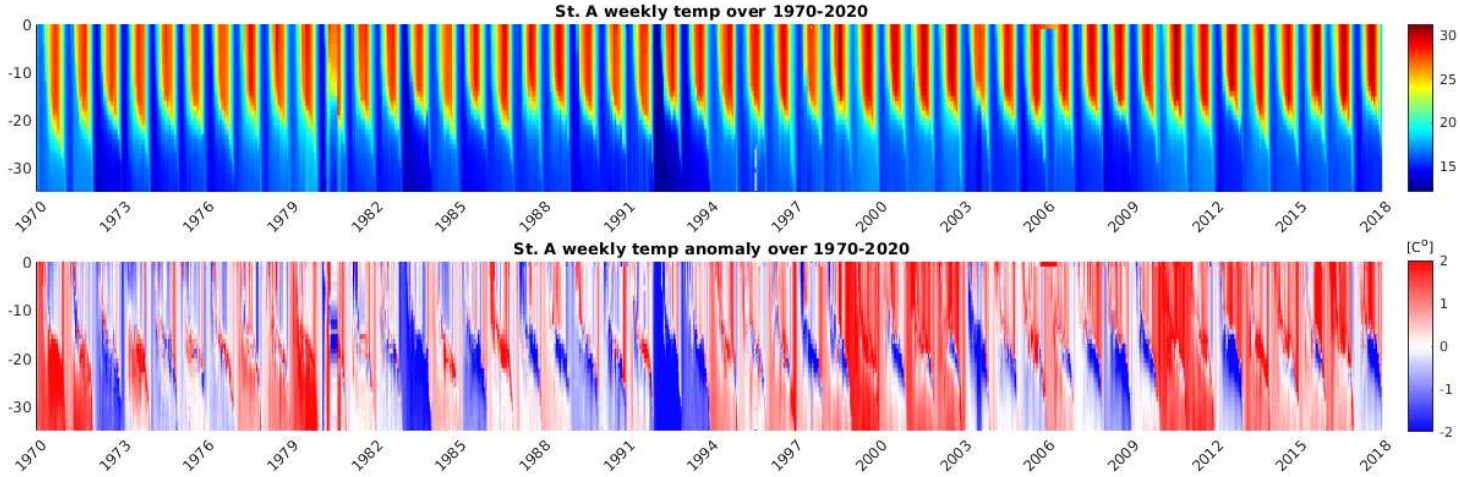


Fig. 32.1 Location maps of monitoring stations in Lake Kinneret and its watershed. **a** Lake Kinneret (symbol legend *below* map). **b** Watershed (symbol legend *above* map). Additional explanations: *KLL*—Kinneret Limnological Laboratory. *Other stations*—stations *F*, *M* are used for sedimentation flux measurements, *J* for occasional biological measurements, and *Arik* for pesticides. *Littoral stations*—shallow water stations for occasional biology and chemistry measurements

Observations

Source	Data type	Spatial resolution	Time resolution	Time span
IMS (Israel Meteorological Service)	Air temperature and precipitation	IMS stations	Daily	1950-2024
KLL	Lake Kinneret Temperature, Salinity, Chl, Nutrients, Fluorescence, phytoplankton counts	5 Lake monitoring stations	Weekly	1970-2024
Mekorot & IWA (Israel Water Authority)	Streams temperature, conductivity and chemistry.	Rivers inlets	Weekly	1970-2024
IWA	Stream discharge and Lake level	Rivers inlets	Daily	1970-2024

Monitoring Lake Kinneret for the last 50 years



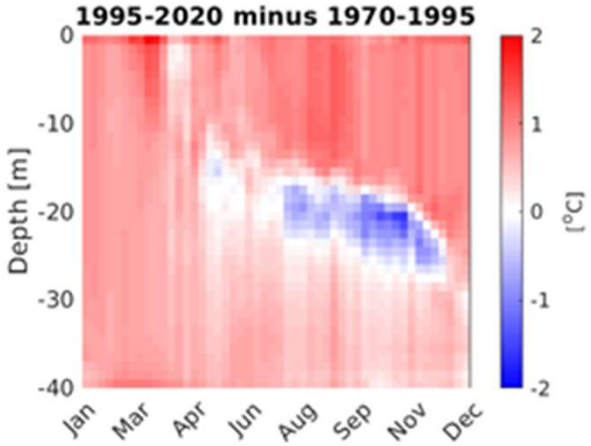
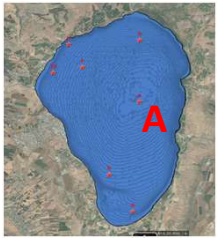
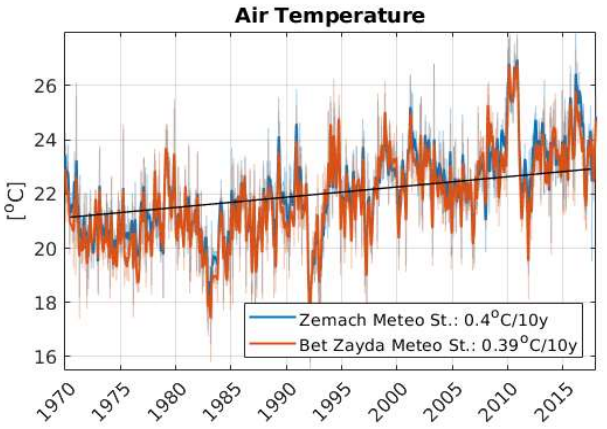
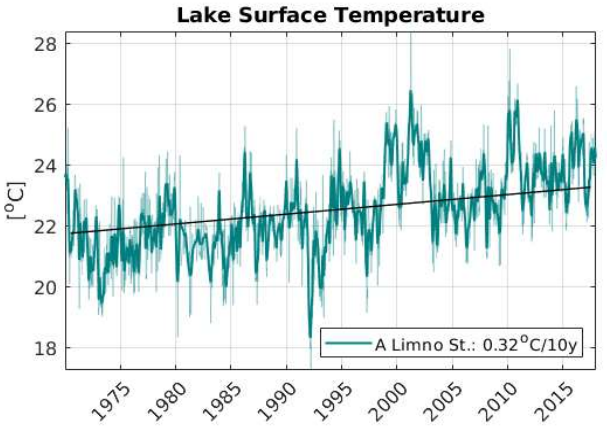


Fig. 2 Temperature anomaly over a year calculated by subtracting 1970-1995 average from 1995-2020 average.

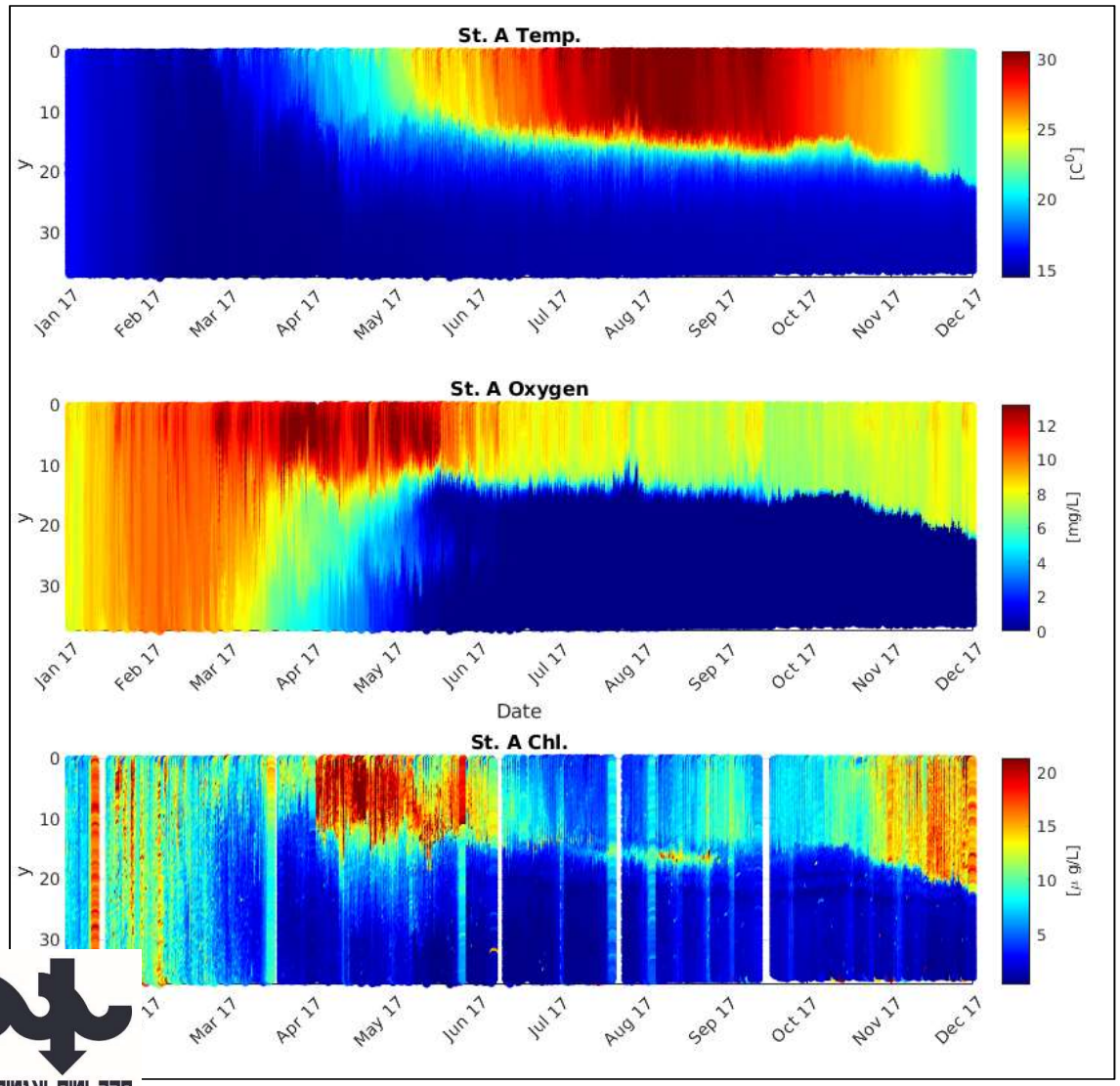
- Weekly profiles of T, EC, Chl, Oxygen and more
- Anomalies show a warmer and more stratified water column





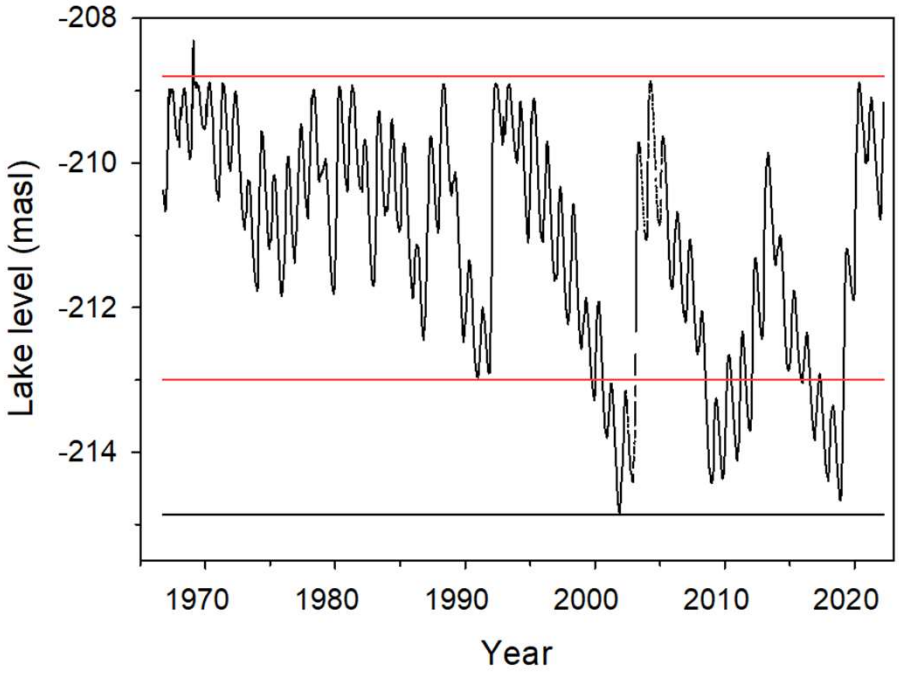


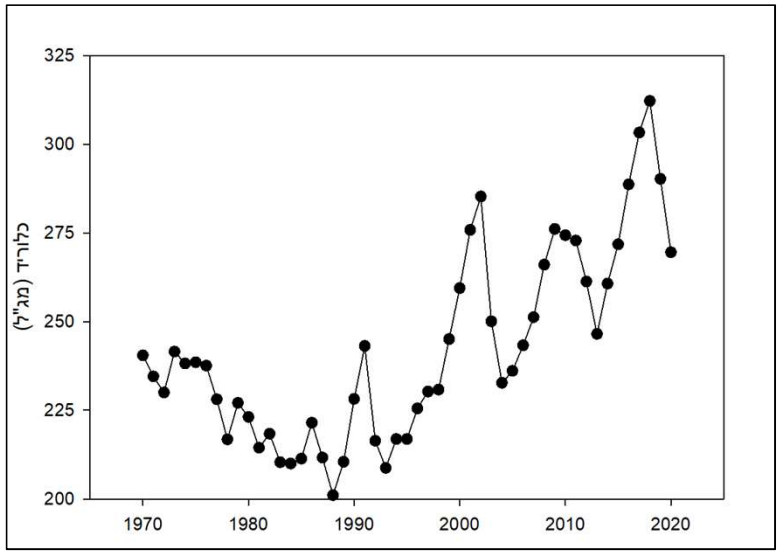
Stratification and the ecological system



חקר ימים ואגמים לישראל
Israel Oceanographic & Limnological Research

Lake level





Continued decline in lake level

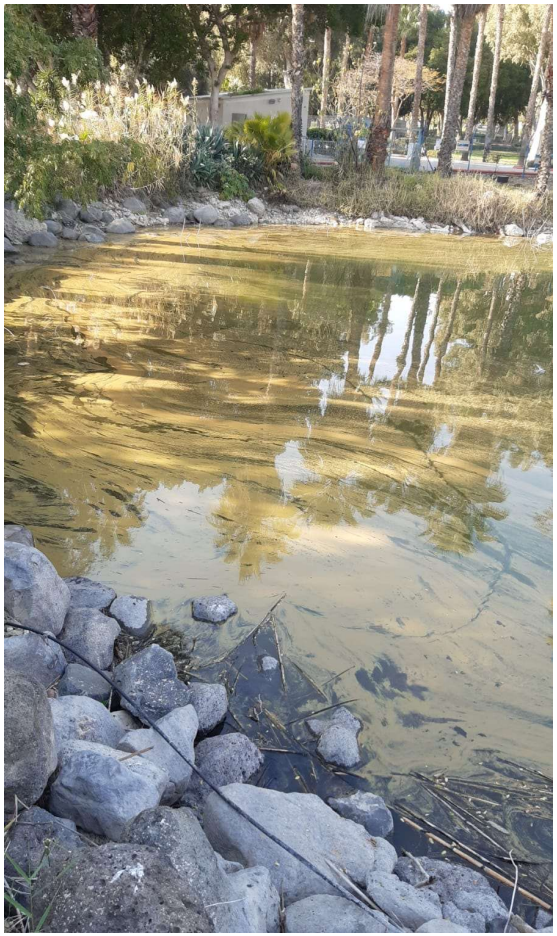
Continued reduction in inflows

Extreme residence times

Increasing salinity

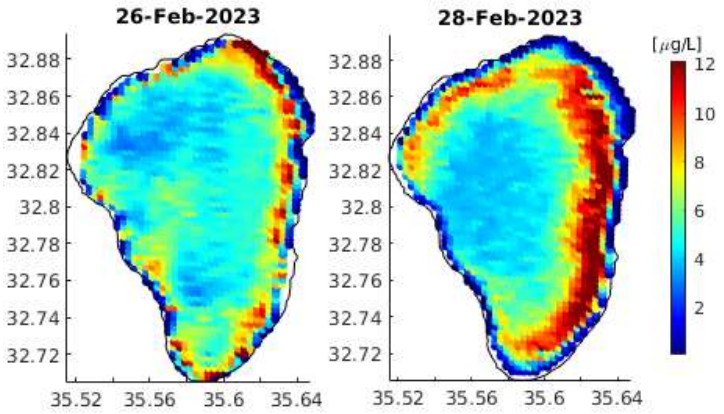
Large Cyanobacteria blooms

Microcystis cyanobacteria- Harmful Algal Bloom – February 2023



When Harmful Algel Bloom is seen in the lake it is usually also seen from space

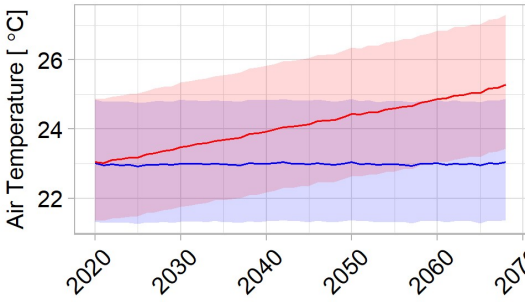
Using an operational physical model, its spread can be predicted



Experimental setup 1D

Baseline – no change relative to period 1990-2020

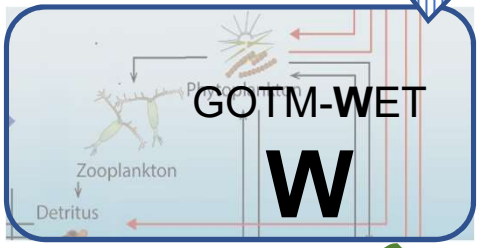
G2.5 – 2.5°C gradual air temperature increase over 50 years

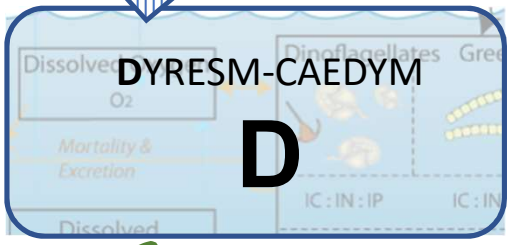


1000 realizations of meteorologic al conditions

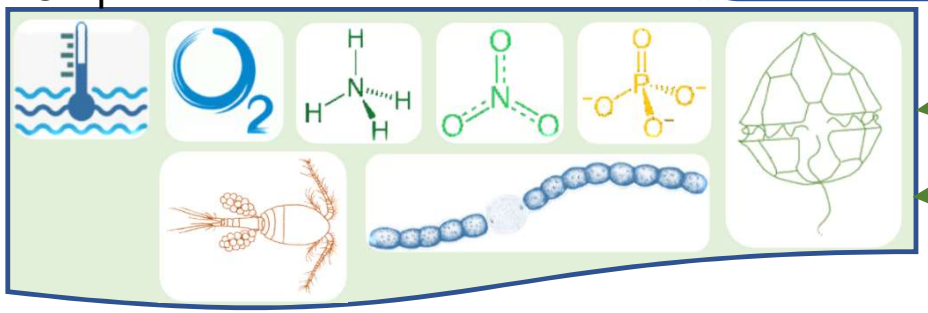
rain

Jordan river flows

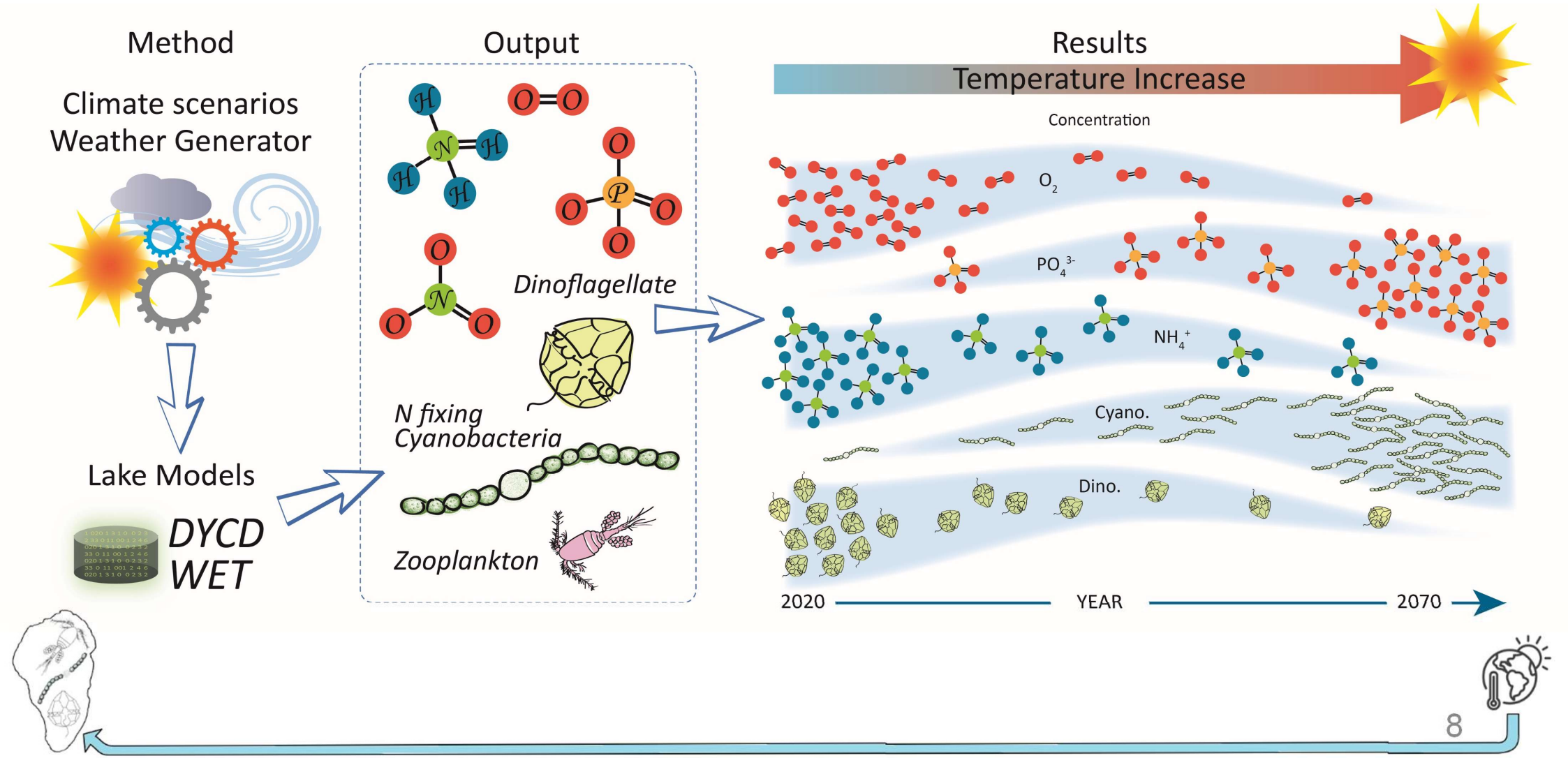




Output:



Summary of climate change impact

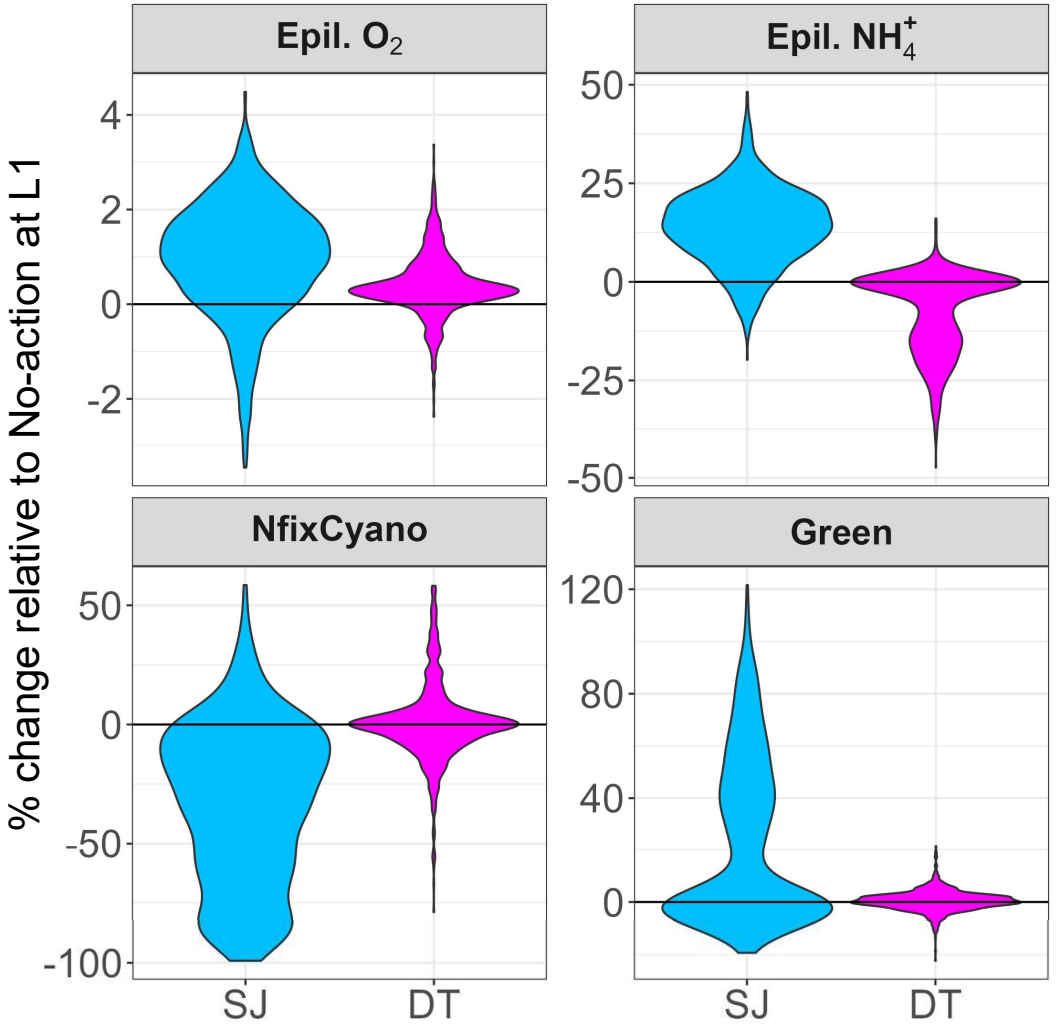


SJ

vs.

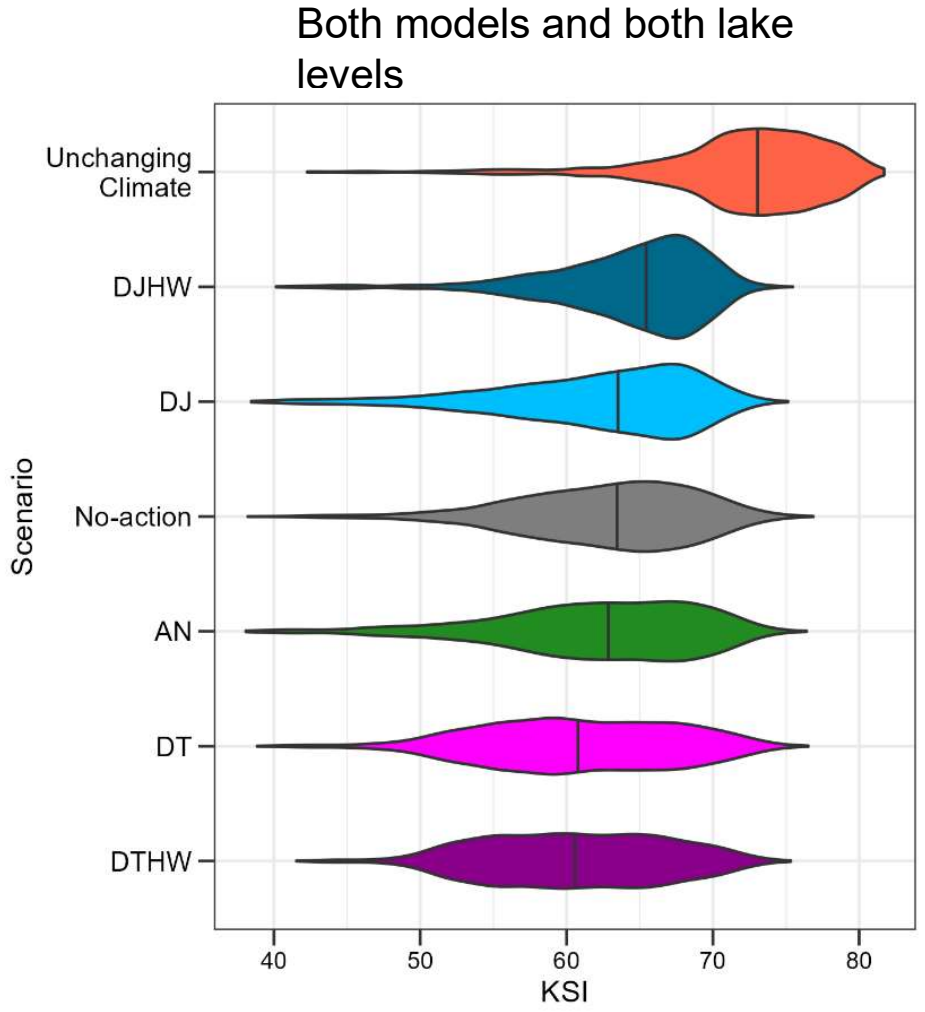
DT

SJ scenario counteract climate change effects on the lake ecosystem



Results: KSI

- Non of the scenarios can fully mitigate climate change
- Relative to taking no action – Scenario SJHW has the best chance of maintaining the ecosystem close to its current state.
- Uncertainty is very high



Kinneret Watershed Model

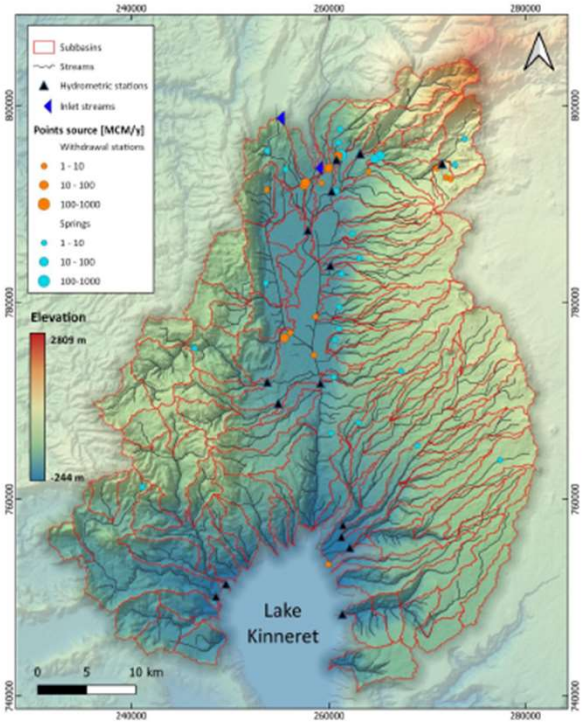
Soil Water Assessment Tool (SWAT)

C. Me

A physical, semi-distributed, and continuous watershed-scale model.

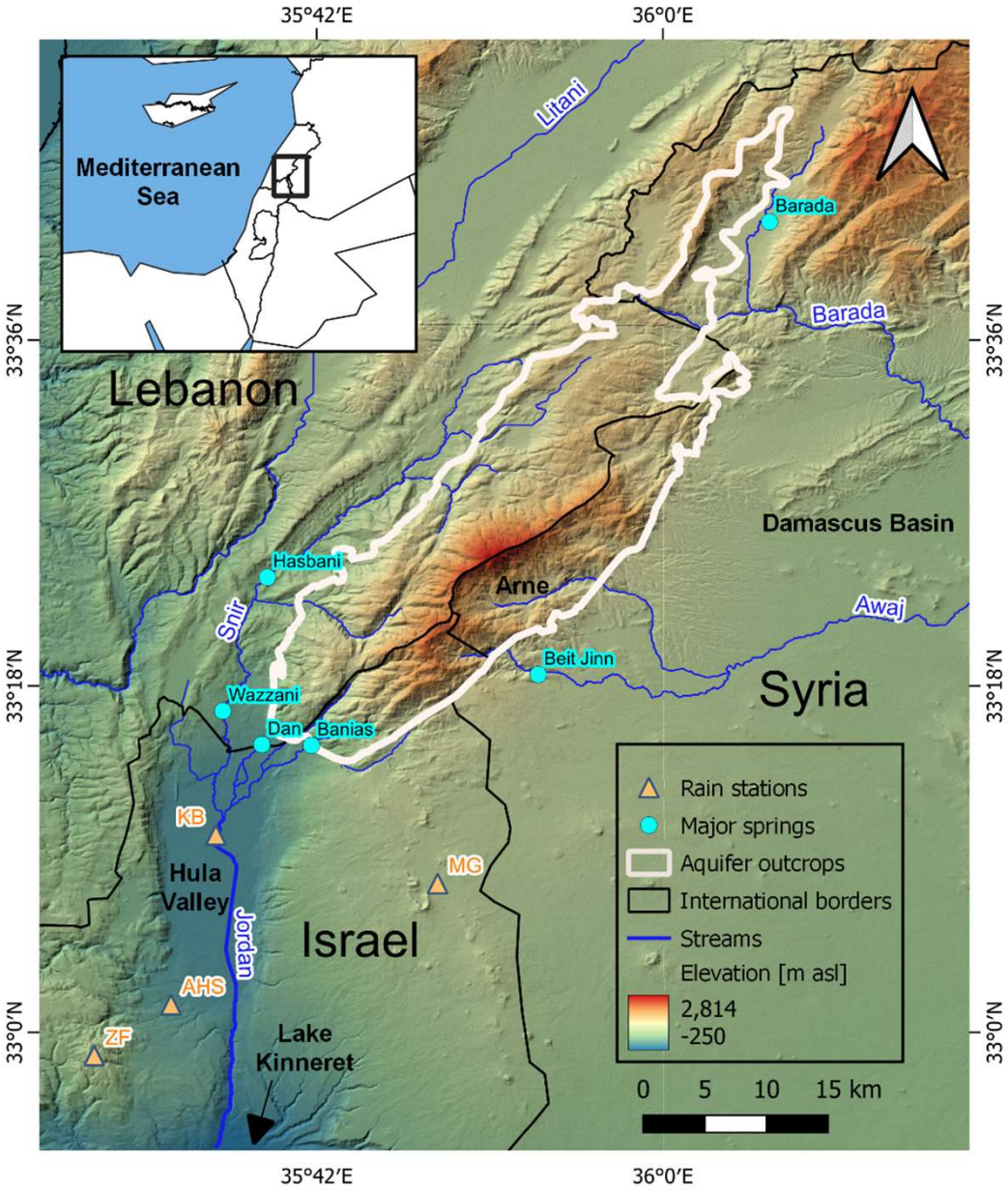
Input

- Elevation
- Soil type
- Land use
- Source/sink points
- Reservoirs
- Climate



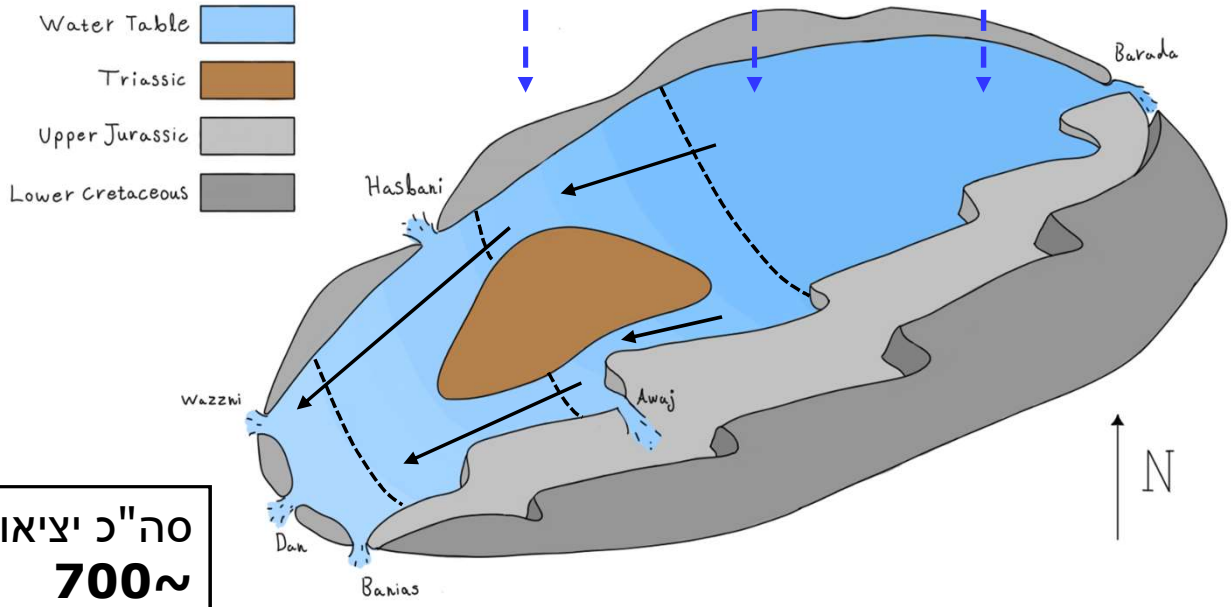
Output

- Runoff generation
- Intermediate processes
- Stream discharge


35°42′E
36°0′E
33°36′N
33°18′N
33°0′N
Mediterranean Sea
Lebanon
Litani
Barada
Barada
Damascus Basin
Hasbani
Arne
Snir
Awaj
Beit Jinn
Syria
Wazzani
Dan
Banias
KB
MG
Hula Valley
Jordan
Israel
AHS
ZF
Lake Kinneret
Rain stations
Major springs
Aquifer outcrops
International borders
Streams
Elevation [m asl]
2,814
-250
0 5 10 15 km

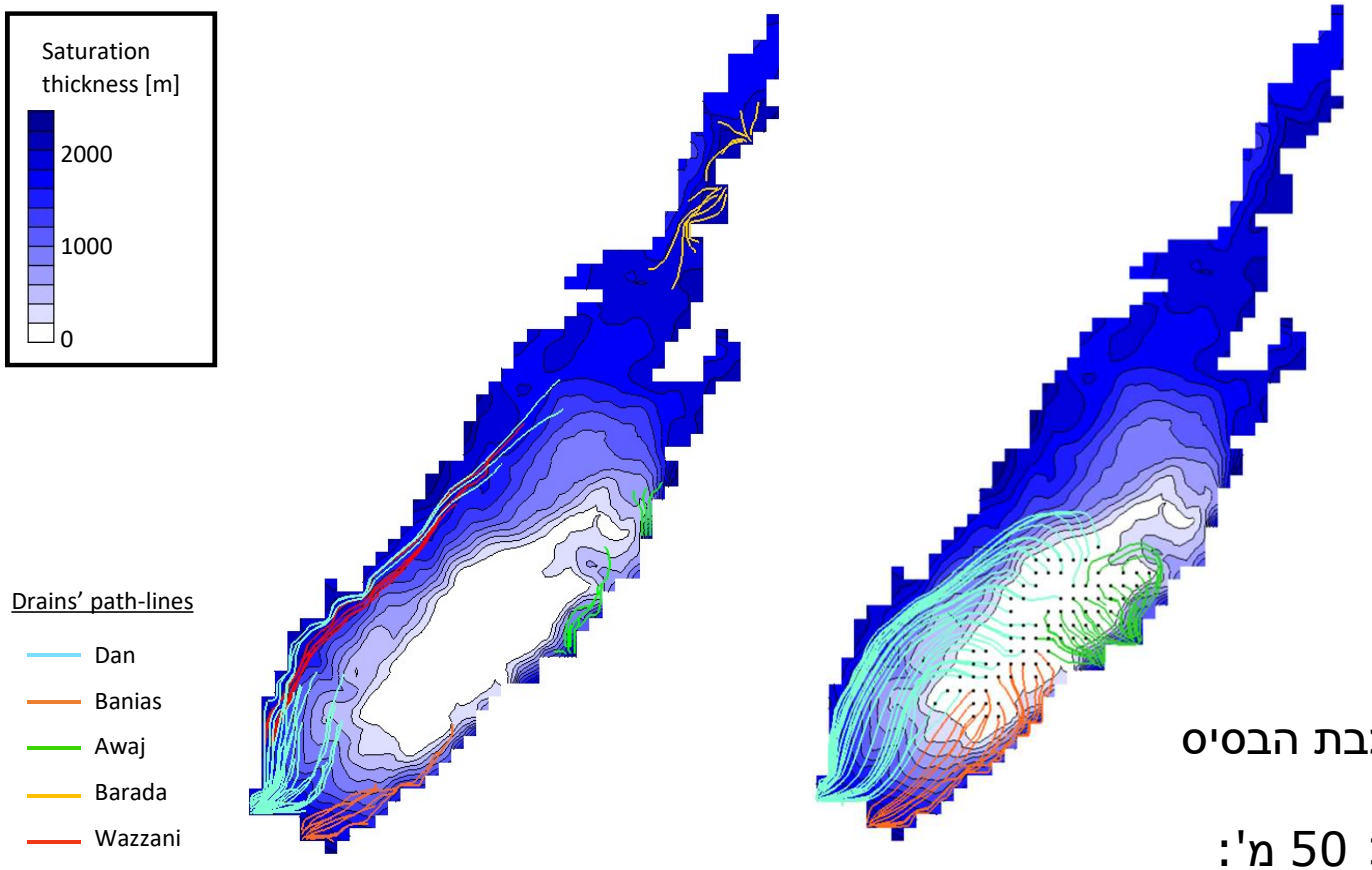
היפותזה

סה"כ כניסות:
700~
מלמ"ש



סה"כ יציאות:
700~
מלמ"ש

נתיבי זרימה באקוויפר



תאים משכבת הבסיס
+
עובי רווי < 50 מ':

Hydrographs

Management issues

- Water level
  - Water quantity
  - Water quality , especially salinity, cyanobacteria
  - Water supply reliability including trans-national
- Recreation
- Fisheries

- Solutions
  - Increased storage
  - Desalinated water
  - Improved watershed management
  - Reduce salt inflow