

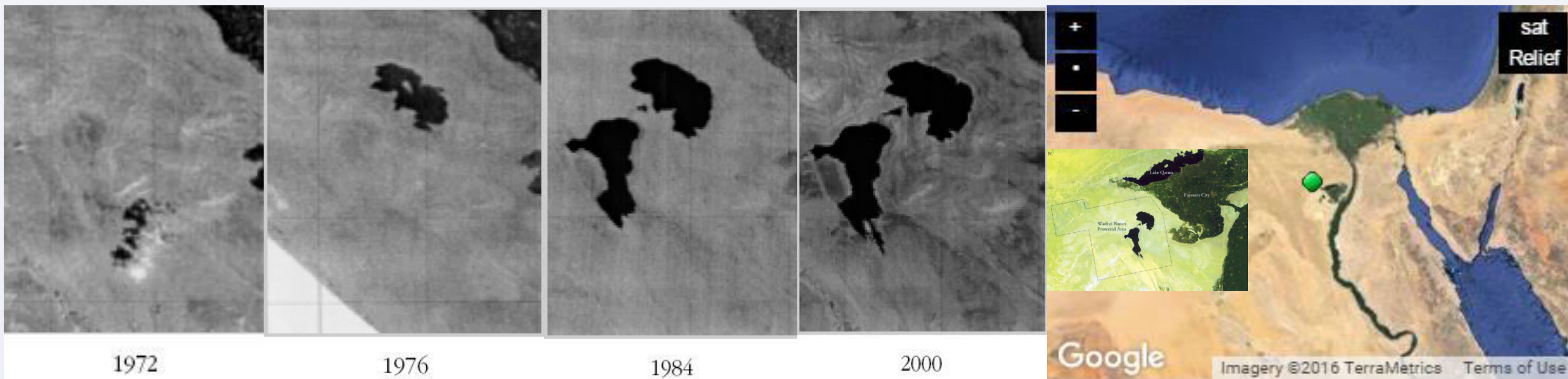


The Different response of the macrobenthic community to different anthropogenic activities on a new limnological ecosystem in Wadi Al Rayan Lower Lake, Western desert of Egypt.

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In the Desert a new limnological ecosystem has been created



In the **1970s**, at the **Wadi Al-Ryanin** depression in the Western desert of Egypt, **two man-made** lakes have been formed from the **drainage water** of farm lands in the EL-Fayoum Province.



Since then the **biodiversity** has **changed** significantly **specially** in the newly formed **lakes**. The Wadi Al-Rayan area is now protected for its biological biodiversity and **unique habitat** features.

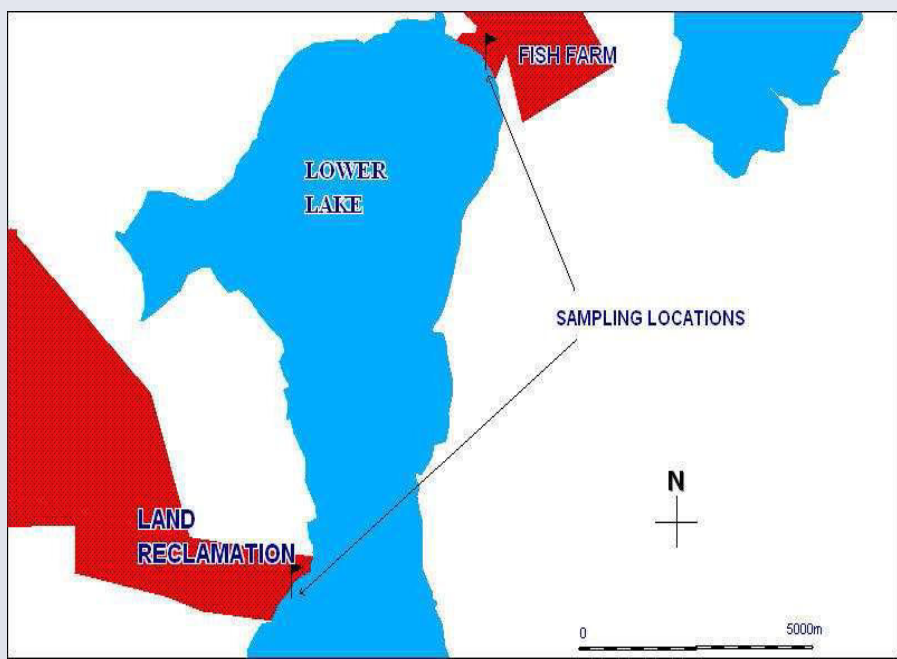
BUT

Some anthropogenic disturbances are threatening the lake ecosystem

- Fish Farming
- Land Reclamation



The Land Reclamation project



The Fish Farms project

Hypothesis

These developing activities have an impact on this new limnological ecosystem

AIM of this study

Compare the impact of these anthropogenic activities on the **macrobenthic** community structure and composition during **twelve months** from June 2003 to May 2004

Macrobenthos as biological indicator

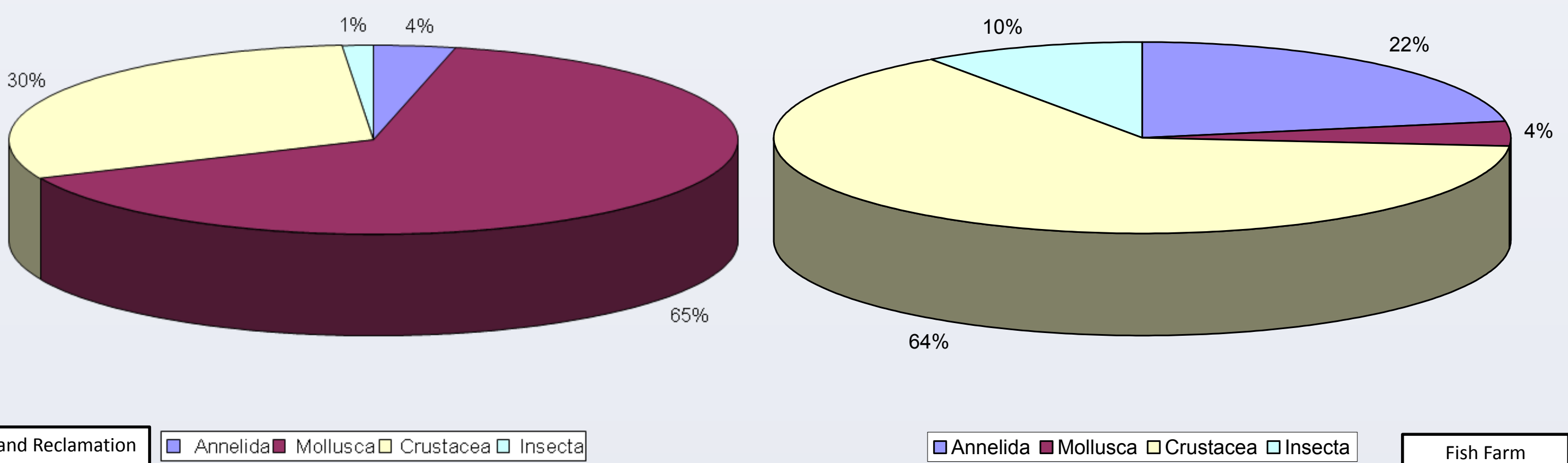


Organisms retrieved over a 1 mm mesh size sieve that live in the soft-sediment of the seabed with **short generation time**

Biotic Results

Macrobenthic communities were significantly different in different months in both the Fish Farm and the Land Reclamation area.

PERMANOVA table of results						
Source	df	SS	MS	Pseudo-F	P(perm)	Unique perms
Mo	11	73177	6652.4	3.1709	0.0001	9828
Ar	1	60397	60397	28.788	0.0001	9947
MoxAr	11	38885	3535	1.685	0.0004	9820
Res	95	1.99E+05	2098			
Total	118	3.72E+05				



r.c.= relative contribution; Eudominant (A) over 30% of individuals, Dominant (B) 10:30% of individuals, Subdominant (C) 5-<10% of individuals, Minor (D) 1-<5% of individuals and Rare (E) under 1% of individuals

- Crustacea was the eudominant class in both sampling areas.
- Mollusca was an eudominant class only in the Land Reclamation area.

Group F.F.			
Average similarity: 44.26			
Species	Av. Abund	Contrib%	Cum. %
Corophium voltator	568.64	48.64	48.64
Naididae Sp.	156.44	14.76	63.4
Gammarus locusta	91.69	13.27	76.68
Chironomus Sp.	100	10.15	86.82
Lumbriculidae Sp.	72.54	10	96.83

Group L.R			
Average similarity: 37.75			
Species	Av. Abund	Contrib%	Cum. %
Hydrobia Sp.	936	62.93	62.93
Corophium voltator	446.5	31.51	94.44



Corophium voltator

In the Fish Farm area, five species are dominant. The amphipod *Corophium voltator* was reported as the most dominant among them.

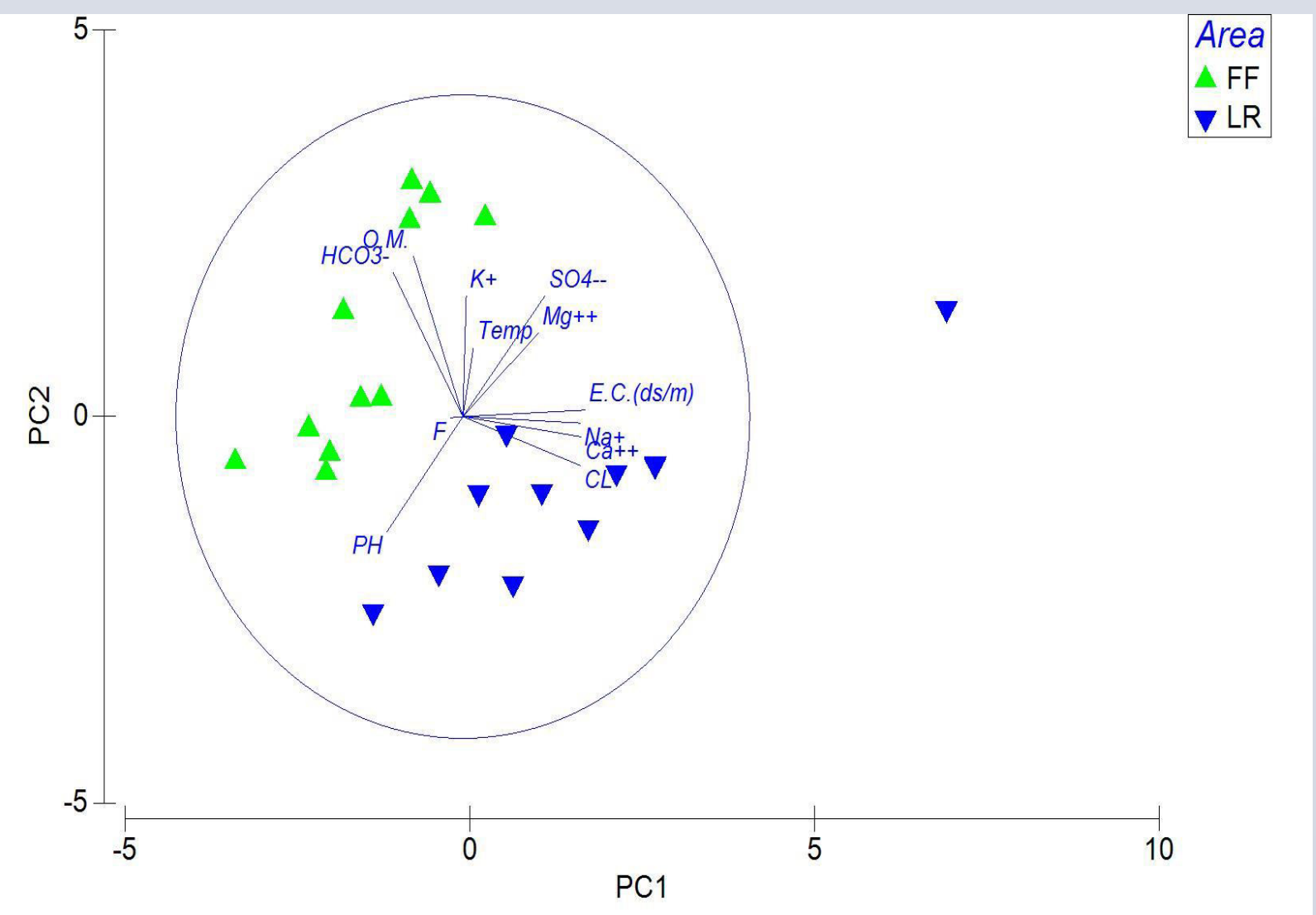


Hydrobia sp.

In the Land Reclamation area 94% of the population was dominated by *Hydrobia sp.* and *Corophium voltator*.

Abiotic Results

- ❑ The PCA plot showed that both Fish Farm (FF) and Land Reclamation (LR) area are grouped separately.
- ❑ **Fish Farm** => Organic matter and bicarbonate anions are the main abiotic factors.
- ❑ **Land Reclamation** => sodium, chloride and calcium are the main abiotic factors



Conclusions

- The drainage water's of the **Land Reclamation** project has a more **dramatic impact** on the benthic community composition **than** the **Fish Farm** drainage water.
- The use of **fertilizers** may be the cause behind this effect.

- The **Fish Farm** Project represents a **source** of **organic matter** for the lake. If kept at low inputs as at present, this organic matter may stimulate further primary and secondary production in the lake system.