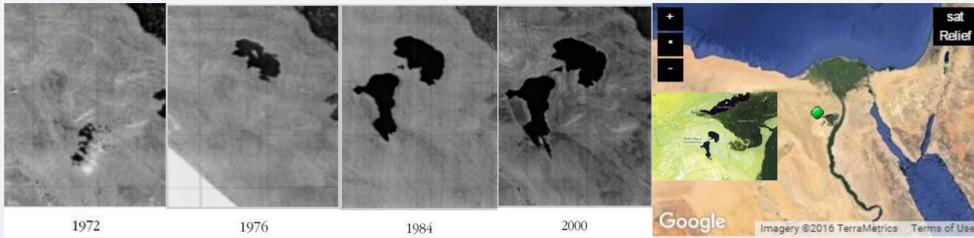


# The Different response of the macrobenthic community to different anthropogenic activities on a new limnological ecosystem in Wadi Al Rayan Lower Lake, Western desert of Egypt.

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## In the Desert a new limnological ecosystem has been created



In the **1970s**, at the **Wadi Al-Ryan** 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 **specialy** in the newly formed **lakes**. The Wadi Al-Ryan area is now protected for its biological biodiversity and **unique habitat** features.

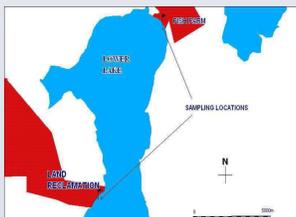
### BUT

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**

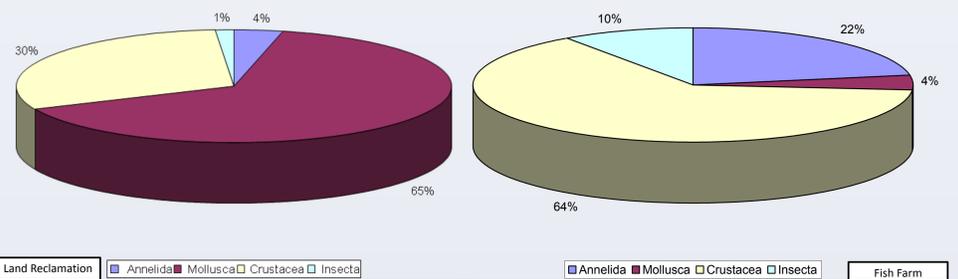
## Conclusions

- 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.

## 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				



Land Reclamation

Fish Farm

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. %
<b>Corophium voltator</b>	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. %
<b>Hydrobia Sp.</b>	936	62.93	62.93
<b>Corophium voltator</b>	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

