Bioaccumulation within two important fish species in the Lower Phongola River and Floodplain.

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WATER RESEARCH COMMISSION

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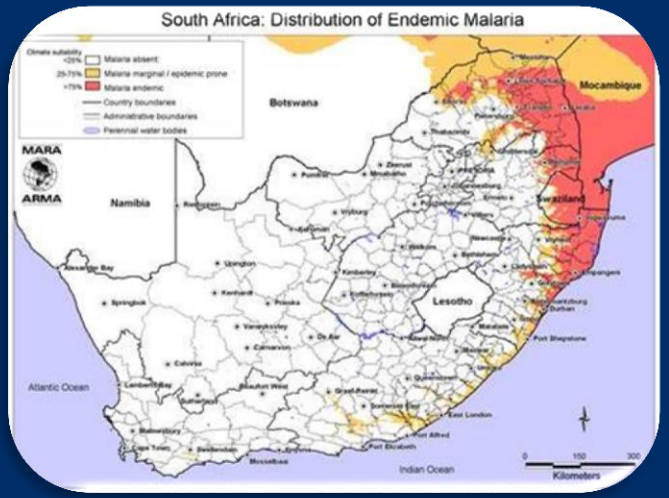
Introduction

- Malaria is wide spread
  - Major cause of illness and death
- DDT indoor residual spraying
  - Supported by WHO since 2006
  - Was previously banned



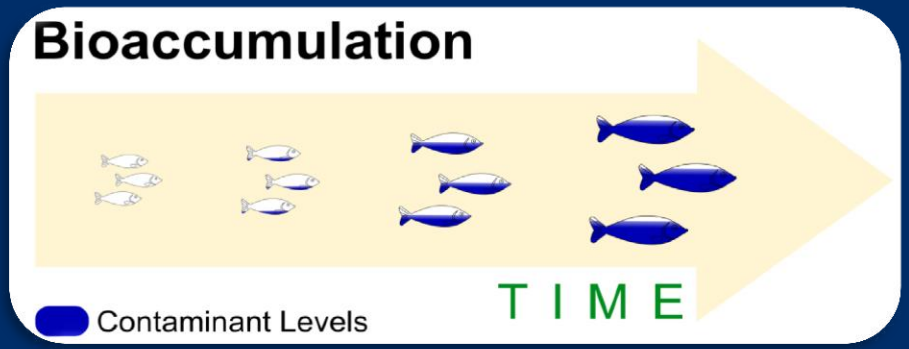
Introduction

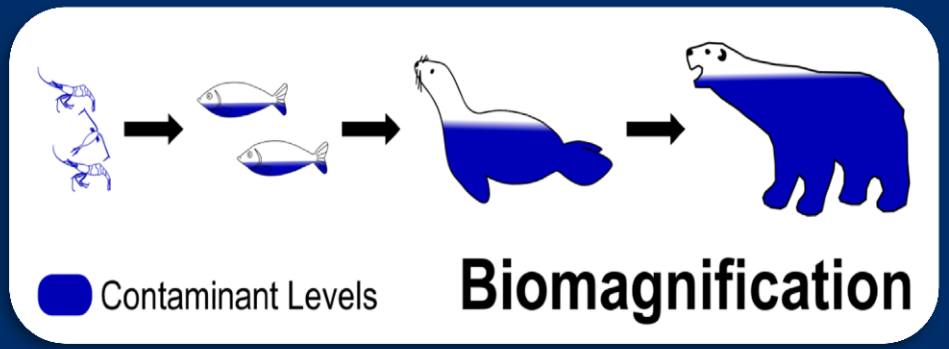
- Bio assessment
  - Environment monitoring
  - Effect of DDT on environment and communities
- Motivation
  - Ecological survey of area
  - Possible impacts on surrounding community

www.h2oacquariofilia.it

Introduction

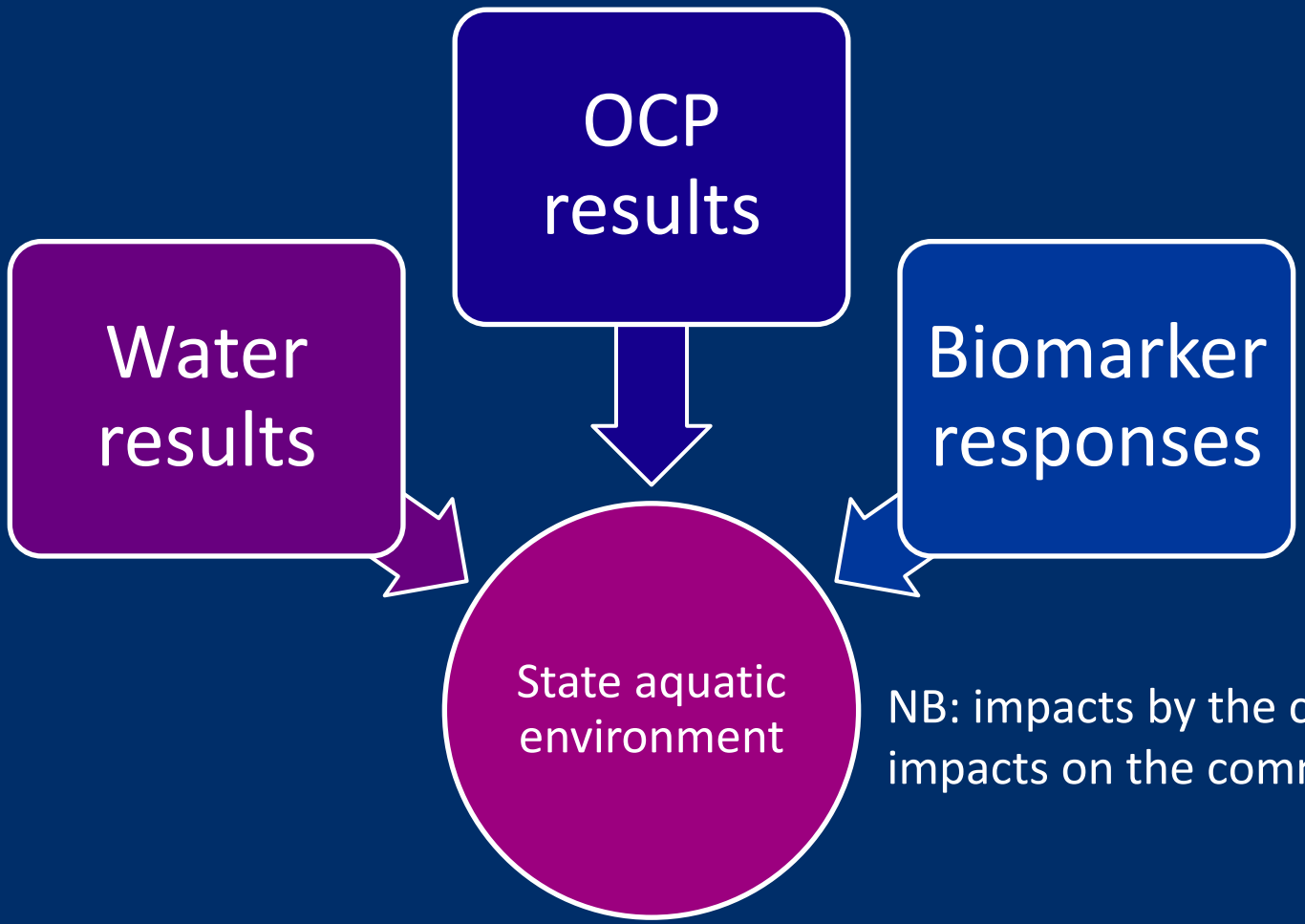
- Organochlorine pesticides (OCP's)
  - Pest control
  - Lipophilic – "love fat"
  - Enter fish via 2 possible pathways
    - Bioaccumulation &/or biomagnification





http://mercurypolicy.scripts.mit.edu/blog/?p=499

Hypothesis

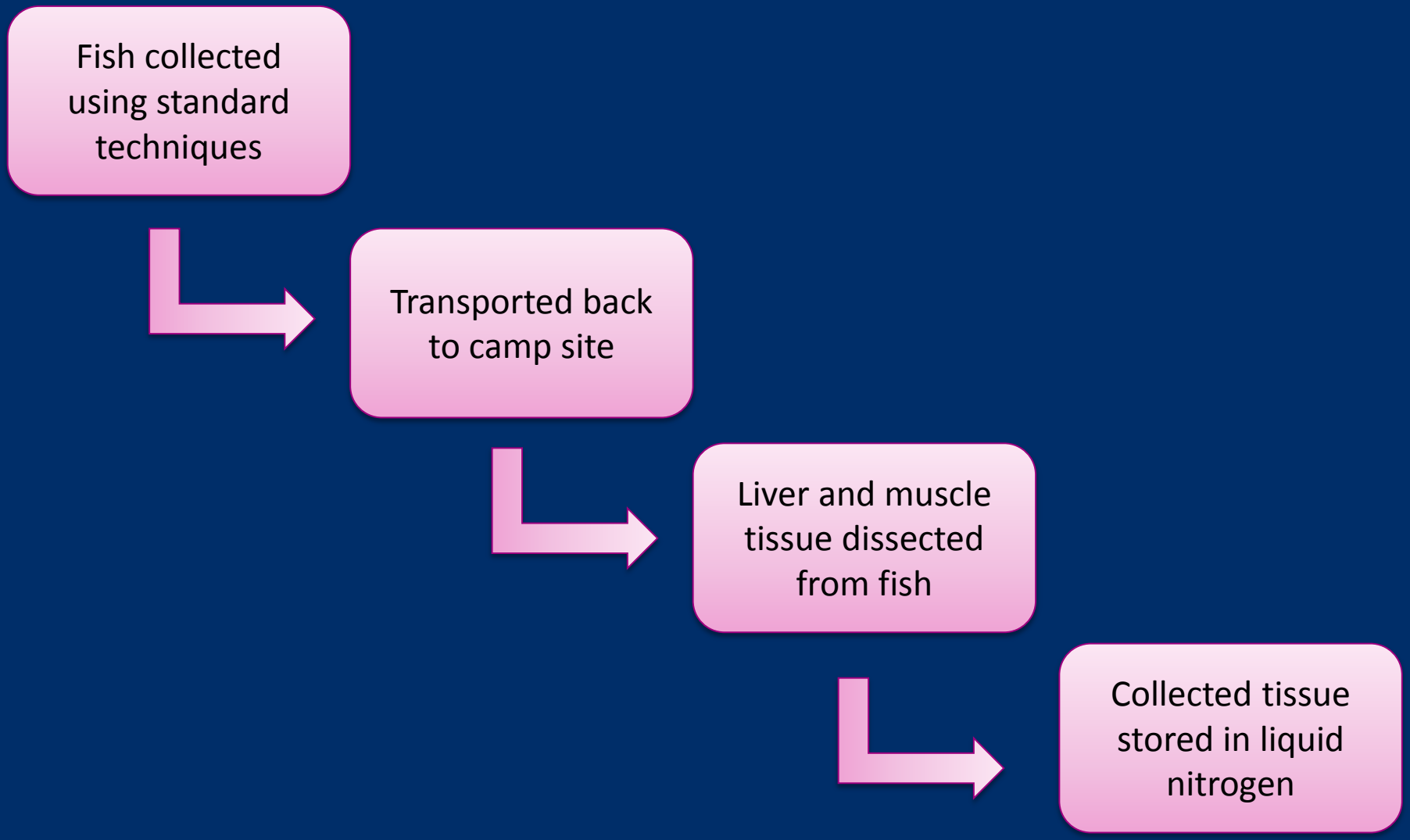


NB: impacts by the community/ impacts on the community

Outcomes

1. Determination of current OCP levels
2. Comparison of PP-DDT and PP-DDE levels
   - Historic vs. Recent spraying
3. Mitigation measures

Materials and Methods



Results

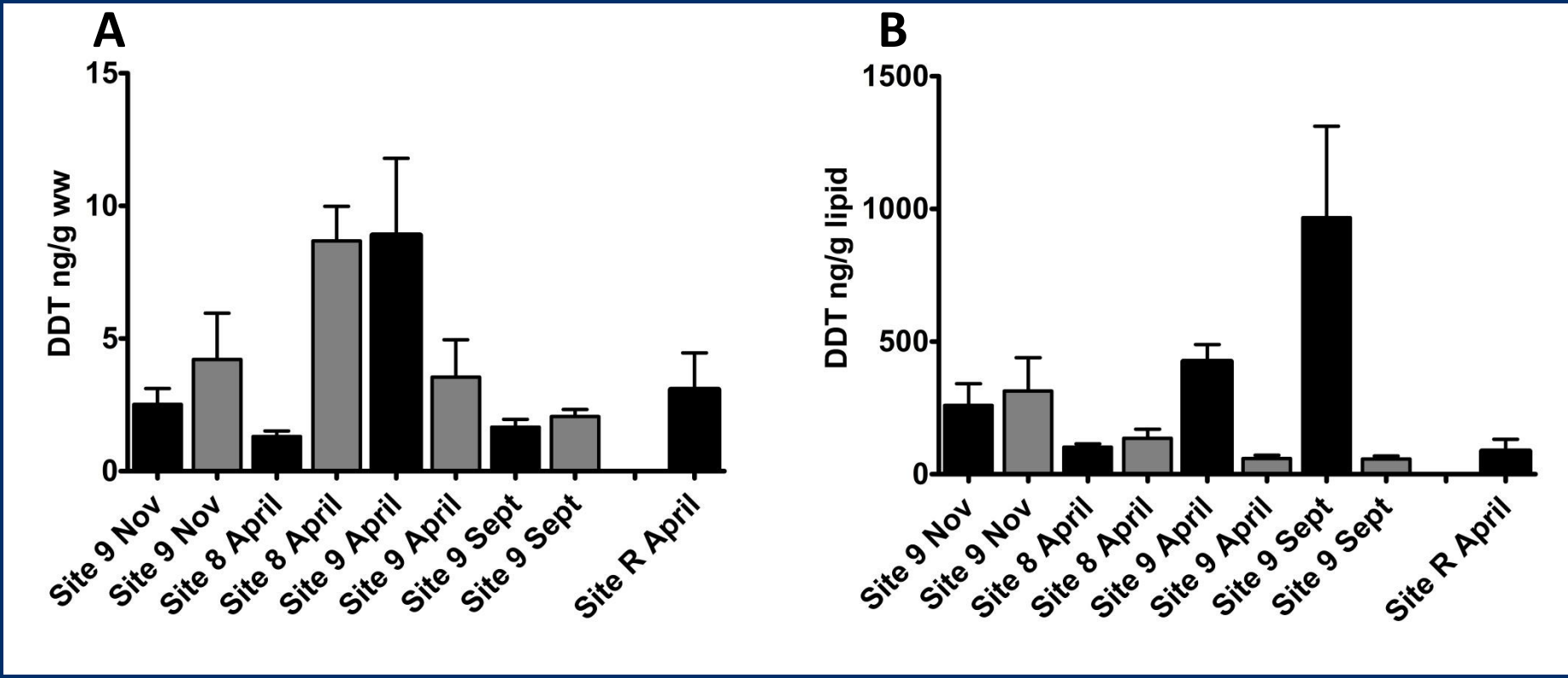


Figure 1: Graphs showing the levels of DDT and its metabolites found within wet weight (A) and lipid weight (B) in *Hydrocynus vittatus* (black) and *Synodontus zambezensis* (grey), during all of the sampling trips.

Ratios

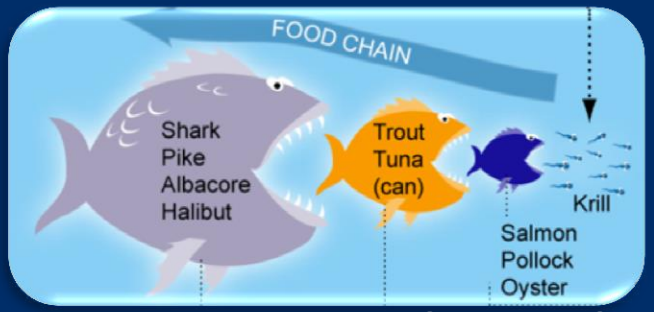
Hydrocynus vittatus		
	PP-DDE/PP-DDT (WW)	PP-DDE/PP-DDT (LW)
Site 9 November	3,636587998	3,646884261
Site 8 April	3,649674385	3,846240382
Site 9 April	2,932960532	4,400210686
Site R April	1,891359282	1,863694127
Site 9 September	5,247472921	3,642947285

The higher the value, the more historic the spraying is within the area.

Synodontus zambezensis		
	PP-DDE/PP-DDT (WW)	PP-DDE/PP-DDT (LW)
Site 9 November	2,466280904	2,990971725
Site 8 April	1,225688853	1,242748838
Site 9 April	2,328132841	2,515748946
Site 9 September	2,087913384	2,202186639

Discussion

- Levels of DDT higher in *H.vitt*
  - Food web linked
  - Biomagnification

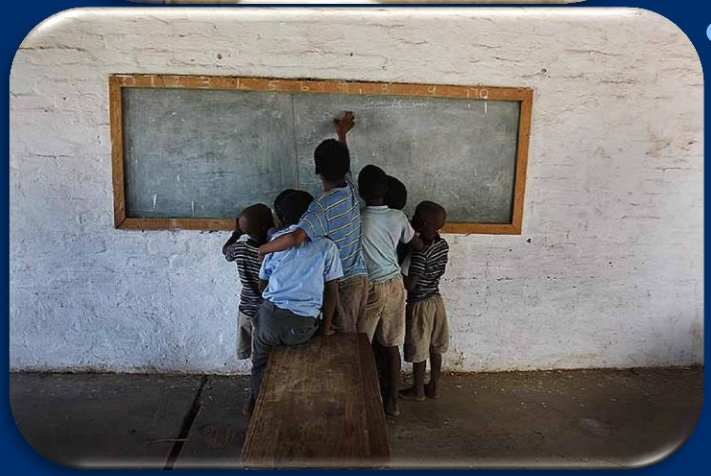


http://rjd.miami.edu/conservation/bioaccumulation-biomagnification-when-bigger-isnt-better

- The PP-DDE to PP-DDT ratios show historic spraying within the area
  - Positive for both the environment and the community
  - Could be negative in terms of Malaria and its spread

Important concepts

- DDT used for Malaria:
  - Needs to be monitored
  - Protection of environment and community



- Risk assessments:
  - Human consumption of OCP's
  - Educate communities on their use of resources

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Thank you for listening!

Do you have any questions?