Development of a molecular diatoms index for water quality assessment of Swiss rivers

LIFEWATCH ERIC WORKSHOP
CIBIO-InBIO Facilities, Vairão
February 27th

Florian Mauffrey, Ph.D.
Post-doctoral fellow - University of Geneva
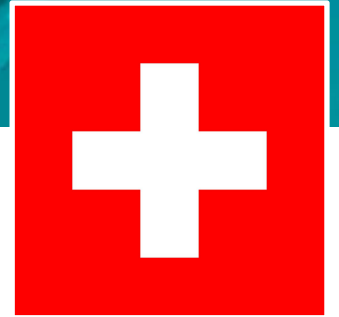Project leader - ID-Gene Ecodiagnostics
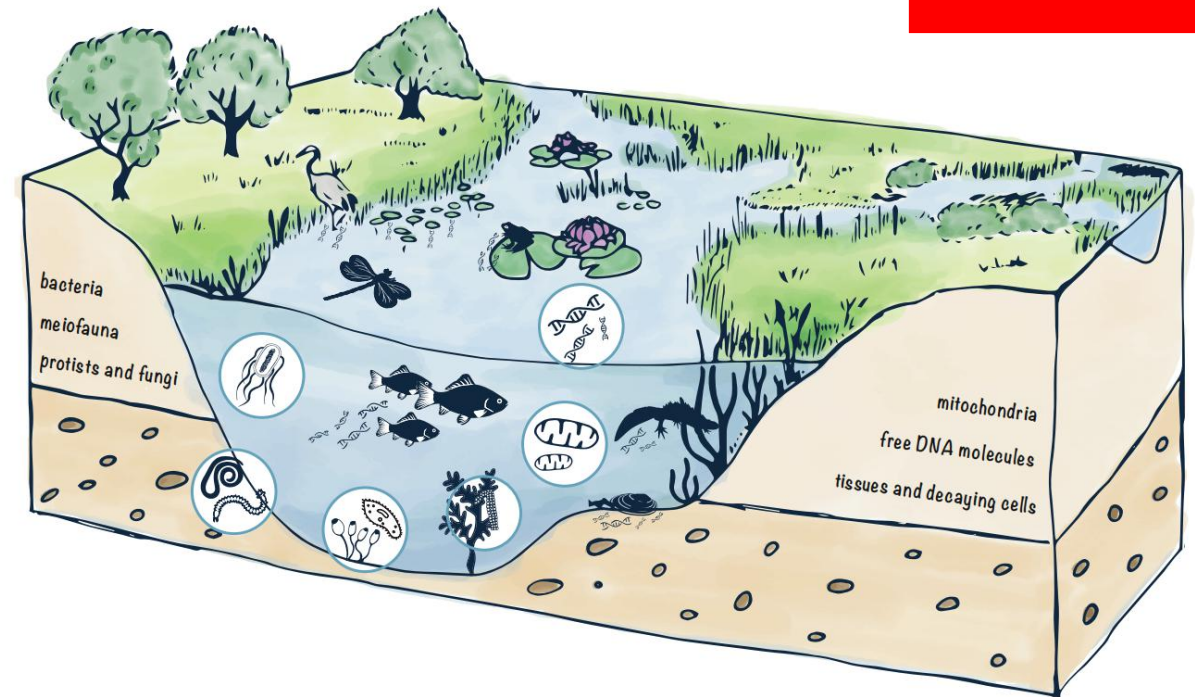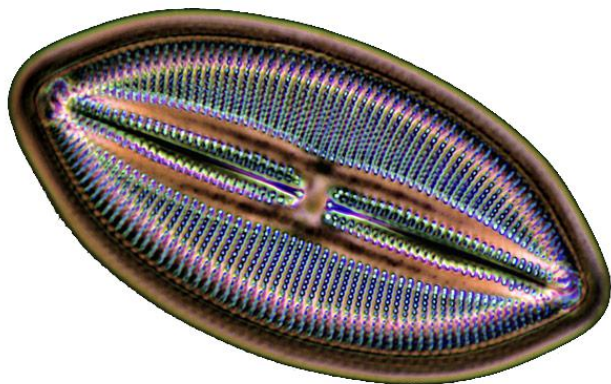
UNIVERSITÉ DE GENÈVE

ID-GENE ecodiagnostics

LifeWatch ERIC

DNAqua-Net
EU COST ACTION

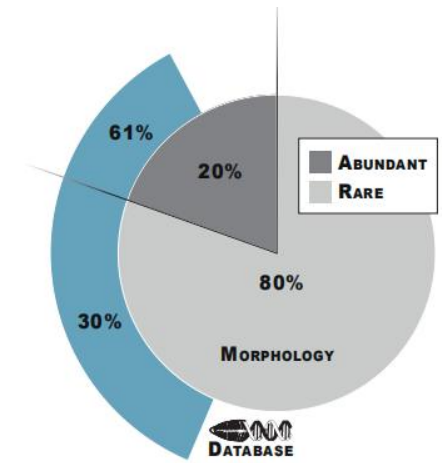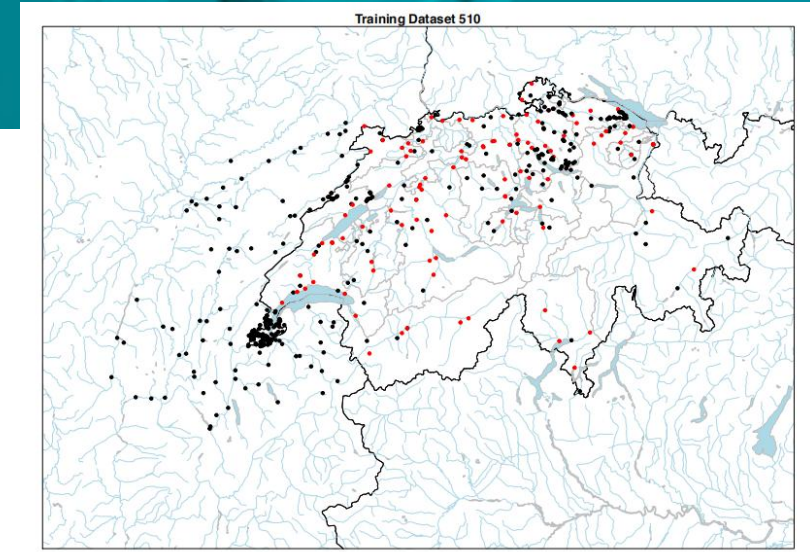Pr. Jan Pawlowski

The Swiss diatoms index (DI-CH)

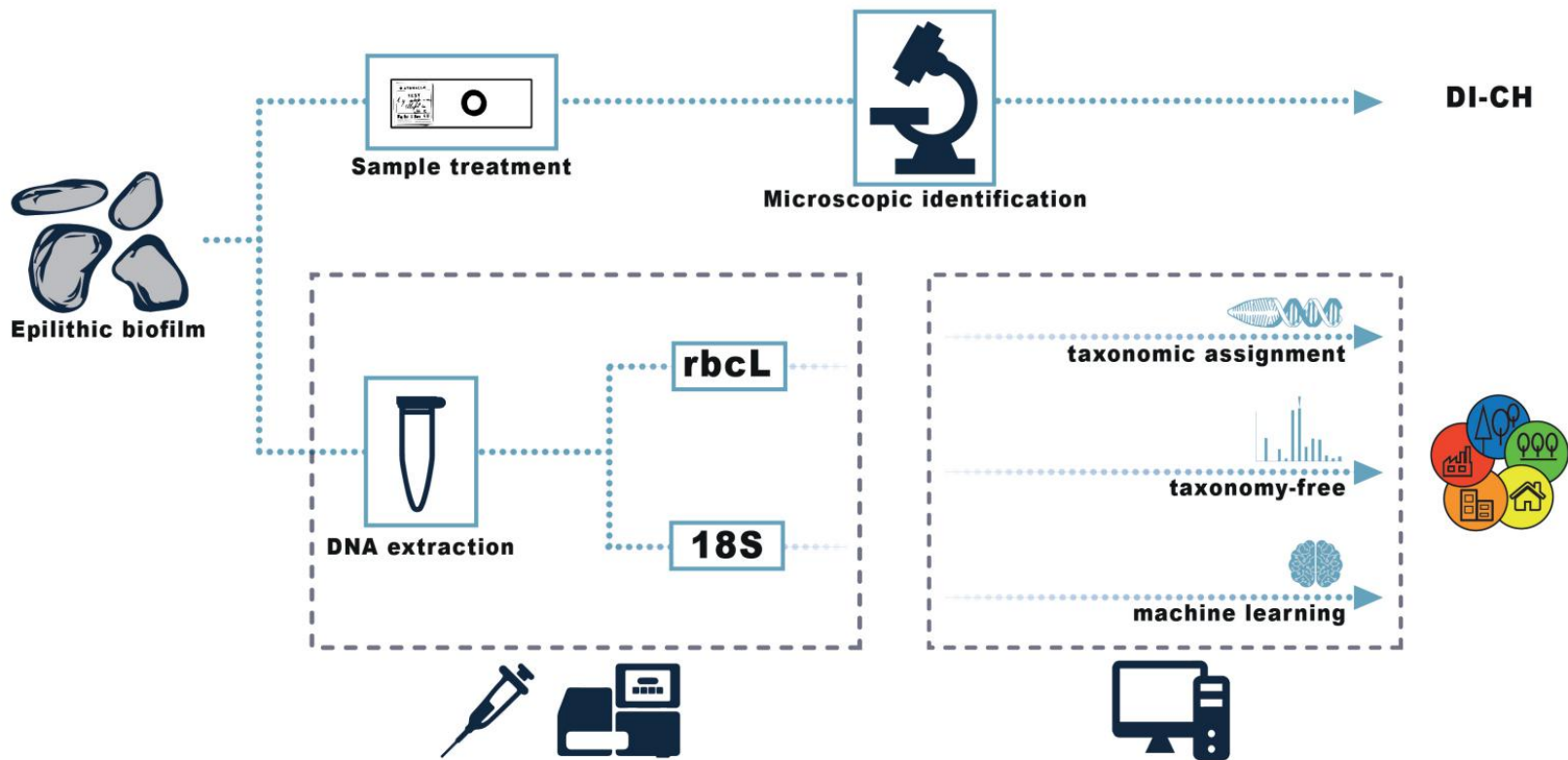- **Included in the Swiss decree on water protection**

- **Based on chemical parameters**

- **Morphology identification as standard**

bacteria
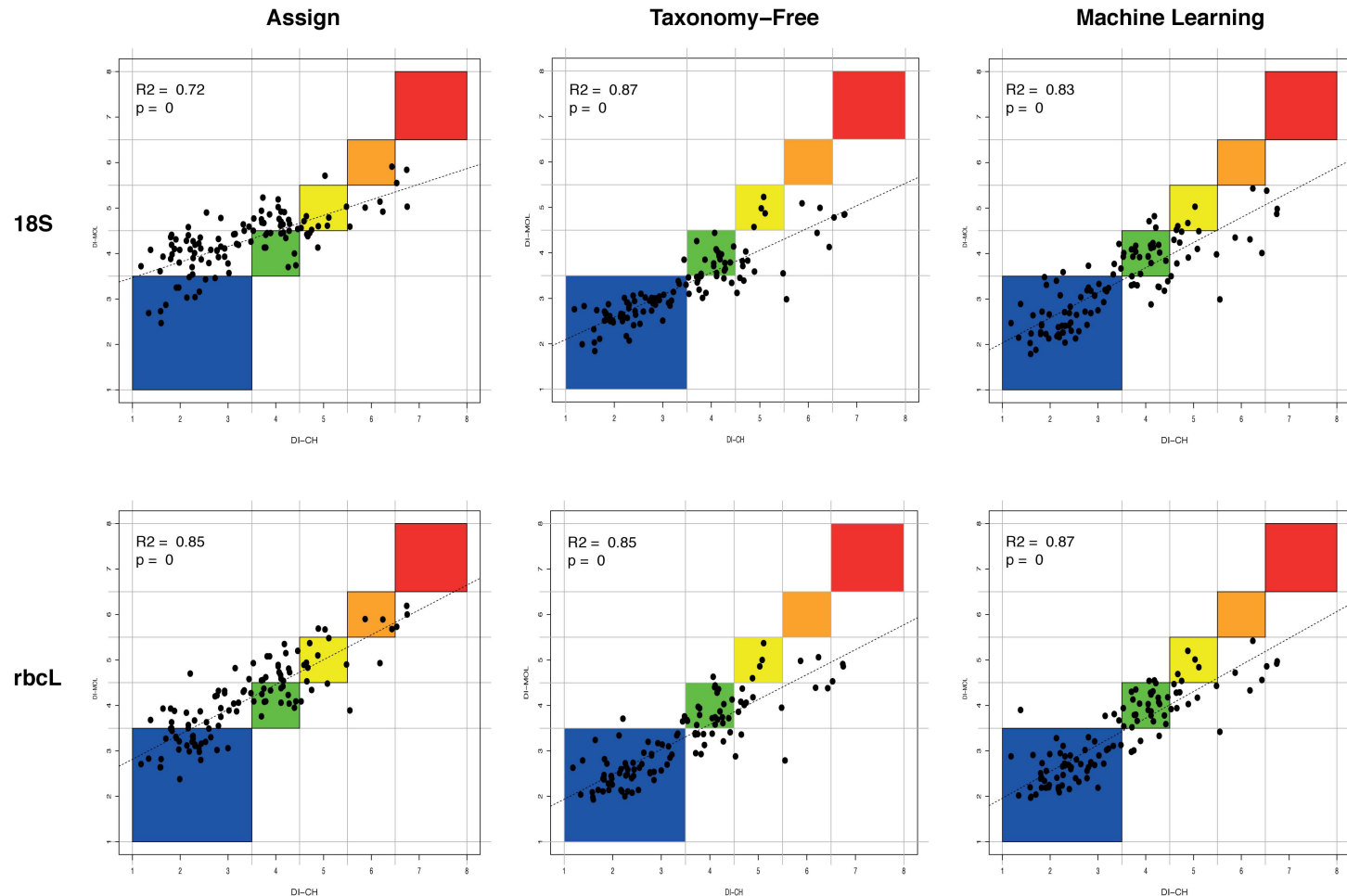meiofauna
protists and fungi

mitochondria
free DNA molecules
tissues and decaying cells

The molecular DI-CH: a new standard ?

The molecular index

Morphology vs Molecular

Laure Apothéloz-Perret-Gentil

The molecular index

|	Assign	Taxonomy–Free	Machine Learning
18S	R2 = 0.72, p = 0	R2 = 0.87, p = 0	R2 = 0.83, p = 0
rbcL	R2 = 0.85, p = 0	R2 = 0.85, p = 0	R2 = 0.87, p = 0

- **Good performances**

- **Machine learning showed the best results**

- **18S database issues and bad assignation**

- **Underestimation of bad and very bad quality samples**

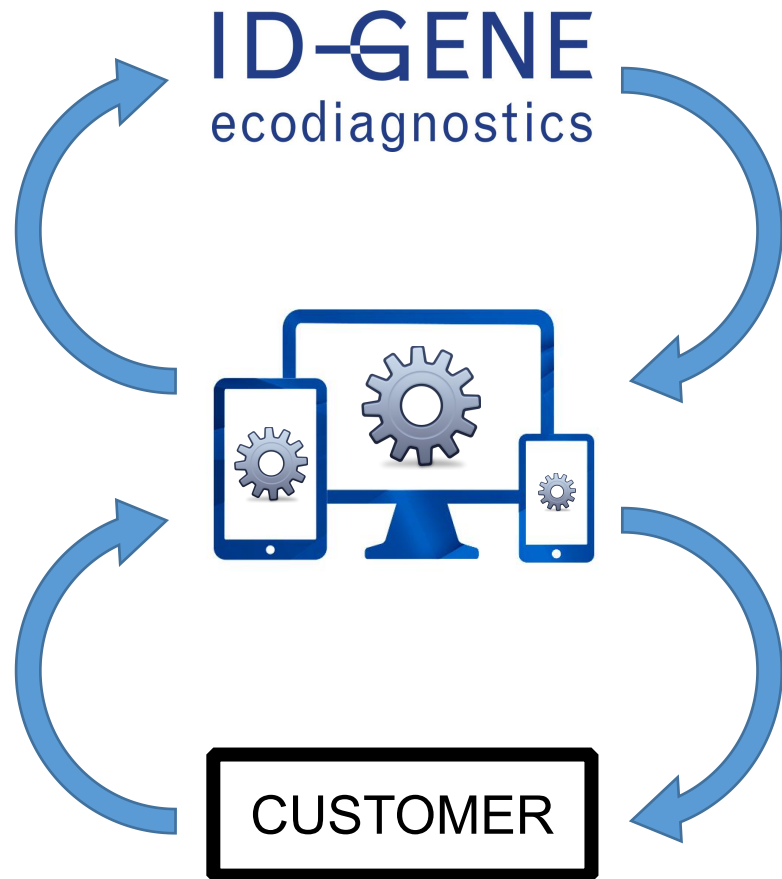Laure Apothéloz-Perret-Gentil

The molecular index

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- **Lack of bad quality water samples in the Swiss dataset**

- **No information on diatoms health**

- **Loss of knowledge of diatoms systematic**

+
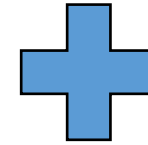
- **More samples, faster, cheaper**

- **Better monitoring of occasional pollution**

- **Better use of the data**

- **Standardization of the method**

A future online platform
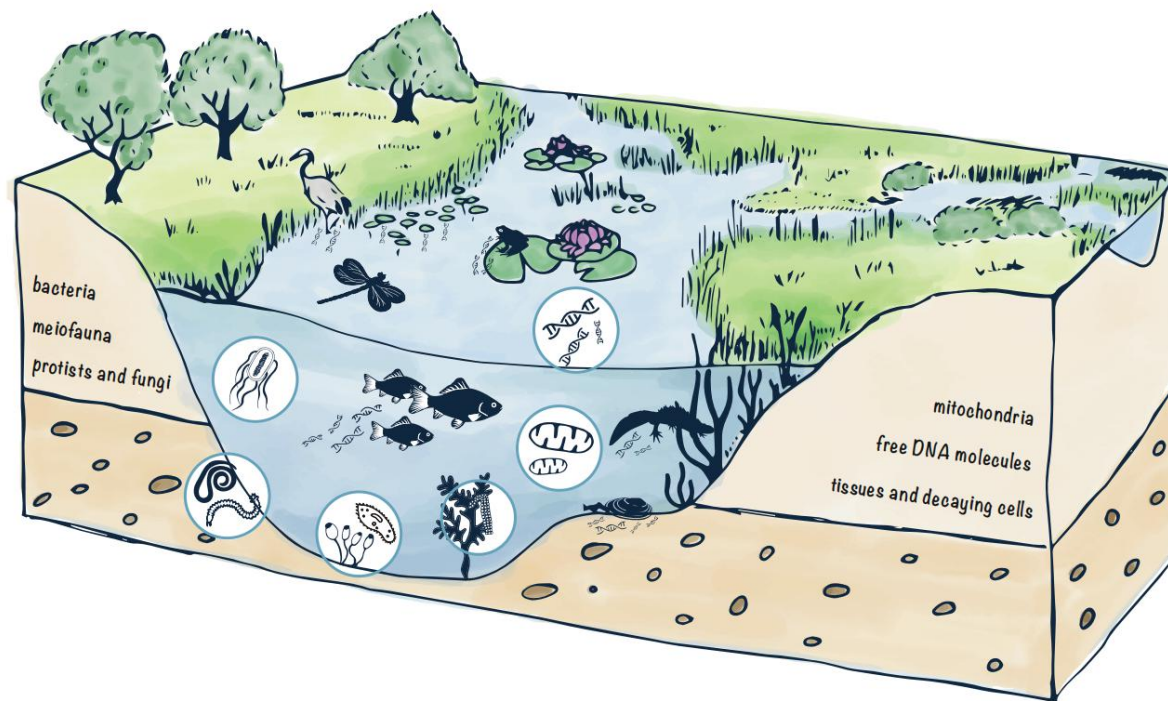
ID-GENE
ecodiagnostics

CUSTOMER

For ID-Gene

- **Semi-automatic data processing and analysis**

- **Effective database management**

- **Automatic production of biomonitoring report**

For the customer

- **Facilitate the access to biomonitoring services**

- **Follow-up of the analysis process**

THANK YOU