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**BSB27 MONITOX**

## **Evaluation of Groundwater Quality through Environmetrics.**

**The case of Nestos and Strymon River Regions,  
Northern Greece.**

*Thomas Spanos<sup>1\*</sup>, Nikolaos Mittas<sup>1</sup>, Christina  
Chatzichristou<sup>1</sup>, Sophia Mitkidou<sup>1</sup>, Konstantinos  
Dermentzis<sup>1</sup>, Nikolaos Kokkinos<sup>1</sup>, Vilson Topi<sup>1</sup>, Despina  
Selina Spanou<sup>4</sup>, Antoaneta Ene<sup>2</sup>, Oleg Bogdevich<sup>3</sup>,  
Elena Zubcov<sup>5</sup>, Liliana Teodorof<sup>6</sup>*

MONITOX International Conference "Environmental Toxicants in Freshwater and Marine Ecosystem in the  
Black Sea Basin", September 8<sup>th</sup>-11<sup>th</sup>, 2020, KAVALA, GREECE

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1 "Environmental Toxins in Freshwater and Marine Ecosystems in the Black Sea Basin" International Conference 8-11 Sept. 2020, Kavala, Greece

2 Removal of Cr(VI) from Galvanic Effluents by Chemical Coagulation and Electrocoagulation

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***"Environmental Toxins in Freshwater and Marine Ecosystems in the Black Sea Basin"***  
*International Conference 8-11 Sept. 2020, Kavala, Greece*

***Removal of Cr(VI) from Galvanic Effluents by Chemical Coagulation and Electrocoagulation***

 **Department of Chemistry  
International Hellenic University  
Kavala, Greece**

***Konstantinos Dermentzis,  
Kokkoni Karakosta,  
Christina Chatzichristou,  
Thomas Spanos***

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# Keyword analysis of image-based velocimetry methods applied on water resources.



**Paschalis Koutalakis<sup>1</sup>, Ourania Tzoraki<sup>2</sup>, George N. Zaimes<sup>3</sup>**

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*<sup>3</sup> Assistant Professor, UNESCO Chair Con-E-Ect, Department of Forestry and Natural Environment Science, International Hellenic University, Greece*

## **INTRODUCTION**

- Velocity and discharge measurements are necessary in water resources management and flood monitoring, analysis, forecasting and mitigation.
- Various measurement methods exist (e.g. Rating Curves, Current Meters, Acoustic Doppler Devices, Image-based methods etc.).
- Image-based methods are used to calculate surface velocity by the motion of surface particles from one point to another within a given time

## **RESULTS**

- The keywords were grouped in three major categories based on similarity/relativity of the keywords: i) methods, ii) LSPIV system and iii) scientific field.
- These major categories were also sub-divided in further sub-categories.
- The first category “Methods” was divided in: i) imaged-based and ii) traditional





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# SUSTAINABLE URBAN RIPARIAN AREAS – THE CASE STUDY OF DRAMA CITY

Valasia Iakovoglou, Georgios Giatas, Georgios Pagonis, Anastasia Savvopoulou, Iordanis Kasapidis, Pavlos Kiourtziadis, Christina Chatzichristou, Vilson Topi, Thomas Spanos, George N. Zaimis

[viakovoglou@yahoo.com](mailto:viakovoglou@yahoo.com)



# SAMPLING AND ANALYSIS OF THE STOCK OF THE SPARUS AURATA IN THE WINTERING TRENCHES OF MESSOLONGHI LAGOON, GREECE

Dospina Solina Spanos<sup>1</sup>, Thomas Spanos<sup>2</sup>, Elena Zubcov<sup>3</sup>, Lucia Biletschi<sup>3</sup>

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2. International Hellenic University (IHU), Faculty of Natural Sciences, Department of Chemistry, 67404 Agios Lukas, Kania, Greece
3. Institute of Zoology Academy of Sciences of Moldova, Chisinau, Moldova

## Introduction

The fish population of *Sparus aurata* in three selected wintering trenches (A,B,C) in the lagoon of Messolonghi, Greece, was estimated using the Petersen and Schnabel methods. The total length and total weight of the fish in the third trench were measured, and the data was used to design the length and weight scatter plot and the frequency histogram. The descriptive measures of the species total length, total weight and the index CPUE (Catch Per Unit effort) were calculated. The collected data give us an assessment and understanding of this commercial species population in Messolonghi lagoon.

## Study Area

The lagoon of Messolonghi is the largest in Greece and is an important environmental park. The wintering trenches in the lagoon are used in the winter and summer months to protect the fish from extreme temperatures.



Fig. 1. Messolonghi Lagoon and trenches

## Methodology

A gill net was placed in three trenches in the lagoon, for a specific period of time and a number of fish were caught. The fish were caught, anesthetized, marked and released back to the lagoon. The process of catching, anesthetizing-marking and releasing was repeated twice in each trench, while the third time the fish that were caught were stunned and released without being marked.

Petersen marks were used to mark the fish in order to estimate the population using the Petersen and Schnabel methods. A precision scale and ichthyometer were used to weigh and measure the fish that were caught in the third trench. Clove oil was used as an anesthetic for safe handling during the marking and weighing process. Microsoft Excel 2016 was used for the statistical analysis and estimation of the population and CPUE.



Fig. 2. Gill net in wintering trench

## Results

The population was estimated with the Petersen and Schnabel methods. These two methods are based on the total number of fish caught and the number of fish already labeled in a previous catch. CPUE is an indicator of the abundance of a fish stock that is often used to assess the impact of fishing on the fish stocks and the performance of a fishing fleet or gear.

## Population

| trench | Petersen | Schnabel |
|--------|----------|----------|
| A      | 6600     | 6034.222 |
| B      | 11573    | 11900.4  |
| C      | 7600     | 7654.545 |

Table 1. The population of the three trenches calculated by the Petersen and Schnabel methods.

## CPUE

| trench | catch weight (kg) | Fishing duration (hr) | CPUE (kg/1hr) |
|--------|-------------------|-----------------------|---------------|
| A      | 13                | 3                     | 3.33          |
| B      | 23                | 5                     | 4.6           |
| C      | 110               | 24                    | 4.583         |

Table 2. Catch Per Unit Effort in the three trenches.

## Total length and weight scatter plot

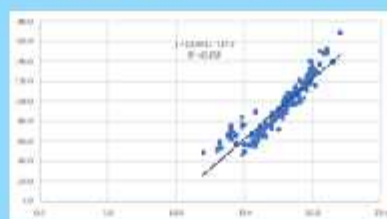


Table 3. Scatter plot of total length and total weight of the fish in trench C.

## Descriptive Measures and Frequencies

| Total Length       |          | Total Weight       |          |
|--------------------|----------|--------------------|----------|
| Mean               | 17.6088  | Mean               | 94.09745 |
| Standard Error     | 0.143587 | Standard Error     | 1.025072 |
| Median             | 10       | Median             | 95.15    |
| Standard Deviation | 1.999357 | Standard Deviation | 29.56771 |
| Sample Variance    | 3.997828 | Sample Variance    | 873.4767 |
| Minimum            | 17       | Minimum            | 49.3     |
| Maximum            | 27       | Maximum            | 168.8    |

Table 4. Descriptive numerical measures of length and weight in trench C.

| Classes | class width | frequency | relative frequency | classes | class width | frequency |
|---------|-------------|-----------|--------------------|---------|-------------|-----------|
| 14      | 14-12       | 1         | 1%                 | 140     | 140-130     | 2         |
| 15      | 13-11       | 3         | 3%                 | 135     | 135-125     | 3         |
| 16      | 12-10       | 7         | 7%                 | 130     | 130-120     | 23        |
| 17      | 10-9        | 10        | 10%                | 125     | 125-115     | 25        |
| 18      | 9-8         | 12        | 12%                | 120     | 120-110     | 25        |
| 19      | 8-7         | 13        | 13%                | 115     | 115-105     | 29        |
| 20      | 7-6         | 21        | 21%                | 110     | 110-100     | 37        |
| 21      | 6-5         | 28        | 28%                | 105     | 105-95      | 21        |
| 22      | 5-4         | 28        | 28%                | 100     | 100-90      | 18        |
| 23      | 4-3         | 23        | 23%                | 95      | 95-85       | 17        |
| 24      | 3-2         | 19        | 19%                | 90      | 90-80       | 4         |
| 25      | 2-1         | 10        | 10%                | 85      | 85-75       | 2         |
| 26      | 1-0         | 3         | 3%                 | 80      | 80-70       | 1         |

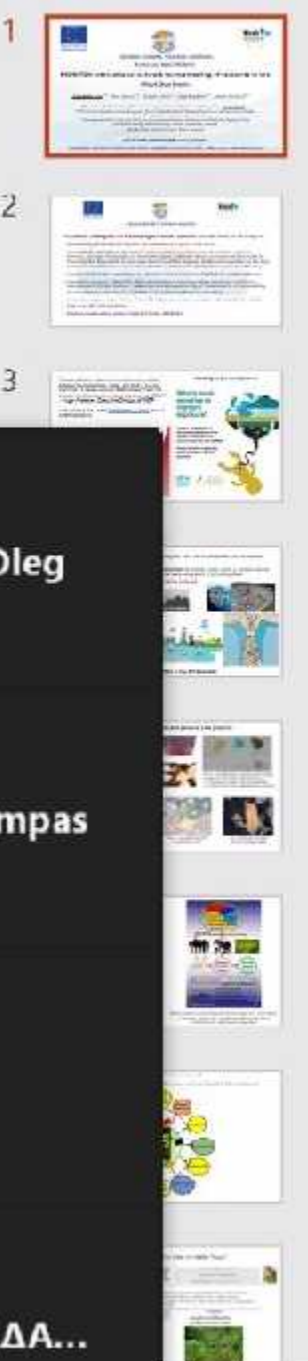
Table 5. Total length and weight frequencies in trench C.

## Conclusion

In general, the population estimates using the two methods did not show significant differences, which validates our sampling. Since trench B had the largest population in relation to the other two trenches and A had the smallest, our results are logical based on the fact that CPUE is an indicator of fish stock abundance. The  $R^2$  of the correlation equation between length and weight was calculated to be 0.854, so the correlation is quite accurate and reliable.

From the data we observed that most fish in trench C have a length of 18.1 to 19cm and a weight of 99.1 to 109g.





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# MONITOX international network for monitoring of toxicants in the Black Sea Basin

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**\*Prof. dr. habil. Antoaneta ENE, Project Manager**

**"Environmental Toxicants in Freshwater and Marine Ecosystems in the Black Sea Basin", Kavala, GREECE, Sept. 8th-11th, 2020**



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ANTOANETA ENE



# A study on drinking water quality in SE Romania

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## S1.16. Natural radioactivity and risk to population in selected recreational and beach sites from Black and Aegean Seas in Romania and Greece

**Antoaneta Ene**<sup>1,2\*</sup>, Thomas Spanos<sup>3</sup>, Elena Zubcov<sup>4</sup>, Oleg Bogdevich<sup>5</sup>, Liliana Teodorof<sup>6</sup>,  
Laurentia Ungureanu<sup>4</sup>, Igor Nicoara<sup>5</sup>, Adrian Burada<sup>6</sup>, Cristina Despina<sup>6</sup>, Christina Xatzichristou<sup>3</sup>

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"Environmental Toxicants In Freshwater and Marine Ecosystems In the Black Sea Basin", Kavala, GREECE, Sept. 8th-11th, 2020







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# Ecological Risk Assessment of Heavy Metal Pollution in Sediments from Romanian MONITOX Network

Liliana Teodorof, Adrian Burada, Cristina Despina, Daniela Seceleanu-Odor,  
Cosmin Spiridon, Mihaela Tiganus, Marian Tudor, Antoaneta Ene, Elena  
Zubcov, Thomas Spanos, Oleg Bogdevich

Kavala. 8-11 September. 2020





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# Pharmaceutical residues monitoring in surface water in Romania. Status and concerns

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Associate prof. Carmen Lidia Chiriacu



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Alao Olumide...

Nadia Andreev



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# S1.17. Active measurement methods of indoor radon and thoron in selected spaces in Galati town

Antoaneta Ene<sup>1,2\*</sup>, Liviu Vodarici<sup>3</sup>

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\*Prof. dr. habil. Antoaneta ENE, Project Manager

"Environmental Toxicants in Freshwater and Marine Ecosystems in the Black Sea Basin", Kavala, GREECE, Sept. 8th-11th, 2020





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## BSB27 MONITOX

# The characteristic of stable isotope composition of the precipitation for the evaluation of water cycle in transboundary region of Romania, Ukraine and Republic of Moldova

Oleg Bogdevich, Antoaneta Ene, Oleg Cadocinicov, Elena Culighin

### Abstract

The stable isotope technique is a perspective method for the evaluation of the water cycle in the water resource formation. The evaluation of the recharge mechanism of the transboundary groundwater aquifers is a very important in this region. The stable isotope composition of  $H^2$  and  $O^{18}$  in the precipitation was analyzed from five meteorological stations from the Republic of Moldova in the period 2007 – 2015 years, which are in GNIP network. The analysis was made in Isotope Hydrology Laboratory of IAEA by stable isotope analyzer Pikarro2140i. The obtained results were compared with neighboring countries GNIP stations. The importance of stable isotope analysis of all water objects as precipitation, river and groundwater was demonstrated. Spatial and temporal variations of stable isotopes in

### Study area







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WQBTOR International Conference

"Environmental Trends in Freshwater and Marine Ecosystems in the Black Sea Basin"

September 8-11, 2020

## **WATER QUALITY OF THE MOUTH OF THE PRUT AND DANUBE RIVERS ACCORDING TO MICROBIOLOGICAL INDICES IN SPRING 2019**

*Igor Subemetskii, Maria Neeru, Elena Zubcor*

*Institute of Zoology, Chisinau, Republic of Moldova*



Microsoft PowerPoint interface showing a presentation slide. The slide title is "HCH and DDT residues in sediments from rivers in Moldova". Logos for the European Union and Black Sea are visible. The presenter's name and affiliation are listed as Anastasia Ivanova, Laboratory of Hydrobiology and Ecotoxicology, Institute of Zoology, Chișinău, Moldova.

NAVNA\_A\_PDFs in sediments Moldova Lucia\_Card\_2020 - Microsoft PowerPoint

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**HCH and DDT residues  
in sediments from rivers in Moldova**

Anastasia Ivanova  
Laboratory of Hydrobiology and  
Ecotoxicology  
Institute of Zoology, Chișinău,  
Moldova

Заметки к слайду





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## Monitoring of oligoelements in water ecosystems

Ciorba Petru

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