“Accurate measurements of Dissolved Oxygen, Phosphorus and Chlorophyll in several aquatic environments for the correct assessment of Biodiversity Monitoring”

Report

Regular Reporting on Subproject Progress

Reporting period: 1st Semester 2018

Report No: 04

Prepared by
Simone Fajardo
2018-06-08
Abbreviations

IBMETRO - Instituto de Metrología de Bolivia
INACAL - Instituto Nacional de Calidad - Perú
INEN - Servicio Ecuatoriano de Normalización - Ecuador
INTI - Instituto Nacional de Tecnología Industrial - Argentina
LATU - Laboratorio Tecnológico del Uruguay.
NMI - National Metrology Institute
CRM - Certified Reference Materials
RM - Reference Material
DO - Dissolved Oxigen
P - Phosphorus
SI - International System of Units
INM - Instituto Nacional de Metrología de Colombia
CENAN – Instituto Nacional de Metrología de México
INMETRO – Instituto Nacional de Metrología de Brasil
NRC - National Research Council
Content

1. Introduction ........................................................................................................................................4
2. Performed Activities .........................................................................................................................4
3. Implementation progress ................................................................................................................4
4. Adjustment required .......................................................................................................................5
5. Next Steps ........................................................................................................................................5
Annex ................................................................................................................................................5
1. **INTRODUCTION**

Measurement of Dissolved oxygen, Phosphorus and Chlorophyll A, in water bodies is an indispensable input when it comes to nature research from a hydrobiological, ecological or environmental protection point of view.

This project seeks to provide the necessary tools to improve the measurements of Dissolved oxygen, Phosphorus and Chlorophyll A in water bodies. In this way, the data produced by medium and long-term sensors will be comparable and traceable to the SI. This will be a solid basis for decision-making in environmental policies.

The actions taken based on these measurements directly affect the public, health, economic activity, as well as the growing and maintenance of aquatic ecosystems.

2. **PERFORMED ACTIVITIES**

This project is developed by five NMIs: LATU, INTI, INEN, IBMETRO and INACAL.

During 2018 first semester, four CENTRA meetings were hold.

The following main topics were defined:

- Required purchases of materials and reagents are in process in all the NMIs that are part of the sub-project. Once acquired, each NMIs will be able to validate the methodologies implemented.
- Information was developed for promotional material that will be used in the diffusion of the sub-projects, in printed flyers that can also be used in electronic media.
- Training in primary coulometry measurement system was carried out in January at INMETRO with the participation of INTI, INACAL, LATU and INM. This is an extra activity in the project plan. This necessity arose at the first face-to-face meeting, due to the need of several NMIs of the project to develop CRMs through this methodology, among them, potassium iodate, necessary for the calibration of dissolved oxygen sensors.

3. **IMPLEMENTATION PROGRESS**

Regarding the determination of dissolved oxygen, each NMI is currently in process of implementing/improving the volumetric or gravimetric Winkler method, based on the available equipment each NMI has available or was able to acquire.

Concerning to determination of phosphorus in river water, each NMI continues in process of implementation of the method, based on their available equipment, and those who already performed analysis will focus on improving the existing procedure.

In relation to determination of chlorophyll purity, the Quantitative Nuclear Magnetic Resonance (qNMR) training is confirmed in the National Research Council (NRC) in Canada. NRC has mentioned, that they could also offer training in chromatographic techniques coupled with mass spectrometry. However, date is still not established.

Additionally INTI confirmed training for determination of chlorophyll by spectrophotometry method for July 16-20 of 2018.
4. **ADJUSTMENT REQUIRED**

It was necessary to change the training date for the determination of chlorophyll purity at NRC and determination of chlorophyll by spectrophotometry method at INTI, due to problems in INTI.

Training in chlorophyll determination by spectrophotometry at INTI was coordinated for the month of March of this year, but due to problems in the institution, it was re-scheduled for the month of July. Due to internal policies in IBMETRO and INACAL they will not be able to attend this training.

On the other hand, training in purity determination to be carried out in NRC is still being coordinated, LATU and INTI will attend, because they have the required equipment to implement this method. In addition, to contribute to the development of this capability, other NMIs in the region will be invited, so that they will be able to strengthen their knowledge in purity determination. Besides, it will be necessary to assign reference value for RM, and a consensus of several laboratories can be obtained, which is extremely beneficial for the project. Furthermore, it is very important to strengthen the links between the NMIs in the region. The NMIs invited are: CENAM, INMETRO and INM.

5. **NEXT STEPS**

<table>
<thead>
<tr>
<th>What?</th>
<th>Who?</th>
<th>When?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement or improve P measurement method and validation</td>
<td>NMIs</td>
<td>November 2018</td>
</tr>
<tr>
<td>Implement DO measurement gravimetric or volumetric method and validation</td>
<td>NMIs</td>
<td>November 2018</td>
</tr>
<tr>
<td>Training in Chlorophyll A measurement method (determination by spectrophotometry)</td>
<td>NMIs</td>
<td>July 2018</td>
</tr>
<tr>
<td>Training in Chlorophyll A measurement method (determination of purity)</td>
<td>NMIs</td>
<td>August 2018</td>
</tr>
</tbody>
</table>

**ANNEX**

Updated Action Plan as annex