



June 2021

International Nutrient Inter-Comparison 2022: Newsletter #3

Keep up to date on the facts, plans and people involved with the International Nutrient Inter-Comparison voyage (INIV2022) scheduled for May 2022

INIV is an opportunity for global nutrient chemists to come together to gain first-hand knowledge and experience of measuring nutrients in the ocean.

The goal of this voyage is to enhance peer to peer communication while tackling a broader understanding of time-scale nutrient changes for the oceanographic community.

Across the voyage our focus will be on better understanding method variabilities that cannot be achieved with a standard proficiency study. We hope to answer questions and improve techniques that will be shared with the global community

Welcome

Welcome to the third INIV newsletter. This newsletter aims to provide monthly updates around the current and future activities for INIV 2022. In this newsletter, we pose a few questions around nutrient methods and previous comparisons. Not a nutrient chemist but still have thoughts on the questions – feel free to follow up as well. Read on to start the conversation!

Voyage Update

Recently the team has been putting together a daily schedule for the ship operations as well as mapping out the spaces that could be used by laboratories. With the large interest shown we are trying to

determine what will be the best spaces for instrument use. We have been looking closely at other laboratories that are available on RV Investigator.

There has also been interest locally from the nearby University expressing interest in ‘piggy-backing’ the voyage for some of their oceanographic biogeochemical research.

Planning Timeline

Now: Start official voyage planning with ship management

August 2021: Formal invitation letters for at-sea voyage participation and participant Q/A video session

September 2021: Information about going to sea on RV Investigator.

Questionnaire for required laboratory items while participating on RV Investigator

January 2022: Sea freight cut-off deadline

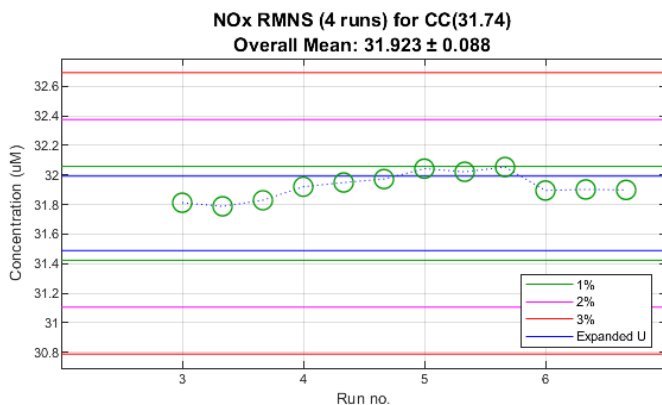
Complete Seagoing medical required for RV Investigator participation

Late April/Early May 2022: Window for shipping and airfreight to be received in Hobart, Tasmania

Certified Reference Material (CRM) for Seawater Nutrients

KANSO, in association with JAMSTEC, produce a nutrient CRM which comes ready to use in 100 mL bottles – [reference material for nutrients in seawater \(RMNS\)](#). The RMNS comes in various lots spanning a wide range of seawater nutrient concentrations. Certified nutrients are nitrate, nitrite, phosphate and silicate.

CSIRO Hydrochemistry aim to include at least one RMNS with each analysis, especially when measuring fresh nutrient samples at sea, as recommended by the [GO-SHIP Nutrient Manual](#) (Becker *et al*, 2020). Our workflow incorporates the RMNS as one of the key quality checks for measurement accuracy.



Example of RMNS measurements made across multiple analysis runs.

The metric bounds CSIRO Hydrochemistry implement are set at 1, 2 and 3% of the RMNS certified concentration (until these bounds are lower than our detection limit, at which point 1x, 2x, 3x MDL). The plot also shows the expanded uncertainty. Typically, we will expect that our analysis is within 1% of the RMNS certified concentration. If the measurements are beyond 3%, we will deem the analysis unacceptable and rerun samples when possible.

CSIRO Hydrochemistry publish all RMNS measurements with our nutrient datasets, which includes the run-by-run data. The final datasets are always uncorrected providing all the necessary QC for someone if they wish to correct.

There are multiple ways in which labs incorporate a CRM into their measurement workflow, including how the results are interpreted and acted upon. We would like to hear from you. **How does your lab use different CRMs?** If you would like to share please email us at iniv2022@csiro.au and we will include a roundup in the next newsletter.

A Rare At-Sea Inter-comparison

Perhaps most people have seen this intercomparison paper from 2019 by [McGrath, T. et al. A rare intercomparison of nutrient analysis at sea: lessons learned and recommendations to enhance comparability of open-ocean nutrient data.](#)

The paper focuses on the measurements made between two labs analysing samples in parallel along the GO-SHIP transect A02. Both laboratories used the same CFA instrument, but operated using their own standard procedures.

On this cruise significant differences were observed between the two laboratories despite using the same instrumentation. These differences were mostly observed in the lower concentration samples. For phosphate, there were up-to deviations of 10 percent.

Improvements between the measurements made by both labs were achieved by one laboratory adding additional low-end calibration standards. These calibration standards helped better characterise their lower-end measurements which is shown by the results in Table 7.

A final recommendation from the paper is that labs should consider the use of multiple calibration curves for better bracketing a wide range of samples. This is an interesting concept – something that not all analysts would agree with. Some would say there was an issue with the linearity of the chemistry.

I would be interested to hear other people's thoughts – email me at iniv2022@csiro.au

- Kendall

Funding

The 2021 SCAR visiting scholar scheme is now open for mid- to late-career stage scientists and academics (at least 5 years after completing their PhD). The scheme provides individuals awards of up to USD \$5000. The application closes on the 30th of August. For more information on eligibility and the application process visit <https://scar.org/awards/visiting-scholars/information/>

We have recently sent an email with potential funding sources you might be able to apply to help you with cost associated to the voyage. This list is not exhaustive, and we encourage you to keep looking at your universities, organisation, and local funding bodies. If you have any questions, would like to have this list resent to you, or have not received it reach out to Julie Janssens our Project funding Manager at Julie.janssens@csiro.au

Participant Bios



Name: Mariona Segura Noguera

Role: Research assistant

Organisation: Institute of Marine Sciences, Spanish National Research Council

Total days at sea: 110 in research vessels and several one-day monitoring trips in small boats.

Favourite voyage: My favourite voyage was as a PhD student to Antarctica with the project TEMPANO. I was running on board inorganic nutrient analysis using a Skalar, an old instrument that had been in cases during the previous 10 years. I spent some months putting it back together from scratch to get it ready for the cruise. Even though I was the first and the last person in the lab on the ship, I felt grateful and privileged every day for the opportunity to visit Antarctica, and also, after the cruise, Chile and Argentina. I have also warm memories of two cruises at the upwelling off the Oregon coast, with the project SUCCES, when I was a post-doc at Oregon State University working with Burke Hales.

On that occasion, I was running in situ continuous nutrient analysis in water pumped to the lab with a Sea Soar, while traveling along transects perpendicular to the coast. Coming from the oligotrophic Mediterranean Sea, I was in awe of the high nitrate concentrations brought along the upwelled water. Also, I got on board while I was pregnant, and our cheerful captain insisted to name my child after the ship, "Wecoma". We named her "Aloma", which is close enough.

What interest you the most about INIV? I am interested in participating at INIV because this is a unique opportunity to share tricks and tips about nutrient analysis with experts in the field. More specifically, I am interested to learn from other colleagues about the use of different reagents as a baseline in oligotrophic waters (i.e., for low nutrient concentrations), as well as the use of traceable standards. During my career as biogeochemist I have worked with a variety of spectrophotometric instruments for nutrient analysis: segmented-flow analyser (FIA) with discrete samples; high-frequency in situ analysis of nitrate and ammonium, also with a FIA; and Liquid Waveguide Capillary cell for the determination of different inorganic and organic nitrogen forms; in addition to low-level nitrate determination by chemoluminescence.



Name: Julie Janssens

Role: Senior Hydrochemist

Organisation: Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Total days at sea: 394 on various Research Vessels

Favourite voyage: If I really have to pick one, it would be my first trip to Antarctica during SIPEX-2 onboard the Aurora Australis. I will never forget the magic of seeing my first penguins, first ice bergs, first whale, aurora and pancake ice and bigger ice floe. This trip was part of my PhD and I was sampling the sea ice, brine and seawater for biogeochemical and trace metal analysis. I loved the challenge of sampling the sea ice and learning more about other projects onboard. I also loved experiencing the amazing community we form on long remote voyages.

What interest you the most about INIV? Meeting and learning from the larger nutrient community, and hopefully understand better why we have discrepancy between datasets.

Voyage Website

We have a website! Check it out for additional information about our voyage including voyage location, planning, getting involved, FAQ and more: <https://wp.csiro.au/iniv2022/>

Contact Us

Please feel free to reach out to the CSIRO Hydrochemistry team at any time during the planning process – iniv2022@csiro.au



RV Investigator on the SR03 transect line in late January 2018. This CTD deployment was at 57°S.

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For further information

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