

Request for Information in preparation of the tender Automated Specimen Sorter

Organisation: Naturalis Biodiversity Center

Date: 19 september 2024

Naturalis Biodiversity Center (*hereafter: Naturalis*)

Naturalis is one of the world's major natural history museums. Our collection is one of the best in terms of both scale and quality. The institute is a valued partner within the network of the 12 largest museums of natural history in Europe and America (Washington DC, New York, Chicago, Denver, Los Angeles, Toronto, Berlin, Paris, London, Copenhagen, Brussels, and Leiden) and a core member of the Consortium of European Taxonomic Facilities (CETAF).

Thanks to our collection, scientific expertise, and research facilities, we play an essential role in biodiversity research at both national and international level. We work with all of the Dutch research universities and several universities of applied sciences. Our contribution towards the academic landscape in the Netherlands is substantial, in the form of chairs, lectorates, supervision of PhD candidates, and BSc/ MSc education, but also through scientific conferences, a national research agenda, and subsidy programs.

At an international level, Naturalis is a leading institute when it comes to compiling and providing access to digital biodiversity information. Naturalis employees fulfill management roles within the Global Biodiversity Information Facility (GBIF), the Catalogue of Life (CoL), and the international Barcode of Life (iBOL) initiatives.

As the largest museum of natural history and one of the largest science-oriented museums in the Netherlands, we are an impactful national provider of educational and public activities. Our activities in this context include membership of the Foundation for Dutch Natural History Collections (SNNC) and the Association of Science Museums and Science Centers in the Netherlands (VSC). The building and the new exhibitions, as well as our online campaigns and activities, are rated highly by the public and our peers.

In 2020, all Naturalis facilities were housed in an entirely new museum building that we have developed, constructed, renovated, and brought into use over the last few years. We have built an open IT infrastructure for national biodiversity data services according to the latest standards, which is suitable for managing large flows of information and high-performance computing applications. Many new employees have found their feet within our organization. We have expanded and strengthened our relationships with our partners in the scientific community, the corporate sector, government bodies, and society.

eDentity: a national eDNA infrastructure

Naturalis is building a large-scale research infrastructure for biodiversity monitoring through environmental DNA. This will allow, for the first time, a near-real time view of the state of biodiversity in the Netherlands. The project is called eDentity, and should be available in 2028. This infrastructure was made possible by a €18.573.838 subsidy from the Applied Research Facilities funding program by the Ministry of Economic Affairs & Climate.

The eDentity infrastructure will allow for the analysis of large amounts of biological samples (soil, water, air filters, etc) through standard procedures. It aims to facilitate all steps of the analysis, from sampling to data analysis, quickly and at low cost, for a maximum of 250.000 eDNA metabarcoding samples per year. Besides setting up a metabarcoding facility, Naturalis will implement a process for large-scale automated sample sorting of community bulk samples, enabling identification of individual specimens in complex samples.

Automated sample processing

Sample triage and sorting limits both the assessment of community composition and building of reference databases because it currently relies on labour-intensive work by skilled persons. In marine benthic monitoring this can result in up to two years delay between sampling and reporting. An approach integrating image recognition and, where needed, additional techniques (e.g. X-ray, hyperspectral imaging, UV imaging, etc.) will make this process more efficient and allow identification of specimens that cannot immediately be linked to vouchers in the reference database. This component will be able to process a complete range of sample types, including: passive open trap samples (terrestrial), attractant trap samples (terrestrial), soil cores, marine samples, and aquatic samples. The biological specimens in these samples are sorted by size or other physical features and quantified. The different fractions of the sample then enter the DNA sequencing component. For macro-organisms, image recognition tools are used to separate known from unknown specimens. Representatives of the latter then enter the DNA pipeline for identification, while another subset is added to the specimen collections.

This contract

As part of the automated sample processing line Naturalis needs a system capable of sorting specimens (<2mm) in liquid. The system must meet the following requirements:

1. The system is capable of analyzing and sorting particles with a size of at least 1.5 mm (larger, up to 2.5 mm is nice-to-have);
2. The system analyzes particles based on shape, irradiation (laser wavelength spectrum organic/inorganic) or other properties;
3. The system is capable of dispensing into 96-wells (flat bottom) plates and tubes with a diameter of maximum 10 mm;
4. During the sorting process particles must remain completely intact.

Reason for the tendering procedure

Naturalis needs a system to automatically sort specimens (<2mm) in liquid. The contract includes the turnkey delivery of the system, and necessary supplies (e.g. flowcells), support, and maintenance for a period of 4-5 years and possibly longer.

Purpose of this request for information

The purpose of this request for information is:

- To find out which parties potentially are interested in the tendering procedure and the contract;
- To ensure that the tender is well aligned with the interests of the tenderers;
- To collect suggestions from potentially interested parties on possible adjustments for the tendering procedure and the contract.

Questions

Please answer the following questions:

1. Would you be interested in submitting a proposal for the aforementioned contract?
2. Are there concerns that Naturalis should consider when purchasing such a system? If so, please list them accordingly.
3. Do you have any comments or suggestions for improvement of the tendering procedure or the contract? If so, please list them accordingly.

Application

Interested companies are invited to send an expression of interest to Naturalis, by sending an e-mail to thomas.vanoudheusden@naturalis.nl. Please state the name of the contact person of your company and his or her e-mail address.

Follow-up

After processing the information collected with this RfI Naturalis will determine how to proceed with tendering this contract. Interested parties will be invited to participate in the follow-up process via TenderNed (www.tenderned.nl).

Naturalis can use the information collected as a result of this request for information when revising the contract. Candidates should note that information they provide in the context of this request for information may be made public (albeit in anonymised form).

Time schedule follow-up

At this moment it is not yet clear what the time schedule for the tendering procedure will be but Naturalis will inform all the participants to this procedure directly about the proceedings.

Deadline

The deadline for responding to this request for information is set at **4 October 2024, at 13:00h CEST**

Yours sincerely,

Thomas van Oudheusden
Procurement consultant
Naturalis Biodiversity Center