Newsletter
01/2014

CzechGlobe
Global Change Research Centre AS CR, v. v. i.

CZECHGLOBE ANNOUNCES "ACCOMPLISHED"

The thing which we had been impatiently waiting for and which seemed as the sound of far future this time four years ago when negotiation meetings on the CzechGlobe project were held, has now finally become reality. The Centre of Excellence CzechGlobe was inaugurated.

This was possible owing to the fact that the Laboratory Pavilion, which is the most important building of the developing Centre – not only in terms of the volume of investments, was successfully opened in the existing premises of GCRC in Brno.

Not only was the Laboratory Pavilion the most financially demanding part of the project, but certainly the most awaited. In addition to the fact that there are all laboratories for environmental metabolomics and isotope analyses, a cluster of growth chambers and other specific equipment, such as a technological test-room, a darkroom for remote sensing and a greenhouse, thirty scientists, students and laboratory assistants, mostly hired for the resolution of the CzechGlobe project in new scopes of science, found their work places here. Those staff members had been temporarily thronging in the two existing pavilions of the premises in Bělidla street.

The anticipated „D-Day" was Tuesday 29th April 2014. The CzechGlobe Grand opening ceremony was attended by a hundred of invited guests including the President of the Academy of Sciences Prof. Drahoš, representatives of the Academy of Sciences of the Czech Republic, foreign infrastructures ICOS and NOAA, Ministry of Education, Youth and Sports, universities and the government. The representatives of embassies in countries CzechGlobe has its scientists in also arrived. The festive atmosphere of the event was also enhanced by the presence of the Chairman of the Scientific Council of CzechGlobe, prof. Linder, and particularly by Ms. Margaret Jarvis from Edinburgh - wife of the late prof. Paul Jarvis, after whom the new Laboratory Pavilion was named and in whose honor a memorial plaque was unveiled. Prof. Jarvis was a significant person in terms of world plant ecophysiology with a very warm relationship to the Czech Republic. It was he who started and directed the ecophysiology research towards the global changes and contributed to the GCRC's integration into the European research community. Therefore, without any exaggeration, he can be considered as an honorary father of CzechGlobe. The Grand opening, which was conceived as a garden party, was held in a relaxed atmosphere, which was induced by the event moderator, Ondřej Vetchý, and, after the official part ended, by Dixieland musical accompaniment as well.

Well, one significant chapter of CzechGlobe was concluded. The infrastructure is almost complete and a lot of people, including the

scientists, will heave a sigh of relief. On the one hand, they are going to have more time for their scientific work and they are going to use top equipment, on the other hand, they will be exposed to the harsh reality that top science costs big money, and this money will have to be "earned" through their projects. Let's cross our fingers, and let's hope that time will tell that the path that was embarked upon was the right one, and that they will prosper when walking it. Anyway, more on this topic can be found in an interview with Professor Marek inside the Newsletter.

-mš-

WE ARE INTRODUCING THE CZECHGLOBE RESEARCH INFRASTRUCTURE

WE WERE GIVEN A GREAT OPPORTUNITY

At this point of the Newsletter we usually present individual CzechGlobe departments and we interview their heads. Today we are going to make an exception, and with regard to the completion of construction and the official opening of the research infrastructure CzechGlobe, we are going to talk to the director of the Global Change Research Centre as well as the coordinator of the CzechGlobe project, Professor Michal V. Marek.

Mr. Director, recently you have inaugurated a new Center of Excellence CzechGlobe. Do you feel relieved?
I'm sure we all feel relieved as it has been three years full of quite challenging work when we were building the research infrastructure. This was a new type of project, so we had to learn to cope with a lot of new things. Even the preparation of the project itself was rather challenging because, if I'm not mistaken, the final project documentation, which we were supposed to hand in, was about two thousand pages long. As far as the actual implementation of the project is concerned, we all were involved. The tasks were divided among all of us, so I guess that all of us felt relieved. We successfully finished the construction of the pavilion and carried out tenders for both small and large investment projects. I consider it remarkable success that we went through all the selection procedures with almost no hiccup. Last but not least, we managed to constitute new subject fields. So I can proudly say YES - we heaved a sigh of relief, but we did it with enthusiasm, because we now have available, in terms of equipment, a truly top modern institute. I think the philosophy of the institute is very promising and progressive. I am convinced that the global change (GC) is still going to be a major problem of humanity that needs to be addressed. We have a new talented team and we are going to keep moving on.

Were there any "critical situations" during the implementation phase of the project? Times when you thought you could not handle it? What I mean is the complex bureaucracy primarily ...
Yes, such situations arose twice. First it was a problem regarding obtaining a building permit, when it turned out that there was an underground sewer we had not known about on the plot of land the building was supposed to stand on. The second issue concerned a tender for a special aircraft sensor. The critical moment came when the selection procedure was „thwarted". Then you have no other choice but to cancel the whole tender and call a new one. The terms of operational programmes are really very strict.

Anyway, let's get back to the very beginning. What was the impetus that made you aspire after the Structural Funds project?
I think, with no exaggeration, that CzechGlobe is a child of European projects. I like reminding people that our group has been addressing European projects dealing with the issue of the carbon cycle and the GC since 1991. We also belong among the direct foundation institutions of European infrastructure ICOS within the ESFRI programme. Thus, the general impulse was our experience with European projects, with how they are solved and administered, and our membership in the „club" of people in Europe dealing with the GC. The precise impulse came when people around us started to encourage us. At that time, we were the coordinators of the national integrated projects CzechCarbo and CzechTerra, which were carried out within the R & D programme of the Ministry of the Environment of the CR. Already at this point we managed to put together teams from other institutions that dealt with the given issue. This means that we did not begin from scratch, whereas we used what we had known and had been able to, we just put together new teams and broadened the whole idea. Nevertheless, perhaps the most important and decisive factor was our experience from European projects, which gave us the necessary confidence.

And wasn't it also in consequence of public knowledge saying that those who will not have a Structural Funds project are going to be poor?
You know, when you are supposed to be in charge of an institution, you just need to think for the future. It is true that initially the RDI programme was immensely complicated and unclear and the information around it was really foggy. I remember that originally it was only about huge projects with a budget of over one billion Crowns and nothing less was acceptable. In this way, the programme was de facto closed for us. Therefore, when new information regarding funding opportunities for smaller projects appeared, it started to be very interesting for us and we grabbed the opportunity instantly. Primarily, that is right, to ensure the institution's funding. At first, it had not occurred to us what we will eventually create.

How demanding was the preparation of the project? And is it even possible to compare such a project to standard projects that you were used to writing?
I think it cannot be compared to anything else because it's a completely different type of project, and I also think that it cost me and my „Magnificent Seven" - colleagues who prepared the project with me - a few months of our lives. It was extremely complicated and sometimes even frustrating.

When writing the project, you had to deviate from the original focus of the Institute and had to include entirely new subject fields. Weren't you worried or doubtful whether you will be able to establish new teams in relatively short time and whether they will be strong enough to strive in the tough competition?
I think, initially, we might have felt a bit scared. On the other hand, during the implementation of the project, we believed the idea of CzechGlobe so much and we became so enthusiastic that we, including our new colleagues, were full of passion, and we had not even considered possible failure or uncertainty. In addition to that, our experience with coordinating the projects CzechCarbo and CzechTerra in recent years had helped us find fellow colleagues who had been dealing with the issues of global change and they were willing to go for it from the very beginning. What we were more worried about was the competition itself and if we were able to succeed. After all, it was tough and challenging two-stage evaluation, so there was some kind of nervousness there. However, regarding worries about our ability to build quality teams, I can say NO with confidence. Such concerns were simply not accepted.
You also mentioned a deviation from the original focus of the Institute, but in fact, GC has been one of fundamental subject fields of the Institute for the last 10 years at least, so actually we just significantly strengthened it.

Is there a „part" of CzechGlobe you are particularly proud of?

Of course I am very satisfied with some particularly young teams which, despite initial worries, have been developing very promisingly. But I just cannot and I do not want to favor anyone.
As for the overall composition of CzechGlobe team, I would like to point out that one thing completely changed and consequently the current situation is totally different. 5 years ago there were about 30 people dealing with the GC issues, today we have almost 300 people here. We have become a large institution, so we spent a lot of time working out the daily management of such an institution, which brought in new problems and new challenges. On the other hand, I think that we succeeded in rooting the idea of CzechGlobe here and all the employees are trying to participate in its successful running. It's not just a Mr. director's idea. I think we succeeded in that and I am really pleased with it. As for the newly formed teams, we plunged into completely new areas – randomly I can name environmental metabolomics or molecular biology in adaptation biotechnologies. In those cases, we were skating on thin ice, and additionally, these departments are based on utterly young people. Fortunately, everything went well and these teams are very progressive. Overall, I feel that all CzechGlobe employees know exactly what they want, and they are well aware that we were given a great opportunity and if we fail, it will be purely our fault. With this in mind, we set out for our goals. It might sound too buskined perhaps, but it's true.

At the same time, as the Grand opening of CzechGlobe was held, International Science Advisory Board (SAB) of CzechGlobe, which is composed of renowned experts, took place. What is its contribution, for instance, for scientific directions of the Institute or for the development of managerial competencies?
International Science Advisory Board is really beneficial for us since we managed to get on board some very interesting people who understand the field well. At this point it is necessary to consider two aspects, though. If we talk about scientific directions - following purely scientific lines, the benefit here is undoubtedly excellent. Not only does it bring interesting impulses, but also something that we had hoped to, which is access to interesting new contacts, project challenges, and other things through the SAB members. For example our cooperation with American networks NEON or NOAA is to a large extent the result of the Science Advisory Board influence. Regarding the contribution of SAB in terms of management, I feel a bit hesitant. Don't get me wrong, I do not want to sound cocky. Members of the SAB are indeed renowned scientists, but none of them has had experience of managing such a large organization, such a large multidisciplinary institute. Sometimes they ask me questions like „why biodiversity?", „why the human dimension?". So in terms of

scientific questions we always agree, but as far as management is concerned, it is not as good. In addition to that, it gets further complicated by the fact that the operation of CzechGlobe must abide by the laws that apply in the Czech Republic, for example, the Act on Public Research Institutions. This is something the foreign members have absolutely no idea about. Therefore these discussions can be difficult. I do not want to say that we come into conflict, but they just do not understand certain things and do not possess the experience of it. It has to do again with the new dimension we have got to so far. SAB members do perceive that we are a large dynamically growing and excellently equipped institution. However, in the daily management its members cannot help me much. On the other hand, this is something I did not expect anyway. I will be very glad if it helps us keep the scientific direction, look for new challenges and if it helps us with demanding and objective evaluation. However, as far as management is concerned, we will simply have to cope ourselves. It is true that we try to gather experience and information everywhere we can, for example by organizing courses and seminars in the areas of management and soft skills within the EUPRO or ECOP programmes, which we solve here. However it is still a novelty issue for us and SAB, objectively, won't help us much.

Well, we have got to the end again. One chapter is over. What comes next? How are you going to secure the Institute for the next period?
Currently we have completed and submitted a project of the National Sustainability Programme. It was quite a challenging job again. If we succeed, the basic operation of the Institute should be secured for the immediate future at least. We are trying to ensure sustainability through active participation in programmes of international cooperation, such as ESFRI, and we are about to enter the Horizon 2020 projects quite vigorously as well. Furthermore, in connection with operational programmes, we are trying to establish contacts with other ministries than just the Ministry of Education, Youth and Sports, where we are still using the support from RDI OP and ECOP. Last but not least, I must not forget the significant support the Academy of Sciences gives us. Hence, if we are able to make use of all these resources, CzechGlobe could work without any problems.

A FEW DATES AND FIGURES ON THE CZECHGLOBE PROJECT

Key milestones of the CzechGlobe project
29th November 2010 - signature of the decision on the provision of grant
1st December 2010 - start of the CzechGlobe project
29th March 2013 – signature of the purchase agreement on the purchase of the aircraft Cessna 208B Grand Caravan – the heart of the Airborne Laboratory of Remote Sensing
17th June 2013 - the opening and launch of operation of the Atmospheric station at Křešín near Pacov
12th July 2013 - the opening of prof. Nátr's experimental station of plant ecophysiology as well as the training and demonstration center in Domanínek
29th April 2014 – Grand opening of CzechGlobe and the opening of P.G. Jarvis Laboratory Pavilion
31st December 2014 - end of funding

Project Statistics
Total project expenditure 848,729,256 CZK
Total eligible expenditure funded from grants 645,443,366.98 CZK
Construction investments – 114,223,578.98 CZK
Instrumentation investments – 387,190,190 CZK

Number of announced tenders - 115
Number of research domains - 5
Number of research teams - 16
Number of employees - 270
Number of researchers - 152
Number of PhD students - 47

GLOBAL CHANGE AFFECTS MIGRATION OF INVASIVE SPECIES ACROSS THE NORTH POLE

GOT OUR ATTENTION

Whitman A. Miller and Gregory M. Ruiz

One of the ways people have been long and significantly affecting the migration of diverse species, is shipping. In the past, several major shipping routes and ports which significantly increase the risk of the introduction of non-native marine species into new habitats were already identified. The Global change creates additional risks, and biologists Whitman Miller and Gregory Ruiz of the Smithsonian Institute have identified new ways how invasive species can further be dispersing.

Commercial ships have always been the main means which unintentionally spread non-native marine species into new areas. Living organisms are transmitted mainly in tanks and on ship hulls. It is well known that two of the busiest marine canals, the Suez and Panama, affected the transfer of organisms significantly and are responsible for many biological invasions in the past. Those were both ship-mediated transport and natural dispersal.

For the first time in two million years, the rapidly melting ice in the Arctic connects the North Pacific and the North Atlantic oceans. This increases the possibility of migration by both natural and anthropogenic means. Specifically, two main routes in the Arctic have been opened: Northwest Passage along the coast of Canada and the Northeast Passage (known as the northern sea route), approximately 3,000-mile-long journey along the coast of Russia and Norway connecting the Barents and Bering seas. Shipping in this area is increasing rapidly at the speed of 20% a year. In 2013, 71 vessels sailed through the northern route, while in 2009 that was only 2 vessels. If this growth should continue, by 2040 the number of vessels authorized to sail through the Arctic via the northern route alone would rise to 5,600 per year.

The impacts will be both local and global. This fundamental change in the use of trade routes is going to change the dynamics in which life disperses in the sea, and is going to affect their transfer, establishment of new colonies and the impacts of these invasions. During long trips from northern waters through warmer water, most organisms from the cold north were killed or at least significantly weakened. However, in the context of transport through the Arctic, this protective mechanism does not work and the path is incomparably shorter.

Arctic ecosystems are still relatively intact and there is yet enough time to protect them effectively in order to prevent the worst scenario to unfold, which would consist in uncontrolled disperse of invasive species and adverse environmental and health problems, the authors claim.

Arctic shipping and marine invaders, Nature Climate Change, 28th May 2014.

WHAT´S NEW

Professor Marek was appointed a member of the Royal Swedish Academy

Swedish King Carl XVI Gustav awarded Professor Michal Marek a decree appointing him a member of the Royal Swedish Academy of Agriculture and Forestry at a ceremony in Stockholm on 28th January 2014.

Launch of Open access

On 26th February 2014 CzechGlobe on its website announced a call for proposals of projects enabling them to use the CzechGlobe research facilities in the form of „open access“. This open access offer applies to the Atmospheric station at Křešín near Pacov.

Workshop of the InterSucho project

GCRC, together with the Mendel University in Brno, held an international workshop of the InterSucho project on the topic of „Remote sensing tools in drought monitoring“ from 26th to 28th February 2014. High quality of the event was evidenced by the participation of four key lecturers from U.S. research institutions and a number of other foreign contributors.

GCRC researchers publish in the Nature Climate Change journal

Doc. Trnka and prof. Žalud, researchers at the GCRC and Mendel University in Brno, achieved significant success on 26th May 2014. The prestigious journal Nature Climate Change published the results of an international study analyzing the changes in the frequency of major meteorological extreme occurrence that fundamentally affect field crop yield. This can lead to an extensive modification of the agrarian market in Europe.

Newsletter CzechGlobe

Issue V., number 1/2014

Published by: Global Change Research Centre AS CR, v. v. i., Bělidla 4a, 603 00 Brno, tel.: +420 511 192 211

centrum@czechglobe.cz, www.czechglobe.cz

Design, layout and print by: Studio Palec, www.palec.net

Photo credits: Publisher's Archive, S. Kyselová, 123rf.com