

Evaluation of research and professional activity of research-oriented institutes of the Czech Academy of Sciences for the period 2015–2019

Summary Final Report

Name of the Institute: Global Change Research Institute of the CAS, v. v. i.

Evaluated teams and their leaders:

1. Climate Analysis and Modelling (Miroslav Trnka)
2. Environmental Effects on Ecosystems (Otmar Urban)
3. Human Dimensions of Global Change Impacts (Dava Vačkářů)

Part A: Evaluation of the institute

Overall evaluation of the institute elaborated in agreement of all commissions' chairs, who evaluated the institute.

Strengths:

The institute presents a smaller team and two very large teams which conduct internationally recognized research and generated many highly significant scientific results. Their research addresses pressing issues of high societal importance. The institute participates in successful international research infrastructures. Their multidisciplinary approaches employ a broad spectrum of state-of-the-art equipment and modern methods including work in ecosystem stations, other experimental facilities and analytical laboratories in the Institute. The institute has gradually expanded its personnel structure with a number of respected senior Czech and foreign scientists and on the other hand with a large number of young junior scientists and postdocs.

They practice an open access to their infrastructure that is widely used by many researchers from all around the world and is of high interest for other local and foreign institutions and universities

Weaknesses:

Their work occurs at a high scientific level with strong work commitment. Studies also take place in extreme climatic conditions placing a high demand on the professional level, mental resilience and health of employees. The open system of work organization is an opportunity for flexible cooperation according to current tasks, but on the other hand this dynamic organisation makes it difficult to evaluate smaller groups and individuals in an extramural evaluation. The low Czech staff salaries compromise the competitiveness with foreign research organisations and employers, e.g. with neighbouring countries.

Opportunities:

Despite extensive cooperation at the national level, there is still space for cooperation with scientific groups in other CAS institutes. Realization of this opportunity should increase the integration and cooperation with thematically similar teams and could enhance the visibility of Czech research in the field even more.

Threats:

The development and commitment of the team is astonishing, but rapid, which brings the danger of not maintaining the entire system. This issue not only concerns the resources for maintenance but also the associated load with too many administrative duties, e.g. the need for additional grants and a number of meetings.

The existence of the institute is still young and evolving, care must be taken to maintain the current level. The rapid growth and the currently high scientific productivity may be threatened by burnout of current staff and exhaustion after initial enthusiasm. The team leadership and work-life-balance need attention. Incentives for high quality publications should be accompanied by measures to assure good scientific practices.

The field of global change research develops very fast and the changes in ecosystem functions might be much faster than the development of possible adaptation strategies.

Main criterion: 1. Quality of results (H1.1-H1.5)

H1.1	Quality of selected outputs of Phase I
In the Global Change Institute, three teams were evaluated in phase I, two in the group of other natural sciences, one in social sciences. 84, 103 and 11 outputs, respectively, were evaluated. Of these, 67.9%, 57.2% and 81.8%, respectively, were rated as world leading or internationally excellent (category 1 and 2). This indicates the high quality of the evaluated outputs. The average rating of teams is above the average of the given scientific areas.	
H1.2	Contribution of workers on the outputs reached
The contribution of the staff of the institute to these outputs is large, although most of the publications were created in wider cooperation. Nevertheless, the staff of the institute often holds the position as reprint authors.	
H1.3	Quality of all outputs and results
During the period under review, a large number of outputs was produced (411, 425, 65). A high percentage of the output was placed in the first decile or quartile and together with the second quartile made up the majority of publications. The difference compared to the scientific teams of other institutions is evident, among other points, by the fact that they were evaluated in groups of other natural sciences or other social sciences, in which there were no teams of other institutions.	
H1.4	The most valuable discoveries and findings in the fields, their importance for the field
The main mission of CzechGlobe deals with three basic thematic segments of climate change, namely atmosphere - ecosystems - human society. Thereby, CzechGlobe significantly contributes to knowledge gain needed for solving one of the main current challenges for civilization by developing adaptation and mitigation strategies. It is very difficult to specify the most valuable research results, because the scope of the institution and the number of outputs produced is enormous. CzechGlobe provides answers to issues related to climate change impacts, mitigation and adaptation, such as information on, (1) understanding of climate change causes and related processes, (2) monitoring of the changing state of ecosystems, landscapes and society, (3) analysis of the real impact of ongoing climate change on ecosystem services, and (4) implications for the sustainability of socio-economic systems, (5) understanding the mechanisms of responses and the resilience of ecosystems to changing environmental conditions, (6) searching for new ways to involve stakeholders in the development of innovative climate mitigation and adaptation actions in the co-creation process, and (7) development of systems for the educating or informing the decision-makers and the society in the field of perception of climate change. The most significant results have been published in leading journals in the field.	
H1.5	Contribution of the participation of the authors in large collaborations
CzechGlobe collaborates with many international partners from all around the world on both research and application level. As a member of the international research net ESFRI CzechGlobe participates in various international scientific networks, e.g. the long-term monitoring of greenhouse gasses and carbon cycle within ICOS (Integrated Carbon Observation System) or observations of ecosystems within ESFRI AnaEE (analysis and experimentation in ecosystems).	

Main criterion: 2. Societal relevance (H2.1-H2.5)

H2.1	Societal relevance of outputs and results pursuant to CAS and institute mission
The institute was established in response to the strong societal demand for better understanding the global climate change and its impact on various aspects of the environment. With this regard a high societal relevance of outputs is given. Its position is unique and in many ways different from other CAS institutions. The institute and the team go beyond the general mission of the institutes of the CAS, but its societal significance is indisputable.	
H2.2	System functionality for knowledge transfer into practise, its usefulness for society. The impact of the institute's activity on proper practice in society in the area of social sciences and humanities
Global change is a serious societal problem requiring the immediate transfer of scientific knowledge into practice. The institute applies an integrative approach with involvement of stakeholders for efficient development of innovative climate mitigation and adaptation actions, open access to the results of their research, the production of websites and software, assistance to developing countries, etc. Their broad focus covers problems of both natural and societal dimensions.	
H2.3	Relation to practice
The institute produced a number of outputs with practical application. The target groups cover a wide range of users from the agricultural and forestry sectors to decision-making public administration bodies. The outputs of the CzechGlobe LRIs research activities were used for strategic decision-making e.g. by the Ministry of Agriculture, Ministry of the Environment and Ministry for Regional Development. Some of these outputs are as follows: More than 1 000 agricultural and forestry operators were involved in the development of monitoring and forecasting of drought and climate change, long-term research cooperation with industrial partners in the field of management of sustainable energy supply using the operational numerical weather forecasts, export of know-how to developing countries resulting in newly established scientific teams with ecosystem monitoring stations in Vietnam and Ghana, and a biodiversity research station in Columbia. They also participated in the development of various software applications for climate monitoring and the use of results in various practical situations.	
H2.4	Participation in AV21 strategy
CzechGlobe participates in various activities of the Strategy AV21, namely: Research program efficient energy conversion and storage, Natural threat research program, Research program water for life, Research program protection and restoration of the landscape, Research program the city as a laboratory of change; buildings, cultural heritage and environment for a safe and value life. The most important participation in research programmes of Strategy AV21 likely is the project Drought monitoring and forecasting in the Czech Republic.	
H2.5	Cooperation with regions of the Czech Republic
The institute conducted a number of applied research projects focusing on local issues, e.g. the consortium SUWAC (Sustainability water adaptation climate change), the project on carbon balance of the urban ecosystem, a comprehensive approach for monitoring and mitigating the effects of drought in the region of South Moravia, the project LIFE Tree Check, the project UrbanAdapt for urban adaptation to climate change and the development of the methodology LTSEr defining elementary options and procedures of a	

long-term socio-ecologic research (LTSER) in biosphere reserves in the CR. The teams cooperate with local authorities and municipalities to implement the results.

Further criterion: 1. Position in international and national context (D1.1-D1.3)

D1.1	Comparison of the teams and the institute with similar international and national institutes
CzechGlobe is an internationally recognized scientific research unit. It is unique in its complex approach to problem solving and its broad professionalism. There are not many similar institutions abroad in this regard. At the national level, it is unique and has no comparison with any similar scientific institution. The strength is provided among others by the methodological background of both analytical laboratory equipment and an extensive network of measuring stations in the field and a high scientific level of achievements.	
D1.2	Scope and quality of international and national cooperation and the role of the institute in such cooperation; engagement in broad international cooperation
CzechGlobe collaborates with hundreds of international partners from all around the world and with all types of research organisations, universities, companies, international organisations, public service and municipalities. Many vivid and important long-term R&D cooperation agreements were signed by CzechGlobe with international partners. Thanks to interdisciplinary research using modern techniques and research infrastructure, CzechGlobe is a sought-after partner in European research infrastructures. Members from CzechGlobe performed long-term research stays abroad and they have various research visits from abroad. CzechGlobe is also unique in international long-term collaboration with local partners from developing countries.	
D1.3	Participation of the workers in scientific community activities (organizing of conferences and workshops, invited lectures, awards)
More than sixty conferences and workshops, the majority of which were international, were organised and co-organised by CzechGlobe. Researchers gave many invited lectures (10 of them with high importance). They received various awards, especially awards for young scientists.	

Further criterion: 2. Vitality, sustainability and strategy (D2.1-D2.9)

D2.1	Direction in line with the perspective of the planned research directions
The team fulfils its mission in terms of methodology, science and application. Individual teams and the institute as a whole fulfil their main mission and individual directions, such as climate change, the impact of change on ecosystems and society. The main focus is directed toward the influence of climate change on biology.	
D2.2	Assessment of the previous research objectives and their achievement
The institution has a young history so far. The largest proportion of its research activities, with an increasing tendency, was achieved in this evaluated period, so it is not appropriate to consider any change in the direction of research.	

D2.3	Assessment of implementation of recommendations from past evaluation
See above: the conclusions from the last evaluation were to complete the construction of the institute and to fully launch all activities, develop the methodological basis and fulfil all the identified areas of research. These goals were successfully implemented and reached.	
D2.4	Success in receiving grants
CzechGlobe was very successful in obtaining grants, both from national and international funding sources, and as such is self-sufficient in obtaining funding for its activities. However, it should be noted that in the past period, especially in the early years, they have received non-standard institutional support at a high level for the establishment of all activities and the successful start of their scientific work.	
D2.5	Adequacy of instrumental equipment
They have state-of-the-art equipment and facilities for experimentation, observational research, biochemical and physiological analyses and remote sensing including ecostation and other field experimental facilities. The methodological base includes top instrumentation.	
D2.6	Effectiveness of management
The institute is run by strong scientific personalities headed by a director. In addition to the regular bodies (Board of the Institution, Supervisory Board), the international Scientific Advisory Board probably plays an important role in setting key directions and tasks. The institute is structured in departments, within the evaluation it was divided into only three large teams, so the effectiveness of management is somewhat difficult to assess. In fact, the structure is probably variable depending on the solution of individual scientific assignments.	
D2.7	Assessment of professional structure, development strategy and the strategy of keeping best scientists, age structure, career and qualification growth
The scientific structure is very good, balanced in terms of scientific capacity, age and international composition. Experienced senior researchers are sufficiently represented in it, the ratio of Czechs and foreigners is 13: 2, for scientists 48: 18. Scientists from more than 25 countries from around the world now work at CzechGlobe. Almost 80% of employees are under the age of 50. Adequate HR policy is given great attention with a focus on finding scientific capacities or recruitment and motivating junior researchers and postgraduate students for the work in the institute. Work performance, creative work and staff results, are regularly assessed by the attestation (evaluation) procedure according to the career rules of CAS and CzechGlobe. Successful long-term support for the development of human resources at the institute was underlined by the successful certification of HR Excellence in Research Award awarded by the European Commission based on the evaluation of the HR policy of the workplace.	
D2.8	Creating work-life balance conditions, assessment of approach towards possible gender issues
Great attention is paid to establish good work-life balance conditions. A toolkit was made for national and international researchers to know what to do and whom to ask for help with the most common challenges they might face in their career. CzechGlobe work-life balance measures include among others: flexible working hours; part-time work, extra week of holidays, possibility to work in home office etc. CzechGlobe events reflect personal and family life of being a friendly workplace; holding joint cultural, sport and social events, language courses including Czech language course for international colleagues; help with	

movement to the Czech Republic for newly-recruited international employees and related administrative issues and socialisation etc. The report did not state how they deal with gender balance, but men significantly predominate in science leading and management positions.	
D2.9	Relation of the institute with regard to the integration, development and sustainability of the research centre funded by the National Programme of Sustainability II.
Data not available	

Further criterion: 3. Cooperation with universities and participation in education (D3.1-D3.6)

D3.1	Scope of cooperation with universities on national and international level
There is intensive collaboration with national universities in the form of joint scientific projects and accredited Ph.D. programmes. The main partners are Mendel University, Masaryk University in Brno, University of South Bohemia in České Budějovice, University of Jan Evangelista Purkyně in Ústí nad Labem. There also exists extensive international cooperation with universities abroad with which there are a number of joint scientific projects.	
D3.2	Effectiveness of joint research centres
The joint science centres are mainly at the national level: MendelGlobe Centre - Climate change and managed ecosystems (MendelGlobe). The Centre for Tropical Biology (with Biology Centre CAS, Charles University and University of South Bohemia) is focused on integration of tropical ecological and evolutionary research. The institute was instrumental in founding some international centres for cooperation with universities in third countries such as the ecosystem stations in Vietnam and Ghana.	
D3.3	Success rate in supervision of PhD students
The education of postgraduate students plays an important role: 69 students were led in the evaluated period, 44 of them successfully completed Ph.D.	
D3.4	Participation of PhD students in the outputs
The long-term share of PhD students in impacted publication outputs is about 15 %.	
D3.5	Participation of the institute in master or bachelor studies
Members of the institution supervised 61 bachelor and 49 master theses, 38 and 41, respectively, of which were successfully completed.	
D3.6	Assessment of cooperation intensity with universities in the form of teaching
The pedagogical activity of the staff is extensive. They teach in many courses at ten Czech universities, and also in nine universities abroad. In addition to the transfer of knowledge between the institution and universities, it is also one of the ways to attract talented students to work in the institution.	

Further criterion: 4. Outreach activities (D4.1-D4.3)

D4.1	Sufficiency of media strategy and activities in the area of research popularisation
<p>The CzechGlobe PR team is part of the institute and closely collaborates with the Centre of Administration and Operations of the CAS in some activities. The media and outreach activities are based on CzechGlobe communication and marketing strategy. The scientists are often invited for interviews (newspapers, radio, TV) on current topics related to climate change effects on forests, agriculture, soil conditions, and/or biodiversity. The members of the institute realized more than 200 sessions in one year. CzechGlobe provides and coordinates various on-line portals and databases that are daily quoted by mass media and that are visited by wide range of users (e.g. in 2019 „Intersucho“ – Interdrought portal visited more than half million viewers). The members of the Institute also organize lectures for the professional and general public, present their work to children and high school students and organize series of professional excursion at ecosystem stations and laboratories</p>	
D4.2	Publishing activities and its quality
<p>The basis is publishing in scientific journals, they publish 150 - 180 papers a year in IF journals. But the CzechGlobe scientists are also authors or authors participate in professional books and study textbooks. The book „Historie počasí a podnebí v českých zemích ... Sucho v českých zemích“ (History of weather and climate in the Czech Lands. Droughts in the Czech Lands) with most authors from CzechGlobe (including the first author Prof. Brázdil) was awarded the Josef Hlávka Award in 2016, in the field of scientific literature. They also participated as authors in over 70 scientific monographies and numerous (150+) conference proceedings.</p>	
D4.3	Participation in professional organisations in the area of research and development
<p>Team members are involved in more than 20 international and more than 30 national scientific commissions, they participate in editorial boards of various highly-impacted journals, serve as members of evaluation commissions of Czech and international grant agencies and members of national and international scientific societies.</p>	

Other comments of the commission:

The CzechGlobe institute was successfully established as an internationally competitive and highly visible research centre and currently undergoes consolidation with still increasing output. The presentation as large teams did not allow for detailed assessment of the performance of individual smaller teams. For this reason, it is not possible to recommend any change in funding at present. Future evaluation exercises must consider smaller functional units for two reasons, to adequately understand productivity in the institute and to compare the teams in CzechGlobe with teams in other CAS institutes.

Part B: Evaluation of teams

1. Climate Analysis and Modelling

Strengths:

Using large investments, the team established its standing and reputation and became well integrated as part of the European climate research infrastructure over the last five years. Team 1 remained focused on modelling key processes related to climate change. Its high competency is obvious in a number of areas within this field. The team shows a remarkable ability to turn research results in practically usable “products”. The team has been very successful in securing research funding. The team has a healthy age profile with a good balance of young and more experienced researchers

Weaknesses:

The team should put more efforts in measures to foster interaction with other Institutes in Czech Republic and CAS. Several teams and institutes are engaged in highly relevant work in this field. Such interactions should be considered as opportunity. The number of PhD students is relatively low.

Opportunities:

The team has the potential to develop further as a centre of excellence that sets the agenda and integrates climate research in Czech Republic and across Europe.

Threats:

Transition from the initial period funded by the European Union infrastructure fund to the next phase of self-sufficiency will be challenging.

Main criterion: 1. Quality of results (H1.1-H1.5)

H1.1	Quality of selected outputs of Phase I
<p>The team has selected 84 outputs out of the total 411. There are some excellent papers published during the period such as papers in Nature, PNAS or Nature Geoscience. This is reflected also by the scientometric measure as being above the average of Natural Sciences.</p> <p>The distribution of quality of submitted outputs based on bibliometric parameters is very good with 23% of outputs in 1st decile, 33% of outputs in 1st quartile, and 24% of outputs in the 2nd quartile.</p> <p>The distribution of quality of submitted outputs based on Phase I is also very good with almost 68% of outputs in the categories of “World Leading” or “World Leading + Internationally Excellent”.</p>	
H1.2	Contribution of workers on the outputs reached
<p>Most of their work is of collaborative nature. But a good proportion of the submitted papers show a high and decisive level of input by the team and the significance of input of the team is reflected by corresponding or lead authorships on the outputs.</p> <p>Researchers of the team were corresponding authors in 33 out of 84 evaluated outputs (39%);</p>	
H1.3	Quality of all outputs and results

They have an impressive 411 outputs for 46 FTE, which similarly spreads nicely towards the high-quality journals. The distribution of quality of outputs based on bibliometric parameters is good, with 29% of outputs in 1* and 1 st quartile and 56% of all outputs within the 1*-2 quartiles.	
H1.4	The most valuable discoveries and findings in the fields, their importance for the field
1. Describing past climate variabilities and European floods from tree rings, documentary evidence. 2. Drought modelling: Extended drought episodes in summer is an increasing threat caused by the current global climate change. 3. Predicting the effect of mitigation strategies on wheat production under drought. 4. Predicting the climate effects on resilience of wheat. 5. Crop canopy remote sensing and incorporation of these data in models simulating the climate change influence on crops and vegetation.	
H1.5	Contribution of the participation of the authors in large collaborations
Most of the work of the team is performed in collaboration with leading European teams such as Cambridge University, Cranfield, Rothamsted Research or NASA. International collaboration and especially collaboration in large international consortia has increased the quality of outputs.	

Main criterion: 2. Societal relevance (H2.1-H2.5)

H2.1	Societal relevance of outputs and results pursuant to CAS and institute mission
The societal relevance of climate change is unquestionable. Team 1 has developed a clear mission to keep this on the top of the agenda in their working practice. The team has established channels to policy making and agronomy. Perhaps more could be done as a centre of excellence to make stronger links to nature preservation and ecology.	
H2.2	System functionality for knowledge transfer into practice, its usefulness for society. The impact of the team's activity on proper practice in society in the area of social sciences and humanities
Their modelling work finds the way to broader application through certified methodologies and software. There is evidence that the data analysis approaches developed by the team are being adopted by the international climate modelling community.	
H2.3	Relation to practice
The clearest link to practice is realized by their drought prediction pipeline for Central Europe and the modelling and simulation of how climate change affects wheat yield resilience. The team has successfully sought the transfer of the newly acquired knowledge into practice through certified demonstrators, certified methodologies and software products.	
H2.4	Participation in AV21 strategy
Their activity is connected to AV21 strategy, and in their presentation they described the participation in two such programs.	
H2.5	Cooperation with regions of the Czech Republic
The links seem to be driven by personal connections rather than strategic planning. As a significant investment by Czech Academy and Europe into this institute to make a centre of	

excellence in climate change one would expect a more proactive and strategic planning to connect CzechGlobe with Institutes in Czech Republic doing important work relevant to climate change, such as with the Institute of Botany and the Biology Centre to name two. It would be desirable to make some brain storming sessions among researchers in different institutes and investigate measures that can foster collaborations.

Further criterion: 1. Position in international and national context (D1.1-D1.3)

D1.1	Comparison of the team with similar international and national institutes
CzechGlobe is a new institute with a mission in assessing climate change, a hugely important topic. It is very good to see that team 1 took off well, stayed within the core mission and nowadays is well incorporated into the European infrastructure of climate change.	
D1.2	Scope and quality of international and national cooperation and the role of the team in such cooperation; engagement in broad international cooperation
The team has good bilateral collaboration with some leading groups in the field. One could expect more European research project besides the infrastructure projects to take off. The COST Action participations should be followed by participation in research projects.	
D1.3	Participation of the workers in scientific community activities (organizing of conferences and workshops, invited lectures, awards)
Team 1 has participated in political panels related to climate change, national scientific commissions and members are on editorial boards of recognised journals (8). The team has organised a number of bilateral and international workshops and conferences.	

Further criterion: 2. Vitality, sustainability and strategy (D2.1-D2.9)

D2.1	Direction in line with the perspective of the planned research directions
They have a clearly defined direction building the strategy for the next five years on the past five years of success. From modelling the climate change they plan to shift to modelling adaptation and mitigation. They plan to elaborate on modelling work that integrates past, present and future trends. They should maintain their focus on two of their strongest areas; drought modelling and effects of climate change on wheat performance.	
D2.2	Assessment of the previous research objectives and their achievement
The team has shown a good progress from its recent conception. Importantly it kept a focus on the central mission. They should play a larger catalyst role on climate change among groups working on related topics in other Czech Institutes. Overall, the team has achieved the previously stated research objectives for the assessment period.	
D2.3	Assessment of implementation of recommendations from past evaluation
The team has implemented all the recommendations from past evaluation. However, more efforts is needed to connect, collaborate and coordinate their work with other institutes in Czech Republic.	
D2.4	Success in receiving grants

The team has been very successful in securing research funding including grants from international funds. The team should invest more efforts in applying for European collaborative research projects and ERC grants.	
D2.5	Adequacy of instrumental equipment
CzechGlobe was initiated by a large infrastructure investment and the team is successful in keeping up the superb infrastructure and introducing the latest innovations.	
D2.6	Effectiveness of management
The entire Team1 is presented as a large single unit in the report. This way of reporting is not helpful if it comes to judging the management structure and to identify stronger and weaker groups within the team. Some insights could be gained from their website about the structure of Czech Globe. What is apparent that there is an imbalance among the sizes of the different departments. The Department of Climate Change Impacts on Agroecosystems is overly large and should be managed as a separate team compared to the others.	
D2.7	Assessment of professional structure, development strategy and the strategy of keeping best scientists, age structure, career and qualification growth
The team has a good age structure. It is an exciting young Institute. However, no information is provided regarding gender balance or percentage of foreign workers.	
D2.8	Creating work-life balance conditions, assessment of approach towards possible gender issues
No issues noted.	
D2.9	Relation of the team with regard to the integration, development and sustainability of the research centre funded by the National Programme of Sustainability II.
Not well spelled out.	

Further criterion: 3. Cooperation with universities and participation in education (D3.1-D3.6)

D3.1	Scope of cooperation with universities on national and international level
The report indicates a high level of engagement in university teaching programs in a number of Czech universities. Research collaborations nationally is mostly focussed to the local University in Brno. There exist bilateral research contacts with a good number of European University groups.	
D3.2	Effectiveness of joint research centres
MendelGlobe is a formally established centre. Not fully clear what is behind this.	
D3.3	Success rate in supervision of PhD students
The number of PhD students has remained low.	
D3.4	Participation of PhD students in the outputs
Good number of outputs with PhD students.	
D3.5	Participation of the team in master or bachelor studies

Good level of teaching activities.	
D3.6	Assessment of cooperation intensity with universities in the form of teaching
High level of teaching. Members of the team are very active in providing lectures and seminars for bachelor, master and doctoral students.	

Further criterion: 4. Outreach activities (D4.1-D4.3)

D4.1	Sufficiency of media strategy and activities in the area of research popularisation
The team shows a good level of public engagement in form of media, public lectures and organizing open science days.	
D4.2	Publishing activities and its quality
Web-portals www.klimatickamena.cz , but not fully up to date.	
D4.3	Participation in professional organisations in the area of research and development
The members of the team show a high degree of involvement in policy making forums.	

Other comments of the commission:

2. Environmental effects on Ecosystem.

Strengths:

This strong and internationally recognized research team has generated many high-level scientific results. Their multidisciplinary approaches rely on a broad spectrum of state-of-the-art equipment and modern methods, including ecosystem/ecological stations and other experimental facilities and well-equipped analytical laboratories. The team is composed of a gradually expanding personnel structure with a number of respected senior Czech and foreign scientists and on the other hand integrates a large number of young junior scientists and postdocs. Noteworthy is the broad interdisciplinary cooperation with other teams within and also outside the institute on national and international level.

Weaknesses:

The very broad thematic and methodological approach requires a very sophisticated and dynamic allocation of personal work. It appears that the team management structure does not correspond to this. Given the size of the team and the joint reporting of results, it is difficult to determine (at least in the evaluation case) the proportion and performance of individuals or small groups within the team.

Opportunities:

Despite extensive cooperation at the national level, there is still space for cooperation with thematically related scientific groups in other CAS institutes, for instance in the Institute of Botany.

Threats:

The development and commitment of the team is astonishing. The fast development of the field brings the danger of not maintaining the entire system at the required level, also because leading scientists have still too many administrative duties with efforts to obtain additional grants, a number of meetings etc. The high demands on the work pace and work results bring the risk of burnout of current team members. The changes in ecosystem functions can be much faster than the development of possible adaptation strategies.

Main criterion: 1. Quality of results (H1.1-H1.5)

H1.1	Quality of selected outputs of Phase I
103 publications from a total output of 425 between 2015 and 2019 were evaluated in the first phase. 53 of them (51.5 %) were in the first decile or quartile, 38 (36.9 %) in the second quartile. According to the quality 14 papers were evaluated in the Phase I in the group 1 (World leading) and 46 in the group 2 (Internationally excellent), this is a total of 58.3% in the first two groups. Rating of the papers was 2.39, which is above the average of the evaluated group of biological teams.	
H1.2	Contribution of workers on the outputs reached
Researchers of the team were reprint authors in 42 out of 103 evaluated outputs in the Phase I (40 %). However, the group consists of a large number of employees (FTE = 59.5) divided into sub-departments, so the overall share of excellent results per employee is medium to low ($FC_{1.2} / FTE = 0.25$, $N_{RP1.2} / FTE = 0.35$).	
H1.3	Quality of all outputs and results
In the evaluated period, a total of 425 outputs were done, distributed in all quartiles. 189 of these outputs were in the first or second quartile (44.5%). Thus, there are very high-quality	

works, but also works of medium scientific value, rather applied research, which are probably used for local purposes. The recalculated number of outputs at FTE is 7.1 which is a relatively high number. The results also from the outputs of applied research resulted in 68 papers in peer-reviewed journals without IF, 38 books/book chapters, patents, utility models, methodologies etc.. This share of publications in less recognized journals should be decreased.	
H1.4	The most valuable discoveries and findings in the fields, their importance for the field
It is difficult to specify the most significant results for such a large research structure. The team represents almost 50% of the scientific capacity of the institute and is composed of nine closely cooperating groups: Matters and Energy Fluxes, Biodiversity, Biogeochemical and Hydrological Cycles, Ecological Plant Physiology, Environmental Metabolomics and Isotope Analyses, Xylogenesis and Biomass Allocation, Ecosystem Trace Gas Exchange, Adaptive Biotechnologies, and Experimental High-Performance Photobioreactor. The team addresses the globally important issue of climate change impacts on ecosystem functions and services, including cycles of energy and matters, biodiversity, plant acclimation to adverse conditions and consequently the effects on sustainable production, food quality and security, sustainable bioenergy and maintenance of water resources. These activities cover key national priorities of oriented research, particularly “Environment for quality life” including protection of natural resources, mitigation of global change effects, sustainable development of landscape, development of environmental technologies and eco-innovations, and education of environment-friendly society. Research activities cover a wide range of processes in the soil–ecosystem–atmosphere continuum from metabolome adjustment up to changes in biodiversity and geochemical cycles.	
H1.5	Contribution of the participation of the authors in large collaborations
The team operates a unique research infrastructure with the aim to realize an open-access use of the facilities according to demand. They are part of significant environmental European consortia (ESFRI infrastructures ICOS ERIC, AnaEE, Danubius-RI eLTER in particular). The team closely cooperates with numerous national and foreign research institutes/universities as well as other large infrastructures.	

Main criterion: 2. Societal relevance (H2.1-H2.5)

H2.1	Societal relevance of outputs and results pursuant to CAS and institute mission
The institute and thus the team were established on the strong societal demand to examine global climate change and its impact on various aspects of the environment, and with this regard societal relevance of outputs are fulfilled. The institute and the team go beyond the general mission of the institutes of the CAS, but its social significance is indisputable.	
H2.2	System functionality for knowledge transfer into practise, its usefulness for society. The impact of the team’s activity on proper practice in society in the area of social sciences and humanities
The system of transfer of scientific results into practice works and the practical outputs are useful. Other groups of the institute deal with issues of societal problems of global scale.	
H2.3	Relation to practice

The work is based on basic research, but the members of the team also carry out applied research. Their field measurements and climate analyses have direct impact on practice. The applied research results arise in cooperation with industrial partners and their direct involvement in formulating research goals. During the evaluated period, they produced 2 patents, 3 utility models, 7 certified methodologies and 7 software products. Long-term datasets from ecosystem stations and experiments enable the analysis of the ecosystem response on changing climate. Some results are also applicable in nature conservation and its management practices.	
H2.4	Participation in AV21 strategy
No information provided.	
H2.5	Cooperation with regions of the Czech Republic
The team and its members transmit their applied results as well as specific analyses for specific regional needs. In this sense, they are in contact with state and regional authorities. They also popularize their results at the local level, organize popularizing lectures, open days and excursions in ecosystem stations, etc.	

Further criterion: 1. Position in international and national context (D1.1-D1.3)

D1.1	Comparison of the team with similar international and national institutes
It is an internationally recognized scientific team. It is unique in its complex approach to problem solving and broad professional approach. At the national level, it is unique and has no comparison with any similar scientific institution. The strength is provided among others by the methodological background of both the analytical laboratory equipment and the extensive network of ecological stations for measurements under field conditions.	
D1.2	Scope and quality of international and national cooperation and the role of the team in such cooperation; engagement in broad international cooperation
International and national cooperation is wide, most of the scientific work is done in cooperation, often in large consortia. However, in the Czech Republic there are institutions that study similar problems, but from a different point of view, where integration and closer connection would be appropriate (Inst. of Botany CAS and others).	
D1.3	Participation of the workers in scientific community activities (organizing of conferences and workshops, invited lectures, awards)
Also in this area, the team's activity is considerable and extensive. In the past period, they organized or co-organized about 20 international conferences and workshops and gave invited lectures (7 of them important). They received various awards, especially awards for young scientists.	

Further criterion: 2. Vitality, sustainability and strategy (D2.1-D2.9)

D2.1	Direction in line with the perspective of the planned research directions
The team fulfils its mission in terms of methodology, science and application. As already mentioned, its scope is very wide, but for the purposes of evaluation, the structure is somewhat confusing and it is difficult to evaluate individual research areas and directions.	
D2.2	Assessment of the previous research objectives and their achievement
See above: the wide range of scientific expertise is difficult to assess in this complex. The overall focus, which is undoubtedly important and has national and international significance, depends primarily on the needs of the state, or the concept of the work of the CAS. However, the set research objectives have been achieved in the past.	
D2.3	Assessment of implementation of recommendations from past evaluation
This parameter is not very appropriate for the team and is difficult to evaluate. At the time of the last evaluation, the team, like the entire institution, was at the beginning of its development, so the recommendations were directed toward a proper start of all activities.	
D2.4	Success in receiving grants
The team is very successful in obtaining grant funds at the national level and involvement in international research centres, including financial benefits from these consortia. With regard to building the entire infrastructure of the institution, the team had the opportunity in the past period to obtain extraordinary funds from national and international sources.	
D2.5	Adequacy of instrumental equipment
The methodological base and equipment of the team are very good. The methodological research infrastructure was regularly updated and innovated during the evaluated period for experimental and analytical work and monitoring of parameters in the field. The infrastructure belongs to the unique CzeCOS platform and represents a national point for European infrastructures.	
D2.6	Effectiveness of management
The team has a non-standard management structure. The team is very large and includes several research departments. It is not entirely clear whether the presented system of the team within the evaluation is identical with the organizational and management structure within the regular activities of the institute. Team leader O. Urban is the head of only one (although large) department in the normal activities of the institute and it is not clear from the report or presentation of the team how the team's activities were actually managed, whether the management was coordinated by an executive group.	
D2.7	Assessment of professional structure, development strategy and the strategy of keeping best scientists, age structure, career and qualification growth
The professional structure is complicated with regard to size and further internal division and it is possible to evaluate it only within the whole team, although the distribution in individual departments would be important. Like most of the evaluated parameters, the size and structure of the team showed a trend toward increase. Total FTE of all team members raised from 50.7 in 2015 to 66.9 in 2019. The FTE of Junior and Senior Researcher increased from 36.0 in 2015 to 44.2 in 2019. At present the team consists of 80 researchers of which 60 are aged 25-50 years. but also with a sufficient representation of senior researchers, including foreign experts. Currently, the number of PhD students represent approx. 20% of the team, many from abroad. Overall these parameters characterize the team as a very vivid entity.	

D2.8	Creating work-life balance conditions, assessment of approach towards possible gender issues
There is no information on whether they support work-life balance, what the gender ratio is and whether they are making efforts in this direction.	
D2.9	Relation of the team with regard to the integration, development and sustainability of the research centre funded by the National Programme of Sustainability II.
No information provided.	

Further criterion: 3. Cooperation with universities and participation in education (D3.1-D3.6)

D3.1	Scope of cooperation with universities on national and international level
The intensity of cooperation with universities is high. It includes research cooperation and common projects, teaching activities, student supervision and the acquisition of talented students for their own work at the Institute. This type of cooperation concerns several universities, in particular Masaryk University and Mendel University at Brno, Charles University Prague, Technical University at Ostrava, Palacky University Olomouc and South Bohemian University České Budějovice.	
D3.2	Effectiveness of joint research centres
Scientific cooperation with universities has in several cases resulted in the establishment of research centres, the most important of which are Mendel Globe Centre – Climate Change and Management Ecosystem focuses on improvement of the quality of basic and applied research in the field of the impact of global change on agriculture, forestry and landscape properties. The Centre for Tropical Biology which was formed together with Biology Centre CAS, Charles University and University of South Bohemia focused on the integration of tropical ecological and evolutionary research. They also established ecosystem stations in Vietnam and Ghana with cooperation with local universities.	
D3.3	Success rate in supervision of PhD students
During the last evaluated period, they team members served as supervisors or consultants of 22 doctoral students from which 20 completed. There is progressive scouting for new PhD students in many Czech universities and abroad.	
D3.4	Participation of PhD students in the outputs
The long-term share of PhD students in impacted publication outputs is 13-16%. This percentage should increase in the future.	
D3.5	Participation of the team in master or bachelor studies
Team members supervised or consulted 24 Bachelor and 18 Master students from which 15 or 22, respectively, completed.	
D3.6	Assessment of cooperation intensity with universities in the form of teaching
Despite the large size of the team, the pedagogical activity also was extensive and successful. They taught many courses (more than 50) at eight Czech universities, but also	

in Slovakia, Bolivia, Spain and Ireland. In addition to the transfer of knowledge between the institution and universities, it is also one of the ways to attract talented students to work in the institution.

Further criterion: 4. Outreach activities (D4.1-D4.3)

D4.1	Sufficiency of media strategy and activities in the area of research popularisation
The team members are often invited for public interviews (newspapers, radio, TV) on the actual topics related to climate change effects on forests, agriculture, soil conditions, and/or biodiversity. The team members participated in about 200 sessions in 2019 only.	
D4.2	Publishing activities and its quality
The members participated in the popularization of research results in professional journals. The members of the team published in professional and popular journals, organized lectures for the professional and general public and organized series of professional excursion at ecosystem stations and laboratories.	
D4.3	Participation in professional organisations in the area of research and development
Team members are involved in more than 15 international and more than 30 national scientific commissions, they are members of editorial boards of various highly-impacted journals, members of evaluation commissions of Czech and international grant agencies and members of national and international scientific societies.	

Other comments of the commission: n/a

3. Human Dimensions of Global Change Impacts

Strengths:

This research team is able to engage with disciplines across the physical, biological and social science. Furthermore, they have a substantial breadth or academic range within this small team. Their work is of high relevance for other CzechGlobe teams, as it provides much of the policy linkages.

Weaknesses:

This is a relatively small team relative to the rest of CzechGlobe institute. Having a critical mass is necessary for long term success. The team is also young, and department level mentorship may be lacking. This, however, appears to be made up for through strong regional collaborations.

Opportunities:

They appear to have well developed regional and international networks and multiple emergent collaborative opportunities. So far, they appear to have been fairly successful in securing collaborative funding, allowing them to grow their reach and impact.

Threats:

The success of this team may be a threat. Several researchers resigned during the assessment period, and the further loss of talented young staff to other institutions will significantly impact the success of this department.

Main criterion: 1. Quality of results (H1.1-H1.5)

H1.1	Quality of selected outputs of Phase I
From the 30 publications published in peer-reviewed journals, 11 were put forward for evaluation. Of these outputs, four were published in the highest decile, two in the first quartile and four in the second quartile, and one categorized as n.a.. Overall this implies that this small group are publishing primarily in high-quality journals. They should be given the space to continue on this trajectory.	
H1.2	Contribution of workers on the outputs reached
<p>The Bibliometric parameters indicate that the greatest proportion of publications evaluated consists of collaborations with five or more research organizations. It also shows a good mix of national and international collaborations.</p> <p>A closer look at the publications shows that certain areas of research are led by a single individual (for example, risk management). However, in other focus areas, virtually the entire team has collectively been involved in developing publications (for example, the ecosystem services focused research leading the field and co-publishing with internationally recognized co-authors such on the ESMERALDA project).</p> <p>It is noted that this is a small team, and imbalances in staff output ratios will be amplified as a result. This is not easy to assess without a detailed assessment of each team member.</p>	
H1.3	Quality of all outputs and results

Looking at the broad suite of publications, these are predominantly Czech focussed, with smaller proportional contributions to regional and global areas. However, it is noted that this group is publishing in high-quality journals.	
H1.4	The most valuable discoveries and findings in the fields, their importance for the field
<p>The team makes valuable contributions in three areas: hazard and risk adaptation, ecosystem service assessment and methodological contributions to both these areas and beyond. In the hazard/adaptation space, the team working on these issues is only a few in Czechia and is gaining national and international recognition for their work here. They have made important contributions to understanding hazardous processes in high mountain regions, particularly associated with earth surface dynamics; rapid mass movements, lake outburst floods, glacier retreat and geo-environmental changes in deglaciated areas. Further important work in the adaptation scape relates to the team's contributions to understanding urban adaptation to climate change.</p> <p>The team has and continues to make multiple important contributions in ecosystem service assessment at the international scale related to biodiversity conservation, cultural ecosystem services and environmental economics. Their findings here have been incorporated into regional and global IPBES assessments.</p> <p>The team has multiple contributions that have advanced method development in these impact areas. It would be interesting to see these developed methods packaged in a variety of different ways – possibly in collaboration with other departments in CzechGlobe or in the CAS.</p>	
H1.5	Contribution of the participation of the authors in large collaborations
A number of contributions in the assessment period were collaborations. Authors were part of more extensive collaborations (contributing here to 25 larger research projects). This is impressive – try to maintain this level of activity.	

Main criterion: 2. Societal relevance (H2.1-H2.5)

H2.1	Societal relevance of outputs and results pursuant to CAS and Institute mission
<p>The work undertaken in this department has a high degree of societal relevance as it is focused on ecosystem service and associate socio-economic impacts of global change. The outputs related to the mapping, modelling and valuation of ecosystem services, climate adaptation strategies, and natural hazard and disaster risk reduction have obvious social relevance. Products that speak to a broader public audience creating knowledge transfer could be further developed given their importance.</p>	
H2.2	System functionality for knowledge transfer into practise, its usefulness for society. The impact of the team's activity on proper practice in society in the area of social sciences and humanities
<p>There are examples listed with the team's research activity report that shows how research is being transferred into practice for results that are relevant to Czech decision-makers. This report also shows how on larger EU projects, the outputs are focused on informing the higher-level EU strategies for biodiversity conservation and climate change adaptation.</p>	

H2.3	Relation to practice
<p>The team has explicitly stated that it seeks to balance research contributions and contributions to practice. There is evidence listed highlighting contributions to international policy development. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and by contributing to the Green Deal are two examples here. A clear strategy of support for integrating the many national findings into national policy would be helpful too. This balanced approach is commendable and should be supported through greater institutional acknowledgement of policy work.</p>	
H2.4	Participation in AV21 strategy
<p>The department indicates that it plays a key role in enabling CzechGlobe to contribute to three of the government's defined priority areas: Oriented Research, experimental Development and Innovation in the CR (Environment for Quality Life, Social and Cultural Challenges, Safe Society).</p>	
H2.5	Cooperation with regions of the Czech Republic
<p>There is evidence of regional collaboration at the project level and teaching commitments to national universities. The degree to which this support is spread throughout the different regions is unknown and maybe a gap.</p>	

Further criterion: 1. Position in international and national context (D1.1-D1.3)

D1.1	Comparison of the team with similar international and national institutes
<p>This team is small and young and still in the establishment phase; however it is having a greater impact and is highly productive, possibly outperforming many equivalent teams at a global scale. The presented evidence suggests that these successes and position are likely to increase and be enhanced in the coming assessment period (+60 contributions from an average of 7 researchers).</p>	
D1.2	Scope and quality of international and national cooperation and the role of the team in such cooperation; engagement in broad international cooperation
<p>Team members play a significant role in international panels focused on environmental issues. They have been actively involved in the international Ecosystem Services Partnership (ESP), a network of scientists for the science, policy and practice of ecosystem services. They have been involved in the ESP Steering Committee (including co-chairing the ESP Steering Committee since 2019). Team members have been a part of and lead multiple ESP working groups, including the Thematic Working Group on Ecosystem Services in Trade-off analysis & Project evaluation and Thematic Working Group on Modelling Ecosystem Services. Consequently, the team members have been able to influence the direction of the global ecosystem services research community, including co-authoring cross-cutting publications and contributing to conference planning. Team members have been actively involved in co-authoring assessments of the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) and have thus contributed to one of the largest science-policy interfaces related to sustainability and global environmental change. They participated as a Review Editor in Chapter 5 of the IPBES Methodological Assessment on Scenarios and Models and as a Lead Author in the IPBES Thematic Assessment on Land Degradation and Restoration.</p>	

The other team members have been involved as a Leading Author and a Fellow, respectively, in the IPBES Regional Assessment for Europe and Central Asia and a Leading Author in the currently elaborated IPBES Values Assessment since 2018.	
1.3	Participation of the workers in scientific community activities (organizing of conferences and workshops, invited lectures, awards)
There are high levels of participation by staff in appropriate and well-regarded fora and in international bodies—for example, ESP and IPBES. Evidence has also been presented for the development of conferences and sessions at conferences. These are appropriate and correctly focussed for a team of this size. Further engagements here could impact the development of publications but provide valuable opportunities for developing networks, a vital issue for young researchers' career development.	

Further criterion: 2. Vitality, sustainability and strategy (D2.1-D2.9)

D2.1	Direction in line with the perspective of the planned research directions
The previously planned research directions that focused on 3 areas of focus have been followed closely, and numerous developments in these areas can be observed.	
D2.2	Assessment of the previous research objectives and their achievement
The research objectives of the department have been achieved. For example, there has been clear growth in publications (both quality and quantity), staff development, attracting international staff to the department and growth in project funding.	
D2.3	Assessment of implementation of recommendations from past evaluation
<p>The initial assessment was undertaken just after this research grouping was formed. In response to the previous assessment, the team has expanded its depth of experience, focussed on improving the quality of publications.</p> <p>The team has grown substantially in the last two years from 5 to 14 researchers. Publications have been enhanced in scope and quality. More experienced people have been brought into leadership positions. The activities associated with growing and nurturing staff through collaborative engagement with international institutions has resulted in the desired knowledge transfer and internal growth. This is evident in the quality and quantity of publications of the different members of the group.</p>	
D2.4	Success in receiving grants
The documentation shows that the group seems highly successful in securing a relatively large number of grants from the National Government and EU. The pandemic may impact the group's ability to secure grants. There is a contingency plan in place.	
D2.5	Adequacy of instrumental equipment
Unlike the other departments within this Institute, equipment and instrumentation do not play a significant role in any research focus areas. The department relies primarily on human capital and basic computing.	
D2.6	Effectiveness of management

<p>Management appears to have been effective based on the successes listed above. Management has, however, recently shifted with Julia Leventon now appointed as the new head of department. This seems to be a positive step – the strategy moving forwards both capitalizes on the past successes and demonstrates refinement and the movement into a new cutting-edge area of system change and transformation, further cementing the interdisciplinary focus of this department.</p>	
D2.7	Assessment of professional structure, development strategy and the strategy of keeping best scientists, age structure, career and qualification growth
<p>This team is relatively young, with almost all of which fall into the 25-45 age categories. Despite this, the publication trajectories of this group look very impressive. The developed strategy and new leadership, combined with high energy and drivers, hold much promise for future successes within this department. The challenge now shifts from developing a viable team to holding on to and growing this now vibrant team – so retention issues. The team seems to be well integrated into the international research community, with multiple exciting research projects on the go. This in itself is a key factor in terms of retention.</p>	
D2.8	Creating work-life balance conditions, assessment of approach towards possible gender issues
<p>From the outside, gender issues appear to have been well managed in the department. There are no signs of work balance issues outside of those global challenges that have arisen due to the pandemic and the balance of childcare, which is more burdensome for female academics. This needs to be factored into performance evaluations.</p>	
D2.9	Relation of the team with regard to the integration, development and sustainability of the research centre funded by the National Programme of Sustainability II.
<p>This department appears to be playing a vital and recognized role in bringing interdisciplinary and social perspectives into a highly empirical and technical area. This is essential for knowledge transfer, decision-maker engagement and ultimately impact. They are a critical component in the sustainability of the CzechGlobe institute.</p>	

Further criterion: 3. Cooperation with universities and participation in education (D3.1-D3.6)

D3.1	Scope of cooperation with universities on national and international level
<p>There is clear evidence of cooperation with Czech Universities and other Universities, (primarily European universities), and International organizations related to teaching, supervisions, project work, and professional development.</p>	
D3.2	Effectiveness of joint research centres
<p>Cooperation appears to be effective with the emergence of various products, ranging from meetings to successful project funding.</p>	
D3.3	Success rate in supervision of PhD students

This is a small and young team of researchers. Currently, supervising 6 PhD students seems appropriate. No information is provided on the rate of throughput and/or success. The department should be looking towards building here in the future.	
D3.4	Participation of PhD students in the outputs
There is evidence that PhD students have been integrated into different stages of research projects, leading teams in a range of roles, from assisting research activities to leading projects. Thus, the team provides a broad space for PhD students to develop their research, collaborative and project management skills and build their research careers. It is also acknowledged that two new accredited joint study programmes with Masaryk university, Faculty of Science – the PhD study programme Environmental Health Sciences, and Jan Evangelista Purkyně University in Ústí nad Labem, Faculty of Social and Economic Studies – the PhD study programme Regulation and behavioural studies, have been established.	
D3.5	Participation of the team in master or bachelor studies
Four staff members actively teach and contribute to courses at the Bachelor level at 4 different universities and supervise Masters and Bachelor (2) and Masters students (1) – supervised during the assessment period. This seems limited and could be enhanced.	
D3.6	Assessment of cooperation intensity with universities in the form of teaching
Strong collaborations with universities across Czechia are evident. Example collaborators include UNU Dresden, technical university of Dresden, Wageningen university Charles University, Prague, Jan Evangelista Purkyne University in Usti nad Labem. Through the evaluation period, 4 team members also held part-time employment at other research institutes, including foreign ones at the University of East Anglia (UK), Natural Resources Institute (Finland), University of Economics in Prague (Czech Republic), Environment Centre, Charles University, Prague (Czech Republic).	

Further criterion: 4. Outreach activities (D4.1-D4.3)

D4.1	Sufficiency of media strategy and activities in the area of research popularisation
This department contributes to outreach activities both as part of CzechGlobe and in their own capacity. There is further evidence of engagement with popular and social media in articles, television interviews, and YouTube video clips. This is at an appropriate level.	
D4.2	Publishing activities and its quality
They have organized conferences and workshops that include participation by local and national governments and public officials. The engagement of these stakeholders is a core component of the interdisciplinary methods that this team is applying. They present extensive evidence of such engagements over the assessment period. Again this level of engagement should be maintained.	
D4.3	Participation in professional organizations in the area of research and development

Evidence has been presented for various sessions hosted at different conferences during the assessment period.

Other comments of the commission:

The range of work being undertaken is extremely impressive. The individual components have enormous promise. Creating further opportunities for internal collaborations will highlight the strengths and potential of this young Institute.

Final report was elaborated by:

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