

PANEL PRINCIPAL COMMENTS AND QUESTIONS ASSESSMENT OF SAS RESEARCH INSTITUTE

Evaluation Period: January 1, 2016 – December 31, 2021



Bratislava, October 17, 2022

Scientific quality and productivity

1. After 6 years of merging to an Earth Science institute – where do you see positive/negative impacts

(Adam Tomašových)

Positive:

- Overall mission of the ESI SAS towards integrated research of lithosphere/atmosphere/biosphere is clearly less specialized than before;
- ESI SAS is conceptually and methodologically more diverse;
- An increase in the number of formal project collaborations (both APVV and VEGA);
- An increase in the frequency of informal communication/discussion among colleagues from formerly distinct organizations (councils, seminars, meetings);
- Explicit merit-based evaluation at individuals level since the merger - we implemented an explicit, 5-year-window evaluation of international publications and citations (updated every year), with the top 20% of researchers receiving additional salary benefit.

Negative:

- Connectivity is more difficult among geographic locations (Bratislava, Banská Bystrica, Stará Lesná, Hurbanovo);
- Higher administration load after the transition to Public Research Institution (vvi);
- The lack of appropriate building and lab facilities in Bratislava (in five buildings at Bratislava - Patrónka campus).

Scientific quality and productivity

2. Please formulate major points for a future joint Institute mission statement (not two separate ones as you did this time)? (Igor Broska)

Further systematic advancement of the Earth Science Institute (ESI) by developing project that would integrate geophysical as well as geological methods of research. Continuous efforts in systematic resolution of the geological history and formation of Central Europe by integrated methods of geoscience research.

→The ESI carries out and develops basic and applied research on geosciences and geophysics. Scientific activities are oriented towards comprehensive research integrated the fields of geology, geophysics and climatology. The research is interdisciplinary and is not bounded just to the territory of the Slovak Republic. Institute collaborates with Earth science institutions abroad. It participates in the transfer of scientific information into practice. It contributes to the growth of knowledge and cultural level of society by popularizing the science and public educational activities;

→The ESI is the only worksite in the Slovakia, which systematically monitors seismic activity, measures the magnetic field, slow deformations of earth's crust and performs non-standard meteorological investigations;

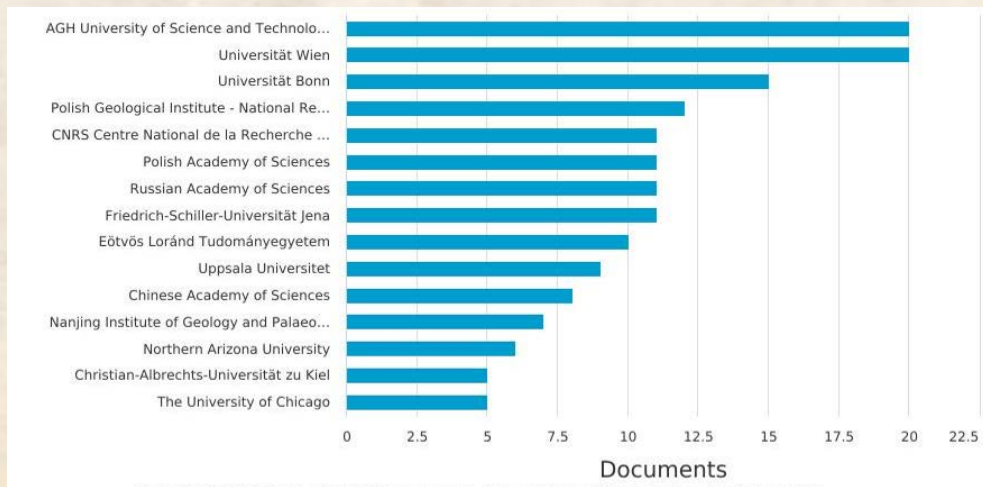
→The ESI provides a PhD study program within the framework of the valid Slovak legislation;

→The ESI is a publisher of international scientific journals *Geologica Carpathica* and *Contributions to Geophysics and Geodesy*.

Scientific quality and productivity

3. Research performance: Do you have plans for improved international collaboration and acquisition of international funds (as several researchers ESI already have done)? (Adam Tomašových)

- International collaboration is extensive as directly shown by coauthors on our outputs (see top 15 institutions, primarily from Europe, also US and Asia), and the majority of researchers are involved in international collaborations;
- We will more encourage/incentivize higher exposure of young researchers at significant international conferences (to unroll international feedback and networks);
- International funds –support for proposal preparation and pre-selection of applicants will be needed/active use of networks to be able to enter consortia.



**Excluding Slovak and Czech Institutes
ESI (2016-2021)
total Scopus publications = 373**

Scientific quality and productivity

4. Geophysics/Climate: Comment on the degree of collaboration with other institutes having focus on water, climate and what is your opinion about potential future intensification of collaboration in environmental/climate/water sciences. (Milan Onderka)

Department of Atmospheric Physics already actively collaborates with:

- The national weather service (the **Slovak Hydrometeorological Institute** in Bratislava) - currently our major partner for studies related to meteorology and climatology. There is an ongoing collaboration especially with the Climatology Division but we are planning to reach out to the Hydrological Division to cover a broader range of climate change related topics;
- Within the SAS alone, we have rather good personal relations with researchers from the **Institute of Hydrology SAS**. We are planning to build research projects joining researchers from both institutes, and potentially include also the **Institute of Landscape Ecology SAS**, as the research conducted at these three institutes often overlaps especially in climate-change related research;
- Outside the SAS our important partner is the **Faculty of Mathematics and Physics, Comenius University** - currently the only institution in Slovakia with a PhD program in Meteorology and Climatology. Two researchers from our institute are involved in PhD mentorship at the faculty;
- The institute is collaborating even with the private sector – **ESPRIT Banská Štiavnica**; and climate experts from 3 neighbouring countries. As of September 2022 we are starting a project focused on hydrometeorological applications (such as flash floods and soil erosion). The project is financed from EU Structural Funds;
- In addition, we are making every effort possible to be involved in collaborative projects with all institutions covering the climate change topics, as combining knowledge from atmospheric sciences, meteorology, climatology, water related disciplines (hydrology), soil science and ecology is essential especially in the context of the ongoing climate change and how the society can adapt to it.

Scientific quality and productivity

5. Number of PhD's stays rather small, but good gender balance is reached. How can number of PhD's be further increased? Why are there, for example, still rather few SAS participants at EGU (with strong Early Career Program)? (Iveta Smetanová)

→ Future hiring of PhD students will require:

1. stronger international advertisement of PhD topics will be needed, also stronger promotion of PhD topics on the ESI website (promote topics, supervisors and their research);
2. popularization lectures for high school students (why to study geosciences) and participation on activities like **“Open days at ESI”** „ **Weekend with SAS**“ „**Petržalka Super school**“ or **European Researchers' Night** (these activities are already taking place);
3. popularization lectures for master students and excursions to our labs (these activities are already taking place);

→ Students are encouraged to participate in broader (not just specialized) EGU-like conferences. However, they are ultimately subjected to time and financial constraints - ideally some intersection so that students expose their research to relevant international audience;

→ Independent researchers decide between general EGU-like conferences (GSA, AGU), less general, but still large-scale meetings (IAS), and more specialized meetings. EGU also does not completely overlap with all our branches;

→ Early Career Program opportunities at EGU – we will encourage participation, we will ask for higher information flow about these options for students.

Scientific quality and productivity

6. Please, comment on low teaching activities in the last years (Fridrich Valach)

→ Some researchers at our institute are also employed at universities (Comenius University in Bratislava and Matej Bel University in Banská Bystrica), and their teaching contribution is thus not listed in the Questionnaire. We only listed the teaching activities of our employees, who are not affiliated with universities (and often teach pro bono, voluntary activities);

→ The option to teach at universities is conditioned by the actual availability of – as the number of students is gradually decreasing and is extremely low now, university departments even compete for teaching among themselves;

→ We published an academic/university textbook on the physical foundations of magnetic storms (in Slovak language) and several monographs in the English – all are useful materials for teaching;

→ Extracurricular teaching activities are extensive (not for credits, difficult to quantify) – we teach students how to use instruments or devices or are taken to the field, and we organize informal block courses in Analytical methods in geology, micropaleontology, lasting for one or two days.

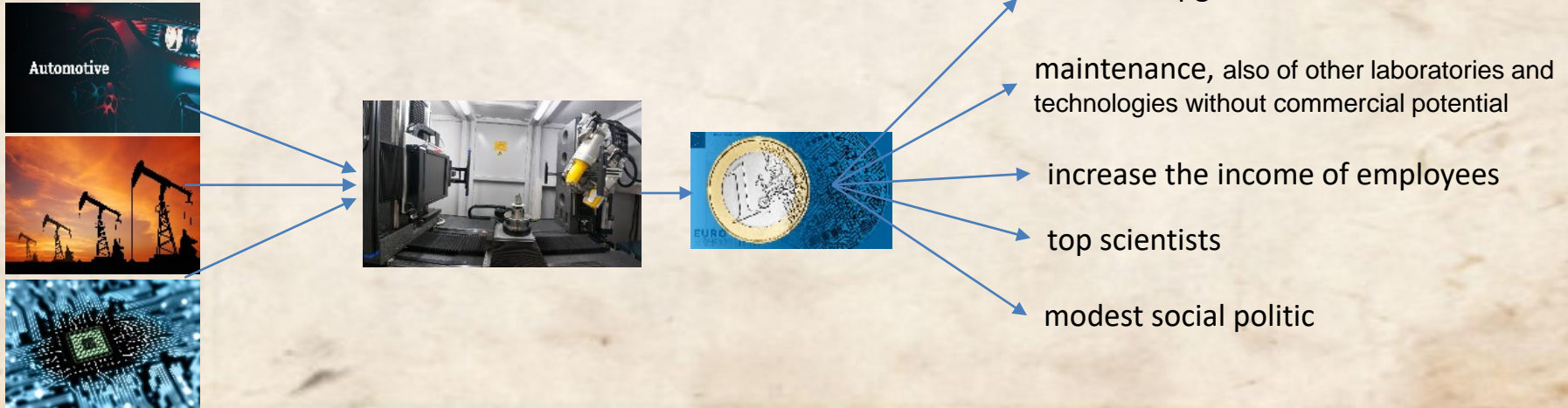


Societal, cultural or economic impact

7. You have some good industrial contacts. Earth Sciences are relevant for a society.

(Radovan Kyška – Pipík)

- ESI built modern analytical infrastructure primarily for scientific research. Because this infrastructure is in some cases unique, like microCT or limnic platform, we offer our free time capacity to industrial sector;
- This way we connect the science and applications. It is also important to say, this activity is necessary, because we have very limited institutional sources to ensure operation of all technologies.

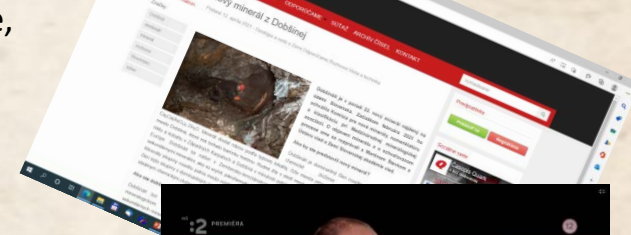


Societal, cultural, or economic impact

8. How can image of Earth Sciences in Slovak society be improved (or, does it need to be improved?) (Stanislava Milovská, Ján Madarás)

ESI is active in several ways:

- Presentations in media:
 - interviews and reports in TV, broadcast, press;
 - informations on SAS web News, FB, articles in popular science magazines, books, short movies, SAS „Open Academy“ project;
- Public talks, excursions for schools, discussions, field excursions;
- Collaborations with museums (exhibitions, sample collections, lectures);
- Collaborations with institutions of nature protection, Geoparks, cultural heritage, restoration of monuments, archaeology, architecture...
- Cooperation with the decision-making sphere, regional self-administration (Project Waters, Environmental strategy 2030)...



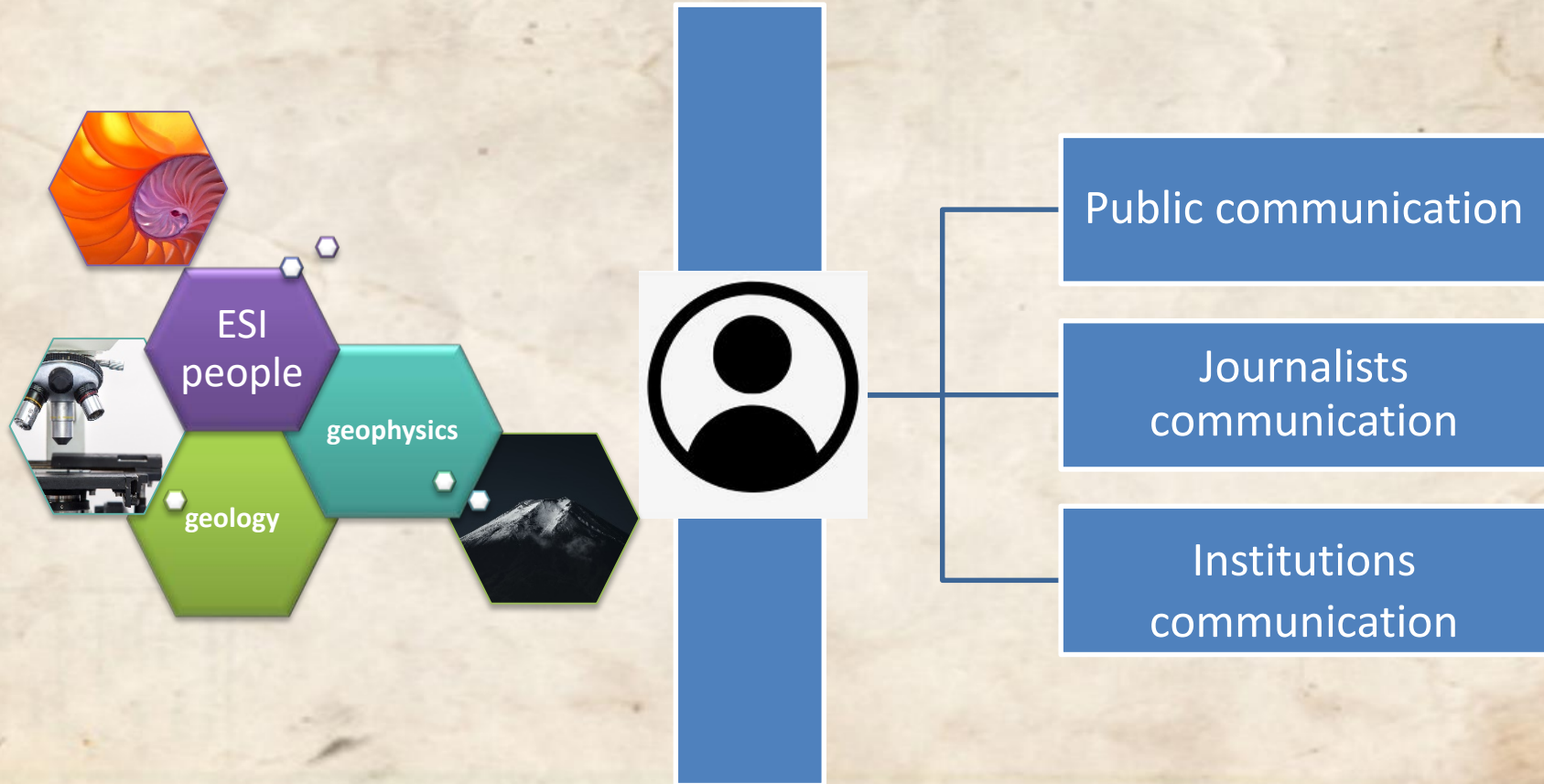
- Not all outreach activities are published or released...
- Improvement is needed

We plan...

- **to complete our website** and add a link to “popular science” section with our scientific news, curiosities and upcoming events for public;
- **continue the attractiveness of the institute's Facebook page**: it currently has 913 followers from 10 countries, most in the 25-44 age group;
- **more offer** our facilities and supervision for motivated students of secondary schools – competitions, Olympiads;
- **make the cooperation with industry more visible** to tax-payers and show them that science is useful;
- **collaborating institutions** should always mention input of ESI.



- to engage a person responsible for public relations: arrangement of public talks, school-children visits, interviews with our scientists for popular science magazines (Quark, Vesmír...)



Societal, cultural, or economic impact

8b: ... And can you comment on decreasing number of public lectures (already before COVID)?

2.7.2. Table of outreach activities according to institute annual reports

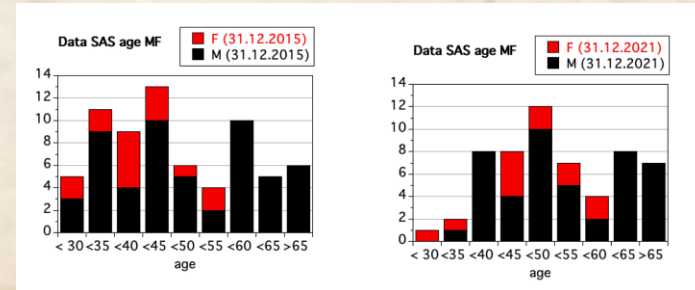
Outreach activities	2016	2017	2018	2019	2020	2021	total
Articles in press media/internet popularising results of science, in particular those achieved by the Organization	18	26	36	10	36	33	159
Appearances in telecommunication media popularising results of science, in particular those achieved by the Organization	23	24	15	4	17	16	99
Public popularisation lectures	37	28	60	15	7	6	153

- Change in the methodology of reporting popularization lectures for the public from 2019. Repeated activities within one topic (e.g. gold panning courses for elementary school students) are reported as one popularization lecture.

Societal, cultural, or economic impact

9. Women are still widely underrepresented in staff/executive body/external advisory board – what plans for improvement do you have? (Radovan Kyška – Pipík)

- ESI is equal-opportunity employer, and constitutionally cannot hire anybody on the basis of gender. We underscore a family-friendly working environment and allow for breaks in daily working schedules that are related to parenting and children. Parents with young children can have flexible working schedule adjustable according to their needs;
- All positions in executive bodies are based on voting. Of course, we encourage women to participate so that they can be elected;
- Among PhD students, the women are frequent and we will make an effort to keep them in academia. However, many of our former students decided to leave academia after the maternity-leave or during the family buildup owing to significantly better salaries outside of academia;
- We note that several outstanding women scientists that developed their careers at our institute later moved to universities – this partly generated the gap in the contribution of women in the older cohorts;
- The representation of women in the institution also depends on the type of work: e.g. Research laboratories (9), Economic department (4) is represented exclusively by women. Women also occupy working positions in the library (2) and at the administration (5).
- Women are also exclusively represented in bioclimatology research (3).



Strategy and potential for development

10. Where do you see your institute on the European Science Map? Importance, Strength, international impact? (Ján Vozár, Martin Števkó)

- The ESI is involved in broad international/European projects with actual high importance that directly addresses Europe's goal to become self-sufficient in terms of food sovereignty and security (bioclimatology), climate changes (paleoclimatology, paleobiology), raw materials (critical metals, deposit surveys and exploitation) and natural disaster mitigation across Europe (seismology, volcanology);
- The laboratories in Banská Bystrica are playing an important role as research hub, bringing together various institutions (from 25 countries around the world), accelerating our international cooperation as well as developing collaboration with industrial partners;
- We will focus on maintaining key international networks and making our institute more attractive for high quality research scientists. Besides financial part, we should focus on essential condition, which the institute has in its own hands, to facilitate the easier coordination and management of big international projects, like electronic administration and communication.

25 countries around the world in BB lab



Strategy and potential for development

11. Where do you see future joint geophysics-geology projects? (Ján Madarás)

- The effect of the merger of the former institutes began to manifest itself gradually. Currently, the institute handles - in the form of leadership or joint partnership mainly with universities - 11 projects of the Agency for the Support of Science and Research (APVV). Four of them are connected between geophysics and geology within the research team, because they have multidisciplinary character.
- Two projects out of the 26 solved projects of the Scientific Grant Agency (VEGA) had direct cooperation. Necessary consultations are of course common.
- Within the framework of the 10 projects with international participation, two are linked by personnel between the two divisions. However, it should be emphasized that among the geophysicists, who are mainly graduates of the Faculty of Mathematics, Physics and Informatics, there are up to 7 graduates geologists and applied geophysicists from the Faculty of Natural Sciences. Before 2006, not a single geologist worked at the Institute of Geophysics. So the interconnectedness is evident.
- Currently (September 2022), the institute has signed a project of the EU Structural Funds focused on meteorology and climatology, where the proportional representation of both divisions is balanced.

Strategy and potential for development

12. Where do you see future partners of Atmospheric Physics, which seems thematically somewhat isolated in the Earth Science Institute? (Pavol Nejedlík)

- The department of Atmospheric physics collaborates randomly within the ESI, mostly with the geological departments (atmosphere – surface interactions) and with the department of Geomagnetism (atmospheric conditions during measurement campaigns). This activities will continue;
- Nevertheless, the collaborating partners are coming mainly from other scientific bodies and universities mostly described in previous question Geophysics/Climate and also from private sector;
- Part of the work is done in collaboration on specific methodologies for meteorological operational processes within **Slovak Hydrometeorological Institute** (Methods for Drought monitoring system and there is ongoing collaboration in precipitation monitoring);
- Further activities which are going on, and will continue, focus on the climate change impacts by bringing specific data and information for the adaptation strategies (ongoing BLEPOSK project with a private company and collaboration with National forestry centre in other projects);
- International collaborative partners are mostly from surrounding countries. Among them **Global Change Research Institute of Czech Academy of Science, Hungarian Meteorological service, University of Natural Resources and Life Sciences, Vienna, AT**;
- Wide international cooperation is going on within the COST Actions in which is the Department of Atmospheric physics actively involved. They are oriented on micrometeorology and precipitation monitoring at present;
- The working capacity of the department does not allow us to perform “all-inclusive” atmospheric research, it is rather focused on the specific targeted problems with the partners working on similar topics.

Other questions and comments

13. Specify how the questionnaire was created, who participated on review of the results and on the strategy and potential development. (Ján Madarás)

- ❖ All the organizational components of the institute participated in the preparation of the Questionnaire, more than 20 employees in total;
- ❖ Economic, financial and personnel indicators were taken from the institution's published annual reports, as well as a selection of the most important publications. They are selected annually by the ESI Scientific Council according to established criteria;
- ❖ The lists of the most cited publications according to the established criteria were taken from the database of the Central Academic Library and compared with the ESI library;
- ❖ Key representatives of researchers from the both divisions were selected to compile the texts, i.e. heads of departments, chairman of the scientific council, scientific secretary, heads of divisions, general director. The selection was intended to cover all professional activities;
- ❖ Other activities (e.g. lists of implemented projects, organized conferences, selection of popularization activities, awards, etc.) were selected from the ESI databases by the director's secretariat and subsequently checked by the general director;
- ❖ The strategy and potential development of the institute were basically taken from the approved Action Plan for the development of the institute until 2020 and updated until 2025.