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**Person Responsible:** Burcu Özsoy

**SCAR Delegates Report 2021**  
**Online**

## **Application of Turkey for Full Membership**

**Report Author(s)**  
Prof. Hasan Mandal

### **Summary**

This paper is an application by Turkey for Full Membership of SCAR as an Initial Stage Program. The letter of application and an annex on scientific work undertaken and to be continued by Turkey are provided. Turkey acceded to the Antarctic Treaty in 1996 and is a non-consultative party. It adopted the Protocol on Environmental Protection to the Antarctic Treaty in 2017.

### **Recommendations**

The Delegates consider the application of Turkey for Full Membership of SCAR.

### **Budget Implications**

Initial Stage Membership fees are \$12,400, which would represent an additional annual positive contribution to SCAR's budget, above the Associate Member Fees currently contributed by Turkey.

23.01.2020

Prof. Steven L. Chown  
President  
Scientific Committee on Antarctic Research (SCAR)  
Scott Polar Research Institute  
Lensfield Road  
Cambridge  
CB2 1ER  
United Kingdom

Dear Prof. Steven Chown,

The Scientific and Technological Research Council of Turkey (TÜBİTAK) is pleased to submit the application for upgrading its existing Associate Membership to Full Membership of SCAR. TÜBİTAK is a national member of International Science Council (ISC) and was accepted as SCAR's Associate Member in 2016.

The short statement of Antarctic Achievements, proposed continuing program of scientific research in Antarctica is presented for your attention at the following documents. You are also kindly requested to see the statement of the organization's agreement to comply with the principles of the protection of environment recommended by SCAR as seen in the added document.

Regarding this, we hope to get a full membership in SCAR while considering an upgrade in our membership status would positively affect our contribution at this platform and its activities.

Sincerely yours,



Prof. Hasan Mandal  
President

The Scientific and Technological Research Council of Turkey

APPLICATION FOR FULL MEMBERSHIP OF  
SCIENTIFIC COMMITTEE ON ANTARCTIC  
RESEARCH (SCAR)

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SUBMITTED TO: SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH

THE SCIENTIFIC AND TECHNOLOGICAL RESEARCH  
COUNCIL OF TURKEY (TÜBİTAK)

## APPLICATION DOCUMENTS FOR FULL MEMBERSHIP OF TURKEY TO SCAR

### - Turkey's Polar Studies -

#### 1. Introduction

Although the Republic of Turkey made its first official attempt to be involved in Antarctic affairs by ratifying the Antarctic Treaty in 1995, Turkish scientists have been carrying out scientific studies on the region since 1967. Since 2017, the Antarctic studies, which are held under the auspices of the Presidency of the Republic of Turkey; are carried out under the responsibility of the Ministry of Industry and Technology. In order to ensure that polar research activities are carried out with international participation and embraced in a systematic manner, the Ministry has made the relevant planning and launched the “National Polar Science Program” with participation of more than 120 scientists and over 40 government agencies and universities. The objective of the Program is to implement the scientific activities and research on polar sciences with a systematic integrity and project approach. National Polar Science Program shall focus on priority research themes aligned with SCAR, human resources, international collaboration, education, publicity and public access, science expeditions and logistics as well as a Turkish scientific research station.

Below is a summary of the activities and events carried out within the scope of the Program:

- The process concerning the ratification of the Madrid Protocol and all of its Annexes by the Turkish Grand National Assembly was coordinated and the Protocol entered into force upon its publication in Official Gazette No. 30075 dated 24 May 2017. Turkey has finished working on harmonization of Protocol on Environmental Protection to the Antarctic Treaty to its domestic law and the related regulation was published in Official Gazette No. 31154 dated 13 June 2020.
- The coordination of annually conducted National Antarctic Science Expeditions, which four expeditions has been successfully completed so far, is provided.
- Each year a delegation headed by the Ministry of Industry and Technology attends the ATCM as well as the CEP.
- Turkey becomes a member of international organizations working on polar studies (SCAR, COMNAP, European Polar Board) and increasing the efficiency within such organizations.
- Within the scope of bilateral cooperations; signing of Memorandums of Understanding processes with 15 countries continues and MoU’s with 5 countries have been signed.
- National Polar Sciences Workshop are annually organized, following the National Antarctic Science Expeditions.
- Turkish Scientific Research Camp (2019 – 2022) has been established in Horseshoe Island for efficient scientific studies. The feasibility studies are in progress for the scientific research station.

## **2. A Brief History of the Turkey's Antarctic Activities**

Atok Karaali, an ionosphere physicist, can be cited as the first Turkish researcher to carry out scientific studies in Antarctica. Karaali conducted research at Plato Station, as part of the U.S. project "Operation Deepfreeze" between 1959 and 1965. In 1968, the U.S. Advisory Board on Antarctic Place Names named a small rocky area, 9 km east of Matikonis Hill in the Marie Byrd lands as the Karaali Rocks. Umran Inan, who carried one of the most prominent Antarctic upper atmosphere studies, was named after him in 1994 on a hill in Victoria land west of the Ross Ice Shelf (Inan Peak). Today, Antarctic research is carried out at many universities and affiliated institutes.

The Antarctic Treaty, signed in 1995 by Turkey, came into force on January 24, 1996. ATCM meetings were attended by a delegation of representatives of various public institutions including ministerial level, organizations and universities.

## **3. National Polar Science Program**

"National Polar Science Program (2018-2022)" has been prepared and by the Ministry of Industry and Technology with contribution of 40 institutions. The objective of the Program is to implement the scientific activities and research on polar sciences with a systematic integrity and project approach.

The vision of the Program is "becoming one of the scientifically-successful-countries in the world in terms of polar sciences". Under this vision the objectives are;

- Implementing the scientific activities and research on polar sciences with a systematic integrity and project approach,
- Ensuring that national science expeditions are conducted to the continent,
- Promoting bilateral cooperation on polar sciences and ensuring that Turkish scientists are deployed in the scientific bases of other countries collaborating with those countries on scientific purposes,
- Ensuring that scientific infrastructures are established in polar regions,
- Strengthening Turkey's scientific position in Antarctica and Arctic Regions,
- Enhancing the scientific and technological competencies of the country on this issue by encouraging Turkish scientists to conduct polar research,
- Promoting human resources on polar sciences by increasing the number of under graduate, graduate, doctorate and post-doctorate programs,
- Becoming a member of international organizations working on polar issues and increasing the efficiency of Turkey within such organizations,
- Creating awareness on global climate change and to conduct polar education and outreach activities.

Turkish Antarctic Science Program 2018-2022 has been delivered in December 2017 by the Ministry of Science, Industry and Technology. Istanbul Technical University Polar Research

Center (ITU PolReC) at first place, was the responsible body for the implementation of the Program. The document has 7 chapters as the information follows:

- Chapter 1: Introduction
- Chapter 2: National Polar Science Program (includes goals, scope, timeline, monitoring and evaluation)
- Chapter 3: Priority Research Themes
- Chapter 4: Human Resources
- Chapter 5: International Collaboration
- Chapter 6: Education, Publicity and Public Access
- Chapter 7: Science Expeditions and Logistics

Turkish Antarctic Science Program is planned to be conducted in harmony with the working groups established by SCAR consists of 4 main titles:

- Physical Sciences
- Geosciences
- Life Sciences
- Social Sciences and Humanities

Within the scope of **Physical Sciences**, scientific studies are aimed at:

1. Applied Physical Sciences and Innovative Technologies,
2. Atmosphere and Climate Research,
3. Modelling Studies,
4. Kinematic and other monitoring systems
5. Sea Ice Processes,
6. Astronomy and Astrophysics,

Any scientific information such as geodynamic processes, geodetic and geological studies about the Antarctic Continent, which one of the most vital parts of the earth, is important.

Within the scope of **Earth Sciences** scientific studies are aimed at the following areas:

1. Geodetic Studies
2. Geomorphology
3. Volcanology
4. Magmatism-Geodynamics
5. Sea / Lake Geology and Geophysics
6. Glacial Studies
7. Structural Geology
8. Geodynamic Modeling
9. Seismology

There has been significant scientific progress in **life sciences** during the recent years, however more research is necessary surrounding the Southern Ocean especially the effects of Climate

change on biological sources and ecological structure. Within the scope of life science scientific studies are aimed at the following areas:

1. Polar Biodiversity
2. Biochemistry and Biogeochemical Cycles
3. Biotechnology
4. Ecology and Pollution Studies
5. Medicine

SCAR has been involved in the Humanities and Social Sciences Expert Group since 2010 about geopolitics, the environment, tourism, and so on. Within the Turkish Antarctic Science Program framework of social and humanities; law, international relations and environment is also covered.

The Scientific and Technological Research Council of Turkey (TÜBİTAK) aimed to leverage scientific research by creating support mechanisms for researchers who are interested in the identified priority research themes and who have studies in the mentioned fields, and at the same time to enable Turkey to move forward in the scientific studies related to the polar regions. By the launch of “Antarctic Science Project” in 2017, the scientific expeditions to continent were conducted annually and project calls were opened for selection of researchers with their projects eligible to participate in the expeditions. These projects were financed by the Ministry of Industry and Technology. Last but not least, Polar Research Institute is established under TÜBİTAK at the end of 2019, therefore all the procedures will be handled from the Institute from now on.

#### **4. Human Resources**

There is a growing demand for building specific expertise on variety of science disciplines in order to carry out studies in Polar Regions. In this framework; polar studies have been included in the TÜBİTAK Science, Special, Service and Incentive Awards organized by TÜBİTAK to contribute to the training and development of scientists and researchers. Similarly, Turkish Academy of Sciences (TÜBA) promoted scientists by giving awards on polar sciences in 2020.

Within the context of National Polar Science Program, National Workshop on Polar Sciences are planned to be organized on an annual basis. The scientific projects of Turkish scientists are evaluated, progresses in priority themes are covered, the findings and conclusions of scientific expeditions are assessed and it provides a basis in the determination of the scientific themes of the next expeditions. The National Polar Science Workshop was held at Istanbul Technical University in 2017 and 2018, at Middle East Technical University in 2019. Approximately 500 people/scientists participated in these workshops. Due to Covid-19 pandemic, the fourth science workshop was held online by TÜBİTAK Polar Research Institute. The number of participant was over 700 people/scientists. Following the workshop, an online Polar Science Festival was organized for younger generations, where polar researchers gave talks about their studies. Thousands of students from all over the country participated to the online festival.

Within the concept of Polar Program, supporting Turkish researchers' attendance to international conferences, congresses and scientific activities is essential. In this context Turkish researchers have attended the IASC; Arctic Frontiers and SCAR OSC meetings within the Program period.

## **5. International Cooperation**

In line with Articles 2 and 3 of the Antarctic Treaty, the Republic of Turkey aims to cooperate with all states on scientific research in Polar regions. In 2020, the process of signing bilateral cooperation agreements with Czech Republic, Belarus, Republic of Korea, Bulgaria and Ukraine has been completed. Signing the cooperation agreement with 15 countries are ongoing. These agreements predominantly consists of scientific collaboration.

International Polar Sciences Workshops are organized with a view to establish cooperation on polar activities among the countries. Workshops on Polar Science Cooperation has been organized between 28-29 July 2017, 5 October 2017 and 18 July 2018 in Istanbul with the participation of Chile, Bulgaria and Republic of Korea.

Since 2017, 20 Turkish scientists were based on Antarctic stations and expeditions of Poland, Belgium, Czech Republic, Bulgaria, Republic of Korea and Chile and 1 Turkish researcher participated at Colombian expedition. In addition, 9 researchers, from Belarus, Bulgaria, Chile and Czech Republic, Germany, New Zealand have attended the Turkish Antarctic Expeditions (TAE) for conducting their research. Besides, TAE's logistic capabilities are always open to all nations.

In addition to these progresses The Republic of Turkey has attained observer status in COMNAP in 2018.

## **6. Education, Publicity and Public Access**

It is considered that informing the society on polar regions will increase public interest on scientific studies. It is also taken into account that motivating children, who will become the scientists of the future on climate change and polar regions, is important. Outreach and education activities at early ages will provide them the opportunity to understand how to conduct research in these regions in the future. In this context, organizing activities such as trainings, seminars, preparing publications, books/journals, documentary and animation films are all ongoing.

During TAE-2, TAE-3 and TAE-4 participation of press members has been provided in order to attract and direct the attention of young researchers with broadcasted documentaries called "Frozen Frontier: Expedition to Antarctica", "Antarctica Diaries: A Trip to the End of the World", and "The Black Box of the Planet: Antarctica".

One of the most important projects developed within the scope of expeditions was realized by TÜBİTAK Popular Science magazine "Bilim Genç". All scientific studies were transferred to

high school students who are the target group of the journal as daily (dairy) and transferred to young people who will make university preference, that is, professional choice, in a language that they can easily understand. The flashbacks to this study prove that the study was successful.

Another important project was carried out by ITU Polar Research Center (ITU PolReC). Within the scope of this project, a “Polar Studies Club” was established in 26 different secondary schools, each with maximum 15 people, and a total of about 300 secondary school students were included. With PolSTeam (Polar Research Student Team), which was founded simultaneously in ITU, about 150 university students gained information about polar studies and participated/organized various activities. With the completion of both formations, the university students visited the middle school students in their clubs and provided them information and answered their questions. Within 5 years, PolSTeam has reached up to 120.000 middle and high school students by giving climate change and polar regions related seminars.

Turkey, which started to train future polar scientists in the age range of 11-17, has come a long way in a short time with the interest of university students. This path taken rapidly in the last 5 years shows that Turkey will improve with the number of scientific interest in the near future regarding polar sciences.

One of the other important event was to host the photographic exhibition “Our Antarctica – Images from the Great White South”, jointly with The Turkish Ministry of Foreign Affairs, the Council of Managers of National Antarctic Programs (COMNAP), the Scientific Committee on Antarctic Research (SCAR) and Istanbul Technical University (ITU) Polar Research Centre (PolReC). The exhibition included photographs by PolReC illustrating Turkey’s scientific activities in Antarctica. The opening reception was held on 14 October 2016 at the Ministry’s art gallery. Attendees at the opening ceremony included Turkish and foreign diplomats, including some ambassadors, officials from Turkish government departments and academics. Furthermore, ITU PolReC also hosted the images from the Great White South in Istanbul. The opening was held at ITU Maritime Faculty which coincide with the 132nd Anniversary of the faculty. Mr. Ahmet Arslan, Minister of Transport, Maritime affairs and Communication attended the opening on 3 December 2016. Significant number of people, from national maritime community, government departments, non-governmental maritime organizations, academics from several universities, ITU maritime students and graduates, visited the exhibition. ITU PolReC arranged the photo exhibition to travel to several middle and high level schools in Istanbul as well. Afterwards the exhibition was sent to Swiss Polar Institute by PolReC. We would like to express our sincere gratitude to Professor David Walton, Emeritus Fellow of British Antarctic Survey, Council of Managers of National Antarctic Programs (COMNAP), and the Scientific Committee on Antarctic Research (SCAR) for arranging SCAR photo exhibition to make its way to Turkey.

Children's Book: Celebrating Antarctica - A Treaty Protecting a Continent is a great resource to help young people learn about the Antarctic Treaty. Julie Hambrook Berkman and Allen Pope authored the book "Celebrating Antarctica - A Treaty Protecting a Continent", which presents the Antarctic Treaty in a book illustrated by school children from around the world. The book has been produced as a pdf in 22 languages. It has been translated into Turkish by Istanbul Technical University (ITU) Polar Research Center (PolReC) and all languages can be downloaded for free at Web Site <http://celebratingantarctica.tumblr.com>.

### *Support for Teachers for the Polar Regions (TPR)*

The aim of the project is to increase the knowledge and capacity of our trainers who train future scientists and to transfer this knowledge and capacity to future generations. Given the climatic conditions and distance of the polar regions, it is also a very difficult task to share the science made in these regions with the younger generations. TPR is a project that aims to involve teachers into the science expeditions to polar regions.

Within the scope of the project, a teacher(s) will take part in Arctic or Antarctic science expeditions between 2 and 12 weeks, observe the activities of the participants/researchers during the expedition, write their observations on the weblog, communicate with the classrooms with appropriate communication devices by voice or video and after the expedition, students and other teachers (from middle and high schools). In TAE-IV, an English teacher from a middle school participated the expedition. She kept a journal and prepared six blog posted for students, made short interviews with the researchers, took photos and videos for exhibition, and made a live question & answer sessions with students from Antarctica via voice call.

## **7. Scientific Expeditions and Logistics**

The Republic of Turkey conducted its very first national and independent Turkish Antarctic Expedition - I (TAE - I) in 2017. Turkish Antarctic Expedition - I was supported by the "Presidency of the Republic of Turkey" and sponsored by the "Ministry of Science, Industry and Technology" and coordinated by the Istanbul Technical University Polar Research Center (ITU PolReC). The expedition consisted of nine scientists from 4 different universities all around Turkey. Researchers under the Turkish Antarctic Expedition - I focused on 4 scientific fields including, physical sciences, life sciences, geosciences and humanities and social sciences. Turkish Antarctic Expedition - I was conducted through non-governmental R/V Australia authorized by Australian Antarctic Division. With the support of the R/V Australia, the expedition included physical sampling of planktons, algae, benthos, distributed over a distance of 2000 nautical miles along the West Antarctic Peninsula. During the expedition, surveying and mapping on land, approximately 2 (two) million square meters of location, a number of points for satellite validation and ground-truthing as well as around 1 million square meters of bathymetric surveying at the adjoining locations were conducted. Bathymetric surveys were jointly conducted by the TAE- I members and the crew of the R/V

Australia. The expedition reached until 67°56' South along the Peninsula. During the TAE - I, Turkish scientists visited Prof. Julio Escudero Base of Chile on 28 February 2017, Jubany - Carlini Base of Argentina on 2 March 2017, Rothera Base of UK on 7 March 2017, Vernadsky Base of Ukraine on 16 March 2017, Bellinghausen Base of Russian Federation and Great Wall of People's Republic of China on 28 March 2017. Turkish scientists were welcomed by Base commanders and staff. Chilean, Argentinian, British, Ukrainian, Russian and Chinese base experiences were much appreciated by TAE - I members and Turkish authorities.

The Republic of Turkey conducted the second national Turkish Antarctic Expedition - II (TAE - II) during 2017-2018 Antarctic season. Turkish Antarctic Expedition - II was supported by the "Presidency of the Republic of Turkey" and sponsored by the "Ministry of Science, Industry and Technology" and coordinated by the Istanbul Technical University Polar Research Center (ITU PolReC). The expedition consisted of twenty-eight members most of whom are scientists with 14 different projects all around Turkey. Expedition had two legs. Leg 1 consisted of camping around Chilean Station (Risopatron). 10 people were deployed on Robert Island. 6 projects run during the camping period. There was additionally a medical doctor, cook, camp leader and technician on the camping side. Leg 2 included navigating from Robert Island through Horse Shoe Island. This part included 9 individual scientific projects.

The titles of scientific projects are listed below:

1. The origin and environmental impact of Western Antarctica Rift Volcanism
2. Cytotoxic, genotoxic and antioxidant effects of Antarctic plant extracts in cancer cell lines and peripheral lymphocyte cell cultures
3. Determination of coastal marine meroplankton diversity in Antarctica-Robert Island and its vicinity by Environmental DNA (eDNA) method
4. Elucidating the effects of climate change on Antarctic freshwater ecosystems (lakes and rivers) by using ecological characteristics, biological diversity and food web structure
5. Secondary Metabolites, Bioactivity and Drug Potentials of Fungi from Antarctica Live Sources
6. Sedimentological Properties of Miers Bluff Formation Outcropping in South Shetland Islands: Sandstone Petrography and Provenance Studies
7. Glacial and climatic studies in the Antarctic Peninsula
8. Relative Sea Level Change along the Antarctic Peninsula: implications for climate and geodynamic processes
9. Late Quaternary glacial and deglacial stratigraphy and sea-bottom morphology in West Antarctica
10. A study on the investigation of microplastic contamination in Antarctica and the distribution of microplasticity
11. The Phylogenetic Origin of Cold-Adaptive Mechanisms of Endemic Notothenioid Sub-Order members in Antarctica Continent

12. Determination of Polyaromatic Hydrocarbon (PAHs) Pollution and Bioturbation in Antarctic Ecosystem
13. Antarctic Sea and Main Land Ice Core Drilling
14. Stratigraphical history of the Quaternary and older units on the TAE-I route to the west of the Antarctic Peninsula (68 South Latitude): Benthic, Planktic and Nannoplankton communities, Paleoecology and Paleoclimate

Turkish Antarctic Expedition - III (TAE-III) was supported by the “Presidency of the Republic of Turkey”, sponsored by the “Ministry of Industry and Technology” and coordinated by the Istanbul Technical University Polar Research Center (ITU PolReC). TAE-III with 24 scientists and 13 projects on board the vessel sailed along the Western Antarctic Peninsula during February 2019. 24 scientists consisted of 18 national and 6 international scientists (Barbora Chattova / Masayk University, Stefan Penkov Velev / Bulgarian Antarctic Institute, Shelley Anne MacDonell / INACH, Francisco Fernandoy / INACH, Arno Christian Hammann / INACH, Lissette Tamara Muñoz / INACH). The operations included the setup of Turkish Temporary Camp on Horseshoe Island made up of 3 container sized modules. Betanzos sailed South along the Peninsula and sailed back to King George Island. Along the route, 13 projects were conducted on board the vessel. Additionally, fully operational Automatic Weather Station (AWS) for measuring basic meteorological parameters was established with solar panels and batteries that could support the system up to four months in case of full darkness without sunshine. The station is also equipped with a satellite modem and antenna for data transmission.

The titles of scientific projects are listed below:

- Terrestrial ecosystems on the margin of maritime Antarctic: interactions between components,
- Geological investigations on Horseshoe Island, Antarctica,
- Ecology, diversity, taxonomy and biogeography of diatoms (Bacillariophyta) of Horseshoe Island,
- Psychrophil and Psychrotolerant microorganism studies which can breakdown with Genomic analysis of herbicides (Dalapon and Bromoxynil),
- Investigation of Genomic Variety Variation in Vascular Plants Specimens from Antarctica,
- Investigation of marine invertebrate diversity in the Antarctic Peninsula Region by using environmental DNA (eDNA) method,
- Determination of Levels of Persistent Organic Pollutants in Antarctic Ecosystem; Passive Sampling Techniques,
- The analysis of the reactions of Antarctica food webs to environmental changes with stable isotope, eDNA and palaeoecological methods,
- Detection and Determination of Heavy Metal Pollution in Sediment and Nacella Concinna in the vicinity of Antarctica,

- Investigation of Amphipod Krustase Fauna in the Shallow Water Tidal Zone Habitats of Antarctica Peninsula Region by DNA Barcoding Method,
- Plankton in Antarctic Pelagic Ecosystem: Pigment Composition, Community Structure, Prokaryotic Metagenics,
- Monitoring of Antarctic Region with AWS and GNSS Stations,

In addition, outreach and education activities were performed. Within the scope of outreach and education part of the expedition, drawings of elementary and middle school students about Antarctica by their own perspective were exhibited by scientists.

Turkish Antarctic Expedition - IV (TAE-IV) was supported by the Presidency of the Republic of Turkey, sponsored by The Ministry of Science, Industry and Technology and coordinated by TUBITAK MAM Polar Research Institute (PRI). TAE-IV with 24 scientists and 15 projects on board the vessel sailed along the Western Antarctic Peninsula during February and March 2020. 24 scientists consisted of 22 national and 2 international researchers (Dr. Sergey Kakareka from Belarus National Academy of Sciences and Dr. Lyubomir Kenderov from Sofia University, Bulgaria). The operations included the installation of GNSS (Global Navigation Satellite System) stations on Horseshoe Island and Dismal Island for monitoring the changes in ice thickness, sea level and tectonic movements. 15 projects were conducted on board the vessel. The titles of the 15 scientific projects are listed below:

- Determination of Organic and Inorganic Pollutants by Collecting Environmental Samples from Horseshoe Island, and Analyzing by Chromatographic and Spectroscopic Methods Combined with Pre-Concentration Strategies
- Timing and origin of magmatism in King George Island (NW Antarctica): implications for Mesozoic to Cenozoic magmatic arc evolution
- Determination of the Littoral Microalgae and Cyanobacteria Biodiversity of Horseshoe Island, Establishment of the Culture Collection, and Evaluation of the General Biotechnological Properties of the Cultured Stains
- Establishing Global Navigation Satellite System (GNSS) Stations on Horseshoe Island in Antarctica
- Maintenance of Previously Established Meteorological Station at Horseshoe Island
- Establishing a Global Navigation Satellite System (GNSS) Station on Faure Island in Antarctica
- Outreach and Education Conducted by High School Teacher
- Meteorite Search and Recovery Expeditions in Antarctica
- Hydrographical Surveying of Horseshoe Island Using Multibeam Echosounder
- Health Monitoring of Researchers
- Evaluation of Psychological and Medical Characteristics of Researchers
- Media and Documentary Studies for Public Awareness about Polar Regions
- Landscape-Geochemical Determination of Marguerite Bay Islands, Antarctic Peninsula
- Hydrobiological Monitoring of Horseshoe Island

## – Sky Quality Measurements in TAE-4

Additionally, Republic of Turkey felt the necessity to be part of COMNAP family while actively building up a scientific background in Antarctica, having an observer status at ATCM since 1996, conducting consecutive scientific expeditions, strengthening relation and collaboration with Antarctic states. Turkey wanted to extend this effort by sharing experiences, developing practices and applying to become an observer state in COMNAP. Therefore, Turkey submitted an application to the consideration of COMNAP Executive Committee (EXCOM) in January 2018 and has become an observer in COMNAP.

### **8. Scientific Station and Scientific Articles**

Through the research; the sustainability of scientific data will be ensured, Turkey will maintain its presence with science in the region, and finally a scientific research station will be established. According to results of the preliminary studies gathered in four national expeditions, it was decided that scientific station shall be established at Horseshoe Island. According to finalization of the feasibility study and procedures for Comprehensive Environmental Evaluation, establishment of scientific station will be launched.

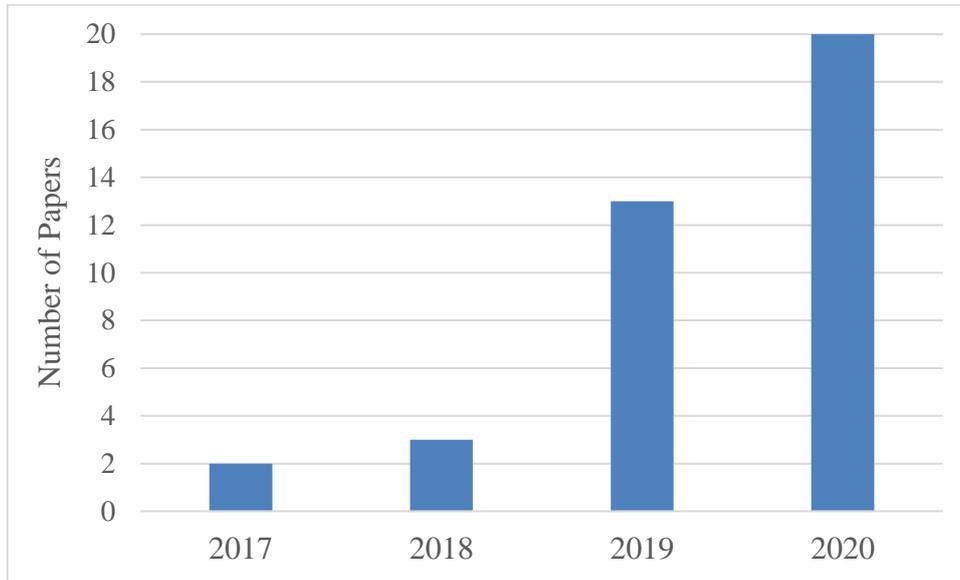
During TAE-III 2018-2019 Antarctic Season, three shelter modules and one automatic weather station (AWS) were installed on Horseshoe Island at Marguerite Bay. Prior to the expedition, the Initial Environmental Evaluation Report was prepared considering Annex I of the Protocol on Environmental Protection to the Antarctic Treaty (1991) and submitted to ATCM. In TAE-IV, three Global Navigational Satellite System (GNSS) stations were established in Dismal Island and Horseshoe Island in order to investigate tectonic movements and atmospheric parameters.

Details about Scientific Articles (ref: ATCM 2019 IP #63 and ATCM 2020 IP #8): The scientific publications on the Antarctic published by Turkish scientists, which are supported by Turkish Antarctic Expeditions, between 2017 and 2020 has been archived. Excluding the supported publications, it should be noted that there are over 150 articles published by Turkish scientists including the works of Prof. Dr. Umrhan Inan and Prof. Dr. Serap Tilav who studied the Antarctic in the United States of America for many years. Figure 1 shows the numbers of publications published until now. Although not all the journals are included, the most important ones -in terms of impact factors- are:

*Remote Sensing of Environment, Journal of Geophysical Research (Oceans), Lithos, Frontiers in Marine Science, Remote Sensing, Journal of Maps, Antarctic Science, Polar Science, and so on.*

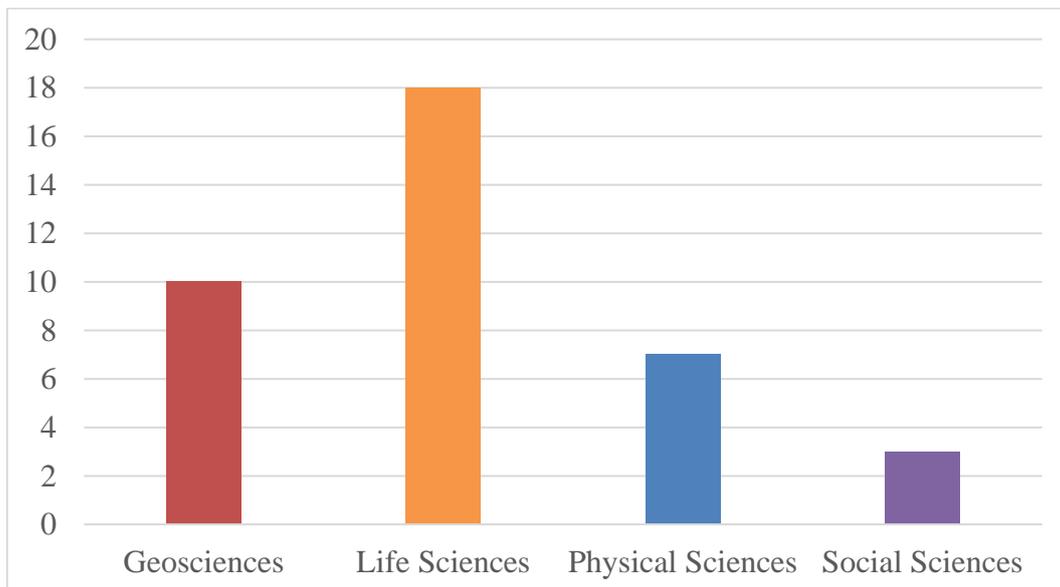
Figure 1 shows the numbers and categories of publications published until now. It is clear that since the announcement of the National Polar Science Program in 2017, the number of scientific publications has gained momentum. Considering the analyses/studies of the projects and preparation/submission processes of the publications will take a while after the expedition; it is estimated that the number of scientific papers will increase in time. The

updated list of publications can be reached from the official website of TUBITAK MAM Polar Research Institute.



**Figure 1.** Number of scientific publications between 2017-2020 by Turkish scientists supported by the National Antarctic Program.

The publications were collected in four categories (namely physical sciences, earth sciences, life sciences and social sciences) which are compatible with SCAR categories (Figure 2).

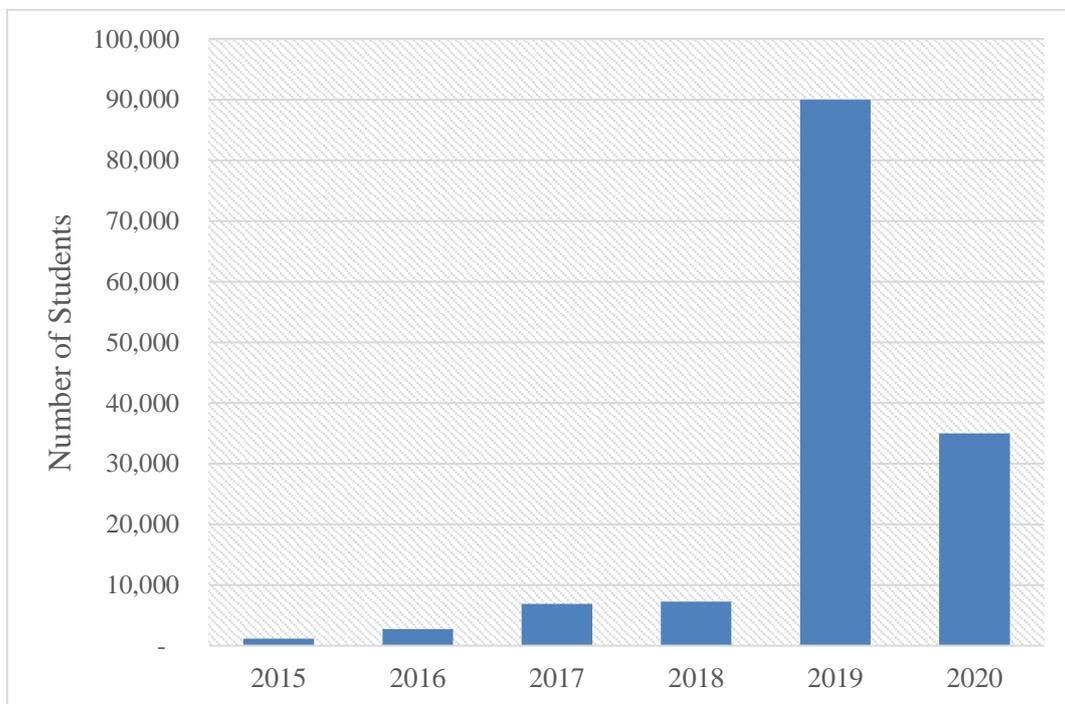


**Figure 2.** Number of Antarctic publications by Turkish scientists between 2017-2020 in four scientific categories

In particular, there were 54 scientific projects from different universities and institutions supported during the 2nd (2017-2018 season), 3rd (2018-2019 season) and 4th Turkish

Antarctic Expeditions (TAE). 26 of them were under the roof of life sciences and 26 projects were under the earth or physical sciences. In addition to these categories, incentives were increased to include the social sciences category into the system, and 2 social science projects were conducted under TAE-IV for this purpose. Furthermore, three books were printed with international cooperation in the Arctic and Antarctic social sciences between 2016-2020.

On the other hand, the National Polar Science Program is carrying out a successful education and outreach program in the field of social sciences. Polar Research Institute under TUBITAK (The Scientific and Technological Research Council of Turkey) and Istanbul Technical University Polar Research Center (ITU PolReC) organize training courses for raising public awareness about the polar regions, global climate change, and the National Turkish Polar Science Program 2018-2022s. Additionally, national and international courses, seminars, conferences, congresses, and suchlike activities are engaged, which include solution suggestions, and scientific explanations and technical findings as results of the practices and studies. APECS Turkey has an influential E&O program that is executed by the Turkish Students Polar Research Team (PolSTeam). During the year, APECS Turkey and PolSTeam members visit primary, middle and high schools to make age orientated presentations about global climate change and polar regions. Due to Covid-19 pandemic in 2020, physical communication was limited and the organizations on education and outreach were held online. The number of students has been reached since 2015 is shown in Figure 3.



**Figure 3.** Number of students reached directly by PRI, PolReC, PolSTeam and APECS Turkey.

**9. Statement of the organization's agreement to comply with the principles of protection of the environment recommended by SCAR**

TÜBİTAK being the institution responsible in coordinating the Antarctic Research Program is hereby agreed to comply with the principles of protection of the environment recommended by SCAR as appears in Annex 1 of SCAR Constitution, SCAR Rules of Procedure, and Rules of Procedure for SCAR Subsidiary Groups.