

The University of Costa Rica Regional Training Center (UCR-RTC). Part I: Contribution to education and training of regional meteorological personnel 1968-2017



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Institutional Structure

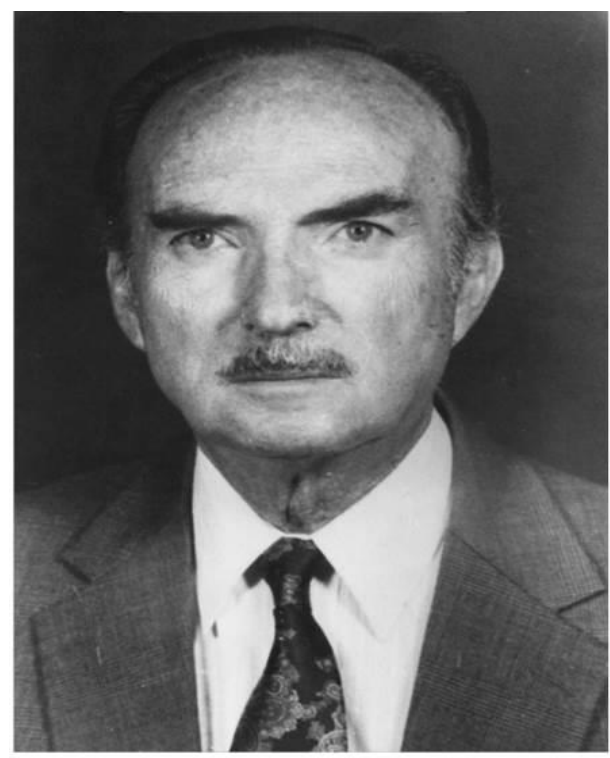
The University of Costa Rica (UCR): **1940**
The Faculty of Sciences and the Department of Physics and Mathematics: **1957**
The School of Physics: **1973**
The WMO Regional Training Center: **1967**
The Department of Atmospheric, Oceanic and Planetary Physics: **1979**
The Center for Geophysical Research: **1979**
Brief History of Meteorology: The RTC

Naturalists and founders

Elliot Coen París (1921 – 1997)

Henry McGhie Boyd (1908 – 2005)

Engineers Elliot Coen and Henry McGhie promoted the creation of the meteorology career at UCR.



Eng. E. Coen P. Eng. H. McGhie B.

The Regional Training Center (RTC)

In 1967, the World Meteorological Organization supported the creation of the RTC based at the School of Physics, UCR. In 1968, and in the following four years, the first lessons of the program were delivered by:

M. Sc. Héctor Grandoso (1918–1981, *Argentina*)

Dr. Jose Luis de Briones (1916–, *Spain*)

Lic. Juan Carlos Jusem (1936 –, *Argentina*)

Fellowship Program for UCR Staff

The UCR encourages, on a continuous basis, the preparation of its staff at Ph. D. level in Europe, South America and United States. To date over **60 Ph.D.'s**, have graduated in several disciplines such as, Astronomy and Astrophysics, Applied Nuclear Physics, Theoretical Physics, Condensed Matter Physics, and Atmospheric Physics (among others) in order to work at the School of Physics. Around **40** of them work currently for the UCR. Some have retired.

“Research” as such, in atmospheric sciences, had a relatively late beginning at the UCR (around the 80’s), due to the fact that several students went abroad to pursue Ph. D. degrees to return to the RTC. See Part II of this poster presentation for the RTC contribution to research activities.

Education and Training Programs

☐ Meteorological Technician : **1 to 1.5 years (offered on regional demand)**

☐ B. Sc. Program in Meteorology : **4 years (a continuous program)**

☐ Licentiate Program in Meteorology : **B. Sc. plus one additional year with thesis (a continuous program)**

☐ Graduate Program in Atmospheric Sciences (Diploma on Applied Meteorology) : **1.5 years (offered on regional demand)**

☐ Graduate Program in Atmospheric Sciences (Master Degrees in Atmospheric Sciences, Operational Meteorology or Hydrology) : **2 years (a continuous program)**

The UCR-RTC Staff

- Alfaro, Eric, Ph.D., University of Concepción, Chile
- Amador, Jorge A., Ph.D., Reading University, United Kingdom
- Castillo, Rodrigo, Ph.D., University of Vigo, Spain
- Durán-Quesada Ana María, Ph.D., University of Vigo, Spain
- Fernández, Walter, Ph.D. (Emeritus), Imperial College, United Kingdom
- Garbanzo, Marcial, Ph.D., University of Western Ontario, Canada
- Gutiérrez, Jorge, Ph.D., Reading University, United Kingdom
- Hidalgo, Hugo, Ph.D., University of California L.A., United States
- Lizano, Omar, Ph.D., University of Puerto Rico, Puerto Rico
- Mora, Gabriela, Ph.D., Colorado State University, United States
- Rivera, Erick, Ph.D., University of Arizona, United States
- Vidaurre, German, Ph.D., University of Nevada, United States

Associated Staff

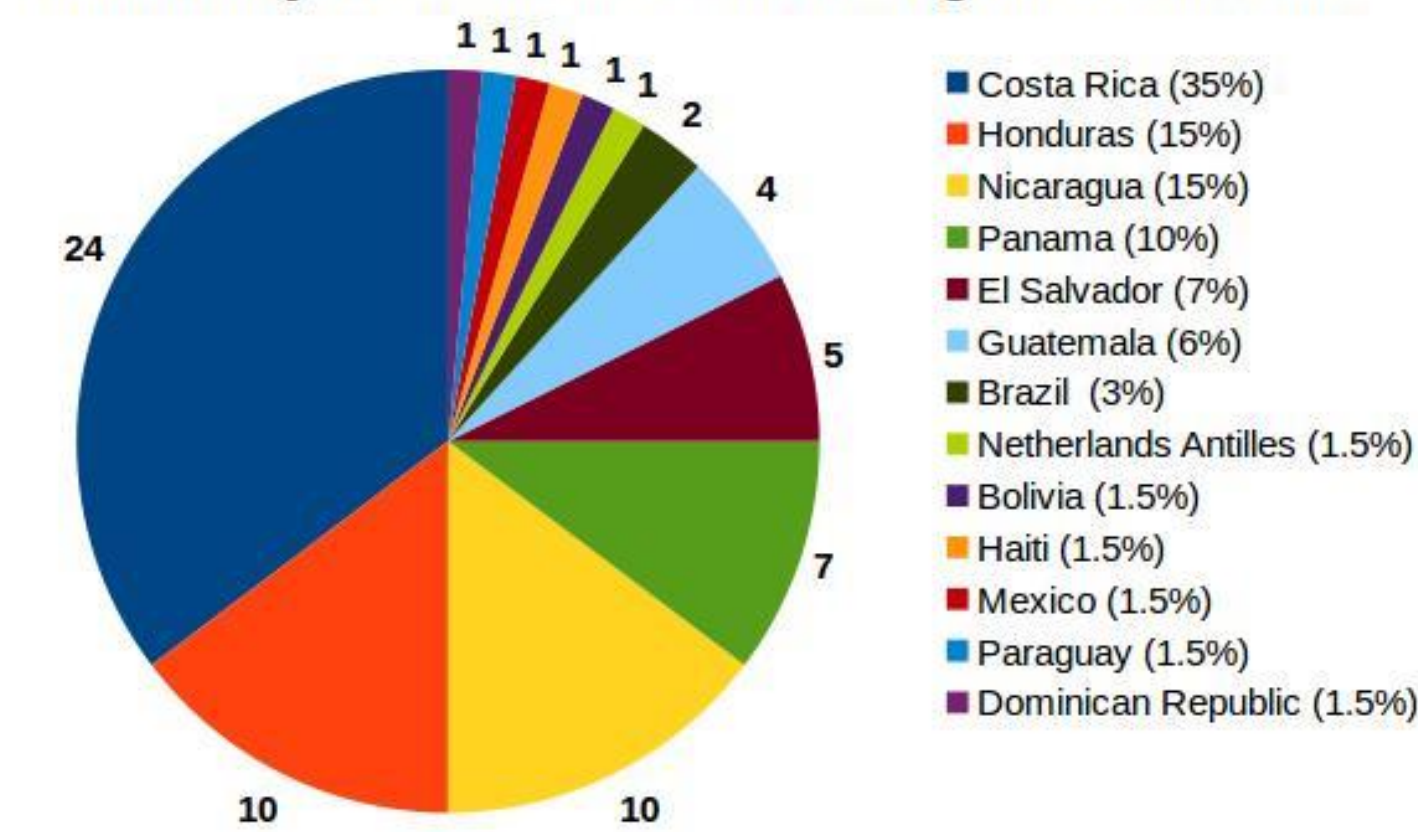
- Fallas, Juan Carlos, Licentiate, University of Costa Rica, Costa Rica
- Maldonado, Tito, Ph. D., Uppsala University, Sweden

UCR Students on Ph.D. Programs

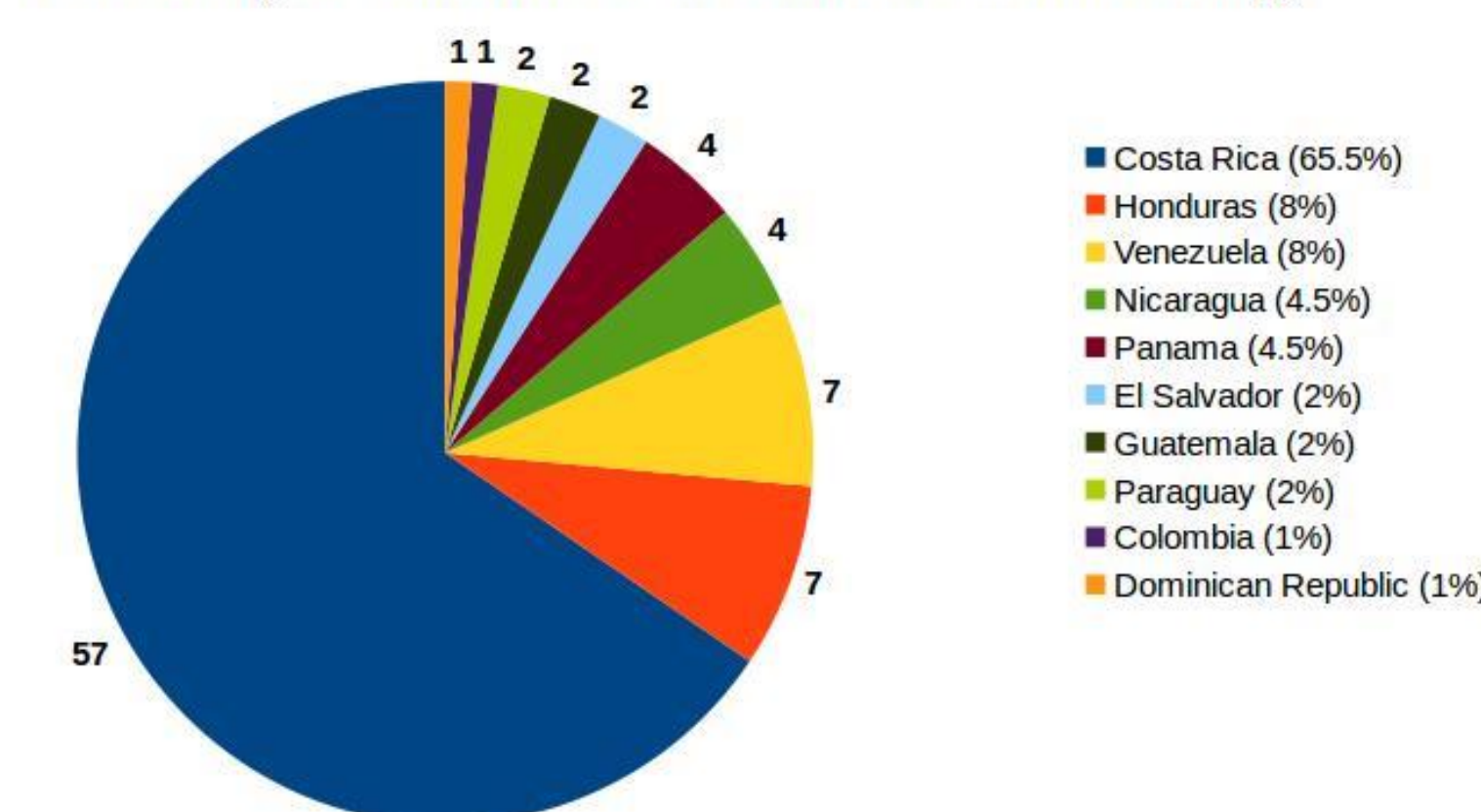
- Arce, Lizdenia, Br., Newcastle University, United Kingdom

UCR-RTC Graduates per Country and Academic Level

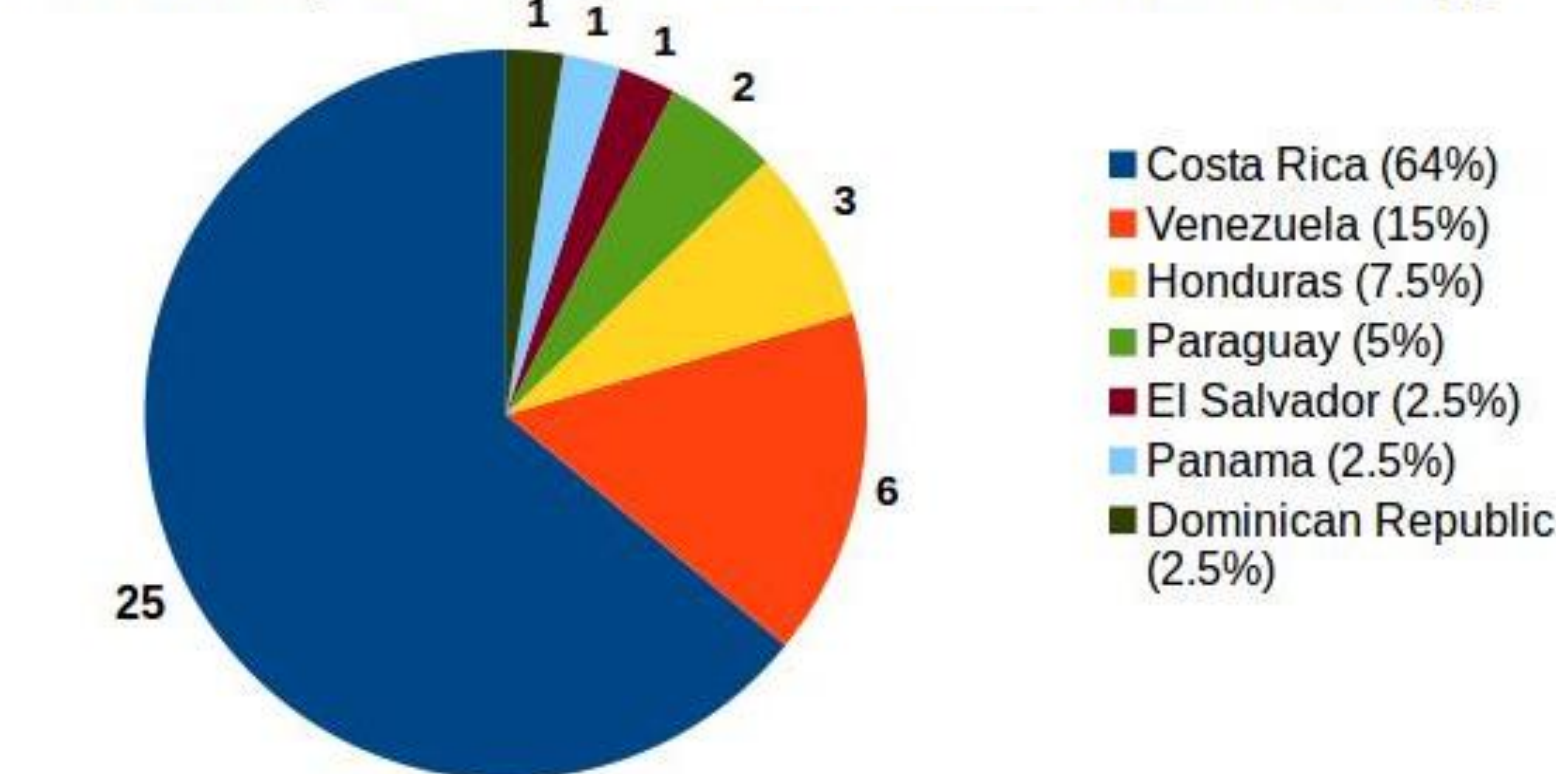
Nationality of Graduates: Meteorological Technician



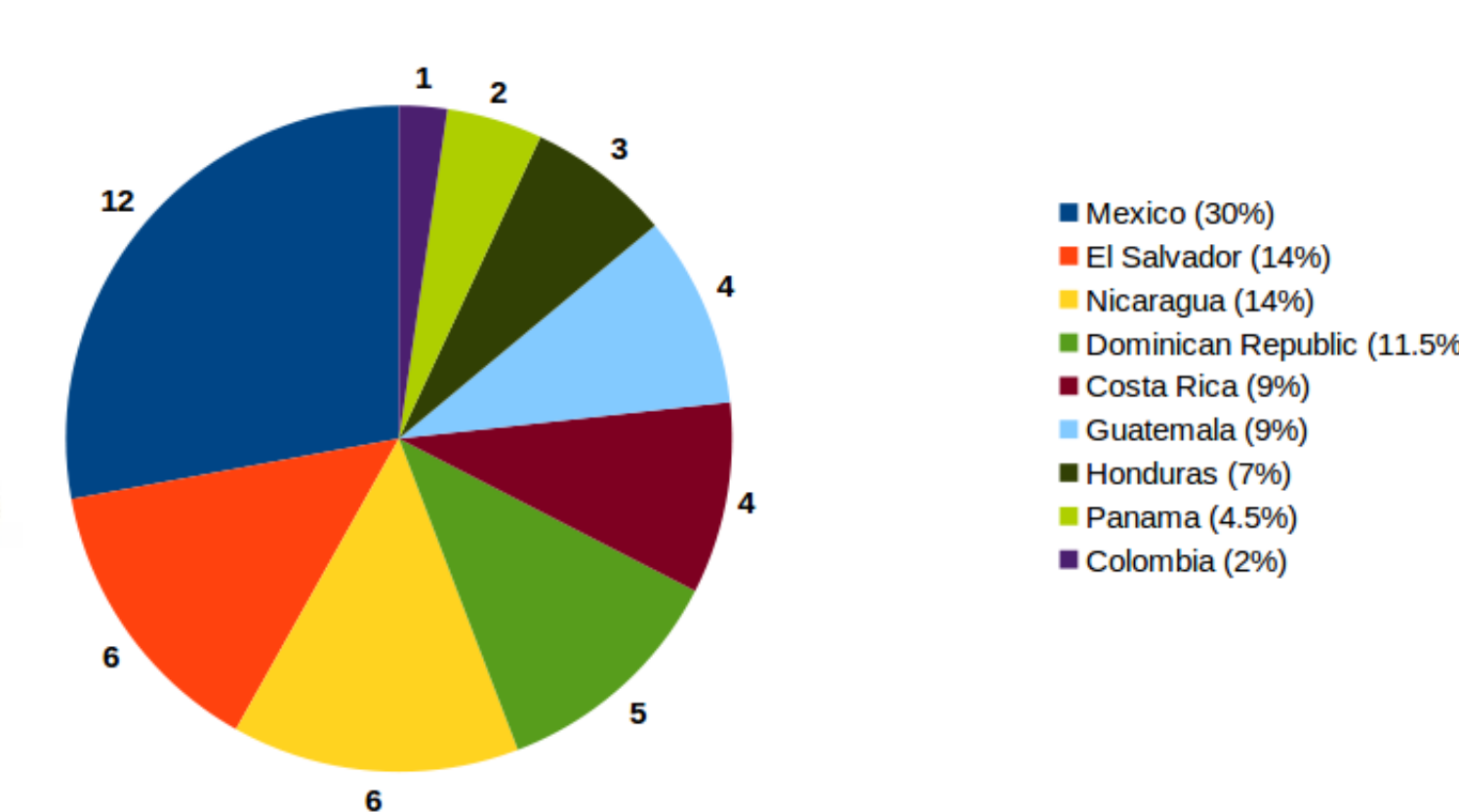
Nationality of Graduates: Baccalaureate in Meteorology



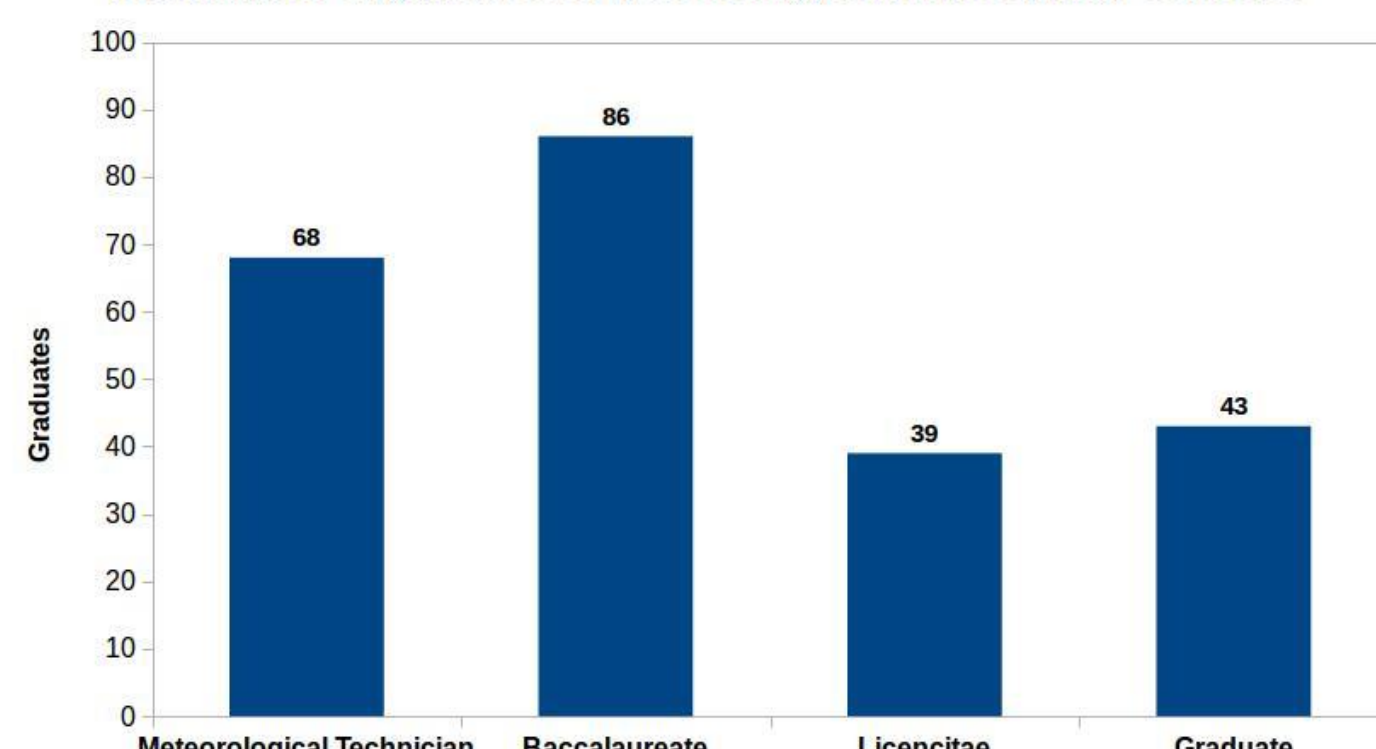
Nationality of Graduates: Licentiate in Meteorology



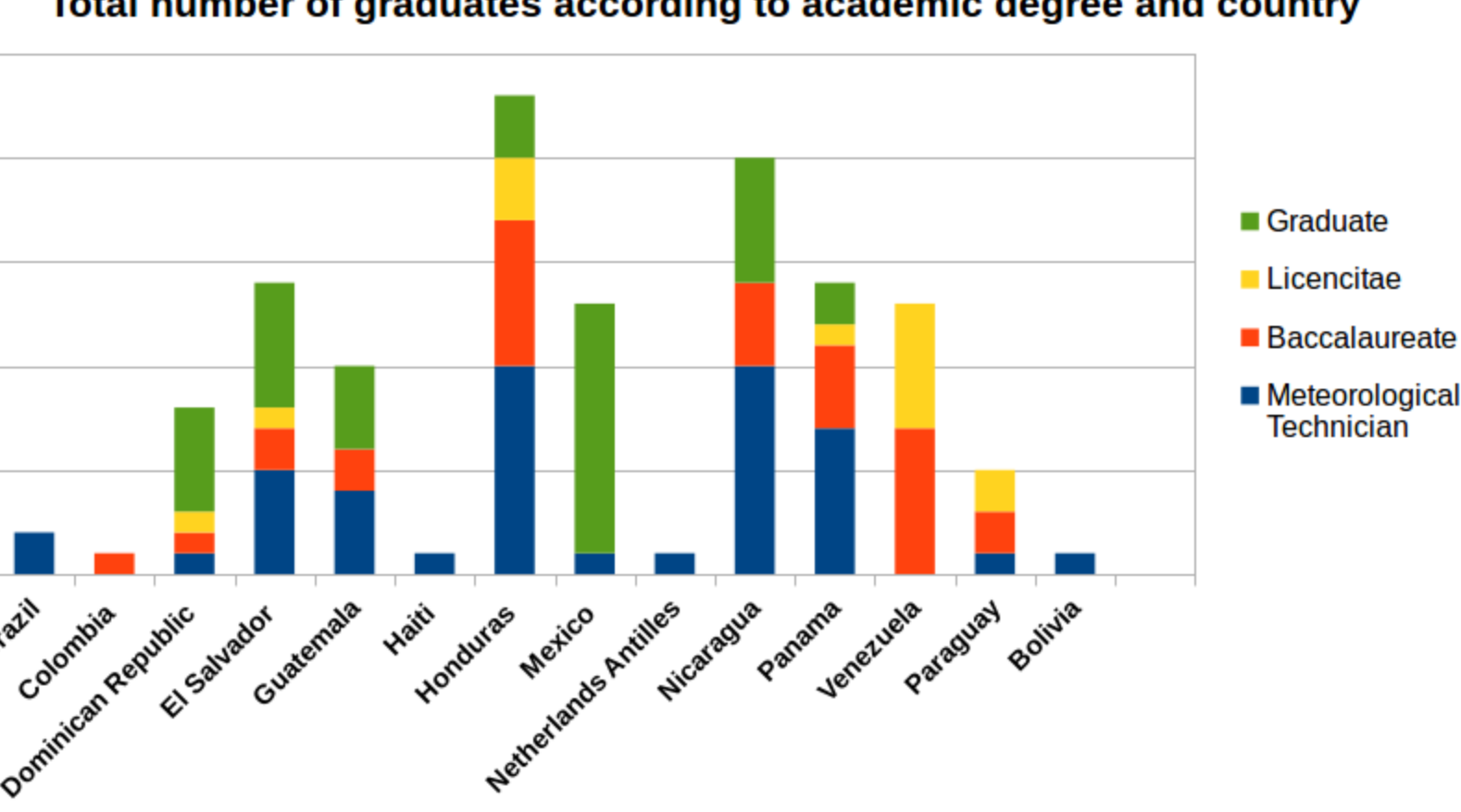
Nationality of Graduates: Program in Atmospheric Sciences



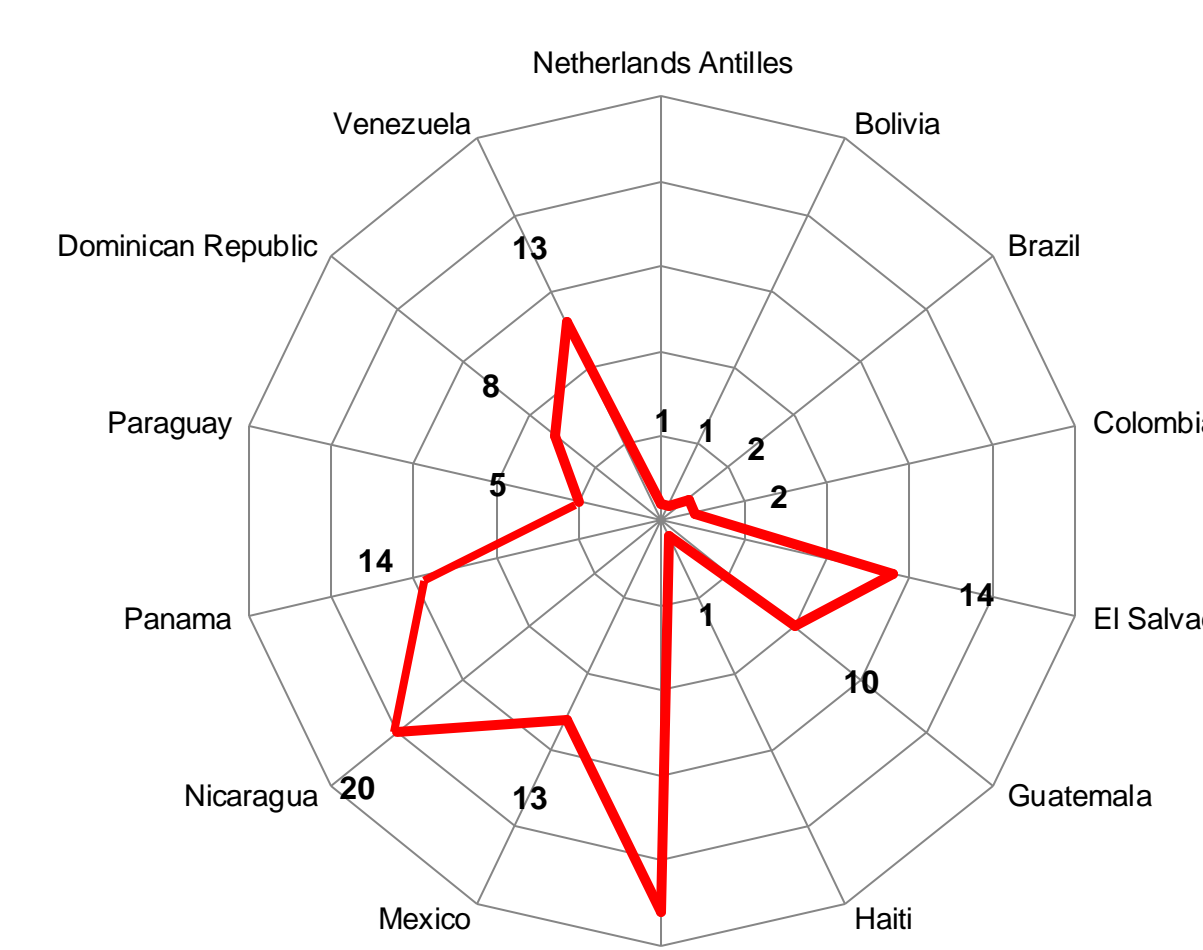
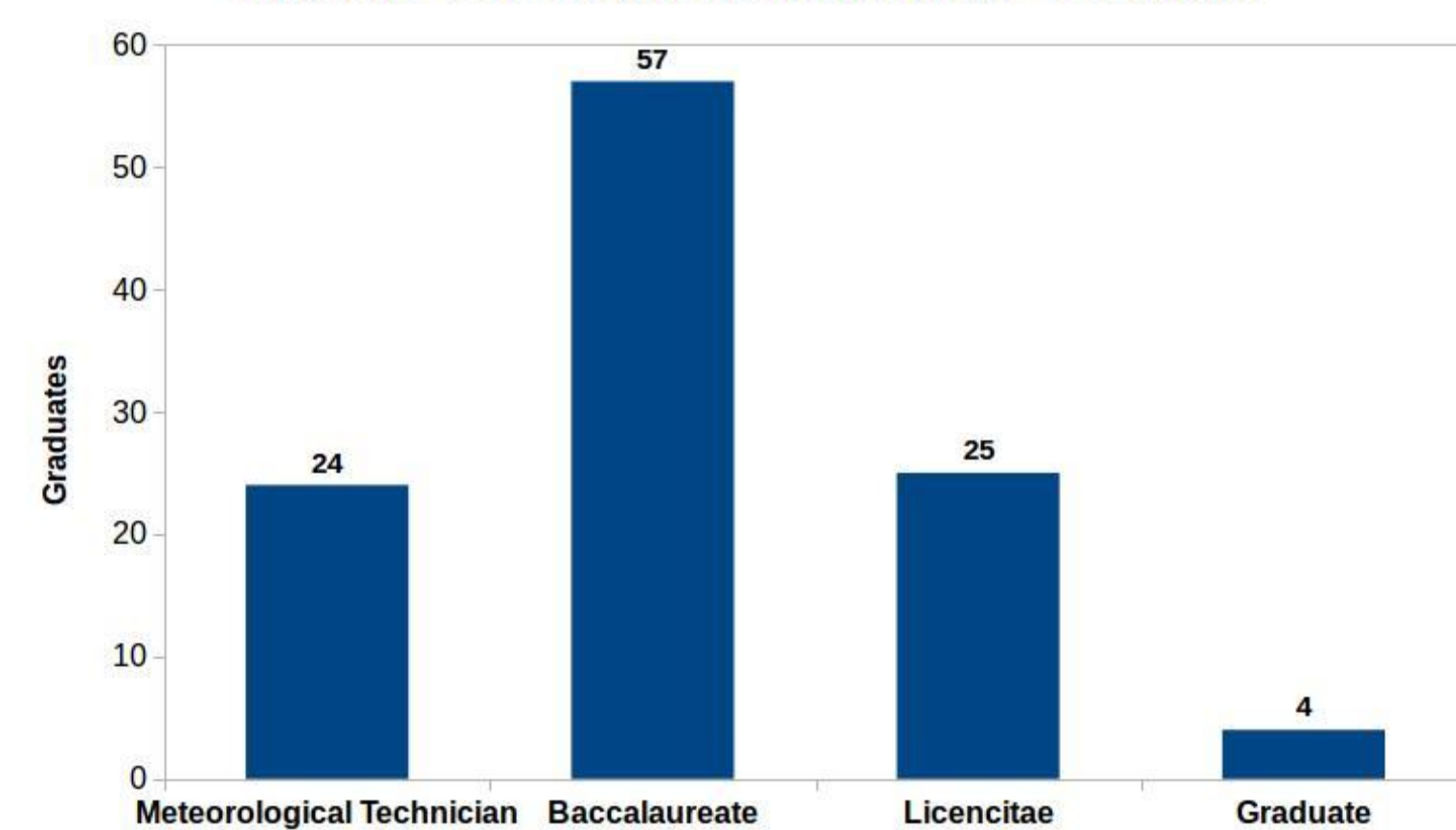
Total number of graduates in Meteorology and Atmospheric Sciences



Total number of graduates according to academic degree and country



Graduates according to academic degree Costa Rica



Summary

The total number of graduates from all atmospheric science programs at the UCR-RTC amounts to **236** from **14 countries in Latin America**. Costa Rica has graduated 110 students (46%), followed by 23 from Honduras (10%), 20 from Nicaragua (8.5%), 14 from El Salvador and Panama (6% each), 13 from Mexico (5.5%), 10 from Guatemala (4.2%), and 32 from the other countries (13.8%). Most countries served by the UCR-RTC are from RA IV, however, some are from RA III (e.g., Paraguay, Colombia). Although most regional countries have graduated a reasonable amount of meteorological personnel at the UCR-RTC, many graduates do not find permanent jobs in their countries when they go back. Lack of qualified personnel is still a major regional problem. The UCR-RTC is helping to partially solve this problem by keeping its **professional programs on a continuous basis** and offering, based on regional demand, **on-line courses mainly at technical level**.

UCR – RTC Online Programs/Courses (in Spanish)

Master in Operational Meteorology Program

The application of knowledge on weather, climate, variability and changes represents a growing challenge for the different productive sectors. Decision-making aimed at mitigating vulnerability to atmospheric and ocean phenomena requires a sound knowledge of the main processes of the climate system, its interaction with society and a high operational capacity. This program offers training aimed at enhancing the students' knowledge of weather, climate, variability and climate change from an operational perspective. The academic offer of our program provides a unique combination of learning in the physical, social and operational aspects of weather and climate. Graduates develop critical knowledge and skills in the use of tools that support the decision-making processes at their home institutions. [Program Director: Dr. Ana M. Durán](#). Started: March 2017.

Aeronautical Meteorology for Observers (CMAO)

The course is aimed at assessing the competencies of meteorological observers in aeronautical meteorology in the Central America region. [Course Coordinator, Dr. Jorge A. Amador](#). The course has nine DL modules comprising basic meteorology, a review of up to date regional weather and climate systems relevant to aeronautical meteorology, meteorological instruments, aeronautical software, aeronautical meteorological reports (METAR and SPECI, among others), and quality management systems. Evaluation of the DL modules is performed along with the development of each module. The last part of the course is an on-site assessment at both, University of Costa Rica and National Meteorological Institute, of observer competencies in aeronautical meteorology. Total duration of the course is ten weeks. The DL techniques will be video/audio and electronic conferencing, and email. Delivered: August 2013 and September 2016.

Climate, Climate Variability and Climate Change

On-line postgraduate course (Master's level), Program on Atmospheric Sciences (UCR code SP 5933). [Course Coordinator: Dr. Eric Alfaro](#). Open in II Term 2007, I Term 2009, and I Term 2011 with a total of 15 students under a Moodle platform at the RTC (School of Physics and Center for Geophysical Research, University of Costa Rica). Topics include, the climate system, radiative forcing, climate feedback, general circulation of the atmosphere and the ocean, ocean-atmosphere interaction, relevant regional climate features, climate variability, analysis techniques, climate prediction, climate change, generation of climate change scenarios and paleoclimatology.

Topics of Meteorology for Aeronautical Meteorology Forecasters

On-line undergraduate course for meteorological personnel working on forecasting techniques for aeronautical meteorology. [Course Coordinator, Dr. Hugo Hidalgo](#). Opened at the request of the Autonomous Executive Port Commission (Comisión Ejecutiva Portuaria Autónoma, in Spanish), and the Department of Aeronautical Meteorology, El Salvador. The course contents can be grouped in the following main topics: introduction to the tropics and tropical meteorology, interpretation of satellite and radar data for aeronautics, weather forecasting by numerical models, local (convective) and mesoscale meteorology, special and operational topics for aeronautical forecasting. Delivered: March 2015.