

Dieci e Lode

Dati climatici delle Ex-Colonie Italiane E Loro Digitalizzazione



Consiglio Nazionale
delle Ricerche
Istituto per la BioEconomia



POLITECNICO
MILANO 1863

Alessandro Ceppi

Bologna (Italy), 31 May 2024



The Project

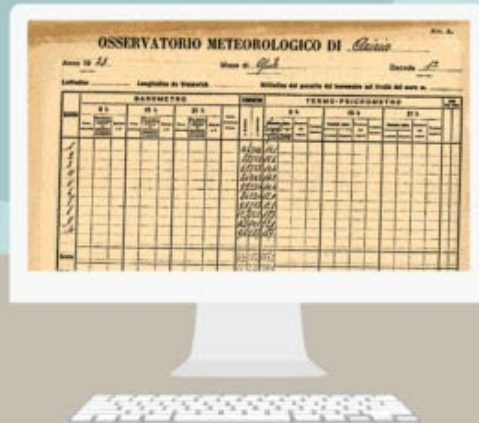


The Project “**Dieci e Lode**”, an Italian acronym which stands for “**C**limate **d**ata of the **F**ormer **I**talian **C**olonies and their **D**igitalization” is co-financed by the Italian *Ministry of Culture* (Public Notice, funded by the European Union – Next Generation EU, for the provision of non-repayable contributions in favour of micro and small enterprises, third sector entities, profit and non-profit organizations operating in the cultural and creative sectors to promote innovation and digital transition).



Dieci e Lode

Climate Data of former Italian colonies and their digitalization



The Team



Principal Investigator



Alessandro Ceppi
(Politecnico di Milano)

Staff Members



Michele Brunetti
(CNR-ISAC)



Dino Zardi
(University of Trento)



Sergio Pisani
(President of AISAM)



Maurizio Maugeri
(University of Milan)



Luigi Iafrate
(CREA)



Francesco Sudati
(Air Force Service)



Maria Carmen Beltrano
(AISAM)



Veronica Manara
(University of Milan)



Marina Baldi
(CNR-IBE)



Samuele Giampietro
(AISAM)



Federico Stefanini
(University of Milan)

Technical, Scientific and Administrative Staff



Fabio Leali
(University of Trento)



Eva De Vecchis
(AISAM)



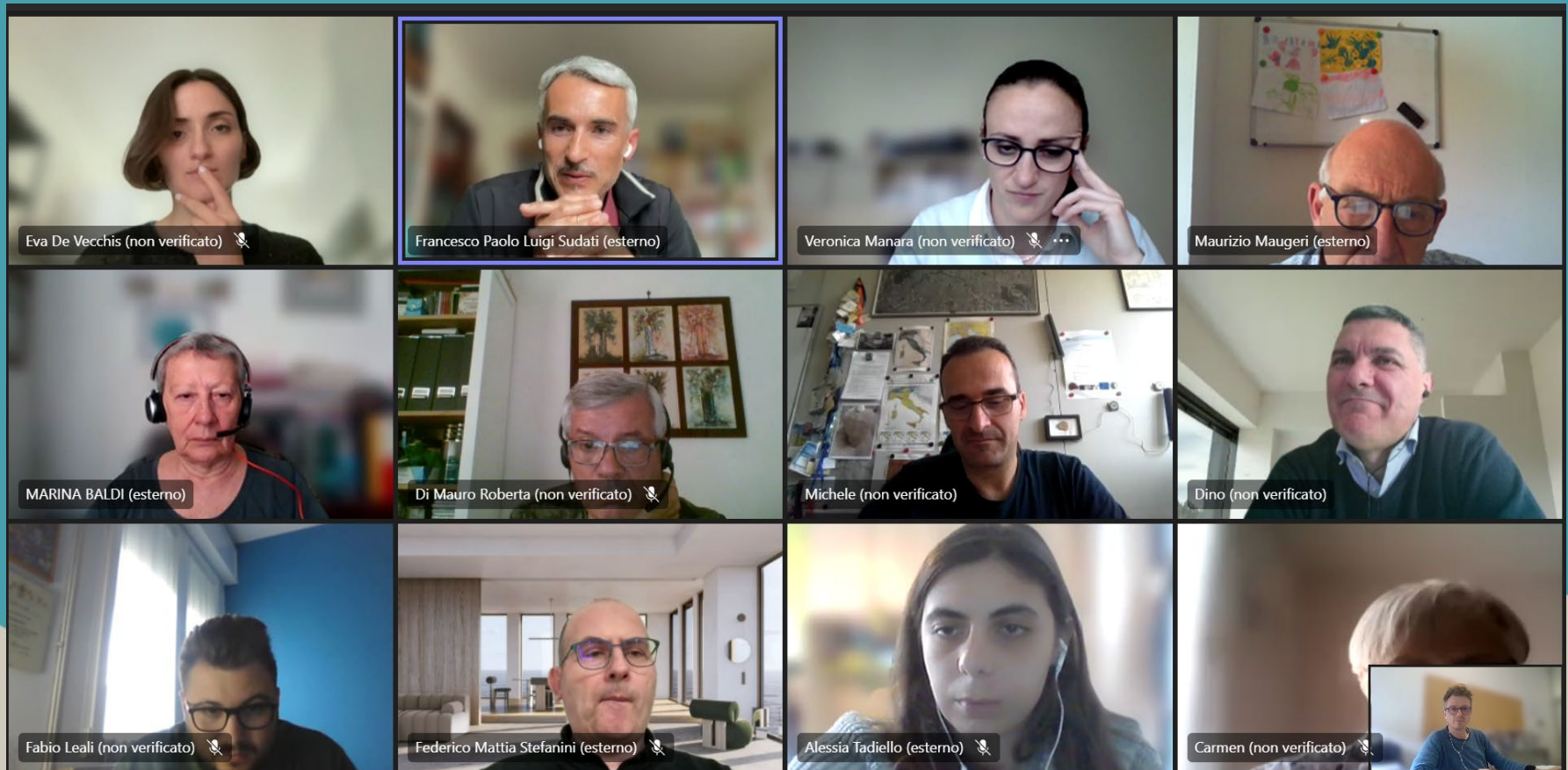
Alessia Tadiello
(University of Milan)



Dati climatici delle Ex Colonie Italiane
E Loro Digitalizzazione

Project information

- This is the **first research project** led by AISAM association which is funded.
- The Project officially started on 20th October 2023, and it will end on 20th April 2025: hence, **18 months** in total.
- We regularly have two online meetings per month with all the Project Team members



The AISAM association

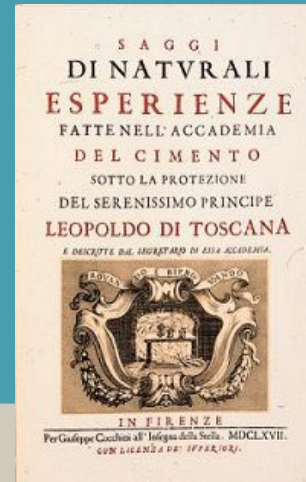
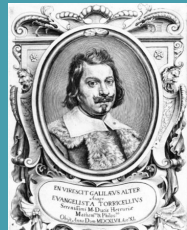
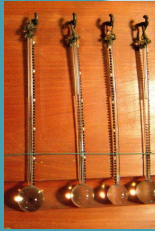
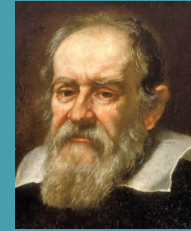


Associazione Italiana di Scienze
dell'Atmosfera e Meteorologia

- **AISAM (Italian Association of Atmospheric Science and Meteorology)** was founded with the aim of promoting the development of Atmospheric Sciences and Meteorology within Italian society in all possible fields, through the promotion and creation of opportunities and tools for meetings, mutual knowledge, and collaboration among all interested bodies.
- It also seeks to promote these sciences culturally, scientifically, educationally, technologically, and professionally.
- It aims to **highlight, on an international level, the initiatives and results achieved by the national community promoting international cooperation and the Italian participation in international projects, programs, and organizations in this sector.**
- It aims to facilitate communication and collaboration between national and other active communities in all disciplines related to Atmospheric Sciences and Meteorology, through the collaboration with their respective reference associations and partners.

Background

- **Italy** has played a very significant role in the **birth and development of modern meteorology**, considering that many meteorological instruments, including **Galileo's thermometer** and **Torricelli's barometer**, were invented in Italy.
- Moreover, what can be defined as **the first international observational network**, linked to the **Accademia del Cimento**, was founded in our country.
- Thanks to this unique role, **Italy possesses a heritage of ancient meteorological data** of exceptional value (Camuffo and Bertolin, 2012).
- The recovery of this enormous observational heritage has been ongoing for a long time (Cottone, 1939; Bossolasco, 1945), and **in recent decades, a significant part of these data has been digitized.**



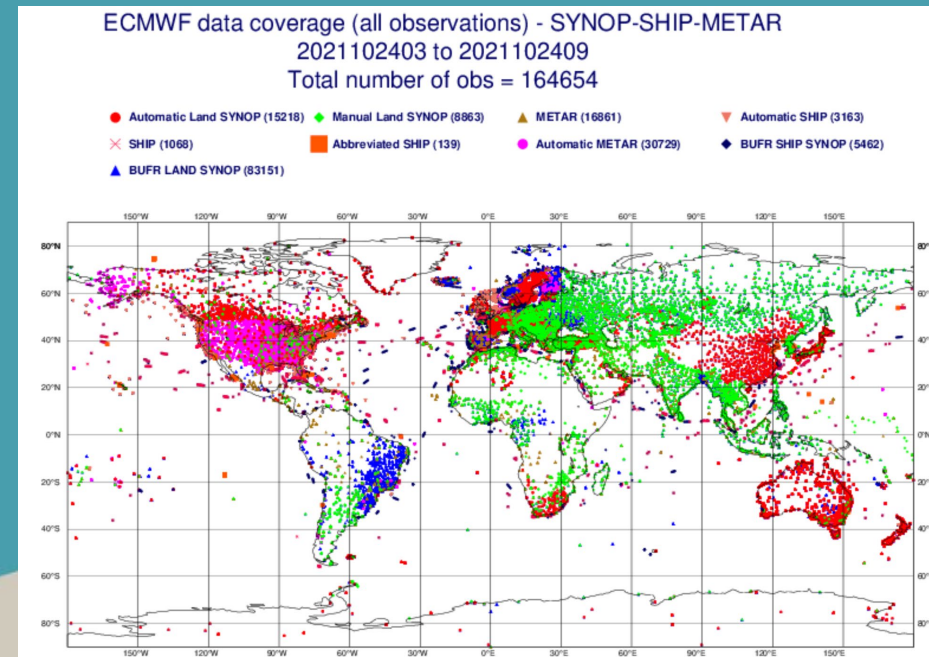
«Dieci e lode»: a Data Rescue Project

Despite many developed activities, a substantial portion of meteorological data remains **only available on paper**, which unfortunately is **deteriorating over time**, risking the loss of an inestimable value for scientific research in the field of meteorology and climate change. Among the data that still need to be recovered, there are those from areas of central-northern Africa which were formerly Italian colonies.



Aims of the Project

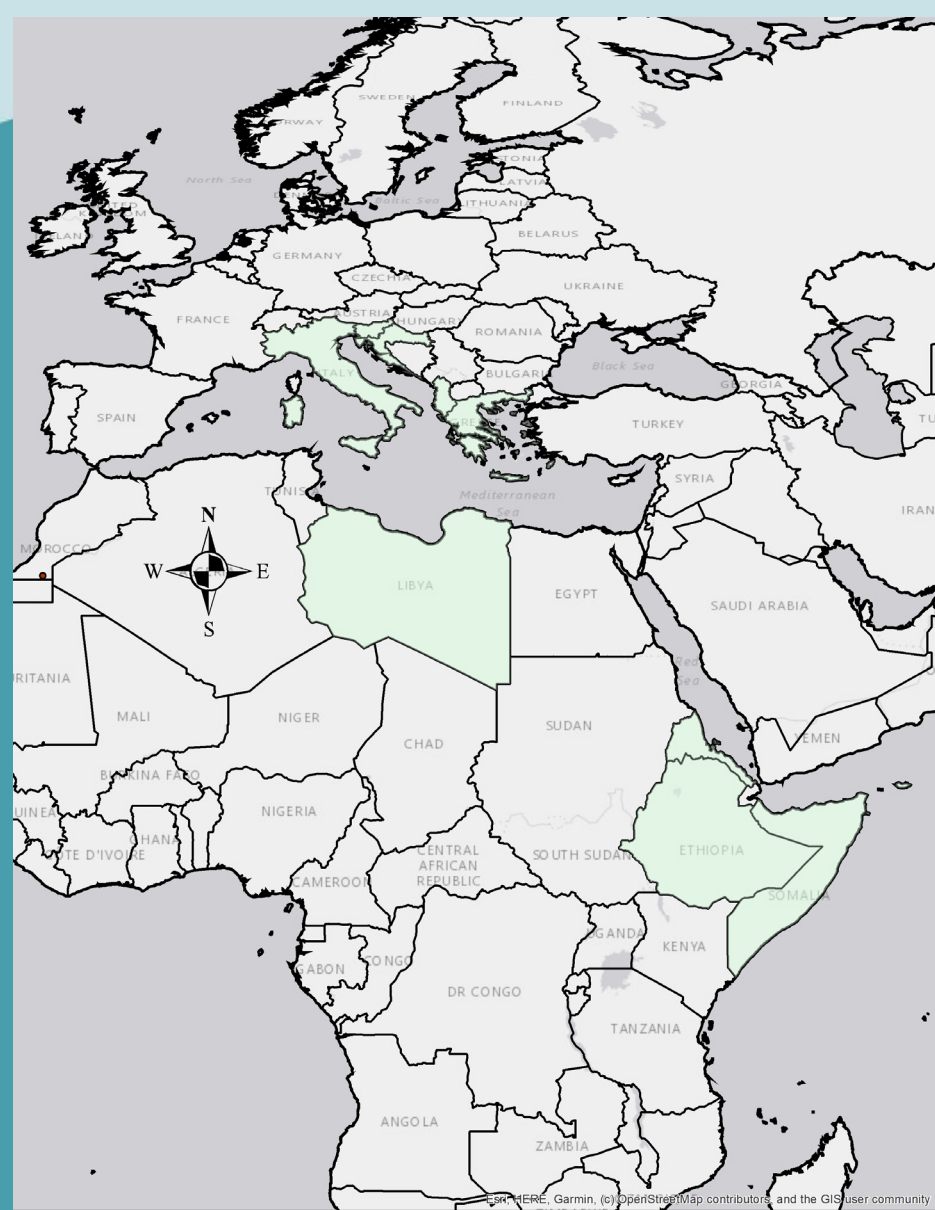
- The objective of this project is to recover meteorological observations from these **former Italian colonies** (particularly, Eritrea, Somalia, Ethiopia, Libya) **and all other territories** (Dodecanese, Albania, Dalmatia, Istria) that were under Italian control which still own valuable data to be recovered.
- Thanks to **free access** to these new precious data, the project will allow to **fill some gaps in climate analyses of the last century**, enabling a significant leap in the reconstruction accuracy of atmospheric patterns for an area that has proven to be crucial in recent climate change.
- In addition, this project wants to study a significant series of past information in territories that are still poorly covered by monitoring networks.



Area of study

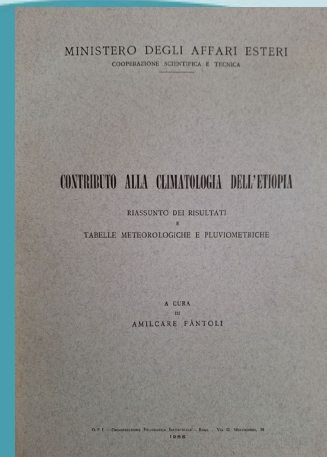
Among the many data still to be recovered, there is a very significant quantity of those collected in territories belonging to Italy (**Eritrea, Somalia, Ethiopia, Libya, Dodecanese, Albania, Dalmatia, Istria**) starting from the 19th century (already since the end of the 1800s.

In fact, the Central Meteorological Office published data and news regarding Eritrea, Somalia, Tripolitania, and Cyrenaica).



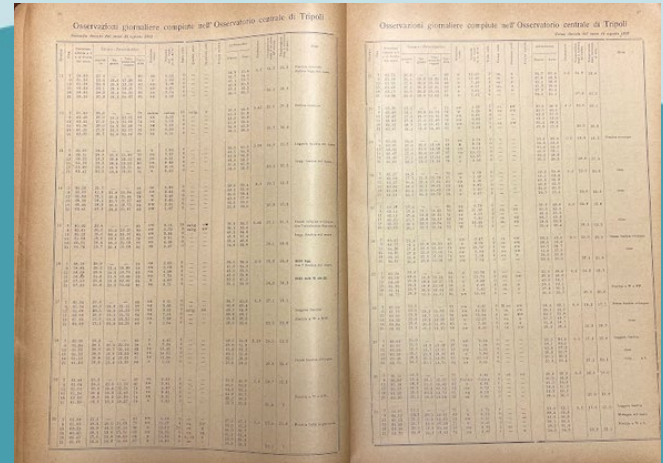
Main volumes to be scanned

- Contribution to the climatology of Ethiopia, Tripolitania, Cyrenaica, the internal regions of Libya, the Ethiopian Plateau and Eritrea: 6 volumes in total.
- Bulletins from the African colonies (only some of them are public online by NOAA in the "Meteorological bulletin of the Italian colonies" for the years 1932, 1933, 1934, 1935-1936)
- Archived paper sheets at CREA
- Bulletins from Amilcare Fantoli's books on Africa published by the Italian Ministry of Foreign Affairs




Main activities

- Once the most relevant data and other information have been identified, activities will proceed with **photographic scanning** aimed at publishing online images of the data sheets and volumes identified during the previous reconnaissance.
- The overall number of pages expected to be scanned is approximately **40,000**. The scanning activity, carried out by **Ronca Editore**, will be accompanied by detailed indexing work to facilitate finding the data and information of interest.



Two pages of a historical data table from the Observatorio central de Triodi. The pages are filled with columns of numerical data, likely representing astronomical or meteorological observations. The text at the top of each page reads "Observazioni giornaliere compiute nell'Osservatorio centrale di Triodi".



Involving the Citizen Science

- The project will be complemented by case studies aimed at evaluating possible implementations of Citizen Science activities aimed at extracting numerical series from digitized data sheets available for climatological research, thus, enhancing a line of activity already present in AISAM.
- Currently, AISAM is coordinating the **Cli-DaRe@School Project**, which involves the participation of many Italian schools and hundreds of students.
- A feasibility study will also be conducted to assess how these activities can be supported by the latest Optical Character Recognition (OCR) technology.



Dieci e Lode

Dati climatici delle Ex Colonie Italiane
E Loro Digitalizzazione

The Cli-Dare Project



Citizen Science for Italian Climate Data Rescue Project

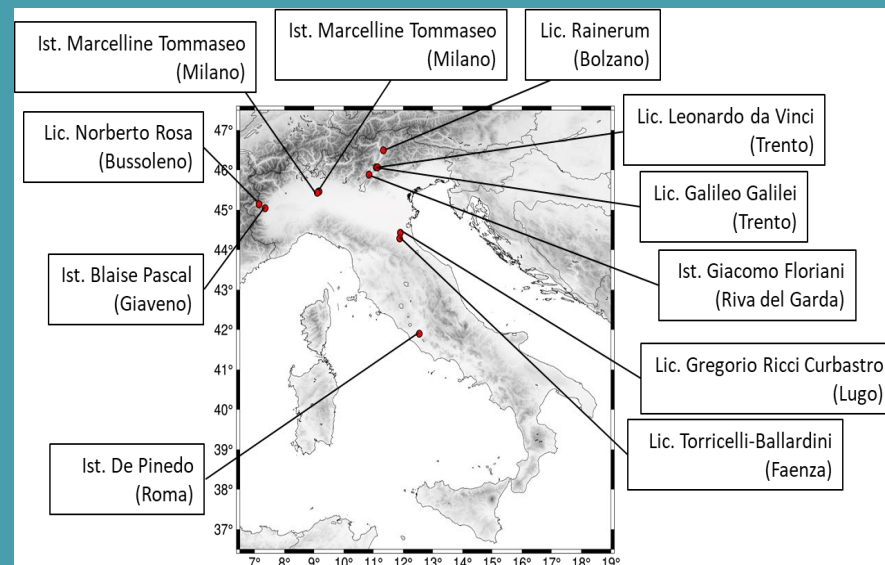
- Cli-DaRe has been set up after a workshop on Citizen Science data rescue activities held in Milan within the Fourth AISAM National Conference (**February 2022**).
- Cli-DaRe aims at strengthen Citizen Science activities for the **rescue of the heritage of Italian old meteorological data** that cannot yet be used for climate research. These data include data that are still available only on paper and data that are available in digital format, but only as images.
- **The final goal of Cli-DaRE is to set up an open access archive of old Italian meteorological observations.**

The image shows a detailed meteorological data table for the station 'MIGLIANO (Gloria) (VI)'. The table is organized by month (from January to December) and then by day. Each day's entry includes various meteorological parameters such as temperature, pressure, and precipitation. The data is presented in a grid format, with columns for each parameter and rows for each day of the year.

The Cli-DaRe@school Project

This work, presenting **the digitisation of about 4000 pages of meteorological data performed by high-school students**, demonstrates how citizen science is an amazing resource for recovering this remarkable cultural heritage, achieving a twofold benefit: contributing to scientific research through massive digitisation of meteorological archives and training young generations by raising their awareness on environment and climate change (Marara et al., 2024). To be submitted to BAMS.

1. Università degli Studi di Milano - Department of Environmental Science and Policy, Italy
2. CNR - Institute of Atmospheric Sciences and Climate, Italy
3. Italian Association of Atmospheric Sciences and Meteorology, Italy
4. Eurac Research, Institute for Alpine Environment, Italy
5. Empa – Laboratory for Air Pollution / Environmental Technology, Switzerland
6. Italian Meteorological Society, Italy
7. Politecnico di Milano - Department of Civil and Environmental Engineering (DICA), Italy
8. Eurac Research, Center for Climate Change and Transformation, Italy
9. University of Trento - Department of Civil, Environmental and Mechanical Engineering (DICAM), Italy
10. University of Trento, Center Agriculture Food Environment (C3A), Italy



Conclusions

- The project of digitizing climatological data from former Italian colonies represents a **significant step towards understanding the climate of the past in areas that still lack a dense monitoring network for detecting meteorological phenomena.**
- The availability and accessibility of data in **international databases** will allow a full utilization of the recovered data, which will be important for a **better understanding of climate change** in the areas covered by the project.
- The cultural content of this project will benefit a wide range of categories and users: from **young students in schools to researchers at universities and research institutions**, as well as **business and meteorological services** in those nations that were once Italian colonies.



Associazione Italiana di Scienze
dell'Atmosfera e Meteorologia



Dati climatici delle Ex Colonie Italiane
E LORO Digitalizzazione

Thank you for your attention

diecielode@aisam.eu

