# Data and metadata rescue in Romania

## **Ancuta MANEA**

Romanian National Meteorological Administration



## **History**

Due to the industrial and agricultural development, the Romanian public interest for meteorological information was growing steadly.

As a consequence, in 1884 the Romanian Meteorological Institute was established.

In 1884, 17 meteorological stations already existed.

However, because a network is more than a collection of stations, it is only after 1887 that we can speak of an organized network, with systematic meteorological observations performed at 30 meteorological stations. Managing a meteorological network means/implies observational programs, standardized meteorological equipment, standard location for this equipment in the meteorological platform and a service department.

- 1887 30 weather stations with climatological program
- 1899 50 weather stations
- 1938 30 weather stations with synoptic program
   180 weather stations with climatological program
- 1959 102 weather stations with synoptic program
   230 weather stations with climatological program
- 1961 170 weather stations (performing both synoptic and climatological programs)
- 1991 229 weather stations (performing both synoptic and climatological programs)
- 2011 160 weather stations (performing both synoptic and climatological programs)
- 2014 158 weather stations (performing both synoptic and climatological programs)



## **History**

Except for the 158 existing weather stations, along time there were another 198 meteorological stations.

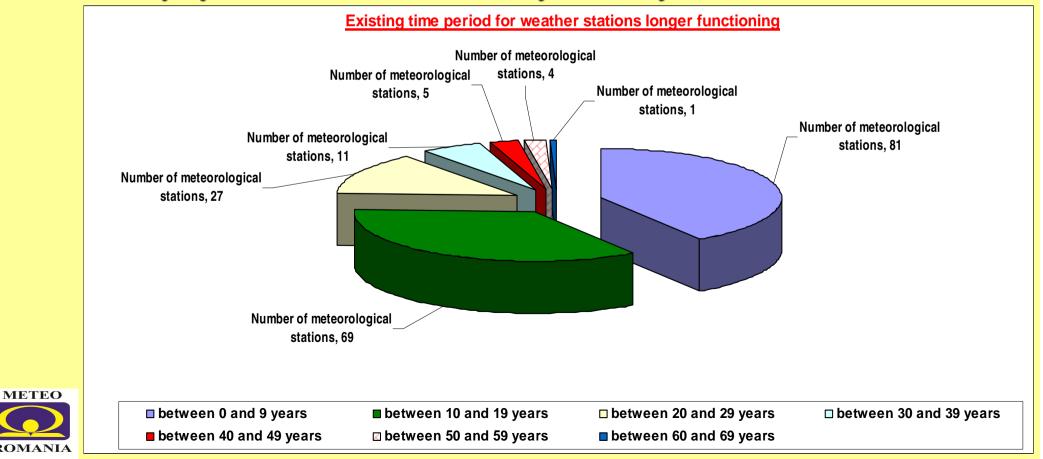
Even if some of them were established as early as: 1886 (Cumpana), 1890 (Armasesti), 1892 (Heresti), 1895 (Casimcea), 1896 (Cristianul Mare, Strehaia, Galavanesti), 1897 (Draguseni), 1898 (Isaccea, Studina), 1899 (Govora, Babadag, Ghimpati), 1900 (Gaesti), 1901 (Retivoiu, Faget, Rucar), 1903 (Scropoasa), 1904 (Perieti), they did not function continuously (there are large gaps):

Strehaia 1896-1916, 1927-1960

Studina 1898-1911, 1944-1960

Govora 1899-1944, 1947-1953, 1955-1958.

#### The majority of these stations ended their activity around the year 1960.

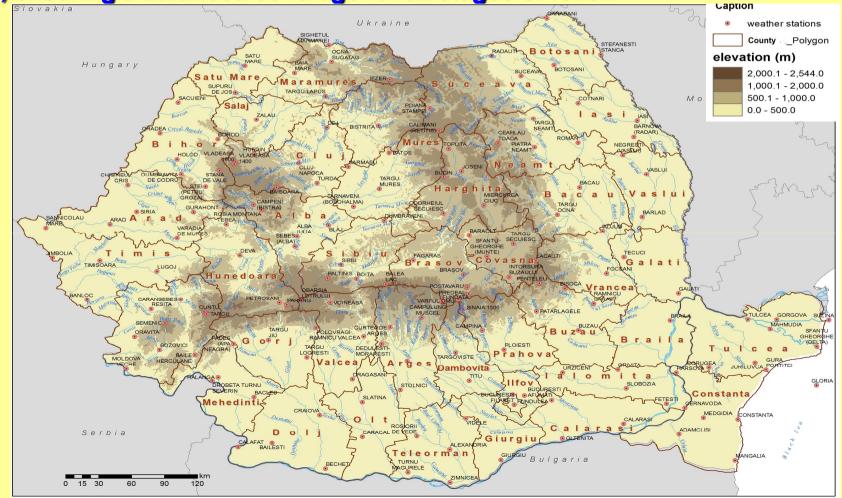


#### **Current status**

Romanian National Meteorological Administration is currently managing a number of 158 meteorological stations and 64 rain-measurement points.

When one tries to make a correct / real assessment of an area, one must take into consideration the aspect related to the natural elements. As a consequence, the Romanian meteorological stations are distributed over the whole territory of the

country, ensuring a balanced coverage for all stages of relief.





#### **Current status**

Even if we have information that, in some locations, early meteorological observations were performed in Romania, e.g.

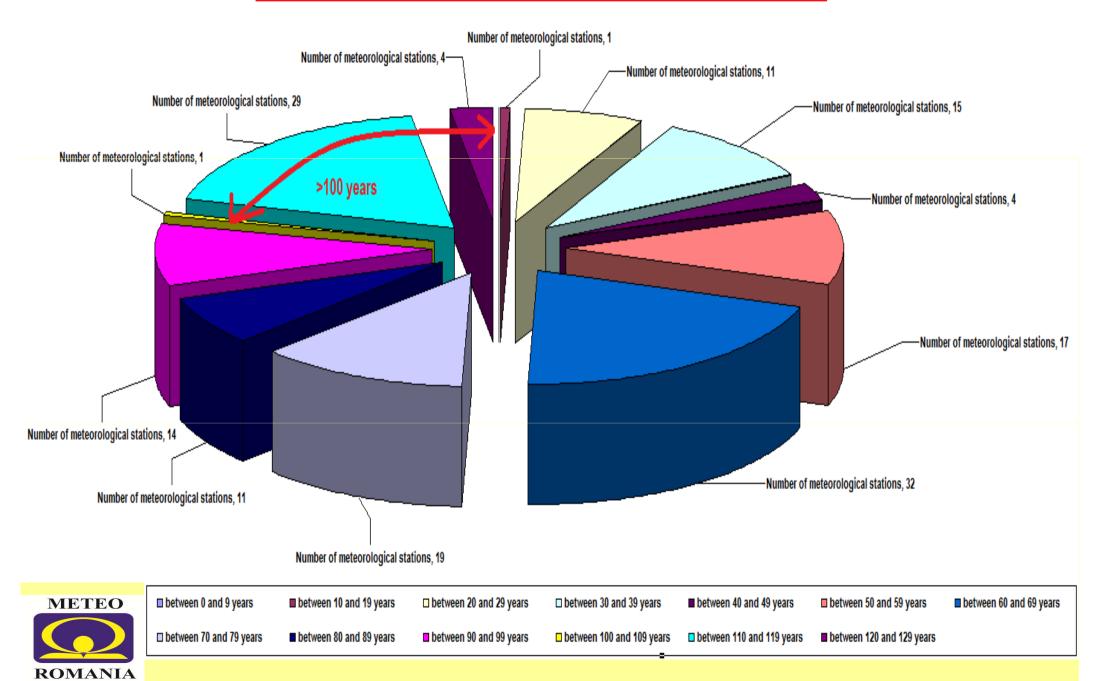
- lasi (1770),
- Bucharest (1773),
- **Cluj (1833)**,
- Alba Iulia, Sibiu (1843),
- Sulina, Oravita, Braşov, Baia Mare, Satu Mare (1857),
- Craiova (1881),
- Târgu Mures, Arad, Petrosani (1883).
  the complete meteorological dataset could not be recovered from old publications/sources.

The following figure is based only on periods with available meteorological data.



#### **Current status**

#### Current weather stations and time periods with available meteorological data

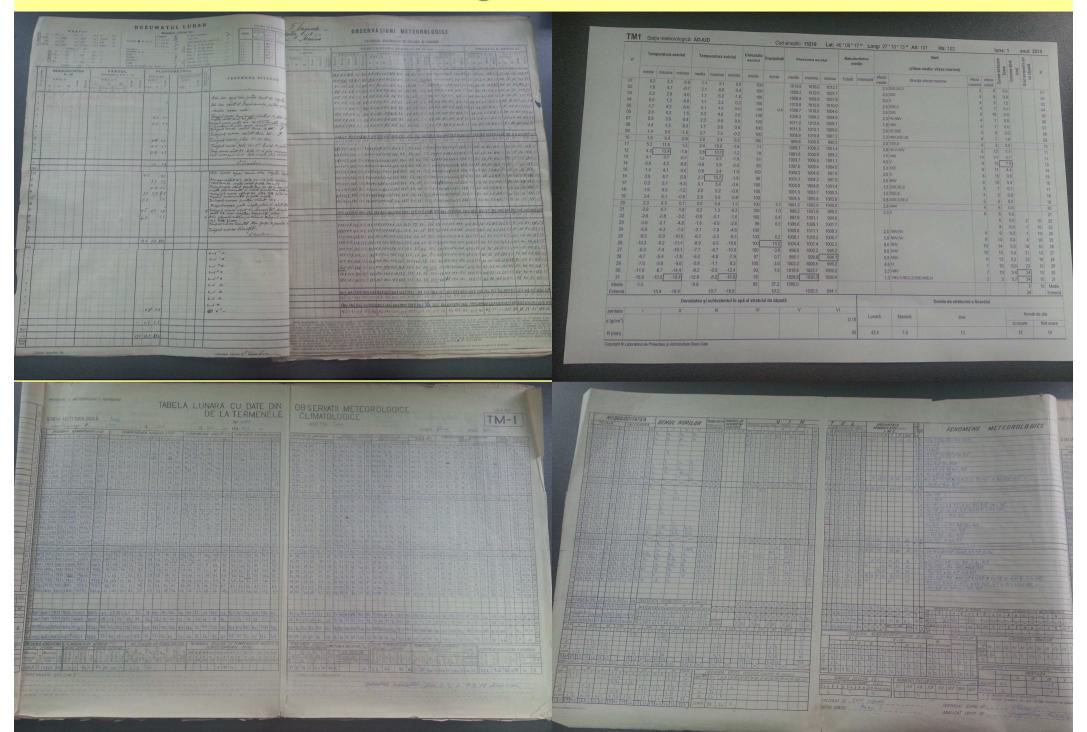


Both data and some metadata are recovered and digitized from old meteorological synthesis (hard copies) from our national meteorological archive and some of them from old documents that can still be found in our library, which is the only one of the kind in Romania.

The design of the meteorological synthesis has changed through time, according to the evolution of the methods of observation and meteorological equipment









MINISTERE DE L'AGRICULTURE, DE L'INDUSTRIE, DU COMMERCE ET L INSTITUT MÉTÉOROLOGIQUE DE ROUMANIE

ANNALES

L'INSTITUT METEOROLOGIQUE

ROUMANIE

1889

STEFAN C. HEPITES

IMPRIMERIE DE LA SOTALE, F. GÜBL FILS, PASSAGE ROUMAIN, 12

MINISTERUL AGRICULTUREI, INDUSTRIEI, COMERCIULUI SI DOMENIILOR INSTITUTUL METEOROLOGIC AL ROMÂNIEI.

#### ANALELE INSTITUTULUI METEOROLOGIC

ROMANIEI

1889

STEFAN C. HEPITES

BUCURESTI

TIPOGRAFIA CURȚII REGALE, F. GÖBL FII, PASAGIUL ROMÂN, 12 1892.

#### INSTITUT METEOROLOGIQUE DE ROUMANIE BUCAREST (FILARET) INSTITUTUL METEOROLOGIC AL ROMANIEI

DUCURESTI (FILARET)

Longitude 20 & E. de Grecowich Latitude 44 25 N. Altitude 84 métres nu-dessus du niveau de la Mer Noire.

êtres à 82 mêtres au dessus du niveau de la

Longitudine 26° 6' E. de la Greenwich. Latitudine 44° 25' N. Altitudine 84 metri d'asapra nivelului Mărei Negre.

POSITIUNEA INSTRUMENTELOR

Barometrele la 82 metri d'asupra nivelului Marei;

DESCRIPTIONEA INSTRUMENTELOR

Instrumentels care all servit is faceres observations for and rele describe in Analete Institution Metateristics and the Analete Institution Metateristics, Tom. I, Part. 2, pag. 2071 (CNNNVIII 6) Tom. II, Part. 3, pag. 208-288-2.

Pentru mat multe amanunte så se vaza partea doua a acestat volum.

NOTA.—Indicationlie manerice date rub titlut Positiunea Sta-fiunel, precam și indițimea barometrelor d'asupra nivelului mărei su surt de căt aprocumative

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Principale date caracteristice

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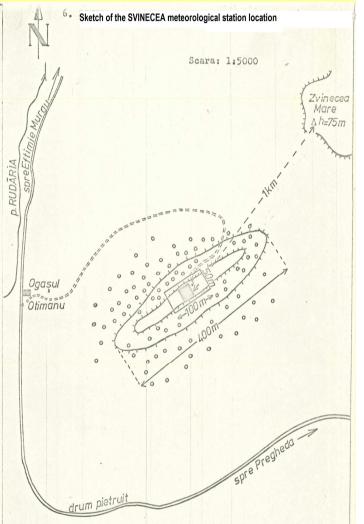
Ava cazuta

Evaporation de l'eau

Direction du vent — Direcțiunea vêntului

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* Vegetation PADUR	I AMEST	ECATE SI PA	JISTI	
3. Special feat	ures of th	ne location		
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•5•	Possible sources that can in meteorological measurement	contrate our in our out in oth college, and interest in an out of							
	4. Administrative and te	chnical information							
.1.		OLUL SILVIC BOZOVICI							
.2.	Road access	de la BOZOVICI Sos.asfaltată pîna							
	la EFTIMIE MURGU, apoi drum pietruit (15 km) pînă la ogașul OTIMAN și, apoi, drum de pămînt (coa 1 h) emploa-								
•3•	Connection to  - the power grid GRU	ere (FAF) pînă sub vîrî  P ELECTROGEN							
	telephonic land line rad	diotelefon oare la 400 - 500 m pe inseuare							
	Observations IN PREZE	INT, SE LUCREAZA LA DEFRISAREA ACEASTA, VOR DISPARE OBSTACOLEI							







# Data digitizing Access to digitized data using a web interface

## LPABD - server aplicaţii

## home

biblioteca ANM

biblioteca SNM

consultare baza de date

buletin nivometeorologic

sinteze climatologice

date OPERATIVE



#### SERVICII - LPABD

[Laboratorul de proiectare și administrare baze de date]

SERVICES

1. Administrare baza de date

- 2. Elaborare de proiecte informatice
- 3. Încărcare date istorice
- 4. Validare date
- 5. Omogenizare date
- 6. Întreținere aplicații
- 7. Asistență tehnică software

Data-base management

IT projects elaboration

Hystorical meteorological data digitization

Meteorological data validation

Meteorological data homogenization

Software maintenence and assistance

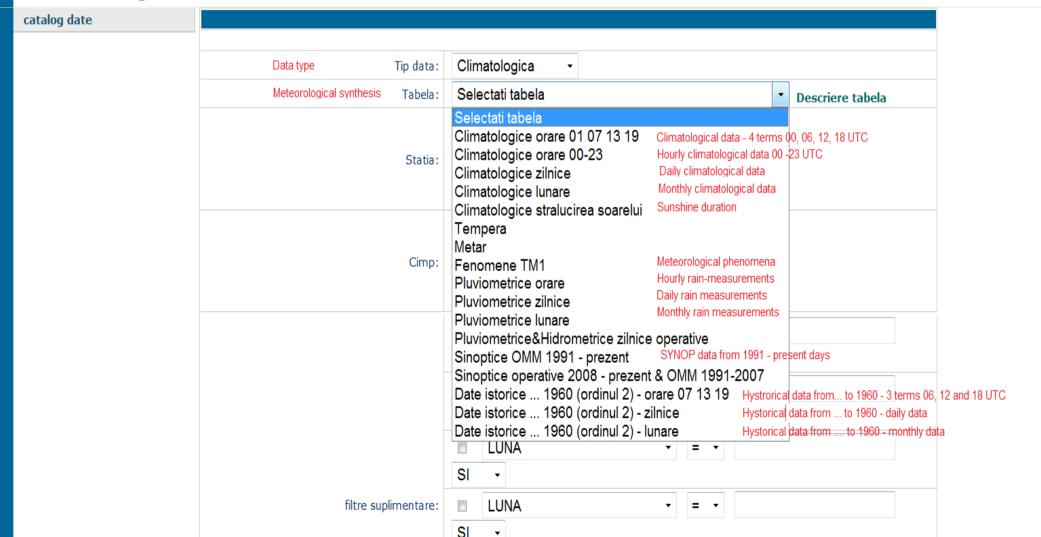


# Data digitizing Acces to digitized data using a web interface

#### Baza de date climatologica

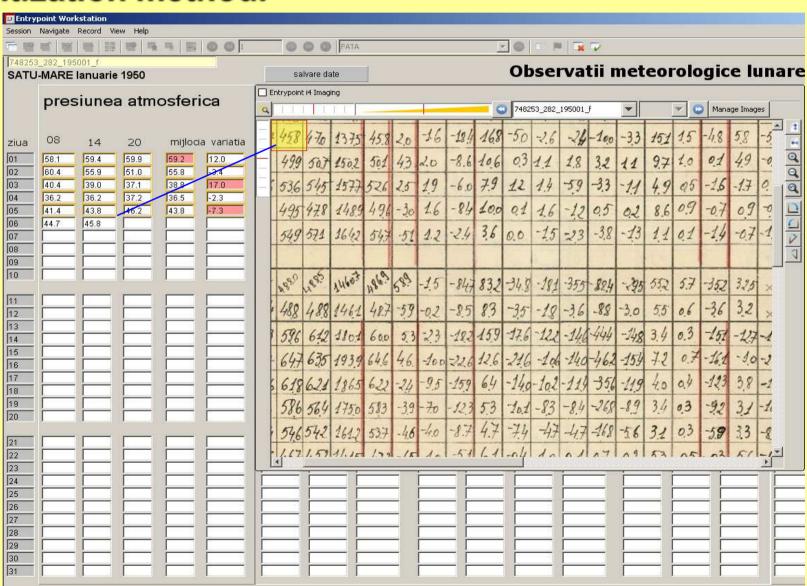
home userInfo interogare

#### creare interogare



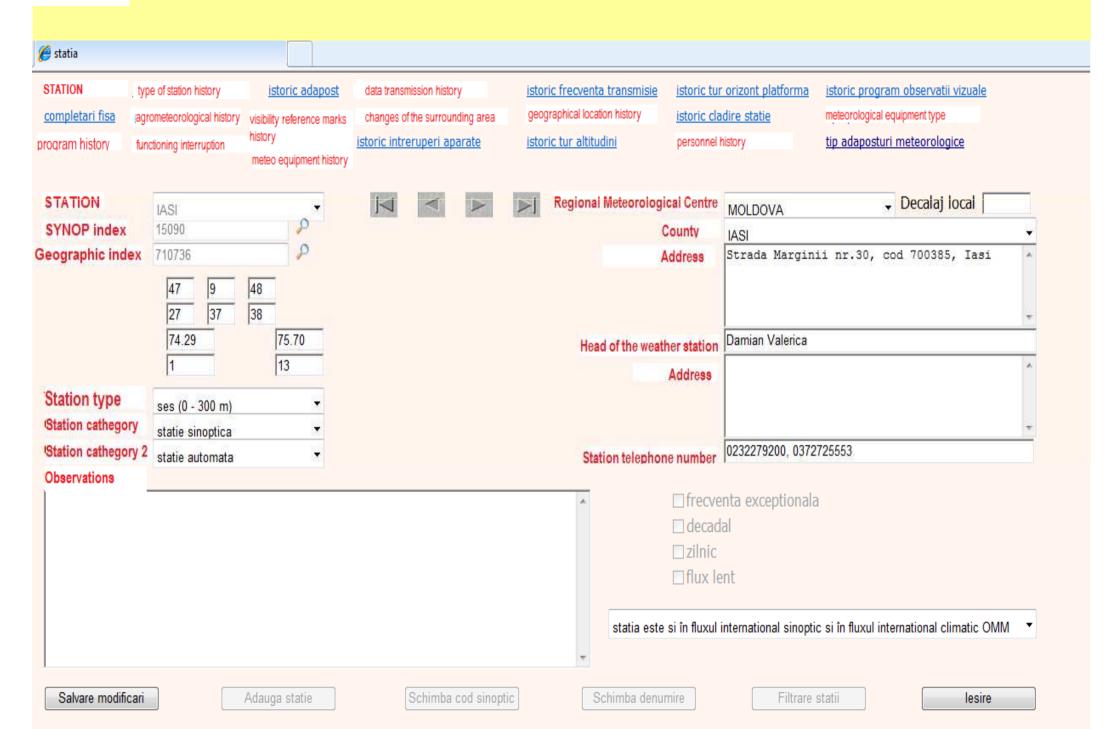
**METEO** 

In order to protect the old documents, the data rescuing process at the Romanian National Meteorological Administration is based on a modern digitization method.





#### Digitizing metadata using a web interface





## Digitizing metadata using a web interface

from	until	name	latitude	latitude	latitude	Idongitude,	Hongitude	llongitude.	altitude pracrorina (m)	HB (m)	address e	observations
01-01-1839 00:00:00	31-12-1842 00:00:00	IASI									Adresa nedocumentata	Unitatea de masura pentru presiunea atmosferica nu era nici mm Hg, nici hPa; temperatura aerului era exprimata in grade Reaumur; observatiile au fost efectuate de Gh. Asachi; datele meteorologice au fost publicate de catre profesorul de fizica T. Stamate in Albina Romaneasca nr.6
01-01-1843 00:00:00	31-12-1846 00:00:00	IASI									Adresa nedocumentata	Profesorul T. Stamate incepe exprimarea presiunii in mm Hg; temperatura aerului se exprima inca in grade Reaumur
01-01-1877 00:00:00	31-12-1882 00:00:00	IASI									Adresa nedocumentata	Observatiile sunt efectuate sistematic de catre savantul Petru Poni
01-01-1886 00:00:00	28-02-1893 00:00:00	IASI - STATIE DE ORDIN II	47	10		27	34		106.00		Scoala Militara, strada Carol	Scoala Militara a devenit Liceul Militar, care mai apoi s-a transformat in Spitalul Militar iar strada s-a redenumit: General Berthelot nr.6. Observatiile au fost efectuate de catre elevii scolii, datele sunt incomplete si au calitate indoielnica.
01-03-1893 00:00:00	01-01-1914 00:00:00	IASI - STATIE DE ORDIN II	47	10		27	34		106.00	90.00	Scoala Militara, strada Carol	Scoala Militara a devenit Liceul Militar, care mai apoi s-a transformat in Spitalul Militar iar strada s-a redenumit: General Berthelot nr.6. Masuratorile au fost efectuate cu rigurozitate de catre verificatorul de masuri si greutati. In data de 12 iunie 1900 adapostul cu instrumente a fost mutat mai spre N.
02-01-1914 00:00:00	28-02-1915 00:00:00	IASI - STATIUNE AGRICOLA (II)	47	6		27	33		68.00		Campul de experiente de la Ezareni.	Statia a fost amplasata pe campul de experiente de la Ezareni al Laboratorului de Chimie Agricola de pe langa Universitate.
01-11-1915 00:00:00	31-12-1916 00:00:00	IASI - INTERNAT (ORDIN II)	47	9	10	29	52	30	97.00		Liceul Internat	Statia de la Liceul Militar a fost transferata la Liceul Internat. Liceul Internat a devenit ulterior Liceul C.  Negruzzi situat pe strada Toma Cozma nr.4
01-01-1917 00:00:00	31-08-1918 00:00:00	IASI - COPOU	47	11		27	33		162.00		Observatorul Astronomic, Copou	Observatiile au fost efectuate de catre personalul Institutului Meteorologic din Bucuresti, in perioada cand acestia au fost refugiati la Iasi din cauza razboiului I mondial.
01-10-1919 00:00:00	28-02-1937 00:00:00	IASI - INTERNAT (ORDIN II)	47	9	10	29	52	30	97.00		Liceul Internat	Liceul Internat a devenit ulterior Liceul C. Negruzzi situat pe strada Toma Cozma nr.4
01-03-1937 00:00:00	30-11-1938 00:00:00	IASI - INTERNAT (ORDIN II)	47	9	10	29	52	30	97.00	93.00	Liceul Internat	Liceul Internat a devenit ulterior Liceul C. Negruzzi situat pe strada Toma Cozma nr. 4
01-01-1938 00:00:00	31-01-1941 00:00:00	IASI - AERO SINOPTICA	47	10		27	36				Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei.
01-12-1938 00:00:00	28-02-1944 00:00:00	IASI - INTERNAT	47	9	10	29	52	30	100.00	95.00	Liceul Internat	Liceul Internat a devenit ulterior Liceul C. Negruzzi situat pe strada Toma Cozma nr. 4
01-02-1941 00:00:00	30-06-1941 00:00:00	IASI - AERO SINOPTICA	47	10		27	36		100.00	102.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
01-07-1941 00:00:00	31-10-1941 00:00:00	IASI - AERO SINOPTICA	47	10		27	36		127.75	129.75	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
01-11-1941 00:00:00	30-06-1942 00:00:00	IASI - AERO SINOPTICA	47	10		27	36		127.00	128.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
01-07-1942 00:00:00	30-09-1942 00:00:00	IASI - AERO SINOPTICA	47	10		27	36		136.00	138.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
01-10-1942 00:00:00	30-06-1943 00:00:00	IASI - AERO SINOPTICA	47	10		27	36		127.00	127.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
		IASI - AERO SINOPTICA	47	10		27	36		110.00	110.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
		IASI- AERO SINOPTICA	47	10		27	36		127.00	127.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
01-10-1943 00:00:00	31-10-1945 00:00:00	IASI - AERO SINOPTICA	47	10		27	36		104.00	106.00	Statia a fost situata pe Aerodrom	Observatiile au fost efectuate de catre personalul din flotila aviatiei
01-11-1944 00:00:00	15-07-1951 00:00:00	IASI							62.00		Strada 9 Mai nr. 16	Platforma a fost amplasata in curtea Corpului 4 de Armata, langa Teatrul National.



### Digitizing metadata using a web interface

istoric_aparate	equipment history								
<u>statia</u>	istoric categorie statie	istoric adapost	istoric transmisie date	istoric frecventa transmisie	istoric tur orizont platforma	istoric	program o	bservatii	vizuale
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from	until	referi	nta i ent	observatii	inventory number	equipment type code	i equipment name	equipment type	manufacturer		functionare
01-10-1984 00:00:00	01-05-1991 00:00	:00	height (cm)		872764	13	ANEMOMETRU		RDG		
01-05-1991 00:00:00	01-07-1996 00:00	:00			892601	13	ANEMOMETRU		RDG		
01-07-1996 00:00:00	01-07-1999 00:00	:00			882402	13	ANEMOMETRU		RDG		
01-07-1999 00:00:00	07-09-2000 00:00	:00			892807	13	ANEMOMETRU		RDG		
14-05-1979 00:00:00					218502	15	ANEMOMETRU		ROSSEL MULLER		
01-12-1983 00:00:00	01-10-1984 00:00	:00			218553	15	ANEMOMETRU		ROSSEL MULLER		
01-03-1970 00:00:00					156613	20	BAROGRAF		RICHARD		
01-06-1994 00:00:00	07-09-2000 00:00	:00			895	23	BAROGRAF		URSS		
01-01-1961 00:00:00	01-07-1966 00:00	:00	100.00		11730`	30	BAROMETRU CU Hg		FUESS		
24-07-1970 00:00:00	01-04-1971 00:00	:00	100.00		3122	30	BAROMETRU CU Hg		FUESS		
01-04-1971 00:00:00	07-09-2000 00:00	:00	100.00		1296996	30	BAROMETRU CU Hg		FUESS		
01-07-1966 00:00:00	24-07-1970 00:00	:00	100.00		13113709	34	BAROMETRU CU Hg		THIESS CLIMA		
17-06-1966 00:00:00	01-09-1988 00:00	:00				43	CONTOR DESCARCARI ELECTRICE		JUNKALOR		
01-10-1959 00:00:00						49	DENSIMETRU		IMH		
15-11-1964 00:00:00	01-04-1979 00:00	:00				57	GEOTERMOGRAF		IMH		
01-01-0001 00:00:00	07-09-2000 00:00	:00	1000.00		f.s.	66	GIRUETA PLACA GREA		WILD		
01-01-1959 00:00:00	01-08-1980 00:00	:00			1301537	74	HELIOGRAF		METRA		
07-09-2000 00:00:00			1000.00			207	TRADUCTOR ULTRASONIC DE VANT	WS425	VAISALA	1	
07-09-2000 00:00:00			133.00		16A	211	TRADUCTOR DE PRESIUNE AER	PMT16A	VAISALA	1	
07-09-2000 00:00:00			140.00			212	PLUVIOMETRU CANTARIRE	VRG101	VAISALA	1	
30-05-2008 00:00:00			200.00			213	TRADUCTOR TIMP PREZENT	PDW 12	VAISALA	1	
07-09-2000 00:00:00	29-05-2008 00:00	:00	150.00			221	PLUVIOMETRU CU BASCULARE	QMR101 / 102	VAISALA	1	

