EW4All in South Caucasus and Kazakhstan

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

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Kazakhstan

WMO OMM
World Meteorological Organization
Organisation météorologique mondiale

State Observatory Network

- **Date of WMO Membership**

04 May 1993

- **Regional Association**

Region II: Asia

- **Regional Involvement**

Region II: Asia

Region VI: Europe

Observation Network

347 Meteorological stations (**119**AWS)

9 Upper-air stations

5 Doppler Weather Radar weather RADARs

216 Agrometeorological stations (**45**AWS)

377 Hydrological stations

170 Air Quality monitoring stations

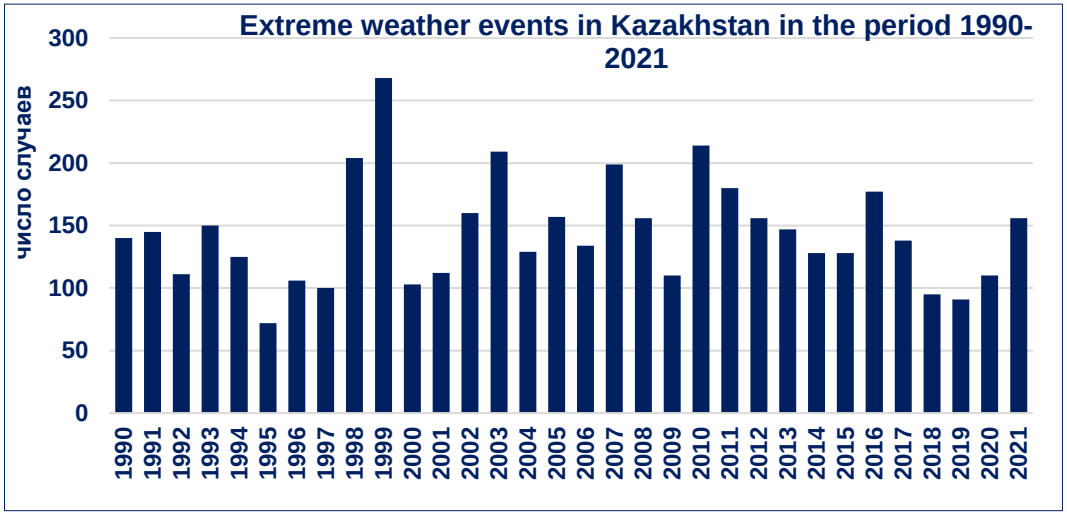
Manufactured products

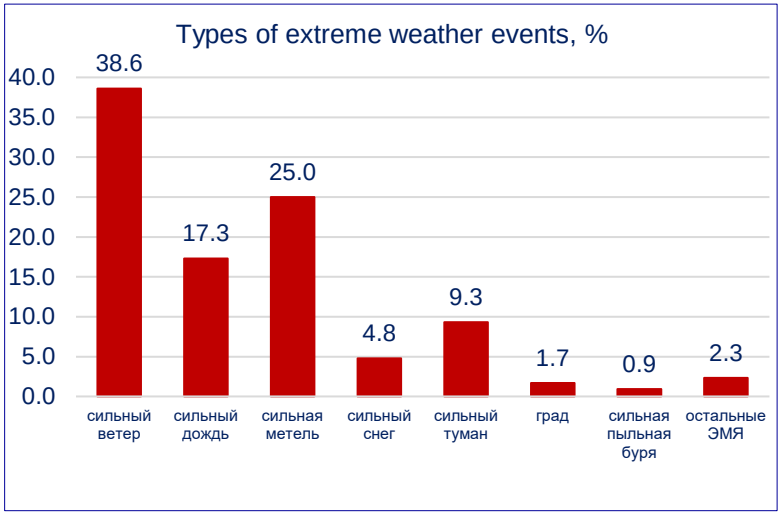
- 46 types of forecasts
- 18 types of bulletins
- 10 types of reference information
- 20 types of analytical information

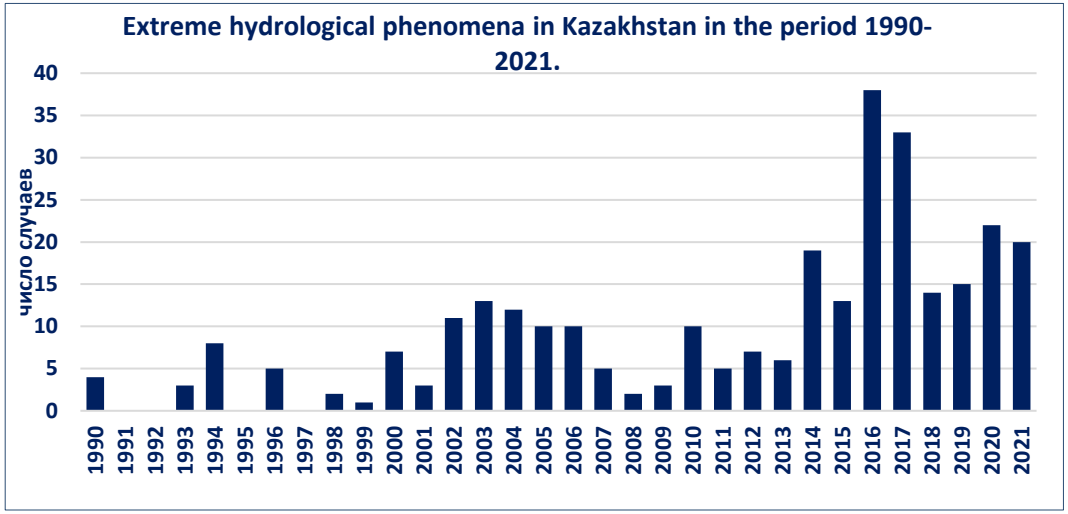
Storm warnings for 20 types of dangerous and natural hydrometeorological phenomena

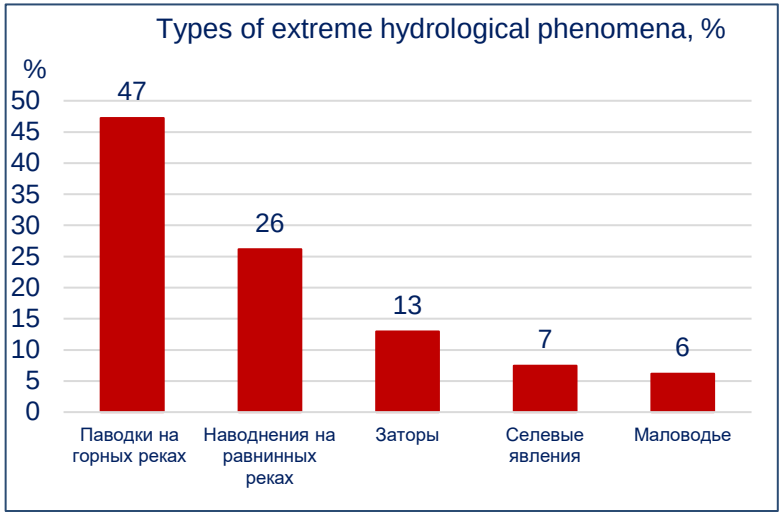
WMO OMM

Natural hydrometeorological phenomena in Kazakhstan









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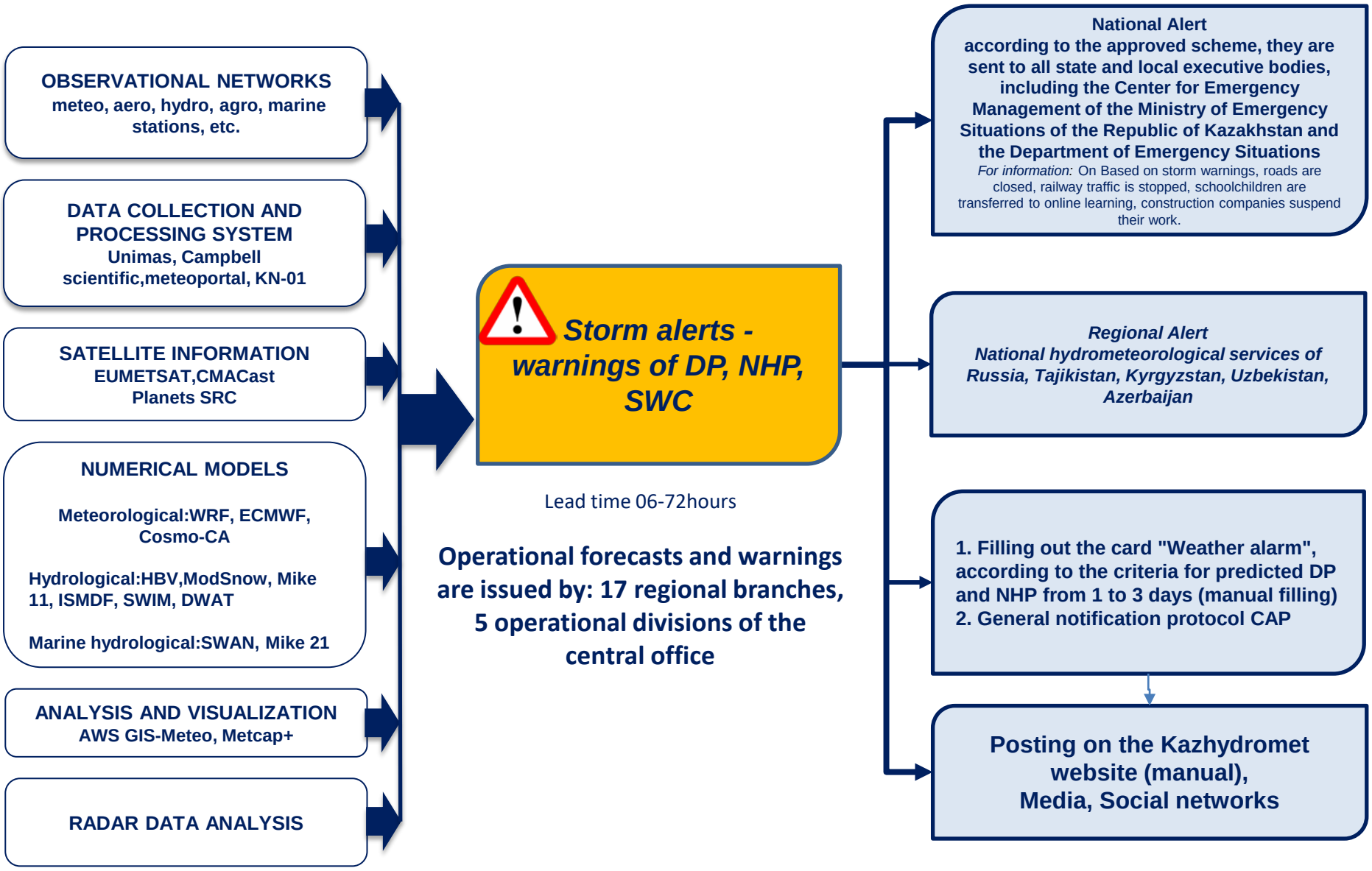
The average annual number of cases with extreme weather events in the territory of Kazakhstan is 135, and with extreme hydrological events is 9

Sync of storm warnings and information



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Joint actions during storm warnings with the Ministry of Emergency Situations and its structural divisions

“Kazhydromet” RSE

1. Joint Order between Kazhydromet and the Ministry of Emergency Situations.

2. Algorithm for interaction between Situation center of the Ministry of Emergency Situations of the Republic of Kazakhstan and "Kazhydromet“ RSE.
For reference: joint actions during storm warnings (adding additional information, duty)

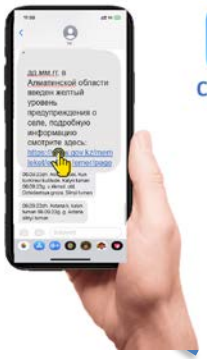
3. Algorithm for interaction between regional emergency departments situations and regional branches "Kazhydromet“ RSE
For reference: 22 emergency situations in each region and cities of republican significance and target audience and15 branches

Ministry of Emergency Situations of the Republic of Kazakhstan

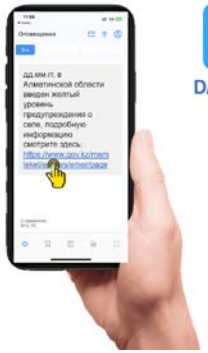
Storm alerts - warnings of DP, NHP, SWC

Alert Tools

The Ministry of Emergency Situations is responsible

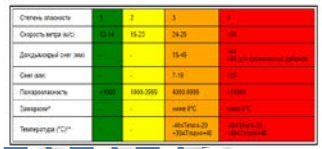


CMC 112



DARMEN

Responsible: Kazhydromet RSE Weather alarm map



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Storm warning system

Weak sides

Unimas
Lack of analysis and visualization

Metcap+
Installed in 2015, there has been no update.

Doppler Weather Radar
1. It is necessary to visualize the compositional map of the existing ones (5 DWR), expand national radar networks (Kazaeronavigatsiya RSE).
2. International exchange of radar data at the regional level.
3. Training by experts in data acquisition (WS and radar data)
4. **Nowcasting Forecast requires** to issue forecasts implementation of the numerical model, educational workshops, trainings.

Numerical weather forecasts
1. WRF
a) A high-performance cluster is needed to run a model with a higher resolution for the entire territory of Kazakhstan.
b) To improve the initial forecasting conditions, it is necessary to implement an assimilation module (data from meteorological stations, DWR)
2.ECMWF
There is no possibility of obtaining global boundary conditions for independent calculation of all necessary products (expensive license)
3.Cosmo-CA
a)COSMO ceases its activities, being replaced ICON (on fee basis)
b) There is no possibility of obtaining global boundary conditions for independent calculation of all necessary products (expensive license)

Manual control
1.Conversion and pdissemination of hydrometeorological storm warnings to all consumers;
2. Posting on the Kazhydromet website, media and social resources;
3. Filling out the “Meteoalert” card;
4. Filling out weather forecasts on the official website “Kazhydromet” (integration with KN-01);
5. Automation of weekly weather forecast estimation.

Solutions

Campbell Scientific
Implemented software MESSIR-NEO

Metcap+
Install new version

Doppler Weather Radar
1. After installation MESSIR-NEO has the ability to solve the problem (visualization of radar data);
2. Release nowcasting forecast;
3. Training;

Numerical models
WRF
1. Purchasing and setting up a high-performance cluster
2. Training by experts in data acquisition (data from meteorological stations, DWR)
ECMWF And ICON
1. Purchasing and setting up a high-performance cluster
2. Annual license to obtain global boundary conditions
3. Full cycle of training and consultations with experienced experts, including adaptation, assimilation and launch of models
Alternative numerical model used in Europe

Automated management of storm warnings
All created hydrometeorological storm warnings should be automatically distributed to consumers, including visualization and publication on the Kazhydromet website

Assessment of the activities of the "Kazhydromet“ RSE

In 2022 *with the support of the World Bank (expert – Austrian Central Institute of Meteorology and Geodynamics) was carried out* ***Expert Assessment of Kazakhstan’s Capacity in the field of Monitoring, Forecasting and Warning of climate-related hazards.***

- ✓ Overall, the evaluation clearly showed that Kazhydromet is currently in a reasonably good position. The company has highly motivated, well-educated and trained personnel, as well as a fairly good technical infrastructure, operating procedures and methods.

Recommended:

1. *Develop new demand-driven products.*
2. *Strengthen scientific and technical infrastructure.*
3. *Increase international activity, strengthen connections and cooperation with international organizations and meteorological services.*

Отчет ZAMG Страница 1

ZAMG Zentralanstalt für Meteorologie und Geodynamik

WORLD BANK GROUP

CAWEP CENTRAL ASIA WATER & ENERGY PROGRAM

GFDRR

Report

Assessment of Kazakhstan‘s Capacity to Monitor, Forecast, Project and Warn on Climate-related Hazards

Zentralanstalt für Meteorologie und Geodynamik (ZAMG)
Giora G.H. Gershtein
Andreas Schaffhauser
Stefan Kienberger

Vienna, May 24, 2022

EUROPEAN UNION

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Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the World Bank and do not necessarily reflect the views of the European Union.

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Proposals of the National Hydrometeorological Service of the Republic of Kazakhstan for the development of an early warning system

Taking into account the experience of the Austrian Center for Meteorology and Geodynamics (GeoSphere Austria) in assessing the activities of the NHMS of Kazakhstan it is proposed to establish and strengthen cooperation within the Early Warning for All initiative by establishing a joint project for the countries of the Central Asia.

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Thank you for your attention!

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