LIGHTNING DETECTION IN BANGKOK

Robert James Stewart
Electrical Engineer
Power Quality Thailand Co., Ltd.

Météorage - *The Global lightning Detection Specialist*

Météorage operates a high-quality network for lightning detection in Europe and has been in this field for more than 30 years.

Météorage provides services for lightning risk assessment, lightning alarm, thunderstorm monitoring, and lightning footprints for past events.

In addition, the service delivers a comprehensive, real-time view of lightning activity by accurately locating lightning impacts, measuring the electrical activity of clouds allow detecting both cloud lightning pulses and cloud-to-ground lightning strokes that are produced by thunderstorms.

Why is it Important?

Lightning can initiate wildfires, cause power outages, and damage to infrastructure.

The objective is to safeguard life, property, equipment and your wallet. It is crucial to monitor lightning in real-time and analyze long-term trends.

Thanks to the partnership with Météorage, PQT can now provide its customers with high-quality information and services in this field too:

- Understanding the potential danger of lightning.
- Provide lightning warnings.
- Monitor how and where a thunderstorm develops.
- Information when lightning took place. (footprint)

Applications

To assess the risk

Service can produce maps, histograms or statistical tables (lightning density, annual variation, peak current distributions).

To prevent risk

To secure people and properties and maintain operational conditions on site. Service provides a real time lightning alarm service that notifies of the arrival and leave of a thunderstorm.

To manage thunderstorm situations

The web and mobile visualisation allows to follow the evolution and trajectory of the thunderstorm.

To confirm the origin of an incident, and to control facilities

Service proposes a tool to access its lightning database and produce a map of the strikes over a defined area and period of time. It allows to check if lightning struck a site or a network.

Lightning Alarm / Alerts

Keep your site operational during a storm, this service keeps interruptions to a bare minimum courtesy of start-of-alert and end-of-alert messages tailored to your business practices and schedule.

The Lightning alarm service does not need any installation or maintenance.

This service complies with the requirements of standard IEC 62793 for thunderstorm warning systems and satisfies regulatory frameworks requiring safety measures during storms.

<u>Configurations Details:</u>

Monitoring area *: - km (*radius of site)

Maintenance time : - mins

(minimum duration of alert after last lightning flash within area)

Communication media : SMS, Email

More!

METEORAGE - Lightning alarm starts - Bangkok

Reply | Reply All | Forward | ...

Wed 8/31/2022 12:10 PM

MÉTÉORAGE

Lightning alarm starts - Bangkok

Dear Sir, Madam,

We inform you of a lightning alarm beginning the 31 of August 2022 at 12h09 Asia/Bangkok.

At the end of the episode, an end of alarm message will allow you to resume your activity.
Should you have any question, please contact our client support via contact form.

Thank you for your trust and see you soon at www.meteorage.com

The METEORAGE Team

METEORAGE - Lightning alarm stops - Bangkok

Reply | Reply All | Forward | ...

Wed 8/31/2022 4:38 PM

MÉTÉORAGE

Lightning alarm stops - Bangkok

Dear Sir, Madam,

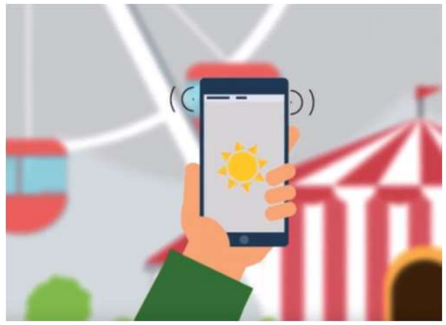
We inform you that the lightning alarm triggered on your site ended the 31 of August 2022 at 16h37 Asia/Bangkok.

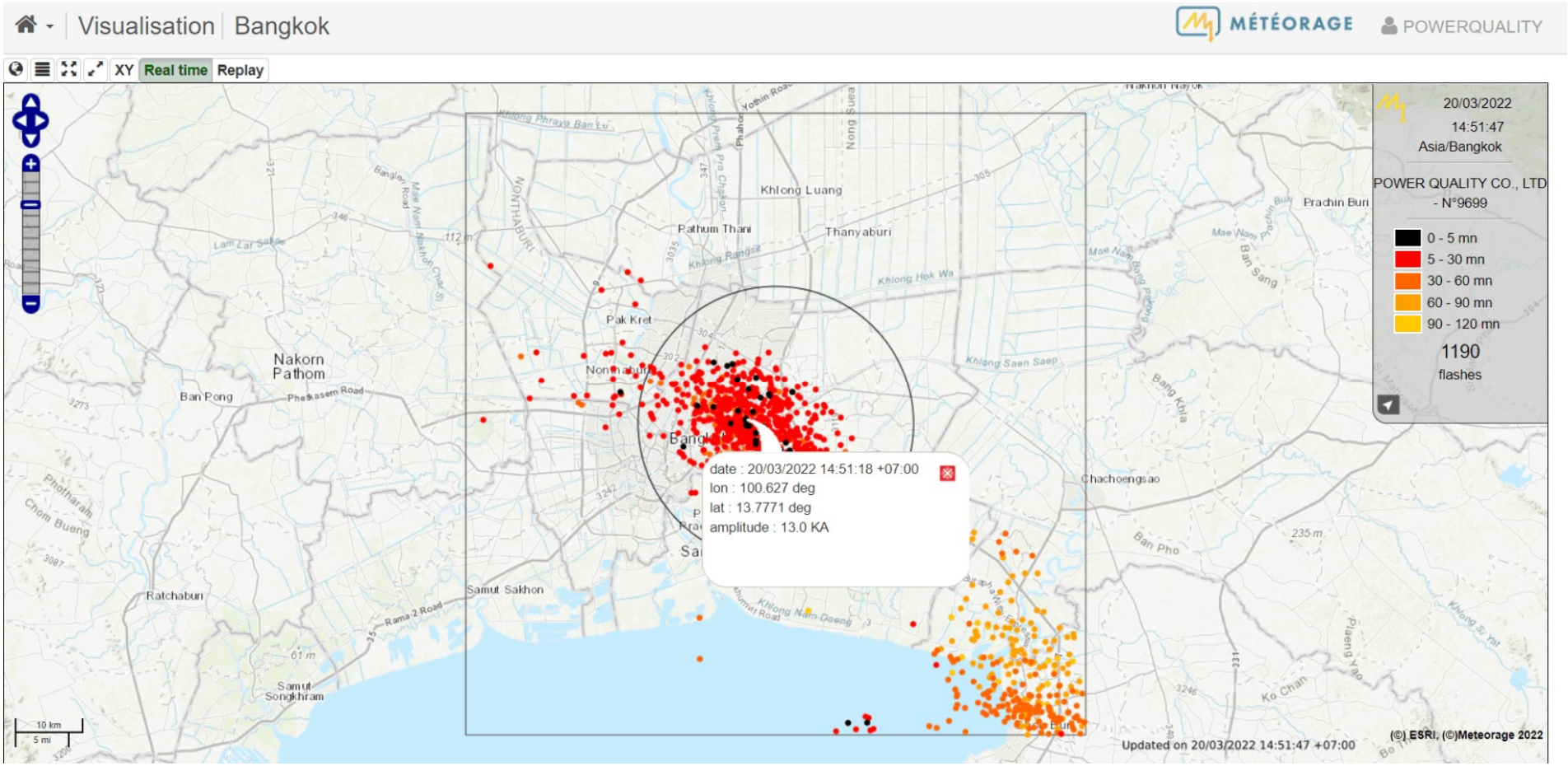
Any lightning risk is now over until further notice and you can safely resume your activity.

For any enquiries please connect to our website : www.meteorage.com
Should you have any question, please contact our client support via contact form.

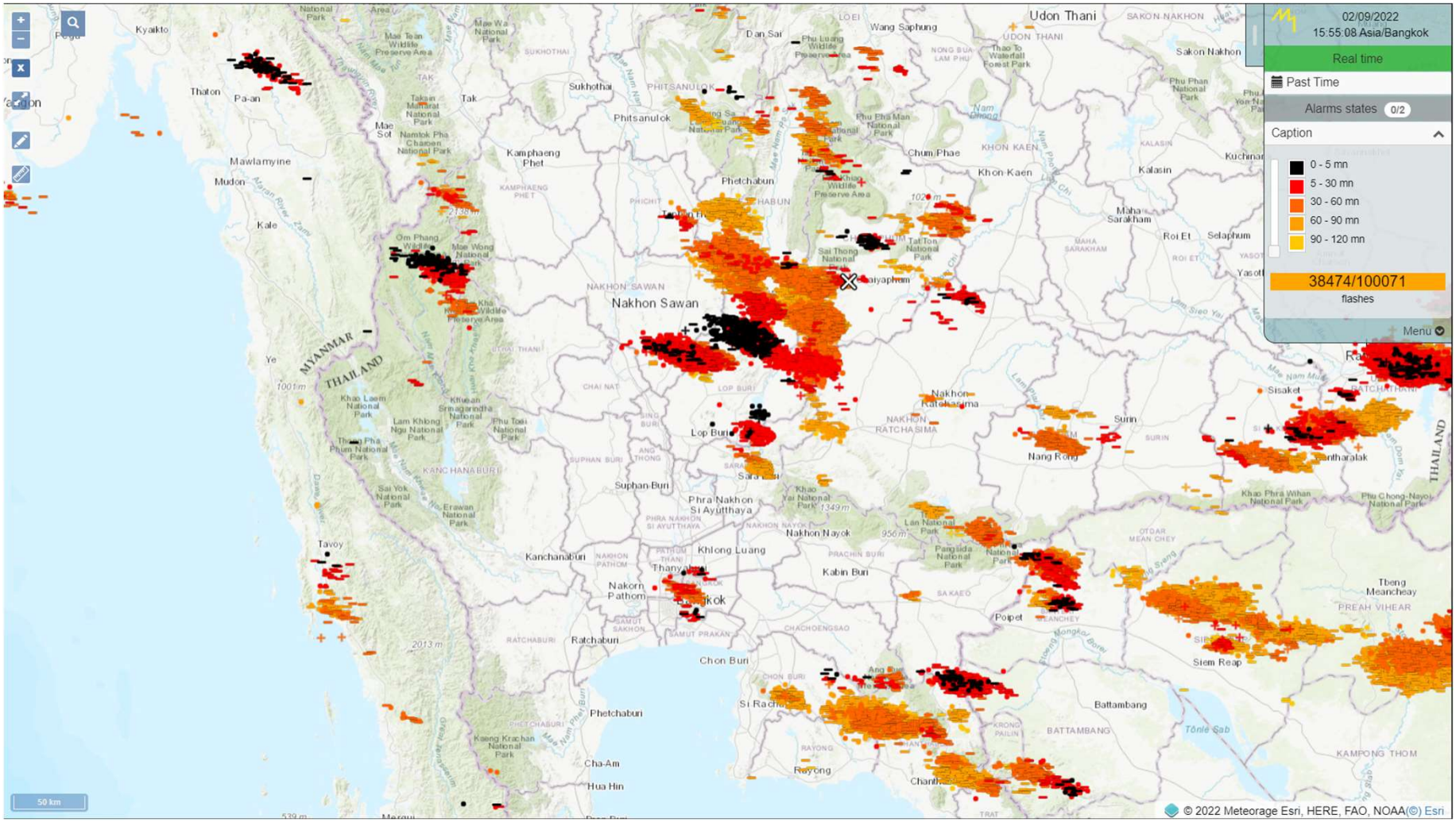
Thank you for your trust and see you soon at www.meteorage.com

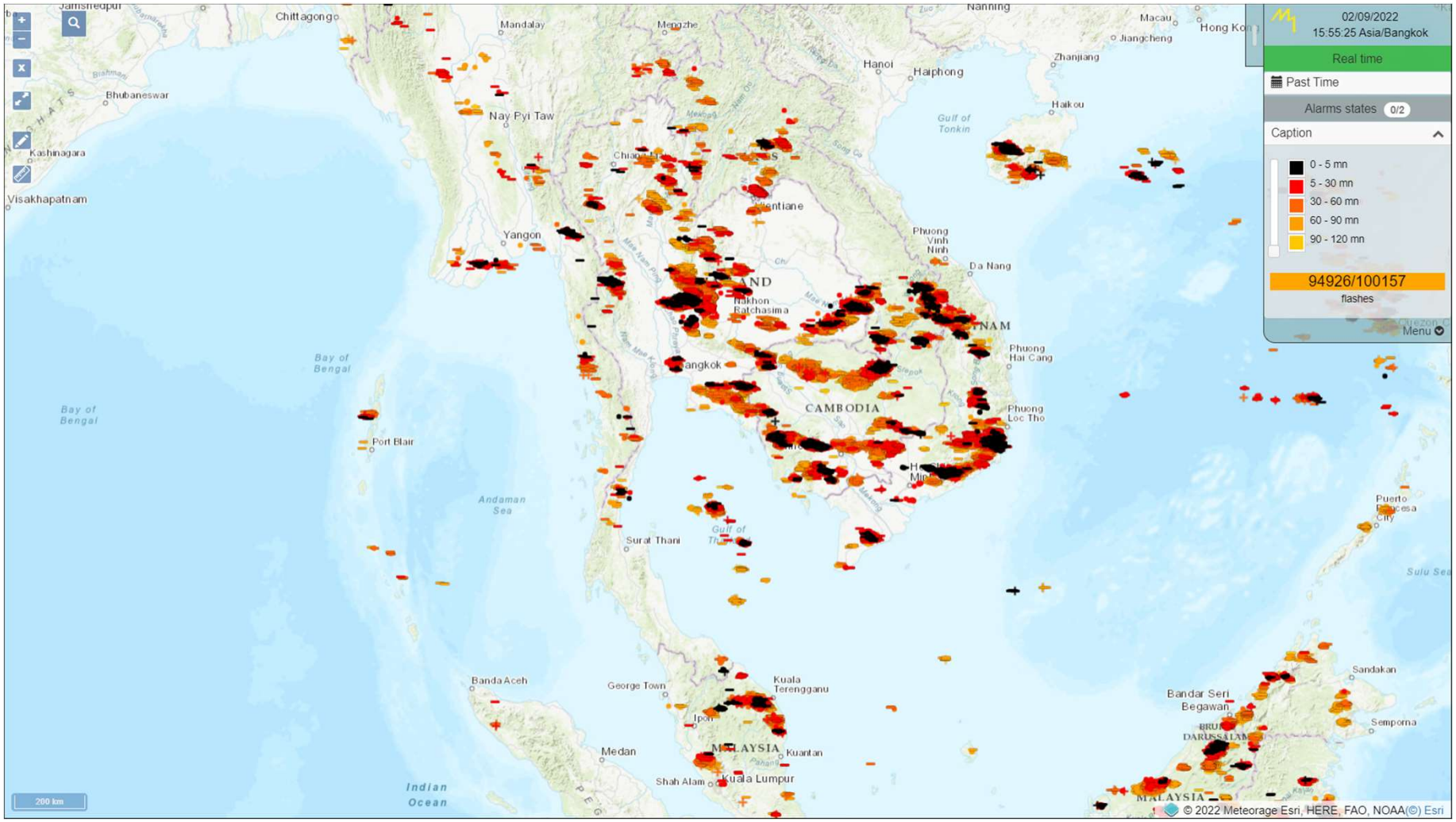
The METEORAGE Team





Selecting each lighting point detected on the map will provide further details as shown on the image.
**The color code shows the chronology of strikes on the map.*


02/09/2022
15:55:08 Asia/Bangkok
Real time
Past Time
Alarms states 0/2
Caption
0 - 5 mn
5 - 30 mn
30 - 60 mn
60 - 90 mn
90 - 120 mn
38474/100071
flashes
Menu
Udon Thani
Nakhon Sawan
Bangkok
MYANMAR
THAILAND
50 km
© 2022 Meteorage Esri, HERE, FAO, NOAA(©) Esri


02/09/2022
15:55:25 Asia/Bangkok
Real time
Past Time
Alarms states 0/2
Caption
0 - 5 mn
5 - 30 mn
30 - 60 mn
60 - 90 mn
90 - 120 mn
94926/100157
flashes
Menu
Jamshedpur
Chittagong
Mandalay
Nanning
Macau
Hong Kong
Jiangcheng
Zhanjiang
Hanoi
Haiphong
Haikou
Bhubaneswar
Nay Pyi Taw
Gulf of Tonkin
Kashinagara
Visakhapatnam
Yangon
Phuong Vinh Ninh
Da Nang
Nakhon Ratchasima
Bangkok
Phuong Hai Cang
Bay of Bengal
CAMBODIA
Phuong Loc Tho
Port Blair
Andaman Sea
Surat Thani
Puerto Princesa City
Sulu Sea
Banda Aceh
George Town
Kuala Terengganu
Ipoh
Sandakan
Bandar Seri Begawan
Semporna
Medan
MALAYSIA
Kuantan
Shah Alam
Kuala Lumpur
Indian Ocean
200 km
© 2022 Meteorage Esri, HERE, FAO, NOAA(©) Esri

Lightning Remote Counter

Obtain detailed information on the presence of lightning strikes after each storm affecting your site.

The service will provide you with a report containing a map and features of each lightning strike, enabling you to :

- *Check on your facilities and your lightning protection*
- *Carry out corrective or preventative maintenance on your facilities*

The lightning remote counter does not require any installation or maintenance.

MÉTÉORAGE

Remote Counter GLD - Power Quality Thailand HQ

Dear Sir, Madam,,

The review of lightnings (279) detected on your site 'Power Quality Thailand HQ' during the period from the

20/03/2022 00:00:00 to 20/03/2022 23:59:59 Asia/Bangkok

is available.

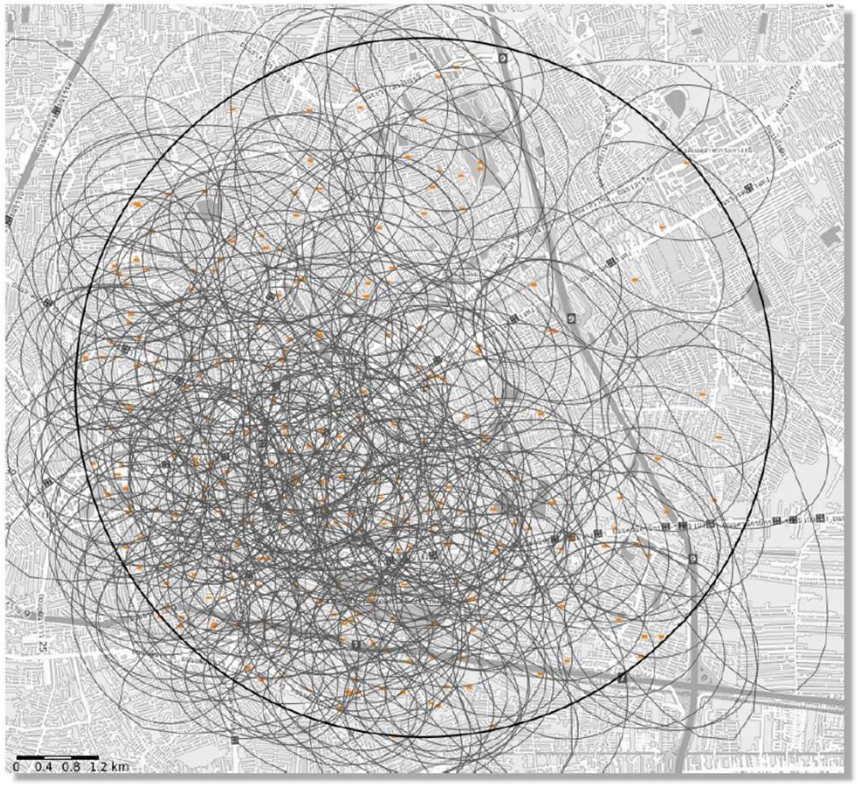
You will find the detail of these information in attachment or while connecting you on our website http://www.meteorage.com - Client Space - with your login and password communicated at the time of set it up of the service.
We remain at your disposal for all supplementary piece of information.
Should you have any question, please contact our client support via contact form.

Thank you for your trust and see you soon at www.meteorage.com

The METEORAGE Team

Sample email: Review of lightning detected around the vicinity of your site location.

Remote Counter GLD



Remote Counter GLD

Power Quality Thailand HQ

20/03/2022 00:00:00

20/03/2022 23:59:59

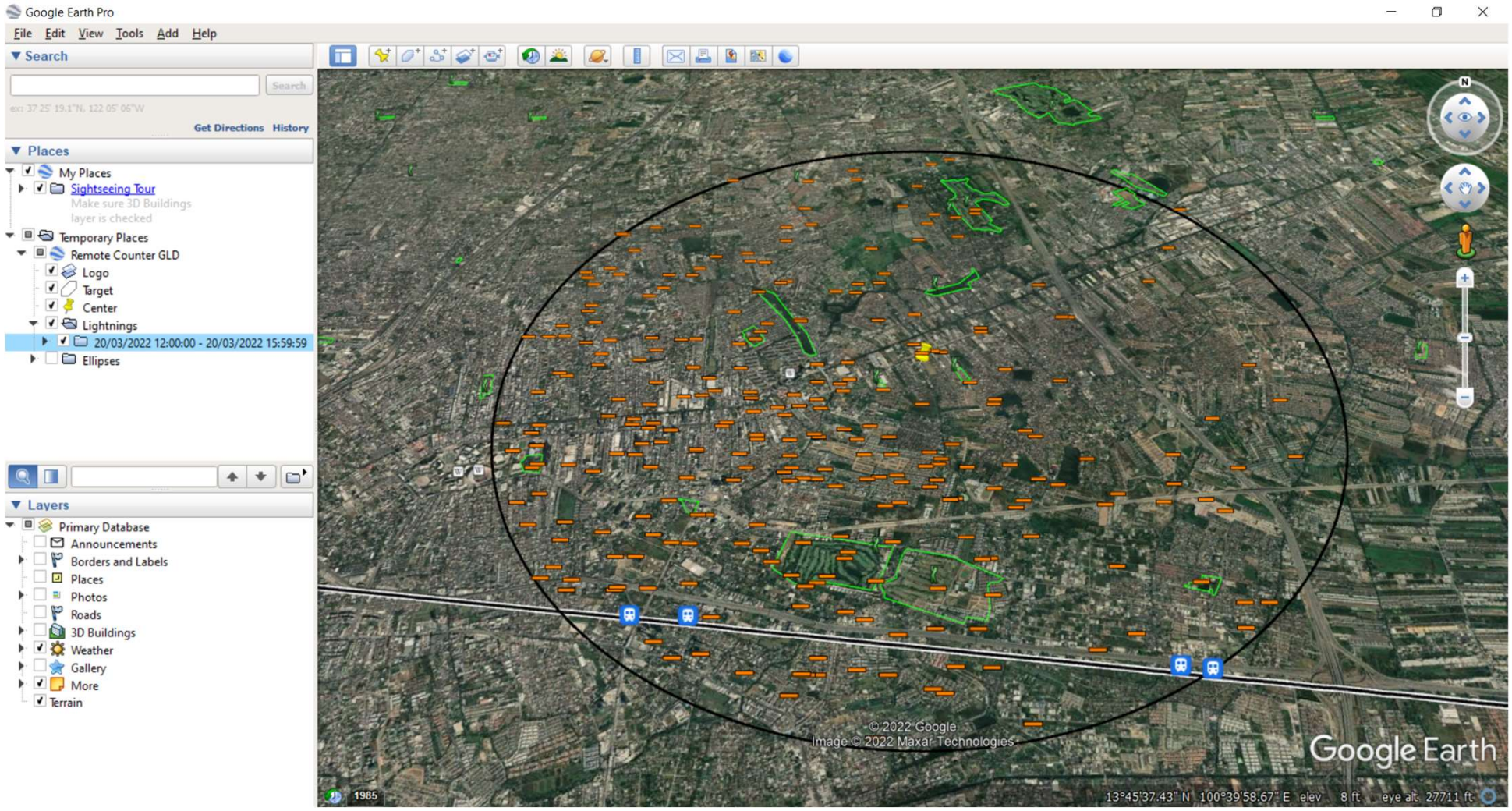
Hour : Asia/Bangkok

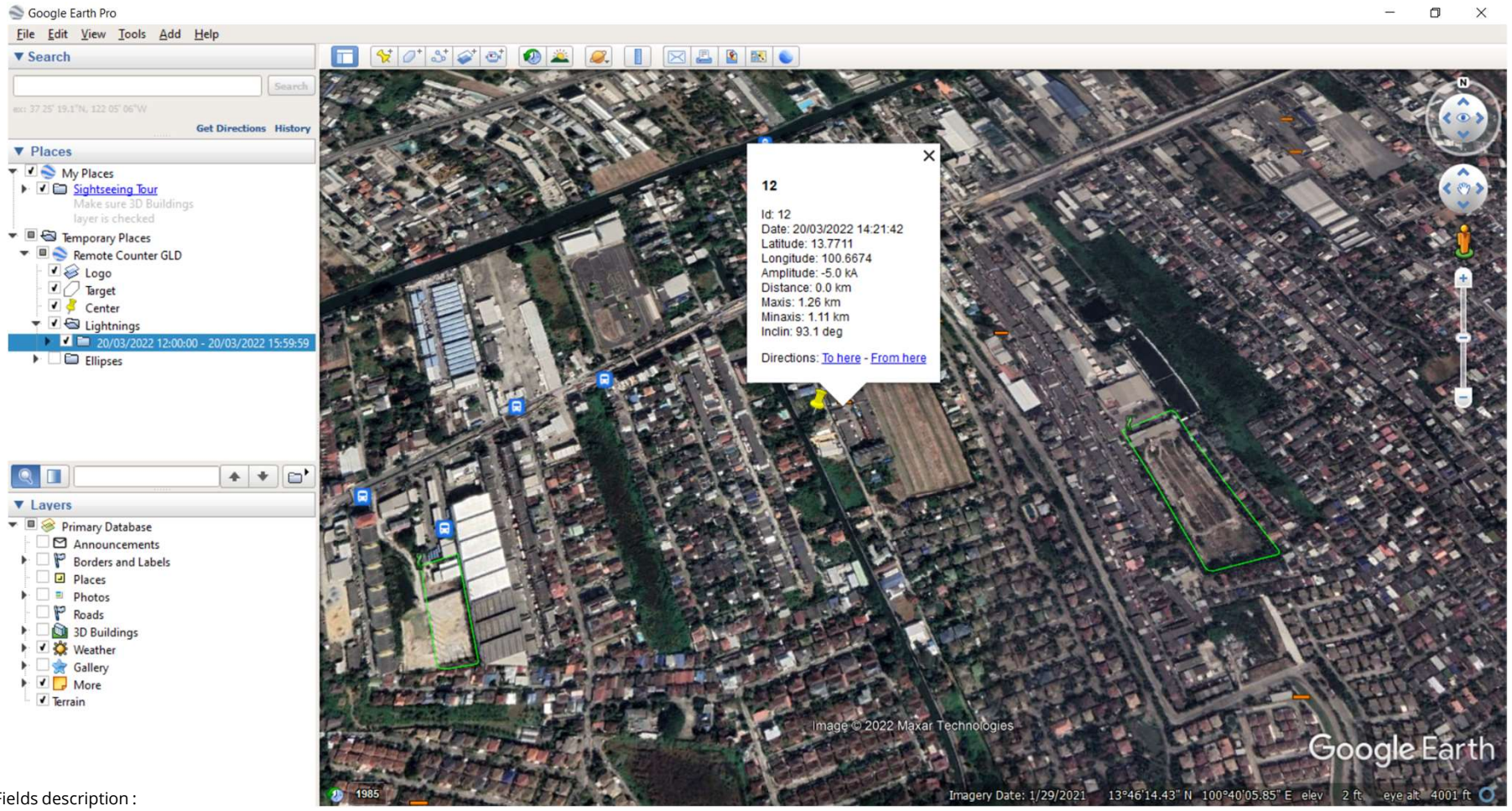
Lightning activity

Number of lightnings : 279

– Negatives strokes : 279

Id	date	lat.	long.	amp.	dist.	maxis	minaxis	Inclin
1	20/03/2022 13:54:02	13.7618	100.6367	-10.0	3.4	1.20	1.06	92.6
2	20/03/2022 13:56:21	13.7516	100.6293	-10.0	4.6	1.23	1.05	84.1
3	20/03/2022 13:58:44	13.7743	100.6397	-14.0	3.0	1.19	1.03	92.2
4	20/03/2022 13:58:44	13.7499	100.6764	-13.0	2.6	1.75	1.04	130.7
5	20/03/2022 14:00:56	13.7773	100.6292	-20.0	4.1	1.13	1.02	80.4
6	20/03/2022 14:00:56	13.7804	100.6281	-19.0	4.3	1.10	1.01	86.9
7	20/03/2022 14:01:59	13.7821	100.6346	-14.0	3.7	1.19	1.03	92.2
8	20/03/2022 14:05:02	13.7697	100.6418	-6.0	2.7	1.51	1.16	126.9
9	20/03/2022 14:09:39	13.8121	100.6714	-33.0	4.6	1.28	0.89	109.9
10	20/03/2022 14:14:09	13.7440	100.6384	-7.0	4.3	1.32	1.12	100.0
11	20/03/2022 14:21:32	13.7725	100.6372	-8.0	3.2	1.26	1.11	92.8
12	20/03/2022 14:21:42	13.7711	100.6674	-5.0	0.0	1.26	1.11	93.1
13	20/03/2022 14:23:27	13.7456	100.6559	-6.0	3.1	2.86	1.13	74.0
14	20/03/2022 14:23:42	13.7702	100.6556	-7.0	1.2	1.32	1.12	99.6
15	20/03/2022 14:24:29	13.7323	100.6615	-9.0	4.3	2.36	1.34	84.5
16	20/03/2022 14:25:35	13.7598	100.6264	-30.0	4.6	1.10	1.01	86.7
17	20/03/2022 14:26:01	13.7575	100.6440	-9.0	2.9	1.21	1.06	96.8
18	20/03/2022 14:26:08	13.7534	100.6483	-16.0	2.8	1.19	1.03	92.1
19	20/03/2022 14:26:15	13.7466	100.6415	-19.0	3.9	1.07	0.82	95.8
20	20/03/2022 14:26:24	13.7580	100.6274	-13.0	4.5	1.20	1.03	90.6
21	20/03/2022 14:26:24	13.7372	100.6620	-14.0	3.8	1.18	1.02	88.6
22	20/03/2022 14:26:24	13.7325	100.6731	-19.0	4.3	1.21	1.04	80.2
23	20/03/2022 14:26:24	13.7569	100.6359	-10.0	3.7	1.43	1.11	127.0
24	20/03/2022 14:27:27	13.7609	100.6269	-6.0	4.5	1.26	1.11	92.6
25	20/03/2022 14:27:47	13.7305	100.6680	-9.0	4.5	1.26	1.11	92.8
26	20/03/2022 14:27:52	13.7787	100.6665	-3.0	0.9	1.27	1.11	93.8
27	20/03/2022 14:28:05	13.7455	100.6501	-19.0	3.4	1.33	0.89	108.0
28	20/03/2022 14:28:15	13.7438	100.6599	-9.0	3.1	1.51	1.11	127.9
29	20/03/2022 14:28:16	13.7357	100.6650	-11.0	3.9	1.55	1.11	125.8
30	20/03/2022 14:28:16	13.7478	100.6292	-17.0	4.8	1.22	1.05	109.9
31	20/03/2022 14:28:48	13.7844	100.6596	-9.0	1.7	1.20	1.03	91.0
32	20/03/2022 14:29:12	13.7696	100.6471	-11.0	2.2	1.37	1.09	121.3
33	20/03/2022 14:29:12	13.7608	100.6618	-13.0	1.3	1.22	1.05	83.4
34	20/03/2022 14:29:12	13.7503	100.6852	-12.0	3.0	1.27	1.06	89.2
35	20/03/2022 14:29:12	13.7744	100.6482	-9.0	2.1	1.20	1.06	99.0
36	20/03/2022 14:29:12	13.7674	100.6558	-14.0	1.3	1.31	0.87	105.4
37	20/03/2022 14:29:28	13.7639	100.6380	-45.0	3.2	1.09	0.82	96.0

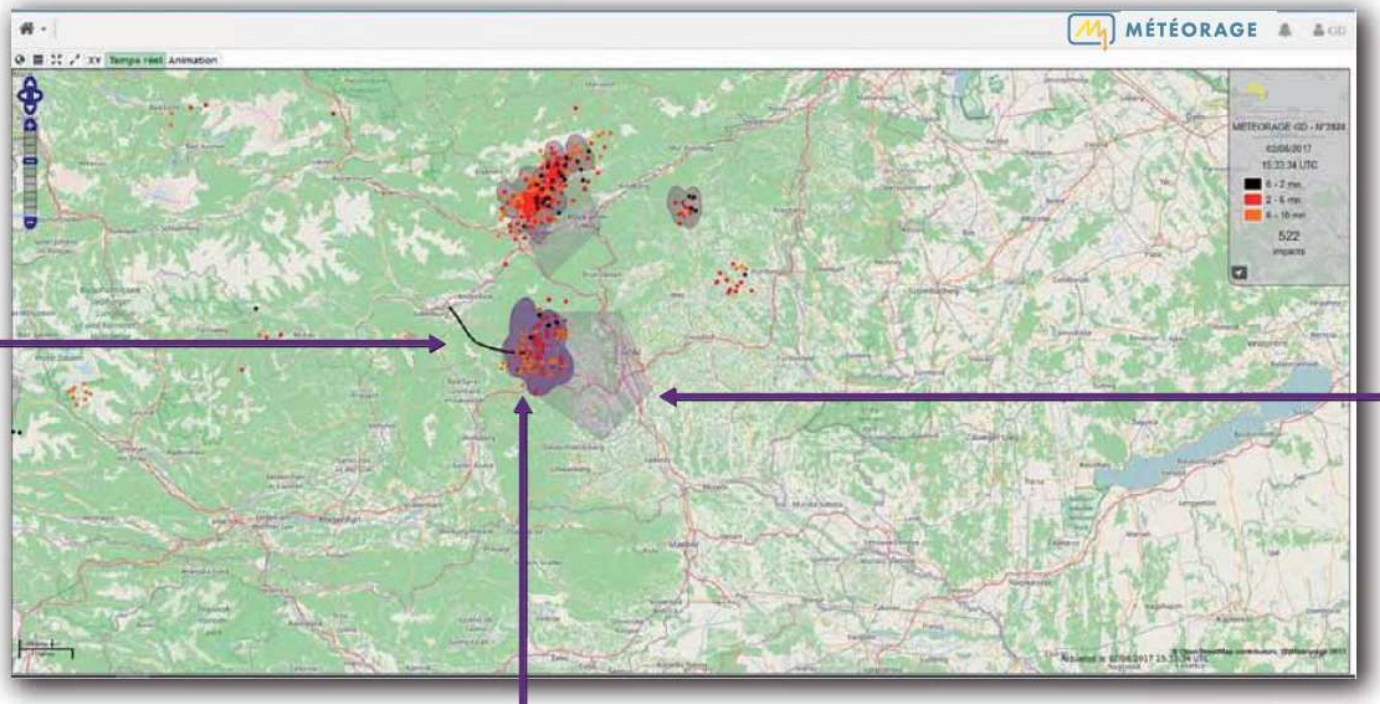

Google Earth Pro
File Edit View Tools Add Help
Search
Search
Get Directions History
Places
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
Temporary Places
Remote Counter GLD
Logo
Target
Center
Lightnings
20/03/2022 12:00:00 - 20/03/2022 15:59:59
Ellipses
Layers
Primary Database
Announcements
Borders and Labels
Places
Photos
Roads
3D Buildings
Weather
Gallery
More
Terrain
© 2022 Google
Image © 2022 Maxar Technologies
Google Earth
1985
13°45'37.43" N 100°39'58.67" E elev 8 ft eye alt 27711 ft



Fields description :
Id : index of the lightning in the survey listing.
Date : date and hour of the lightning event (format: dd/mm/yyyy hh:mm:ss).
Lat. : latitude of the lightning in decimal degrees.
Long. : longitude of the lightning in decimal degrees.
Amp. : calculated amplitude of the electric signal in kAmpere (1 kA = 1000 A).
Dist. : distance in kilometres between the lightning and the center of the area of expertise.
Maxis : semi major axis of the accuracy ellipse in km.
Minaxis : semi minor axis of the accuracy ellipse in km.
Inclin : inclination of the major axis of the accuracy ellipse in degrees from the geographic north clockwise.

*Ellipse is a statistical indicator based on the measurement errors made by the sensors.

Storm Cells



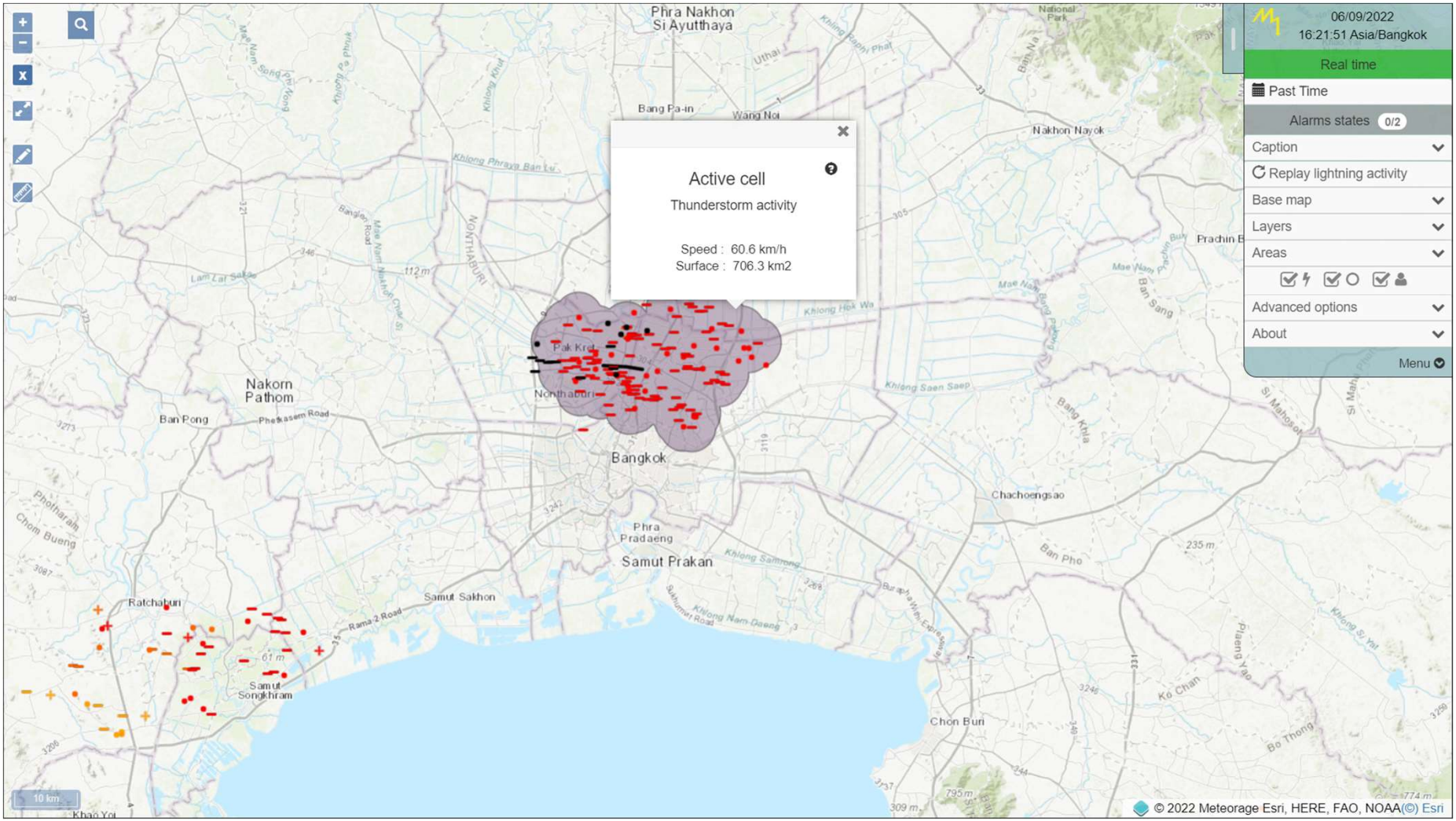
The storm cell's previous path is shown in black

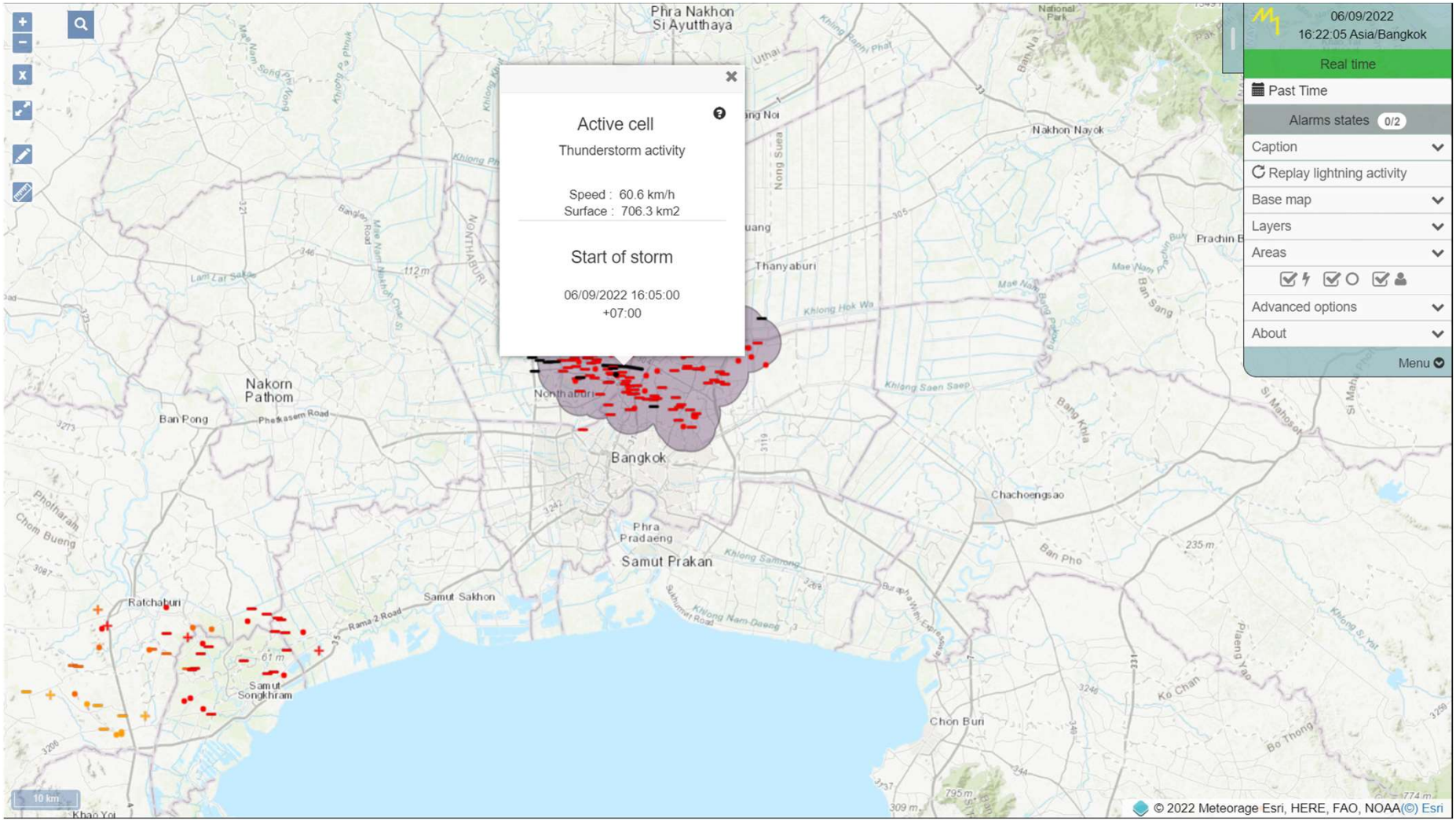
The pentagon associated with the cell shows its predicted path within the next hour.

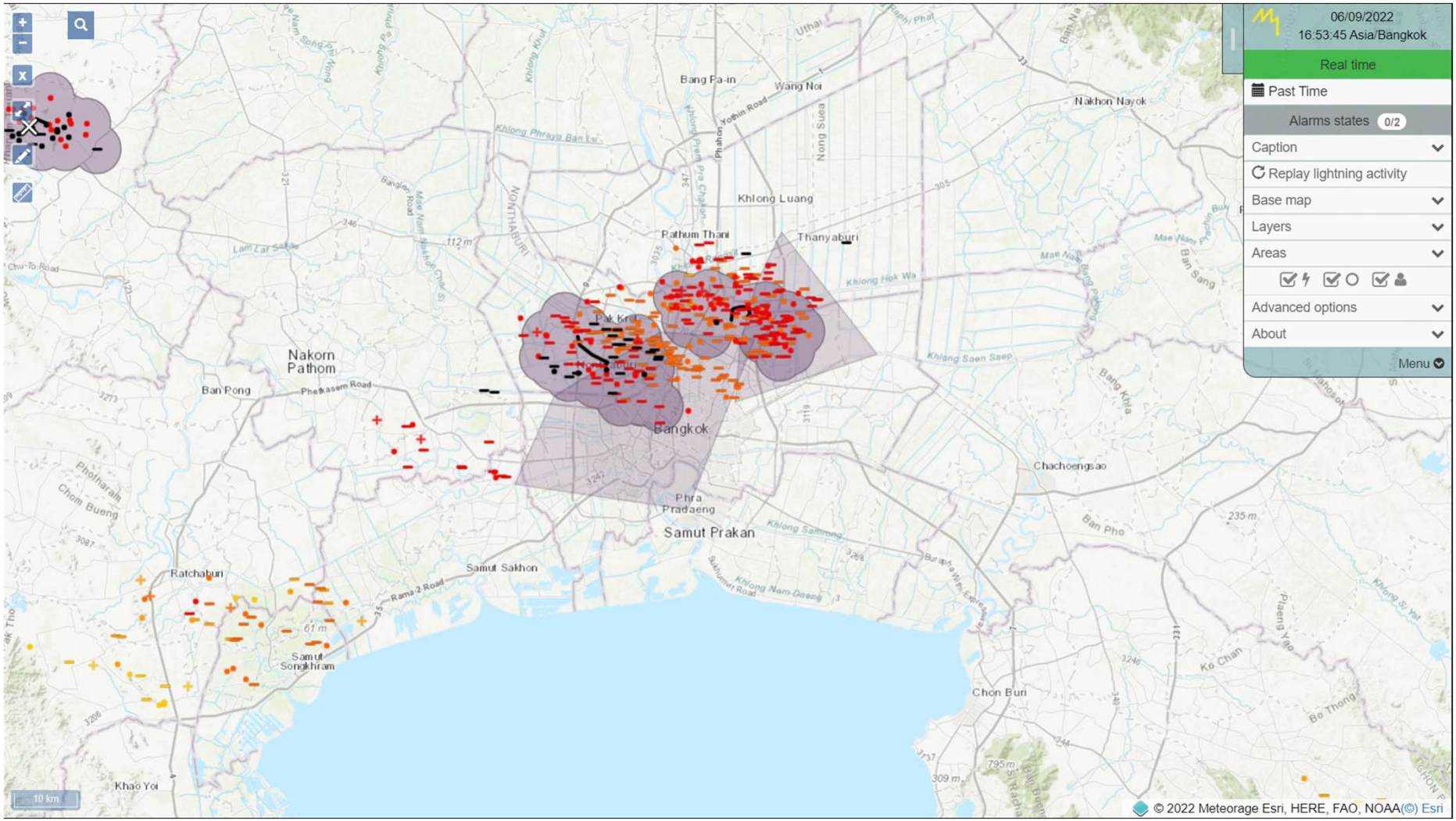
The narrower the pentagon's corridor, the better the prediction.

The cell's colour indicates its severity.
- Active cell: storm situation (light purple)
- Severe cell: accompanied by high risk of strong winds, heavy rainfall and hail (dark purple)

Keep track of the severity of a storm episode and associated dangers and asses the cells direction from a prediction of their movement within the next hour.


Active cell
Thunderstorm activity
Speed : 60.6 km/h
Surface : 706.3 km2
06/09/2022
16:21:51 Asia/Bangkok
Real time
Past Time
Alarms states 0/2
Caption
Replay lightning activity
Base map
Layers
Areas
Advanced options
About
Menu
Phra Nakhon Si Ayutthaya
Nakhon Nayok
Nakorn Pathom
Ban Pong
Nonthaburi
Bangkok
Samut Prakan
Samut Sakhon
Samut Songkhram
Ratchaburi
Chachoengsao
Chon Buri
Phra Pradaeng
Pak Kret
Bang Pa-in
Wang Noi
Ban Sang
Ban Pho
Ko Chan
Bo Thong
Phetkasem Road
Rama 2 Road
© 2022 Meteorage Esri, HERE, FAO, NOAA(©) Esri

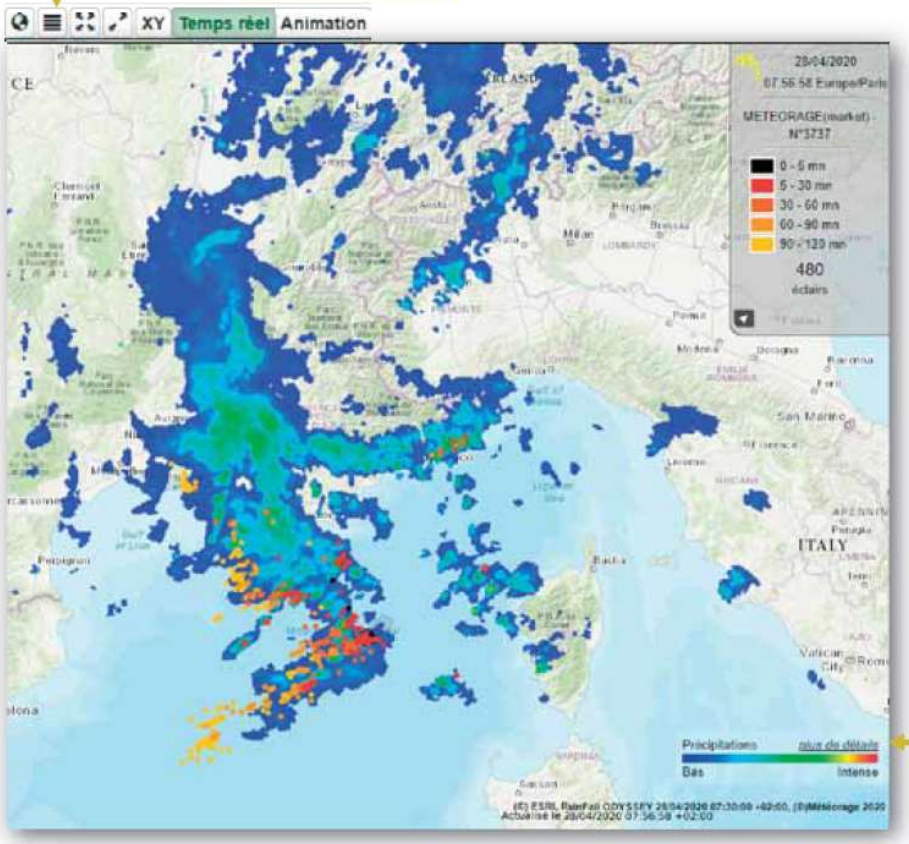

Active cell
Thunderstorm activity
Speed : 60.6 km/h
Surface : 706.3 km2
Start of storm
06/09/2022 16:05:00
+07:00
06/09/2022
16:22:05 Asia/Bangkok
Real time
Past Time
Alarms states 0/2
Caption
Replay lightning activity
Base map
Layers
Areas
Advanced options
About
Menu
Phra Nakhon Si Ayutthaya
Nakhon Nayok
Thanyaburi
Nonthaburi
Nakorn Pathom
Ban Pong
Bangkok
Phra Pradaeng
Samut Prakan
Chachoengsao
Ratchaburi
Samut Sakhon
Samut Songkhram
Chon Buri
© 2022 Meteorage Esri, HERE, FAO, NOAA(©) Esri


06/09/2022
16:53:45 Asia/Bangkok
Real time
Past Time
Alarms states 0/2
Caption
Replay lightning activity
Base map
Layers
Areas
Advanced options
About
Menu
Bang Pa-in
Wang Noi
Nakhon Nayok
Khlong Luang
Pathum Thani
Thanyaburi
Bangkok
Nakorn Pathom
Ban Pong
Phetkasem Road
Chachoengsao
Phra Pradaeng
Samut Prakan
Samut Sakhon
Ratchaburi
Samut Songkhram
Chon Buri
Khao Yoi
Rama 2 Road
10 km
© 2022 Meteorage Esri, HERE, FAO, NOAA(©) Esri

Rainfall Radar (Optional)

Click on the Layers menu to add or remove the "Precipitation" layer.

Learn about the current precipitation rate



Adjust the opacity of the different layers using the + and - buttons

Display the details of the key showing the precipitation rate by clicking on "More details".

Benefits of Lighting Detection

1. Improved Safety

2. Improved Operational Efficiency

3. Saves you Money!

Summary

You can now benefit from lightning risk mitigation services that will enable you to anticipate the arrival of thunderstorms, correlate incidents, optimize your lightning protections and improve your operational and maintenance safety processes.

These services do not require any installation or maintenance of hardware. The system of sensors, communications and data processing is already up and running. All you need is an internet connection to access your online user space.

THANK YOU

Robert James Stewart
Email: roberts@powerquality.co.th
Website: powerquality.co.th
PQ Blog: powerquality.blog