

Database of Notifications, Knowledge, and Information

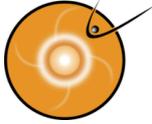
Software developers:
Chiu Wiegand (lead), Rick Mullinix

<https://ccmc.gsfc.nasa.gov/donki/>

Feedback and suggestions are welcome!

Email: chiu.wiegand@nasa.gov, m.leila.mays@nasa.gov

CCMC Tools and Services



Run-On-Request System

Usage Statistics [[charts](#) | [tables](#)]



integrated Space Weather Analysis (iSWA) system



Space Weather Database Of Notifications, Knowledge, Information (DONKI)



Comprehensive Assessment of Models and Events using Library Tools (CAMEL) Framework



SWPC CME Analysis Tool Web Version (SWPC_CAT_Web)



Stereo CME Analysis Tool (StereoCat)



Flare Scoreboard



CME Arrival Time Scoreboard



SEP Scoreboard



Kamodo (Open Source Project)



Kameleon Software Suite



EEGGL tool: Eruptive Event Generator (Gibson and Low)



DONKI

Database of Notifications, Knowledge, and Information

- Catalog of space weather phenomena.
- Chronicles the daily interpretations of space weather observations, simulation results, forecasting analysis, and notifications.
- Key component of the forecaster tool suite, developed to address space weather needs of NASA missions.
- Online tool for dissemination of forecasts, notifications, and archiving event-focused information
- Intelligent linkages, relationships, cause-and-effects between space weather activities
- Comprehensive search functionality to support **anomaly resolution** and **space science research**:
 - Space weather activity archive (flares, CME parameters and simulation results, SEPs, geomagnetic storms, radiation belt enhancements) with links between activities
 - GSFC space weather notification and weekly report archive
- Enables remote participation by students, world-wide partners, model and forecasting technique developers

Click here to get started searching the database by space weather activity type and date

Choose event type

Go to:

- [DONKI Home](#)
- [Search Space Weather Activity](#)
- [Search Notification Archive](#)
- [Login](#)

Search Space Weather Activity Archive

Space Weather Event Type :

Optional start date in format (e.g. 2013-01-31) :

Optional end date in format (e.g. 2013-06-30) :

- ALL ---
- Solar Flare
- Solar Energetic Particle
- Coronal Mass Ejection
- Interplanetary Shock
- Magnetopause Crossing
- Geomagnetic Storm
- Radiation Belt Enhancement
- High Speed Stream
- WSA-ENLIL+Cone Model

Select start and end date for search

For example, Solar Energetic Particle (SEP), to see all SEP events above threshold values



Search Space Weather Activity Archive

Space Weather Event Type :

Solar Energetic Particle

Optional start date in format (e.g. 2013-01-31) : 2013-05-01

Optional end date in format (e.g. 2013-06-30) : 2013-05-31

search

For example, Solar Energetic Particle (SEP), lists all SEP events above threshold values at various locations.

<u>Event Type</u>	<u>Activity ID</u>	<u>SEP Event Time</u>	<u>Associated Instrument</u>
Solar Energetic Particle	2013-05-13T04:12:00-SEP-001	2013-05-13T04:12Z	STEREO B: IMPACT 13-100 MeV
Solar Energetic Particle	2013-05-13T18:02:00-SEP-001	2013-05-13T18:02Z	STEREO B: IMPACT 13-100 MeV
Solar Energetic Particle	2013-05-15T13:25:00-SEP-001	2013-05-15T13:25Z	GOES13: SEM/EPS >10 MeV
Solar Energetic Particle	2013-05-22T15:05:00-SEP-001	2013-05-22T15:05Z	GOES13: SEM/EPS >10 MeV
Solar Energetic Particle	2013-05-22T15:05:00-SEP-002	2013-05-22T15:05Z	GOES13: SEM/EPS >100 MeV
Solar Energetic Particle	2013-05-22T15:30:00-SEP-001	2013-05-22T15:30Z	SOHO: COSTEP 15.8-39.8 MeV

All columns are sortable!
(click column headings)



Go to:

- [DONKI Home](#)
- [Search Space Weather Activity](#)
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Search Space Weather Activity Archive

Space Weather Event Type :

--- ALL ---

Optional start date in format (e.g. 2013-01-31) :

Optional end date in format (e.g. 2013-06-30) :

--- ALL ---

Solar Flare

Solar Energetic Particle

Coronal Mass Ejection

Interplanetary Shock

Magnetopause Crossing

Geomagnetic Storm

Radiation Belt Enhancement

High Speed Stream

✓ WSA-ENLIL+Cone Model

For another example, select
“WSA-ENLIL+Cone Model” to see
all CME simulations in a certain
date range.



Search Space Weather Activity Archive

Space Weather Event Type :

WSA-ENLIL+Cone Model

Optional start date in format (e.g. 2013-01-31) : 2013-05-03

Optional end date in format (e.g. 2013-06-30) : 2013-05-31

search

[Generate Report for WSA-ENLIL+Cone Inputs](#)

Selecting "WSA-ENLIL+Cone Model" lists all CME simulations in a certain date range.

All columns are sortable!
(click column headings)

Model Name	Model Completion Time	CME Input(s)	Predicted Earth Impact	Predicted Other Location(s) Impact
WSA-ENLIL+Cone	2013-05-03T09:33Z	<ul style="list-style-type: none"> CME: 2013-05-02T14:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	
WSA-ENLIL+Cone	2013-05-03T18:07Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T14:32Z
WSA-ENLIL+Cone	2013-05-04T12:48Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) CME: 2013-05-03T22:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T06:39Z STEREO B: 2013-05-06T16:39Z
WSA-ENLIL+Cone	2013-05-04T13:52Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) CME: 2013-05-03T22:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T15:31Z
WSA-ENLIL+Cone	2013-05-05T11:58Z	<ul style="list-style-type: none"> CME: 2011-05-24T11:24:00-CME-001(CME Analysis) 	Earth Shock Arrival Time = 2011-06-01T02:38Z Duration of disturbance (hr) = Minimum magnetopause standoff distance: Rmin(Re) = 6.6 Possible Kp index: (kp)90=1 (kp)135= (kp)180=5	

Search Space Weather Activity Archive

Space Weather Event Type :

WSA-ENLIL+Cone Model

Optional start date in format (e.g. 2013-01-31) : 2013-05-03

Optional end date in format (e.g. 2013-06-30) : 2013-05-31

search

[Generate Report for WSA-ENLIL+Cone Inputs](#)

Shows impact prediction summary for each simulation

Model Name	Model Completion Time	CME Input(s)	Predicted Earth Impact	Predicted Other Location(s) Impact
WSA-ENLIL+Cone	2013-05-03T09:33Z	<ul style="list-style-type: none"> CME: 2013-05-02T14:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	
WSA-ENLIL+Cone	2013-05-03T18:07Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T14:32Z
WSA-ENLIL+Cone	2013-05-04T12:48Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) CME: 2013-05-03T22:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T06:39Z STEREO B: 2013-05-06T16:39Z
WSA-ENLIL+Cone	2013-05-04T13:52Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) CME: 2013-05-03T22:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T15:31Z
WSA-ENLIL+Cone	2013-05-05T11:58Z	<ul style="list-style-type: none"> CME: 2011-05-24T11:24:00-CME-001(CME Analysis) 	<p>Earth Shock Arrival Time = 2011-06-01T02:38Z</p> <p>Duration of disturbance (hr) =</p> <p>Minimum magnetopause standoff distance: Rmin(Re) = 6.6</p> <p>Possible Kp index:</p> <p>(kp)90=1</p> <p>(kp)135=</p> <p>(kp)180=5</p>	



Search Space Weather Activity Archive

Space Weather Event Type :

WSA-ENLIL+Cone Model

Optional start date in format (e.g. 2013-01-31) : 2013-05-03

Optional end date in format (e.g. 2013-06-30) : 2013-05-31

search

[Generate Report for WSA-ENLIL+Cone Inputs](#)

Click here to get full simulation results and graphics for a given run.

Model Name	Model Completion Time	CME Input(s)	Predicted Earth Impact	Predicted Other Location(s) Impact
WSA-ENLIL+Cone	2013-05-03T09:33Z	<ul style="list-style-type: none"> CME: 2013-05-02T14:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	
WSA-ENLIL+Cone	2013-05-03T18:07Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T14:32Z
WSA-ENLIL+Cone	2013-05-04T12:48Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) CME: 2013-05-03T22:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T06:39Z STEREO B: 2013-05-06T16:39Z
WSA-ENLIL+Cone	2013-05-04T13:52Z	<ul style="list-style-type: none"> CME: 2013-05-03T18:00:00-CME-001(CME Analysis) CME: 2013-05-03T22:36:00-CME-001(CME Analysis) 	No or little impact to Earth.	Spitzer: 2013-05-06T15:31Z
WSA-ENLIL+Cone	2013-05-05T11:58Z	<ul style="list-style-type: none"> CME: 2011-05-24T11:24:00-CME-001(CME Analysis) 	Earth Shock Arrival Time = 2011-06-01T02:38Z Duration of disturbance (hr) = Minimum magnetopause standoff distance: Rmin(Re) = 6.6 Possible Kp index: (kp)90=1 (kp)135= (kp)180=5	 DONKI

Full simulation results for the selected run:

CME input parameters are listed for each activity ID (click ID for more CME information)

WSA-ENLIL+Cone Model with Completion Time: 2013-05-04T12:48Z

Model Inputs:

[2013-05-03T18:00:00-CME-001](#) with [CME Analysis](#): Lon.=-89.0, Lat.=18.0, Speed=760.0, HalfAngle=60.0, Time21.5=2013-05-03T22:30Z
[2013-05-03T22:36:00-CME-001](#) with [CME Analysis](#): Lon.=-86.0, Lat.=-18.0, Speed=520.0, HalfAngle=22.0, Time21.5=2013-05-04T05:37Z

Model Outputs:

Earth Impact:
No or little impact to Earth.

Impact prediction times

Other Location(s) Impact:
Spitzer with estimated shock arrival time 2013-05-06T06:39Z
STEREO B with estimated shock arrival time 2013-05-06T16:39Z

Inner Planets Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_anim.tim-den.gif
Inner Planets Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_anim.tim-vel.gif
Inner Planets Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_anim.tim-den-Stereo_A.gif
Inner Planets Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_anim.tim-den-Stereo_B.gif
Inner Planets Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_anim.tim-vel-Stereo_A.gif
Inner Planets Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_anim.tim-vel-Stereo_B.gif
Timelines Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_ENLIL_CONE_timeline.gif
Timelines Link = http://iswa.gsfc.nasa.gov/downloads/20130503_223000_ENLIL_CONE_Kp_timeline.gif

Links to simulation movies and plots



DONKI also shows intelligent linkages, relationships, cause-and-effects between space weather activities

Search Space Weather Activity Archive

Space Weather Activity Type :

Optional start date in format (e.g. 2013-01-31) :

Optional end date in format (e.g. 2013-06-30) :

For example, search for solar flares during May 2013, and click [here](#) for more information on the M5.0 flare

Event Type	Activity ID	FLR Start Time	Associated Instrument	FLR Peak Time	FLR End Time	Class	Source Location
Solar Flare	2013-05-03T17:29:00-FLR-001	2013-05-03T17:29Z	GOES15: SEM/XRS 1.0-8.0	2013-05-03T17:32Z		M5.7	N15E85
Solar Flare	2013-05-13T01:53:00-FLR-001	2013-05-13T01:53Z	GOES15: SEM/XRS 1.0-8.0	2013-05-13T02:17Z		X1.6	N10E89
Solar Flare	2013-05-13T15:40:00-FLR-001	2013-05-13T15:40Z	GOES15: SEM/XRS 1.0-8.0	2013-05-13T16:05Z		X2.8	N10E89
Solar Flare	2013-05-14T01:00:00-FLR-001	2013-05-14T01:00Z	GOES15: SEM/XRS 1.0-8.0	2013-05-14T01:11Z		X3.2	N10E89
Solar Flare	2013-05-15T01:10:00-FLR-001	2013-05-15T01:10Z	GOES15: SEM/XRS 1.0-8.0	2013-05-15T01:48Z		X1.2	N11E63
Solar Flare	2013-05-22T12:30:00-FLR-001	2013-05-22T12:30Z	GOES15: SEM/XRS 1.0-8.0	2013-05-22T13:38Z		M5.0	N13W75

More details and relationships for the M5.0 flare:

Solar Flare

Start Time: 2013-05-22T12:30Z (GOES15: SEM/XRS 1.0-8.0)

Peak Time: 2013-05-22T13:38Z

End Time:

Intensity: M5.0 class

Source region N13W75

Activity ID: 2013-05-22T12:30:00-FLR-001 (version 2)

Note:

Submitted on 2014-02-03T19:49Z by Leila Mays

Click the notification ID to see a copy of the flare notification.

A Notification with ID [20130522-AL-001](#) was sent on 2013-05-22T15:30Z

All directly linked activities:

[2013-05-22T13:24:00-CME-001](#)

[2013-05-22T15:05:00-SEP-001](#)

GOES13: SEM/EPS >10 MeV

[2013-05-22T15:05:00-SEP-002](#)

GOES13: SEM/EPS >100 MeV

[2013-05-22T15:30:00-SEP-001](#)

SOHO: COSTEP 15.8-39.8 MeV

Related events are listed at the bottom. This flare was associated with a CME and also an SEP event near Earth

Click on the activity IDs for information on the CME or SEPs.

Alternatively, search the notification database by space weather activity type and date

Choose event type, or weekly report

Go to:

- [DONKI Home](#)
- [Search Space Weather Activity](#)
- [Search Notification Archive](#)
- [Login](#)
- [New User Registration](#)

Search Space Weather Notification Archive

Notification for Space Weather Event Type :

(Optional) Search start date from (e.g. 2013-01-31) :

(Optional) Search end date to (e.g. 2013-06-30) :

--- ALL ---

Select start and end date for search

- ✓ --- ALL ---
- Solar Flare
- Solar Energetic Particle
- Coronal Mass Ejection
- Interplanetary Shock
- Magnetopause Crossing
- Geomagnetic Storm
- Radiation Belt Enhancement
- SW Report

For example, select ALL to list all notification types and weekly reports.

Search Space Weather Notification Archive

Notification for Space Weather Event Type :

--- ALL ---

(Optional) Search start date from (e.g. 2013-01-31) : 2013-05-01

(Optional) Search end date to (e.g. 2013-06-30) : 2013-05-14

search

Selecting ALL lists all notification types and weekly reports in a certain date range.

Message ID	Sent Date	For SW Event(s)	Sent By
20130514-AL-003	2013-05-14T04:55Z	CME Analysis CME	Dan Comberiate
20130514-AL-002	2013-05-14T03:50Z	CME Analysis CME	Dan Comberiate
20130514-AL-001	2013-05-14T01:45Z	FLR	Dan Comberiate
20130513-AL-008	2013-05-13T19:15Z	CME Analysis CME	Dan Comberiate
20130513-AL-007	2013-05-13T18:35Z	SEP	Dan Comberiate
20130513-AL-006	2013-05-13T18:20Z	CME Analysis CME	Dan Comberiate
20130513-AL-005	2013-05-13T16:25Z	FLR	Dan Comberiate
20130513-AL-004	2013-05-13T06:00Z	CME Analysis CME	Dan Comberiate
20130513-AL-003	2013-05-13T05:20Z	CME Analysis CME	Dan Comberiate
20130513-AL-002	2013-05-13T04:55Z	SEP	Dan Comberiate
20130513-AL-001	2013-05-13T02:52Z	FLR	Dan Comberiate
20130508-7D-001	2013-05-08T16:06Z	Report	chiu wiegand
20130503-AL-001	2013-05-03T18:20Z	FLR	Dan Comberiate
20130501-7D-001	2013-05-01T22:15Z	Report	chiu wiegand

Click on the message ID to see a copy the notification.

All columns are sortable!
(click column headings)



DONKI - Caveats

- Data entry for past events (using logs and alert archives) was performed by students:
 - Could be errors, mostly due to typos, or duplicate entries
 - We are adding data quality flags to indicate whether entries have been “checked”
 - Entries from Aug 2013 onwards is mostly verified.
- Search filters combinations will be added
- More data export options coming (suggestions?)
- CME measurements are made in real-time, with limited data.



Demo: DONKI

Database of Notifications, Knowledge, and Information

<https://ccmc.gsfc.nasa.gov/donki/>