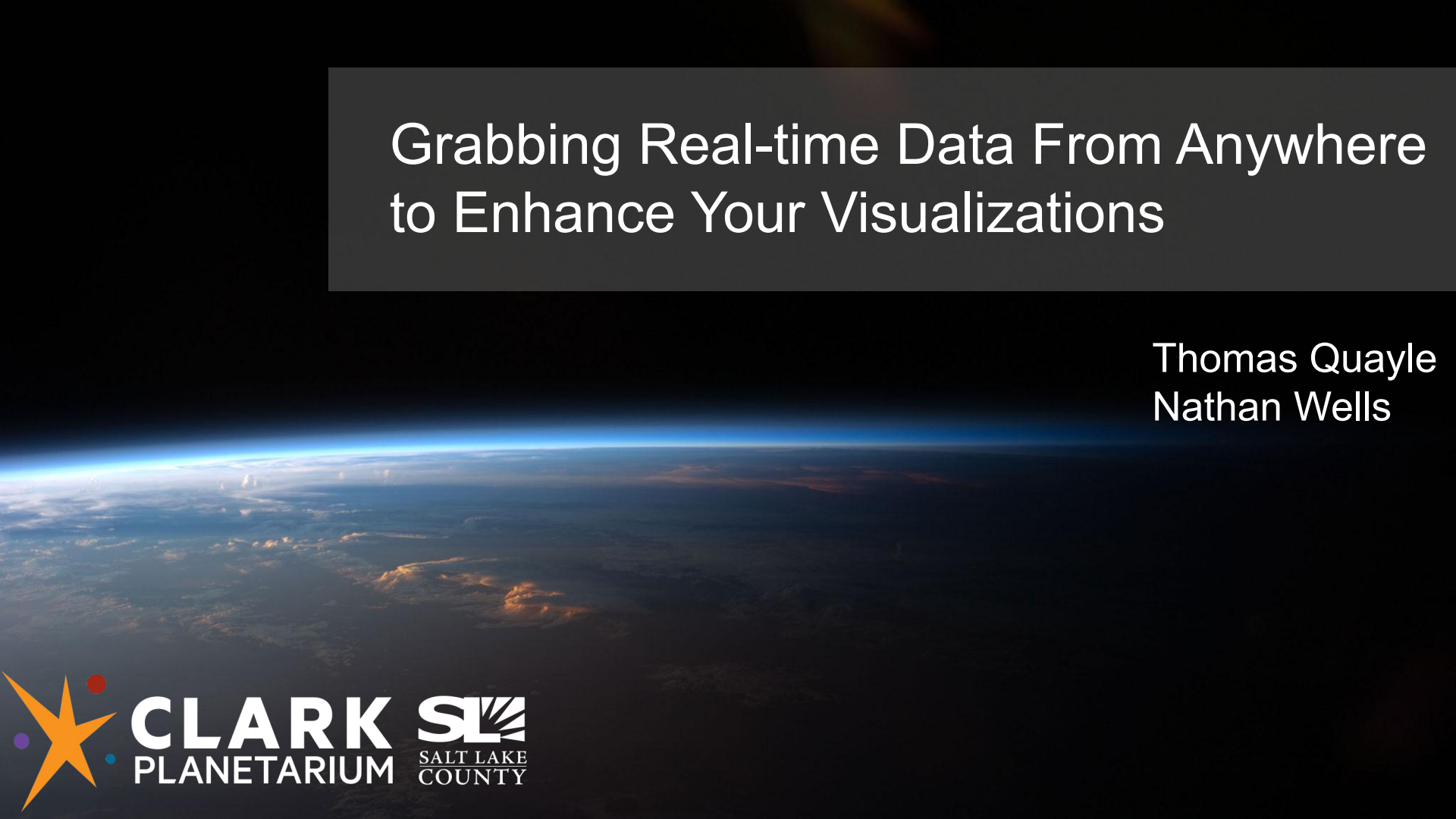
Grabbing Real-time Data From Anywhere to Enhance Your Visualizations

Thomas Quayle
Nathan Wells



Salt Lake City, UT

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Why real-time?

- Learning strategies are evolving to recognize and incorporate the use of real-time data.
- Current information allows more personalization and context to be provided.
- Access to local phenomena promotes higher interest and drives relevancy.

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Taking the next step:

- *Enhancing context to current real-time datasets.*
- *Bringing your own real-time data to expand context and enhance visualizations.*

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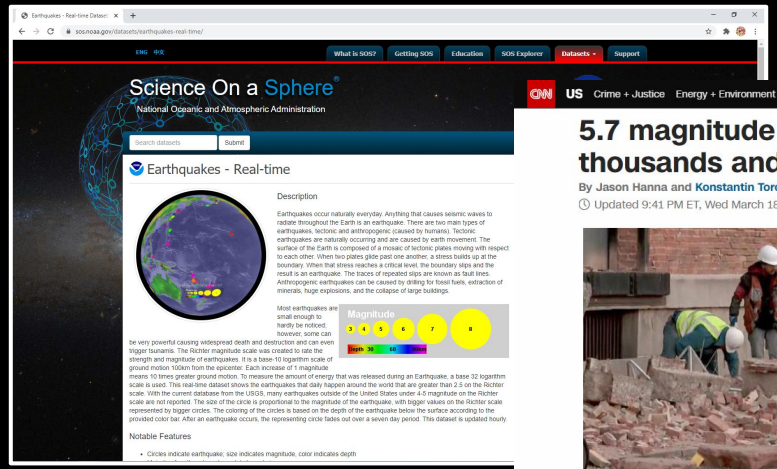
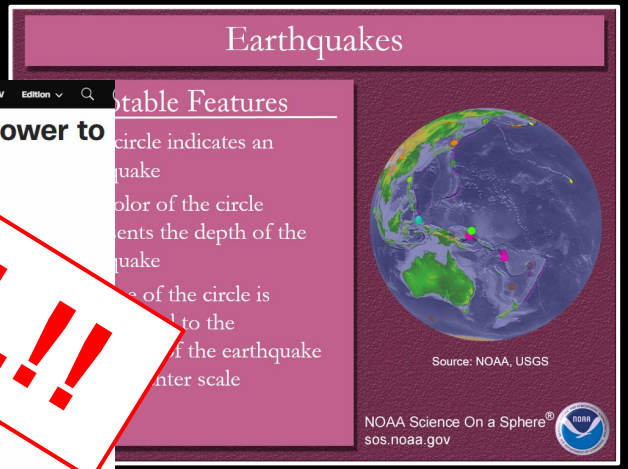
Current capture and display process for real-time datasets:

Available Real-time Dataset → SOS Visualization → Auxiliary Screen Display



COOL!!



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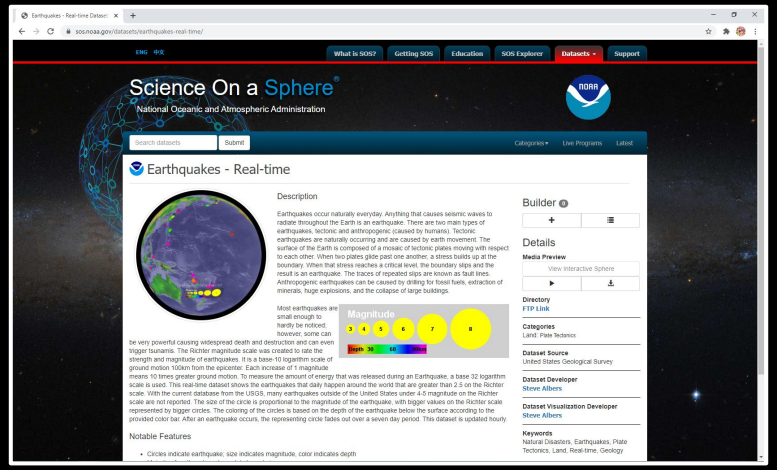
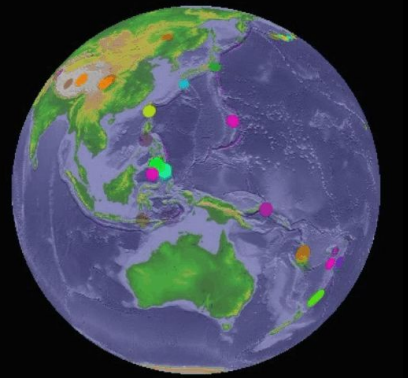
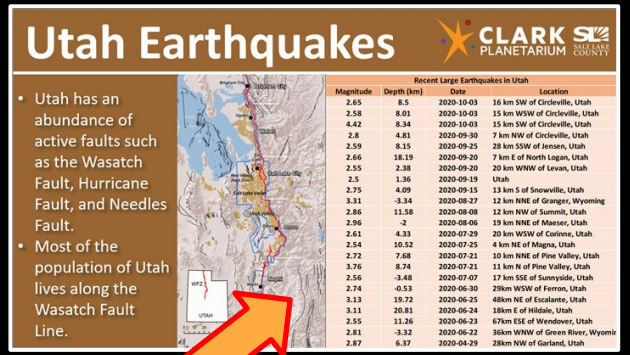
Desired capture and display process for real-time datasets:

Available Real-time Dataset → SOS Visualization → Auxiliary Screen Display







Updated with Local Real-time Data

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Utah Earthquakes

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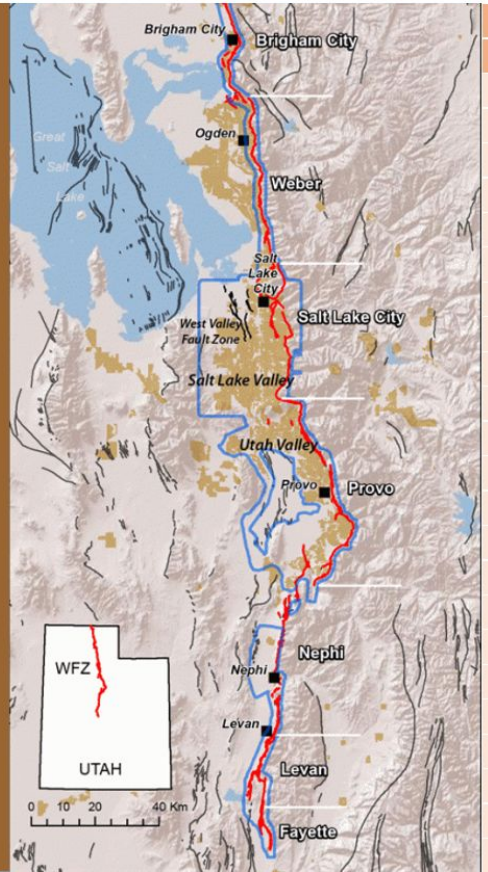
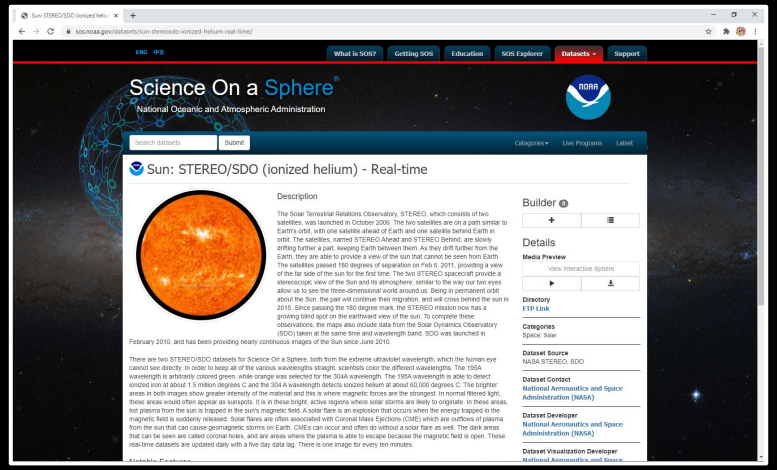
- Utah has an abundance of active faults such as the Wasatch Fault, Hurricane Fault, and Needles Fault.
- Most of the population of Utah lives along the Wasatch Fault Line.

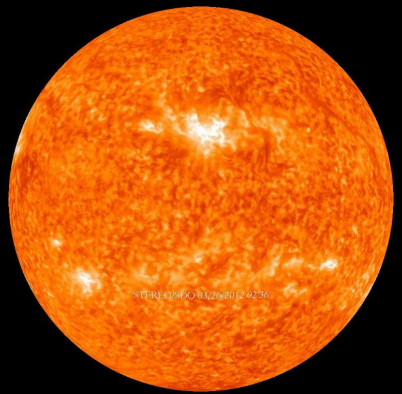


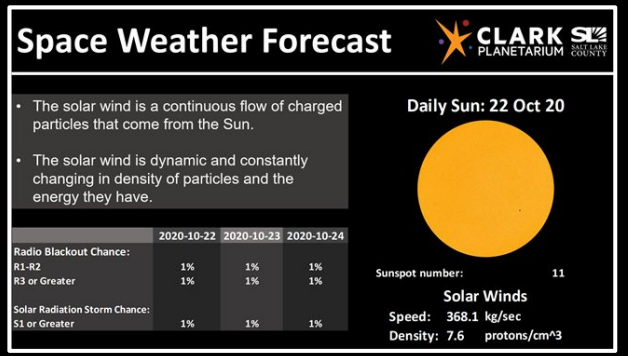
Recent Large Earthquakes in Utah			
Magnitude	Depth (km)	Date	Location
2.65	8.5	2020-10-03	16 km SW of Circleville, Utah
2.58	8.01	2020-10-03	15 km WSW of Circleville, Utah
4.42	8.34	2020-10-03	15 km SW of Circleville, Utah
2.8	4.81	2020-09-30	7 km NW of Circleville, Utah
2.59	8.15	2020-09-25	28 km SSW of Jensen, Utah
2.66	18.19	2020-09-20	7 km E of North Logan, Utah
2.55	2.38	2020-09-20	20 km WNW of Levan, Utah
2.5	1.36	2020-09-19	Utah
2.75	4.09	2020-09-15	13 km S of Snowville, Utah
3.31	-3.34	2020-08-27	12 km NNE of Granger, Wyoming
2.86	11.58	2020-08-08	12 km NW of Summit, Utah
2.96	-2	2020-08-06	19 km NNE of Maeser, Utah
2.61	4.33	2020-07-29	20 km WSW of Corinne, Utah
2.54	10.52	2020-07-25	4 km NE of Magna, Utah
2.72	7.68	2020-07-21	10 km NNE of Pine Valley, Utah
3.76	8.74	2020-07-21	11 km N of Pine Valley, Utah
2.56	-3.48	2020-07-07	17 km SSE of Sunnyside, Utah
2.74	-0.53	2020-06-30	29km WSW of Ferron, Utah
3.13	19.72	2020-06-25	48km NE of Escalante, Utah
3.11	20.81	2020-06-24	18km E of Hildale, Utah
2.55	11.26	2020-06-23	67km ESE of Wendover, Utah
2.81	-3.32	2020-06-22	36km WNW of Green River, Wyomir
2.87	6.37	2020-04-29	28km NW of Garland, Utah

What about other real-time datasets:

Available Real-time Dataset → SOS Visualization → Auxiliary Screen Display







Updated with…?

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Space Weather Forecast

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- The solar wind is a continuous flow of charged particles that come from the Sun.
- The solar wind is dynamic and constantly changing in density of particles and the energy they have.

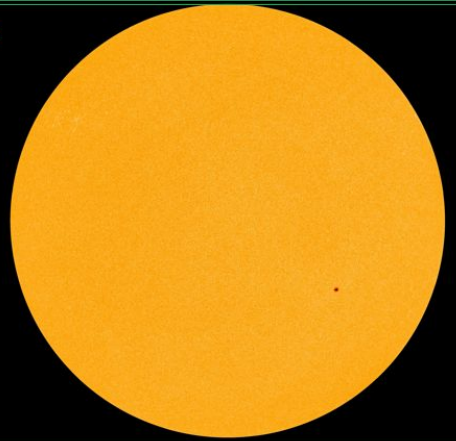
1

	2020-10-22	2020-10-23	2020-10-24
Radio Blackout Chance:			
R1-R2	1%	1%	1%
R3 or Greater	1%	1%	1%
Solar Radiation Storm Chance:			
S1 or Greater	1%	1%	1%

1

Daily Sun: 22 Oct 20

2



3

Sunspot number: 11

Solar Winds

4

Speed: 368.1 kg/sec

Density: 7.6 protons/cm^3

So how does this work?

Data Flow

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Looking for desired real-time components: [Space Weather Forecast]

spaceweather.com
News and information about the Sun-Earth environment

Subscribe to SpaceweatherNews
go!

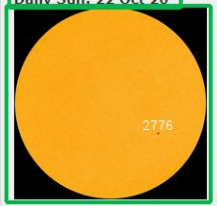
AURORA ALERTS | SUBMIT YOUR PHOTOS | CONTACT US | SUBSCRIBE | FLYBYS | EARTH

Current Conditions

Solar wind
speed: **365.0** km/sec
density: **5.6** protons/cm^3
more data: ACE, DSCOVR
Updated: Today at 2110 UT

X-ray Solar Flares
6-hr max: **A1** 0000 UT Jan01
24-hr: **A3** 0933 UT Oct22
explanation | more data
Updated: Today at: 2115 UT

Daily Sun: 22 Oct 20



New-cycle sunspot AR2776 is stable and poses no threat for strong solar flares. Credit: SDO/HMI

Sunspot number: 11
What is the Sunspot number?
Updated 22 Oct 2020

Spotless Days
Current Stretch: 0 days
2020 total: 204 days (69%)
2019 total: 281 days (77%)
2018 total: 221 days (61%)

What's up in space

Thursday, Oct. 22, 2020

Never miss another geomagnetic storm. Sign up for Space Weather Alerts and you'll receive a text message when auroras appear in your area. Aurora tour guides and professional astronomers use this service. Now you can, too!

SUNSET SKY SHOW: When the sun goes down tonight, step outside and look south. The Moon, Saturn and Jupiter have converged to form a bright triangle in the constellation Sagittarius. It's a great way to end the day: Sky map.

STRANGE RED AURORAS: Spoiler alert: We do not know the answer to this question. *Where did all the red auroras come from?* For much of mid-October, Earth's magnetic field has been very quiet. Extremely quiet. There should have been almost no auroras at all, yet around the Arctic Circle, photographers recorded scenes like this:

Rayann Elzein of Utsjoki, Finland, took the picture on Oct. 17th. "I saw red

archives
October
22
2020

SPACE WEATHER PREDICTION CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Thursday, October 22, 2020 21:32:31 UTC

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Home > Dashboards > Space Weather Enthusiasts Dashboard

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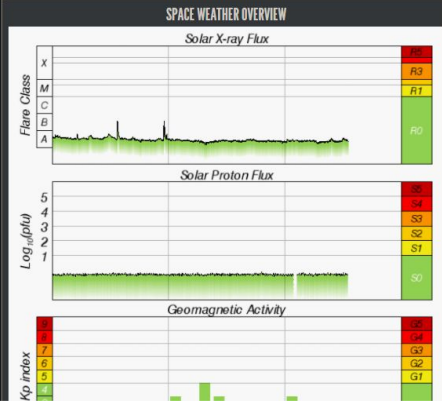
SPACE WEATHER CONDITIONS on NOAA Scales

24-Hour Observed Maximums: R none | S none | G none
Latest Observed: R null | S null | G none
Predicted 2020-10-22 UTC: R1-R2 1% | R3-R5 1% | S1 or greater 1% | G none

Solar Wind Speed: **376** km/sec
Solar Wind Magnetic Fields: Bt **4** nT, Bz **0** nT
Noon 10.7cm Radio Flux: **75** sfu

SPACE WEATHER ENTHUSIASTS DASHBOARD

SPACE WEATHER OVERVIEW

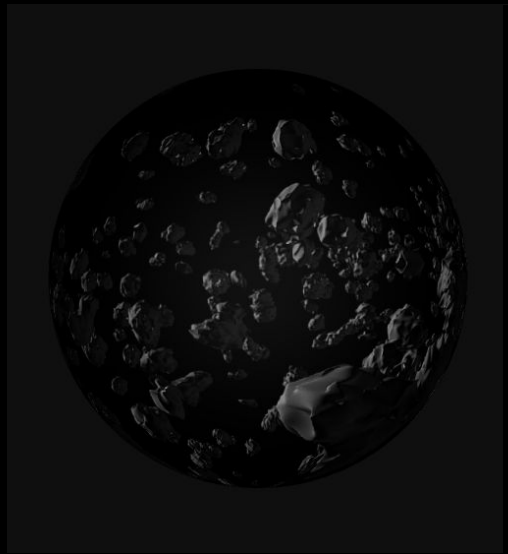



```
:Product: 3-Day Forecast
:Issued: 2020 Oct 22 1230 UTC
# Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center
#
A. NOAA Geomagnetic Activity Observation and Forecast

The greatest observed 3 hr Kp over the past 24 hours was 3 (below NOAA
Scale levels).
The greatest expected 3 hr Kp for Oct 22-Oct 24 2020 is 5 (NOAA Scale
G1).

NOAA Kp index breakdown Oct 22-Oct 24 2020

             Oct 22     Oct 23     Oct 24
00-03UT       3          4          3
03-06UT       1          5 (G1)     4
06-09UT       1          4          3
09-12UT       0          4          3
12-15UT       3          3          2
15-18UT       2          3          3
18-21UT       5 (G1)     2          3
21-00UT       3          3          3

Rationale: G1 (Minor) levels are likely on 22-23 Oct, due to influences
from a series of extensions from the northern crown CH HSS.

B. NOAA Solar Radiation Activity Observation and Forecast

Solar radiation, as observed by NOAA GOES-16 over the past 24 hours, was
below S-scale storm level thresholds.

Solar Radiation Storm Forecast for Oct 22-Oct 24 2020
```

What if there isn't a real-time dataset with info you want to use?

My Own Real-time Dataset? → SOS Visualization → Auxiliary Screen Display

?



Near Earth Asteroids

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Close Approach Data

The following table shows close approaches to the Earth by near-Earth objects (NEOs).

Near-Earth Objects (NEOs) are comets and asteroids that have been nudged by the gravitational attraction of nearby planets into orbits that allow them to enter the Earth's neighborhood.

Object	Close-Approach (CA) Date	Relative Velocity (km/s)	Estimated Diameter
(2020 UL2)	2020-Oct-22 09:46 ± < 00:01	7.47	4.8 m - 11 m
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(2020 TK6)	2020-Oct-22 15:26 ± < 00:01	7.87	14 m - 32 m
(2020 UO3)	2020-Oct-22 15:53 ± < 00:01	16.75	6.2 m - 14 m
(2020 UV)	2020-Oct-22 16:21 ± < 00:01	8.33	9.4 m - 21 m
(2020 TX1)	2020-Oct-22 18:16 ± < 00:01	7.94	17 m - 38 m
(2020 UF3)	2020-Oct-22 22:17 ± < 00:01	22.01	5.7 m - 13 m
(2020 TG1)	2020-Oct-22 22:49 ± < 00:01	13.74	47 m - 110 m
(2020 UK1)	2020-Oct-23 00:56 ± < 00:01	8.95	21 m - 46 m
(2020 TK4)	2020-Oct-23 01:49 ± < 00:01	8.89	14 m - 32 m

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Near Earth Asteroids

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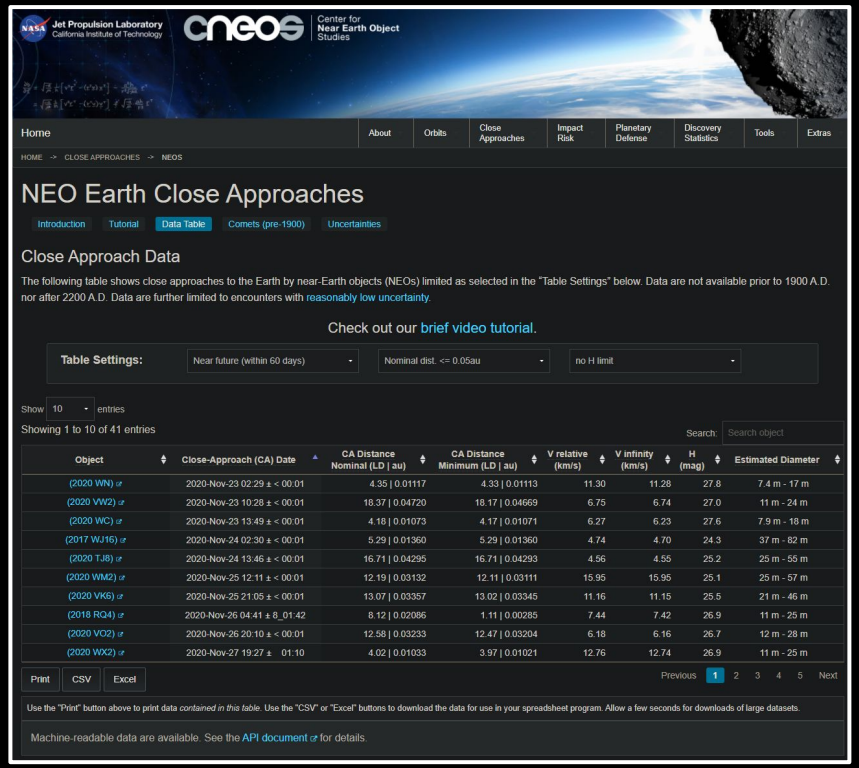
Looking for desired real-time components: [Near Earth Asteroids]



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HOME -> CLOSE APPROACHES -> NEOS

NEO Earth Close Approaches

Introduction | Tutorial | Data Table | Comets (pre-1900) | Uncertainties

Close Approach Data

The following table shows close approaches to the Earth by near-Earth objects (NEOs) limited as selected in the "Table Settings" below. Data are not available prior to 1900 A.D. nor after 2200 A.D. Data are further limited to encounters with reasonably low uncertainty.

Check out our brief video tutorial.

Table Settings: Near future (within 60 days) | Nominal dist. <= 0.05au | no H limit

Show 10 entries

Showing 1 to 10 of 41 entries

Search: Search object

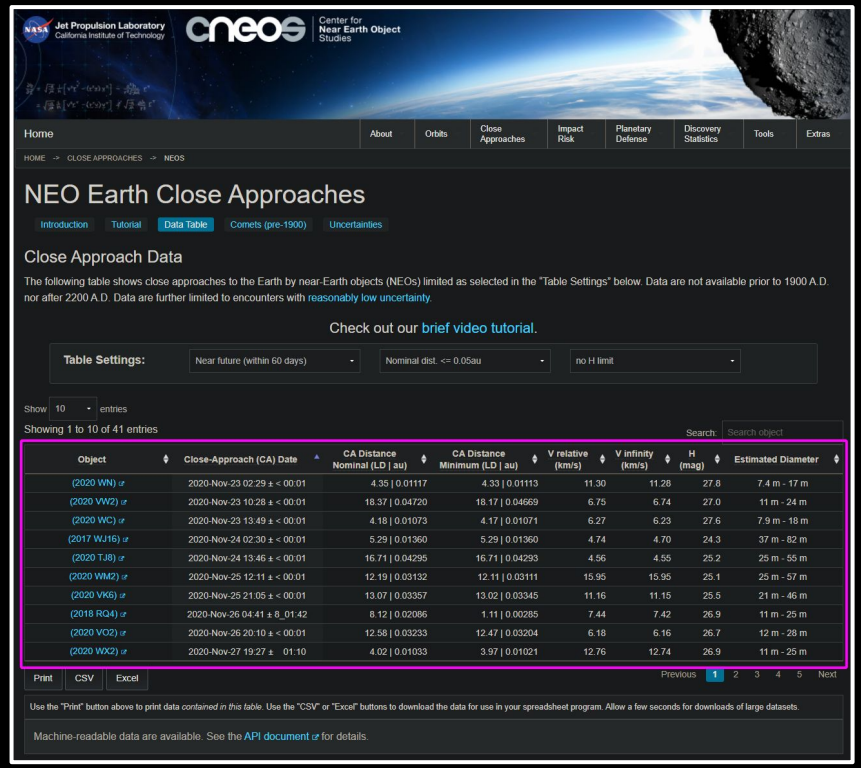
Object	Close-Approach (CA) Date	CA Distance Nominal (LD | au)	CA Distance Minimum (LD | au)	V relative (km/s)	V infinity (km/s)	H (mag)	Estimated Diameter
(2020 WN)	2020-Nov-23 02:29 ± < 00:01	4.35 | 0.01117	4.33 | 0.01113	11.30	11.28	27.8	7.4 m - 17 m
(2020 VW2)	2020-Nov-23 10:28 ± < 00:01	18.37 | 0.04720	18.17 | 0.04669	6.75	6.74	27.0	11 m - 24 m
(2020 WC)	2020-Nov-23 13:49 ± < 00:01	4.18 | 0.01073	4.17 | 0.01071	6.27	6.23	27.6	7.9 m - 18 m
(2017 WJ16)	2020-Nov-24 02:30 ± < 00:01	5.29 | 0.01360	5.29 | 0.01360	4.74	4.70	24.3	37 m - 82 m
(2020 TJ8)	2020-Nov-24 13:46 ± < 00:01	16.71 | 0.04295	16.71 | 0.04293	4.56	4.55	25.2	25 m - 55 m
(2020 WM2)	2020-Nov-25 12:11 ± < 00:01	12.19 | 0.03132	12.11 | 0.03111	15.95	15.95	25.1	25 m - 57 m
(2020 VK6)	2020-Nov-25 21:05 ± < 00:01	13.07 | 0.03357	13.02 | 0.03345	11.16	11.15	25.5	21 m - 46 m
(2018 RQ4)	2020-Nov-26 04:41 ± 8_01:42	8.12 | 0.02086	1.11 | 0.00285	7.44	7.42	26.9	11 m - 25 m
(2020 VO2)	2020-Nov-26 20:10 ± < 00:01	12.58 | 0.03233	12.47 | 0.03204	6.18	6.16	26.7	12 m - 28 m
(2020 WX2)	2020-Nov-27 19:27 ± 01:10	4.02 | 0.01033	3.97 | 0.01021	12.76	12.74	26.9	11 m - 25 m

Print | CSV | Excel

Previous 1 2 3 4 5 Next

Use the "Print" button above to print data *contained in this table*. Use the "CSV" or "Excel" buttons to download the data for use in your spreadsheet program. Allow a few seconds for downloads of large datasets.

Machine-readable data are available. See the API document for details.



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How to Develop Real-Time Slides

- Download necessary programs
- Setup working folder
- Identify a website, and its type
  - Text Type
  - Image Type
  - HTML Table Type
  - Spreadsheet Download Type
- Copy Script Template
- Link Excel Data to PowerPoint

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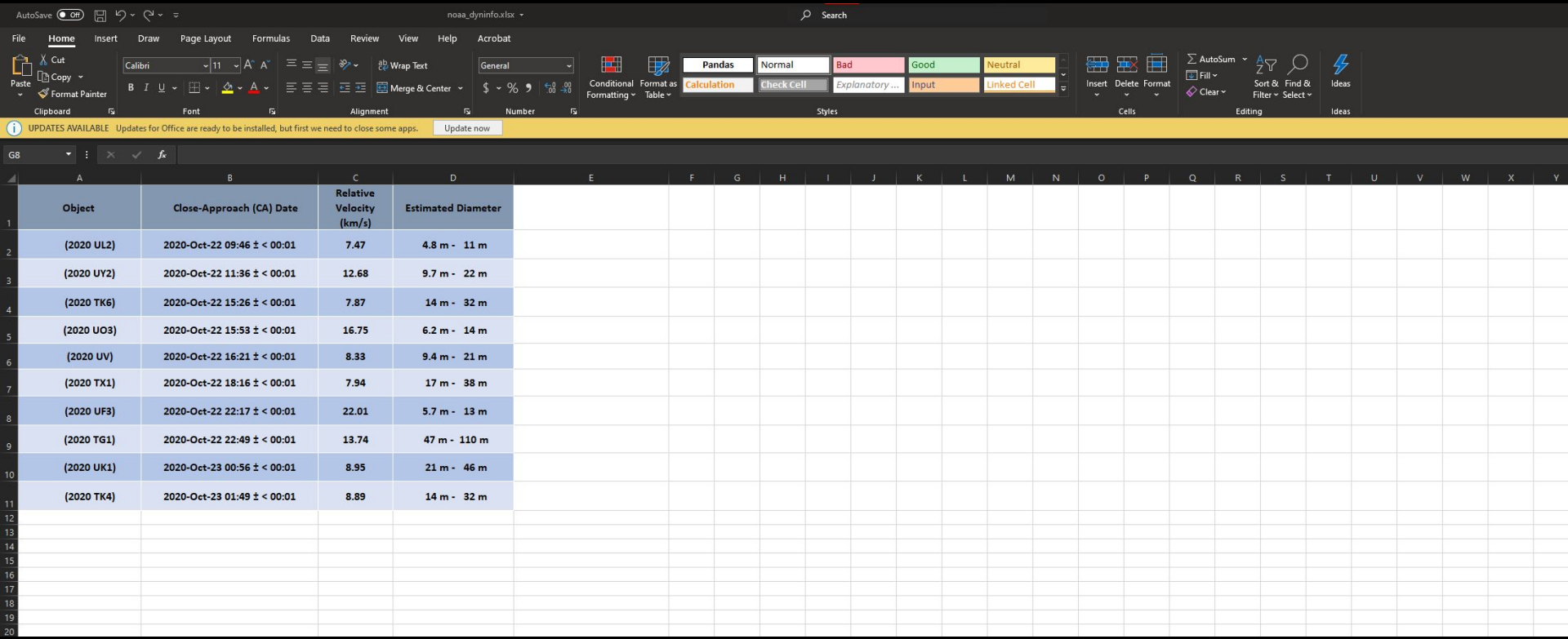

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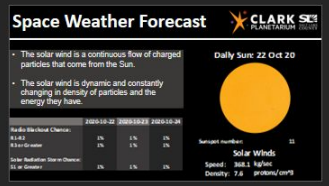

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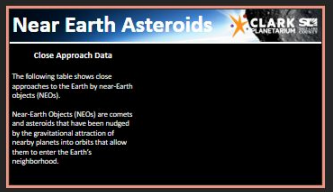

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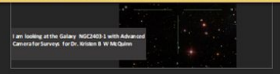
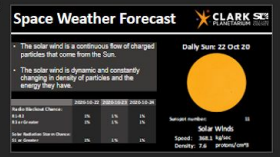
Near Earth Asteroids

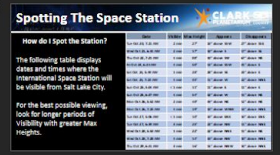
Close Approach Data

The following table shows close approaches to the Earth by near-Earth objects (NEOs).

Near-Earth Objects (NEOs) are comets and asteroids that have been nudged by the gravitational attraction of nearby planets into orbits that allow them to enter the Earth's







Near Earth Asteroids

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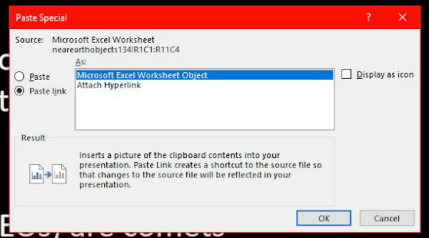
Close Approach Data



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Near Earth Asteroids

Near Earth Asteroids

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Near-Earth Objects (NEOs) are comets and asteroids that have been nudged by the gravitational attraction of nearby planets into orbits that allow them to enter the Earth's neighborhood.

Object	Close-Approach (CA) Date	Relative Velocity (km/s)	Estimated Diameter
(2020 UL2)	2020-Oct-22 09:46 ± < 00:01	7.47	4.8 m - 11 m
(2020 UY2)	2020-Oct-22 11:36 ± < 00:01	12.68	9.7 m - 22 m
(2020 TK6)	2020-Oct-22 15:26 ± < 00:01	7.87	14 m - 32 m
(2020 UO3)	2020-Oct-22 15:53 ± < 00:01	16.75	6.2 m - 14 m
(2020 UV)	2020-Oct-22 16:21 ± < 00:01	8.33	9.4 m - 21 m
(2020 TX1)	2020-Oct-22 18:16 ± < 00:01	7.94	17 m - 38 m
(2020 UF3)	2020-Oct-22 22:17 ± < 00:01	22.01	5.7 m - 13 m
(2020 TG1)	2020-Oct-22 22:49 ± < 00:01	13.74	47 m - 110 m
(2020 UK1)	2020-Oct-23 00:56 ± < 00:01	8.95	21 m - 46 m
(2020 TK4)	2020-Oct-23 01:49 ± < 00:01	8.89	14 m - 32 m

Open Discussion Time:

Thoughts, Questions, Insults?

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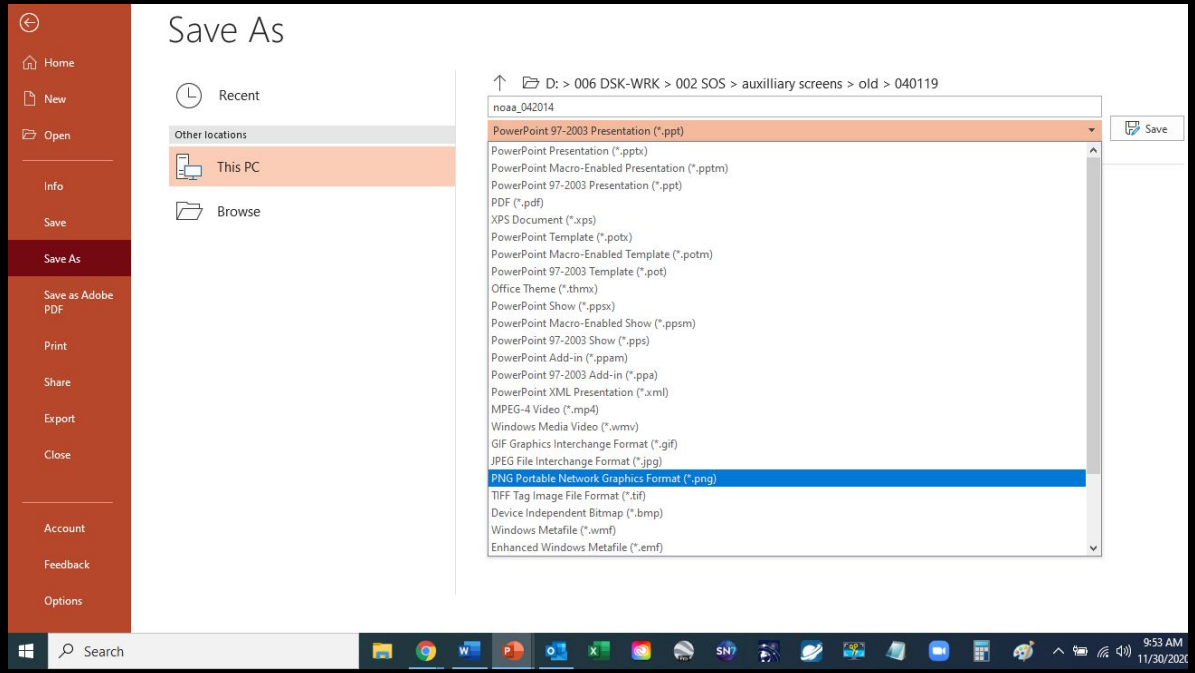
Saving slides as images for use as pips:



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Using slides as pips

Near Earth Asteroids

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Close Approach Data

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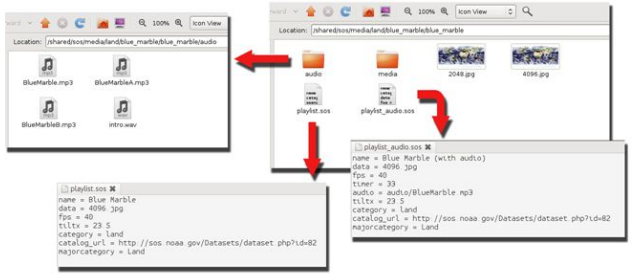
Adjusting pip size and position:

sos.noaa.gov/support/manuals/dataset-manual/

There can be multiple playlist.sos files in one folder for different versions of the dataset. The file names simply need to start with playlist and end with .sos and **there must be one file that is named playlist.sos**. For example, you could have playlist.sos, playlist_with_audio.sos, and playlist_extra_labels.sos all in the same folder. If you don't have a playlist.sos file then none of the variations will show up in the data catalog on the iPad.

The "include" lines used in presentation playlists should not be used in a playlist.sos file, since the purpose of the playlist.sos file is to describe a single self-contained dataset with optional layers, PIPs, etc. Only presentation playlists should use the include attribute.

A playlist.sos Example



In this blue_marble example, there are two playlist.sos files in the folder for the blue_marble dataset, playlist.sos and playlist_audio.sos. Both playlists point to the same data, and the only difference is that one includes audio and a timer and the other doesn't. Notice that the audio files have been put into their own folder. If there are multiple audio files or PIPs, a folder can be created in the dataset folder that contains those files. While this isn't required, it helps to keep the folder uncluttered.

When files that are referenced in the playlist.sos file aren't in the same directory as the playlist.sos, the path to the file needs to be

Content

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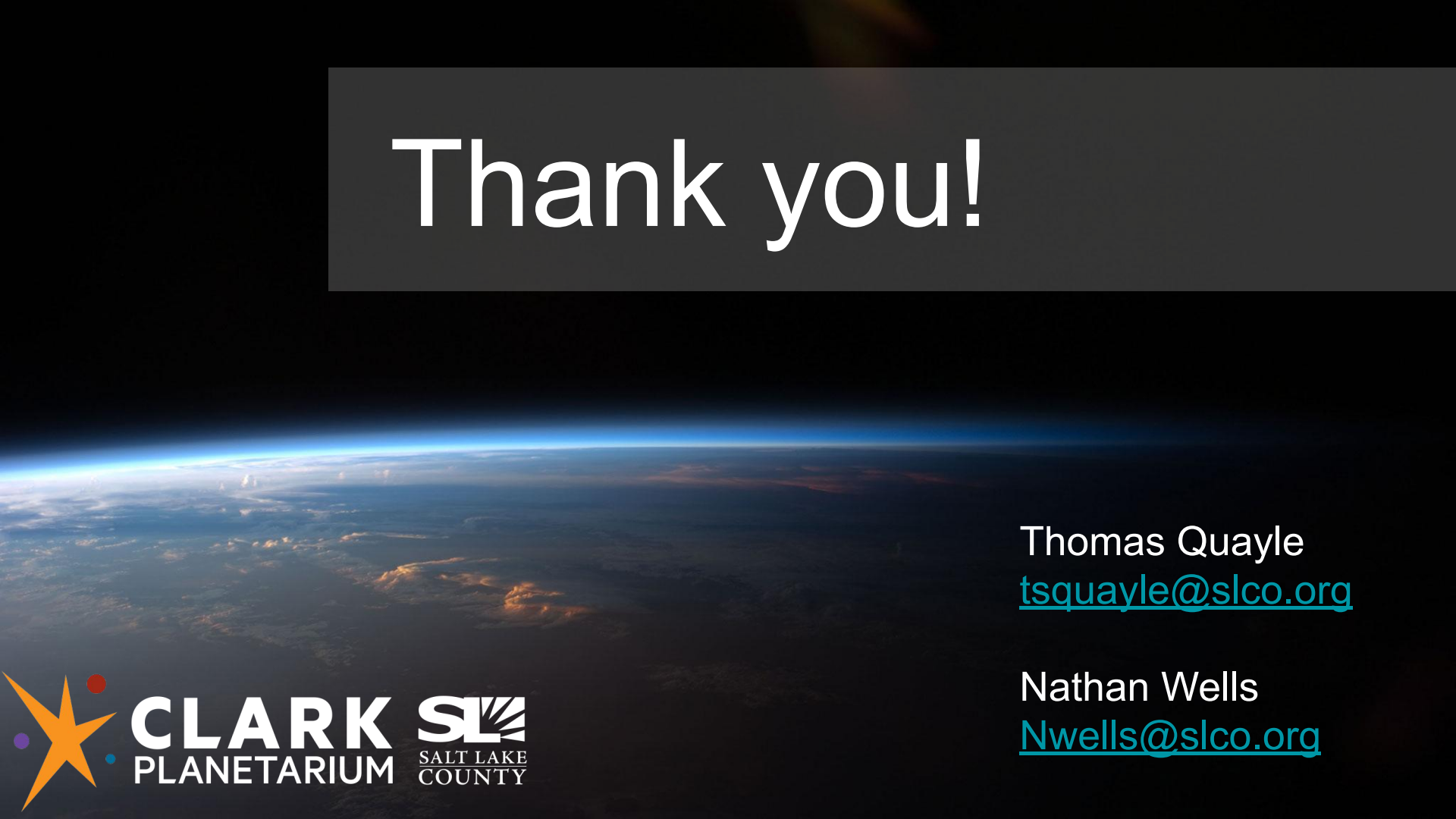
Thank you!



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