Creating new ways to view LEO Satellite observations of winds and waves

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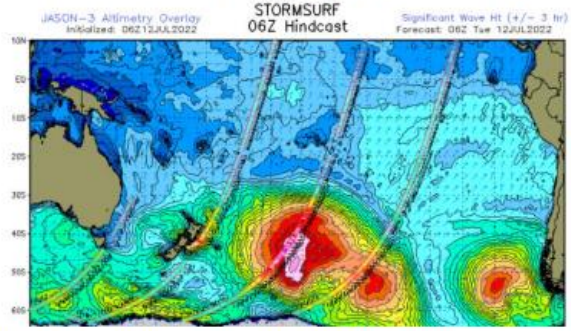
Your Authors

What drove this development?

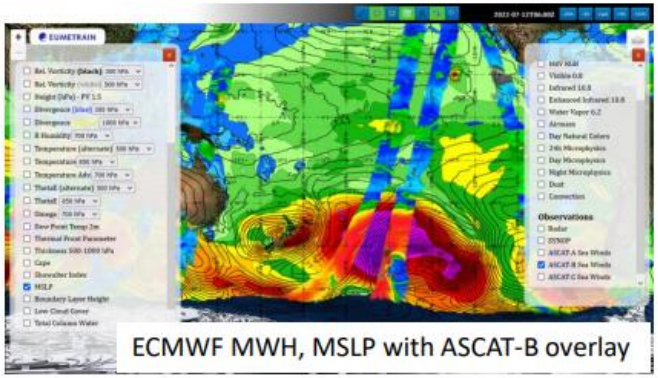
images courtesy EUMETSAT

Surf and Swell event, Pacific Ocean, Original Situation

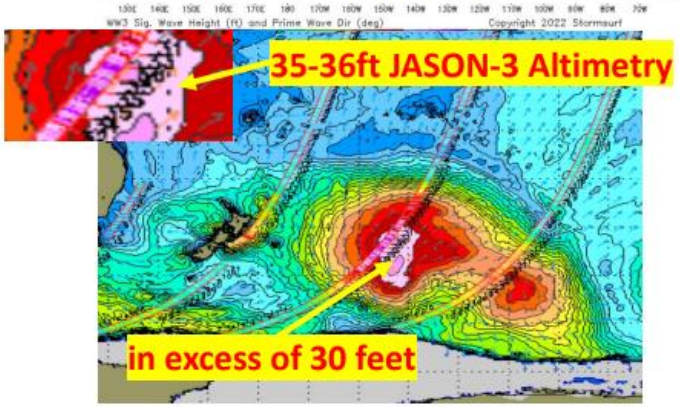
(Various other data, 06UTC 12th July 2022, Stormsurf and EUMETRAIN MapViewer)

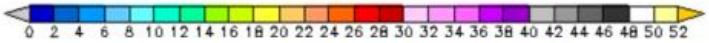


NOAA Wavewatch III with JASON-3 Altimetry overlay

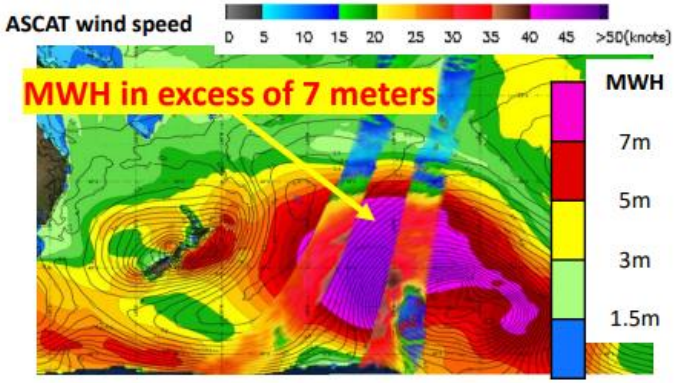


ECMWF MWH, MSLP with ASCAT-B overlay





Significant Wave Height (ft)



MSLP, Maximum Wave Height (MWH) and ASCAT wind speed

images from Stormsurf

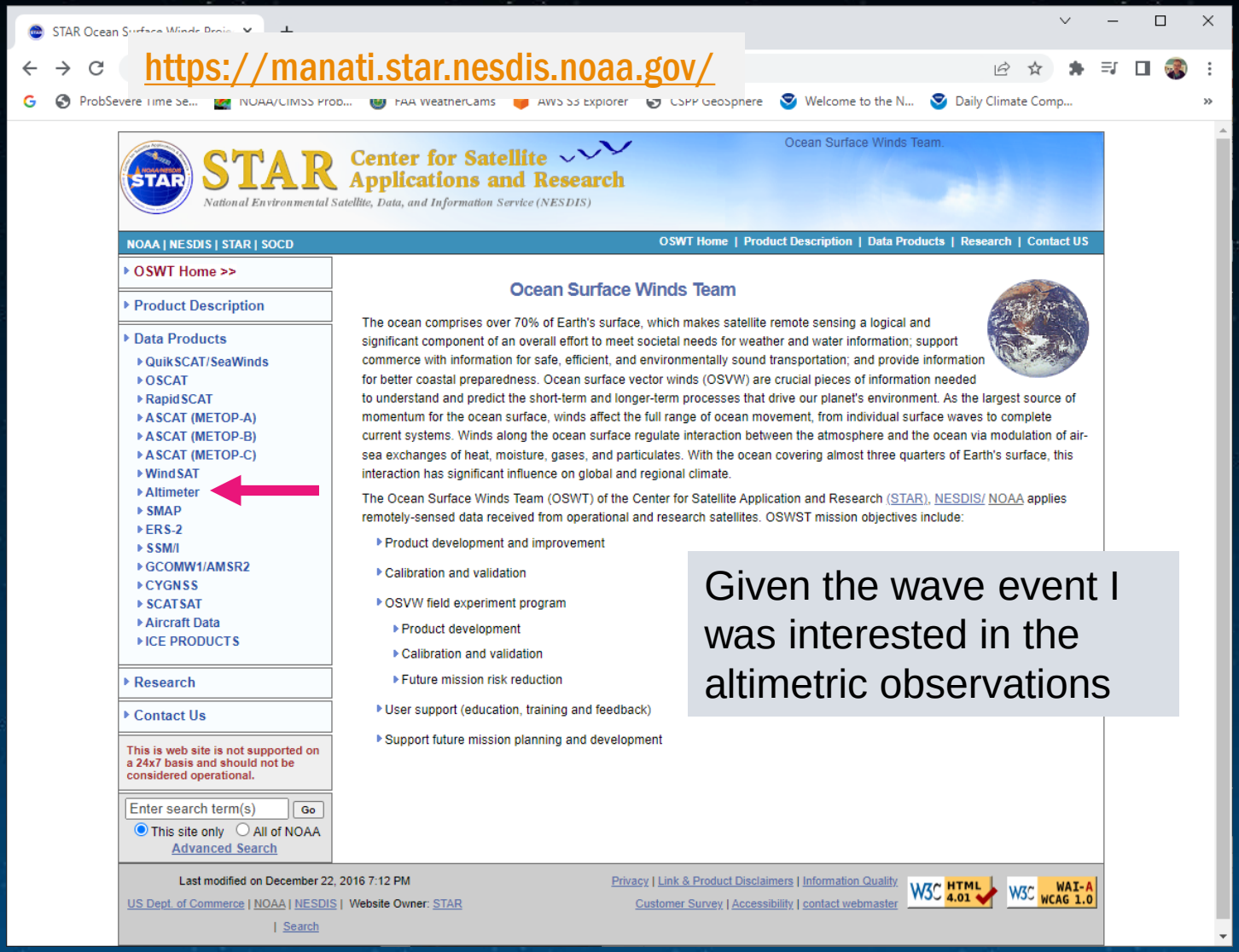
Images from EUMETRAIN

I found it very hard to monitor the progression of waves with just snapshots at the manati website

(Manati website)

This image came from Bodo Zeschke here

So much data at this website



Altimetric Significant Wave Height

https://manati.star.nesdis.noaa.gov/datasets/SGWHData.php

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  - Altimeter >>
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This is web site is not supported on a 24x7 basis and should not be considered operational.

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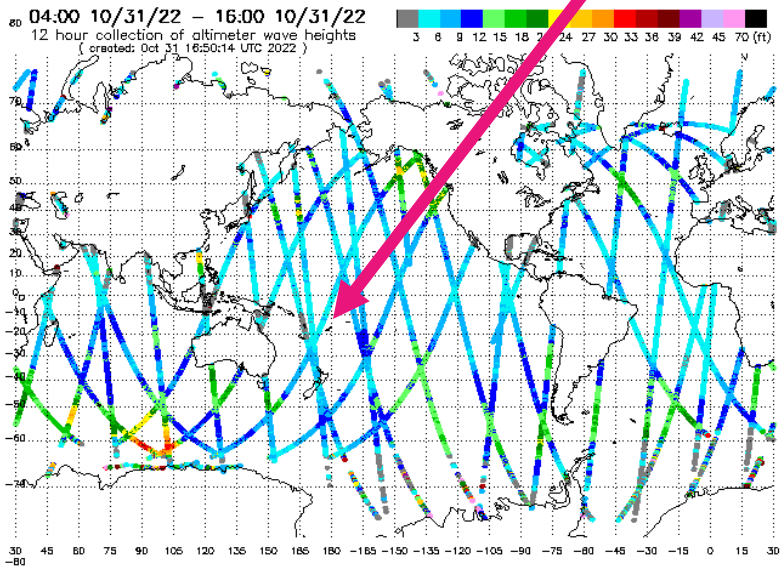
Data from Satellite/Instruments: Altimeter

Additional Products: Significant Wave Height | Year: 2022 | Month: 10 | Day: 31

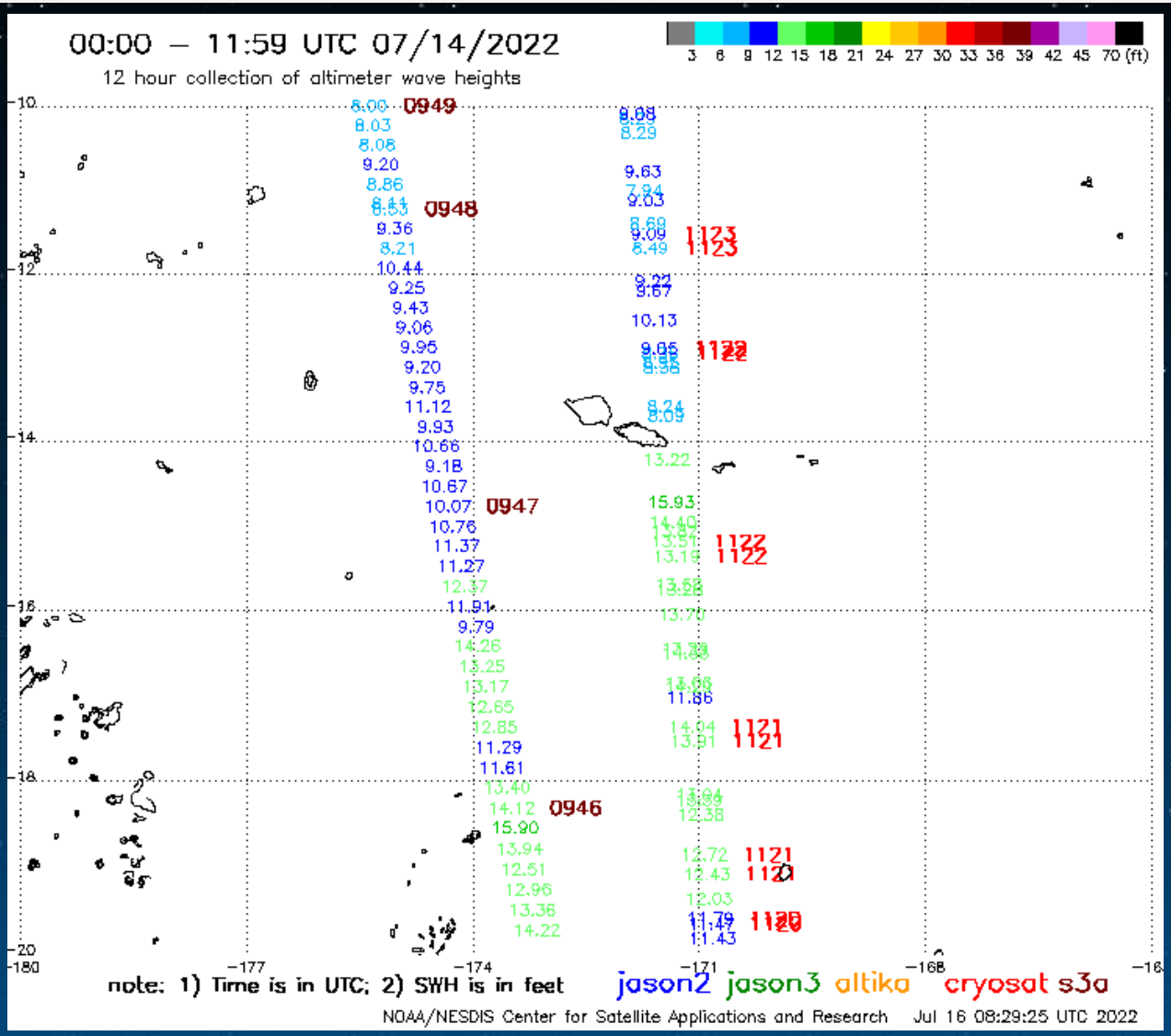
Choose a date, and then click on a location

SIGNIFICANT WAVE HEIGHT



Imagery from 14 July 2022

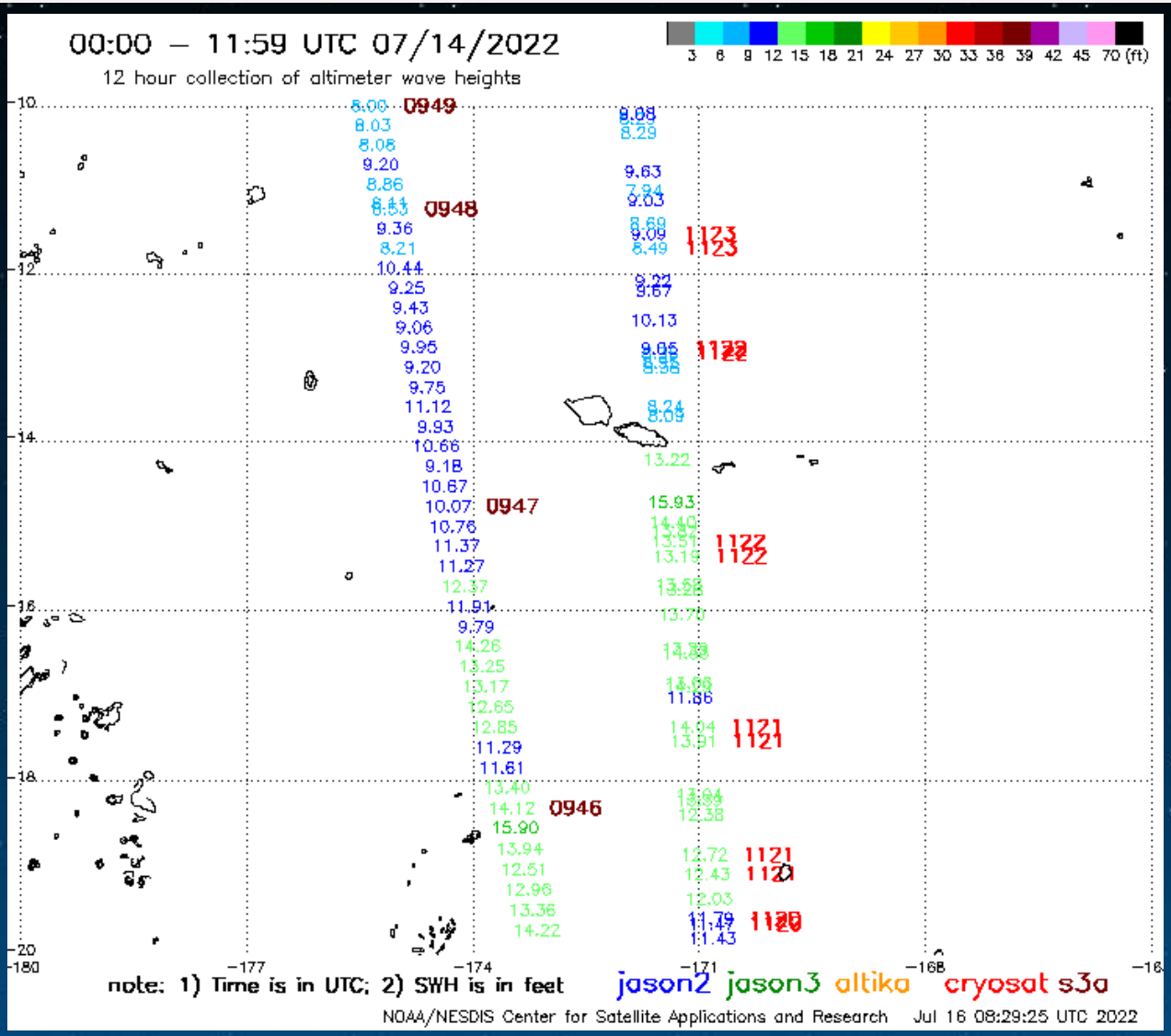
https://manati.star.nesdis.noaa.gov/rscat_images/sgwh/sgwh_wh_arch/WH2022195/zooms/WMB7_00.png



What I don't like: I see one domain, and only at one time.

Imagery from 14 July 2022

https://manati.star.nesdis.noaa.gov/rscat_images/sgwh/sgwh_wh_arch/WH2022195/zooms/WMB7_00.png



Note the url – this website is scrape-able as it turns out – that is, the unix command ***wget*** can be used.

And there is an image with observations from 12:00 – 23:59 UTC (_00 is replaced by _12 in the url)

The '7' in the url – *WMB7_00.png* – is unique to this specific domain

Plan: Make a job that can be called by chron daily

- Get imagery from more than one day – I chose a week

- Create the urls for the specific domain centered on American Samoa – and also the 9 (3x3) domains surrounding it. For the last 7 days

282	6	18
283	7	19
284	8	20

- Do the same for Guam (3x4), and for Hawaii (3x3)

243	255	267	279
244	256	268	280
245	257	269	281

2	14	26
3	15	27
4	16	28

Get the images for these domains, paste them together

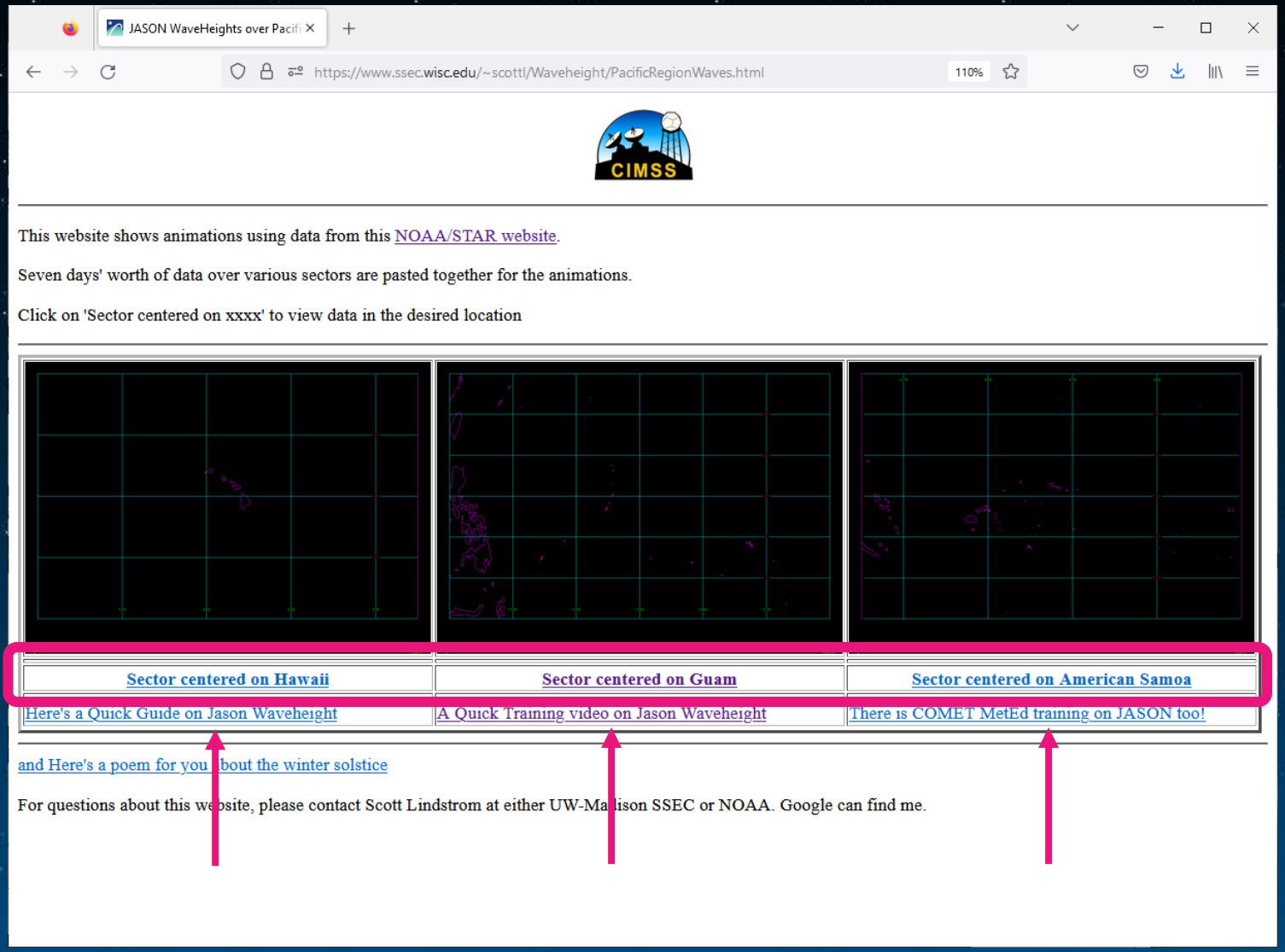
https://www.ssec.wisc.edu/~scottl/Waveheight/PacificRegionWaves.html

- The website above includes links to three separate domains – centered on Guam, American Samoa and Hawaii – that yield week-long animations of the Altimetric wave heights
- Also include links to training on altimetry!

HAnis allows automatic updating of imagery as long as you follow the same naming conventions – that is, image1 – image7 (each time) vs. image20221021 – image20211028 (with values that change each day)

Get the images for these domains, paste them together

https://www.ssec.wisc.edu/~scottl/Waveheight/PacificRegionWaves.html



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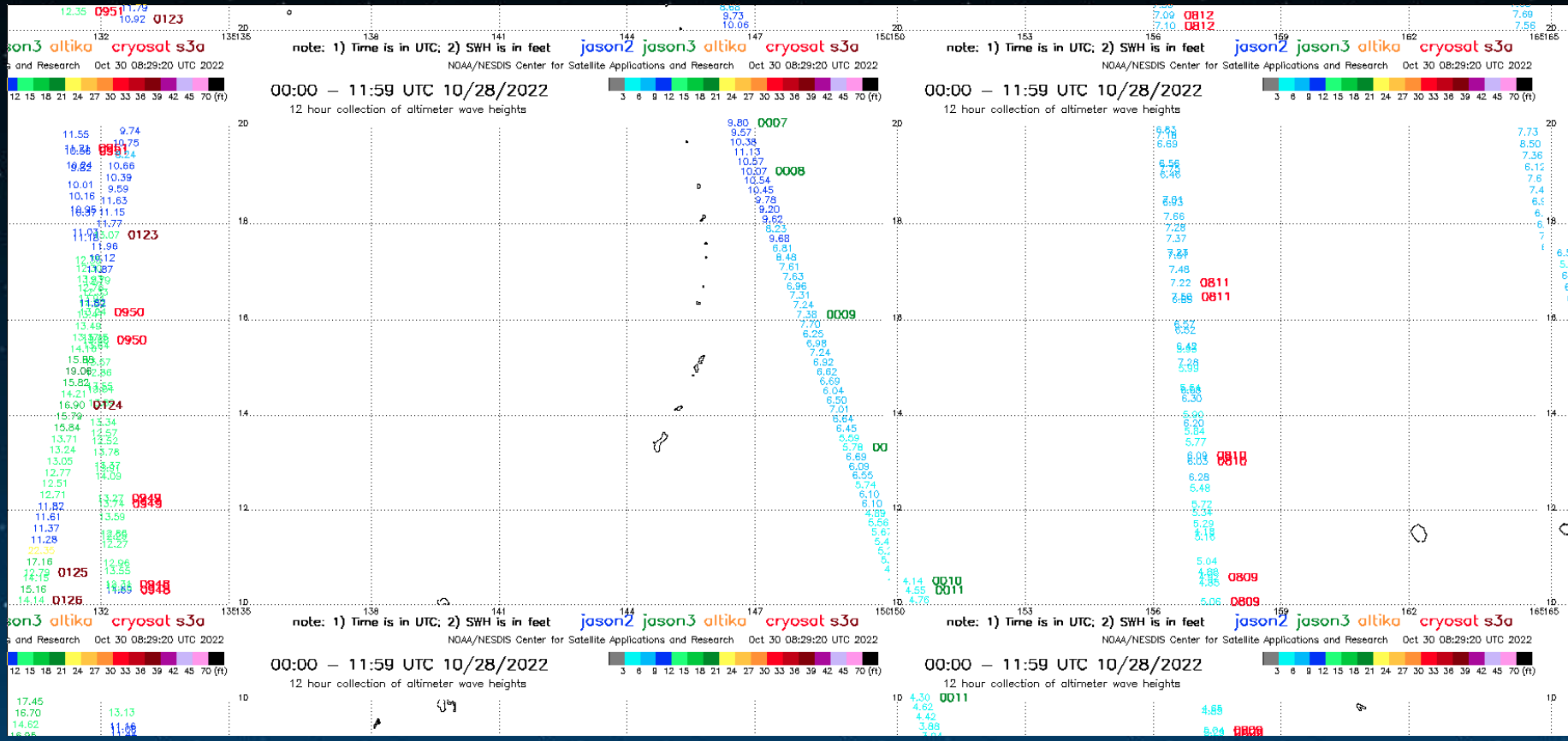
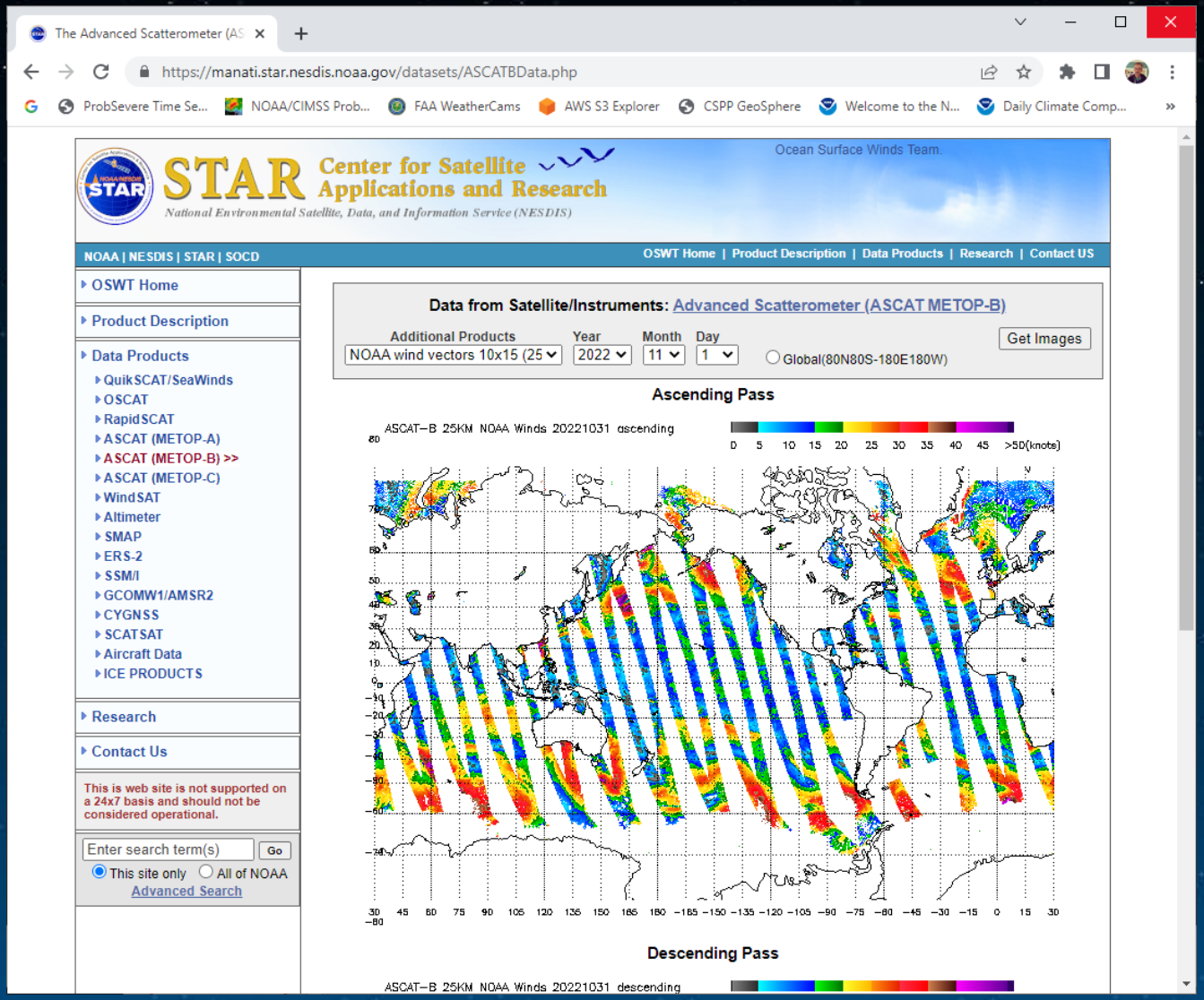


Once the waves were done…

- Why not do something similar for winds?
- ASCAT from MetopB and MetopC are available
  - Similar domains to Significant Wave Height
  - MetopB and MetopC are similar swaths – overlay them
- AMSR-2 Wind Speeds are available
  - Sector sizes are larger than ASCAT sectors

So much data at this website

MetopB


The Advanced Scatterometer (AS
https://manati.star.nesdis.noaa.gov/datasets/ASCATBData.php
ProbSevere Time Se...
NOAA/CIMSS Prob...
FAA WeatherCams
AWS S3 Explorer
CSPP GeoSphere
Welcome to the N...
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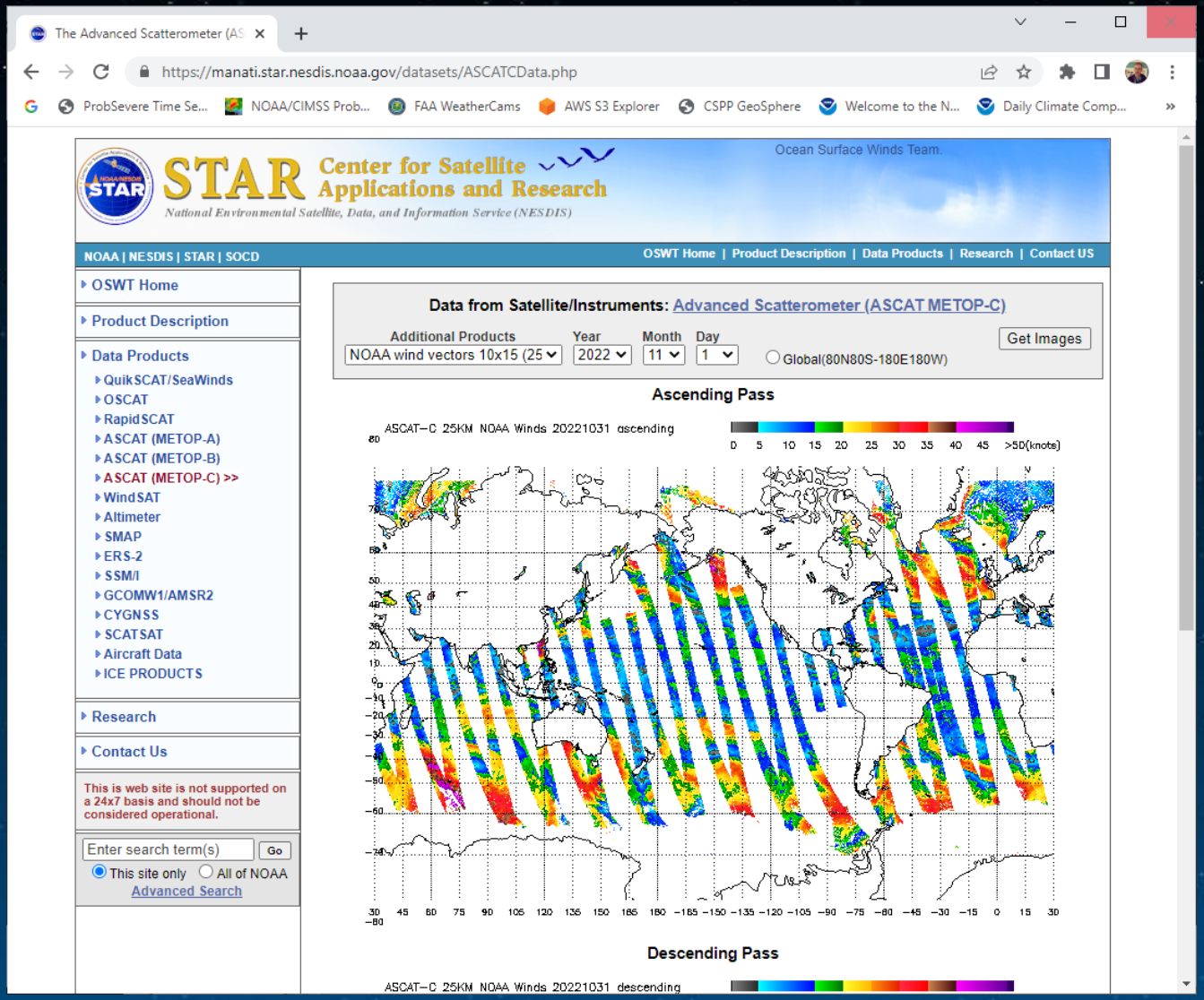
2022
Month
11
Day
1
Global(80N80S-180E180W)
Get Images
Ascending Pass
ASCAT-B 25KM NOAA Winds 20221031 ascending
0 5 10 15 20 25 30 35 40 45 >50(knots)
Descending Pass
ASCAT-B 25KM NOAA Winds 20221031 descending

MetopC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0 5 10 15 20 25 30 35 40 45 >50(knots)
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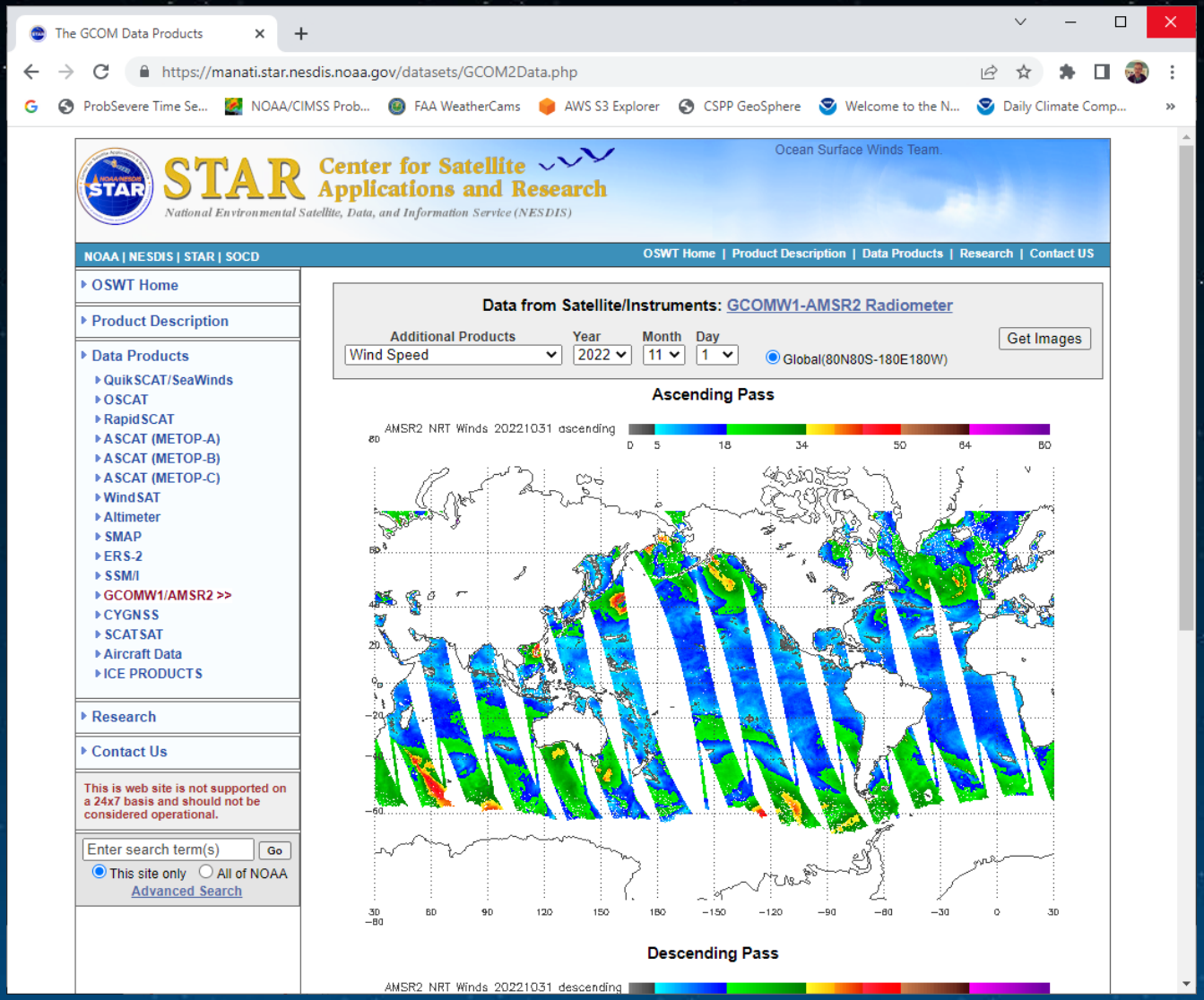
ASCAT-C 25KM NOAA Winds 20221031 descending

AMSR2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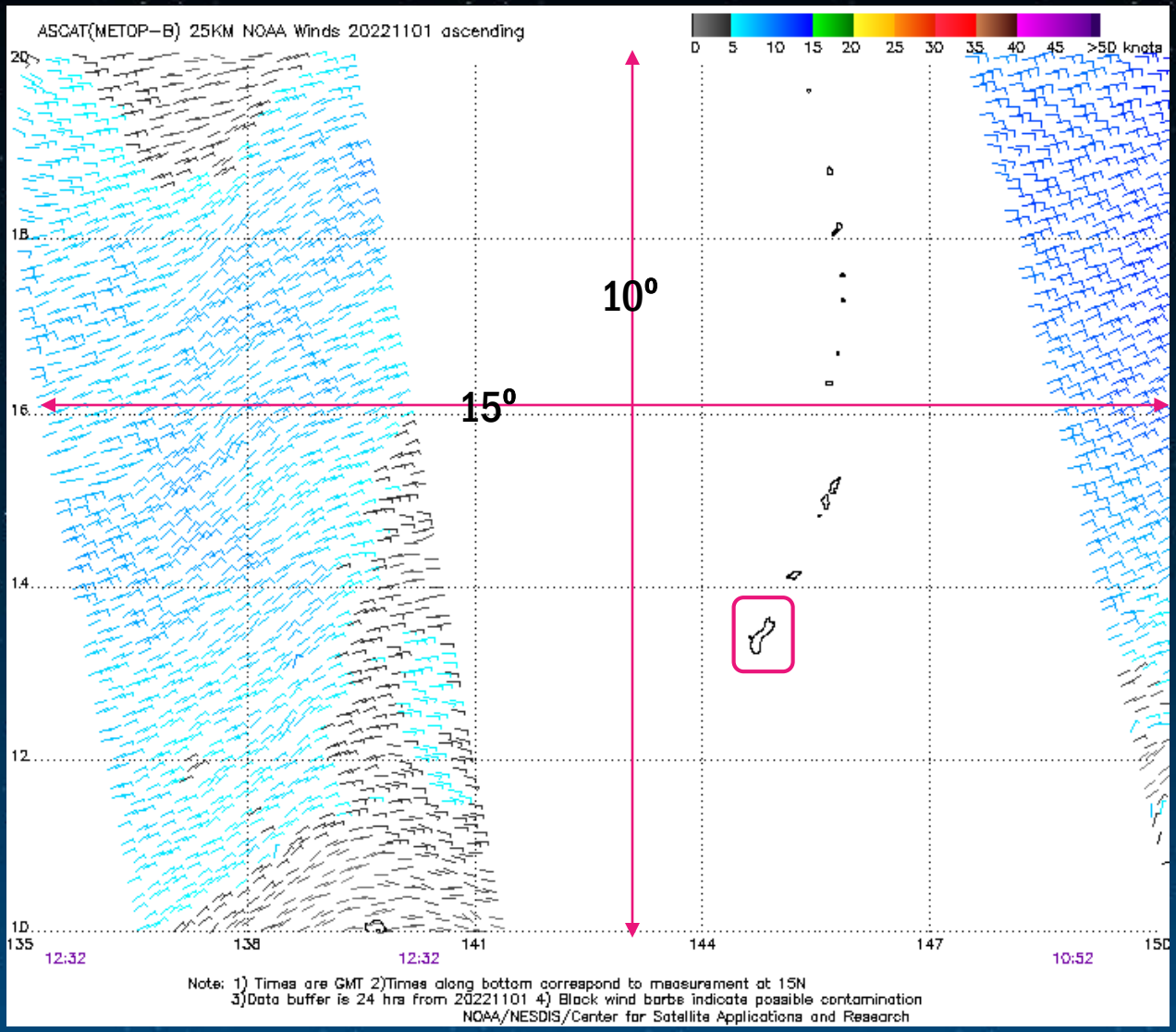
Global(80N80S-180E180W)
Ascending Pass
AMSR2 NRT Winds 20221031 ascending
0 5 18 34 50 64 80
Descending Pass
AMSR2 NRT Winds 20221031 descending

Click near Guam

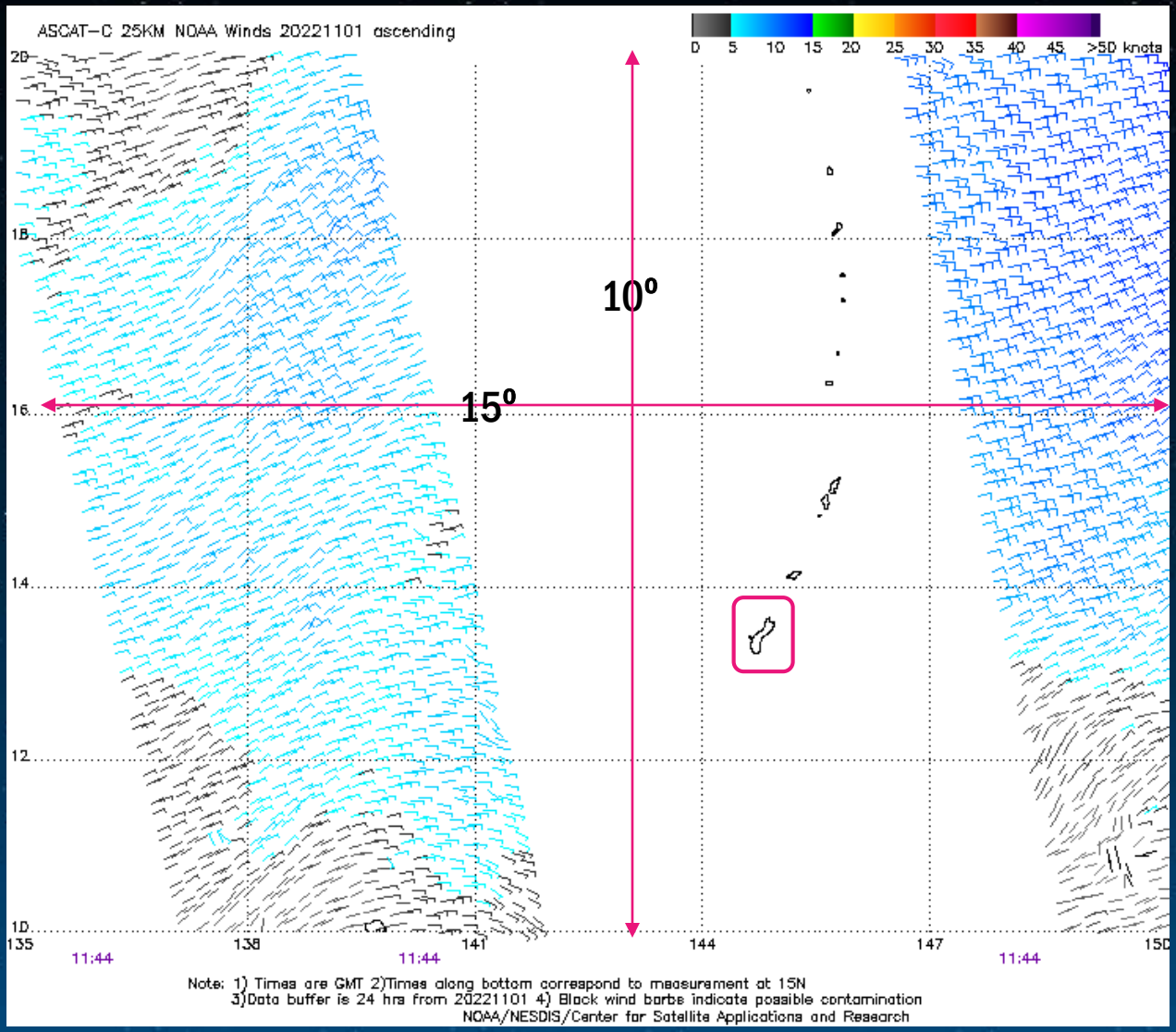
https://manati.star.nesdis.noaa.gov/ascat_images/day_25km_METB/zooms/WMBas256.png



ASCAT from MetopB

Click near Guam

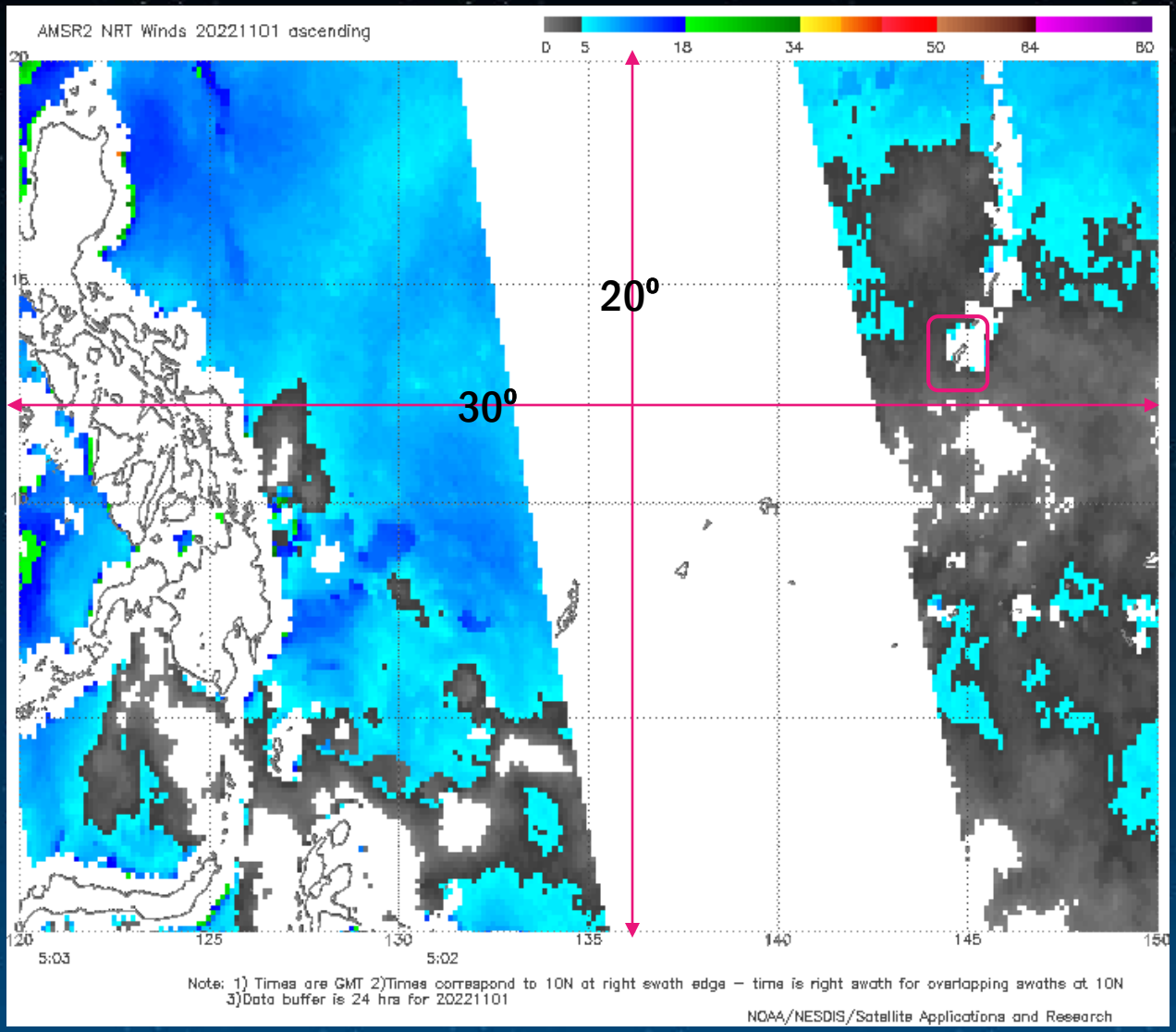
https://manati.star.nesdis.noaa.gov/ascat_images/day_25km_METC/zooms/WMBas256.png



ASCAT from MetopC

Click near Guam

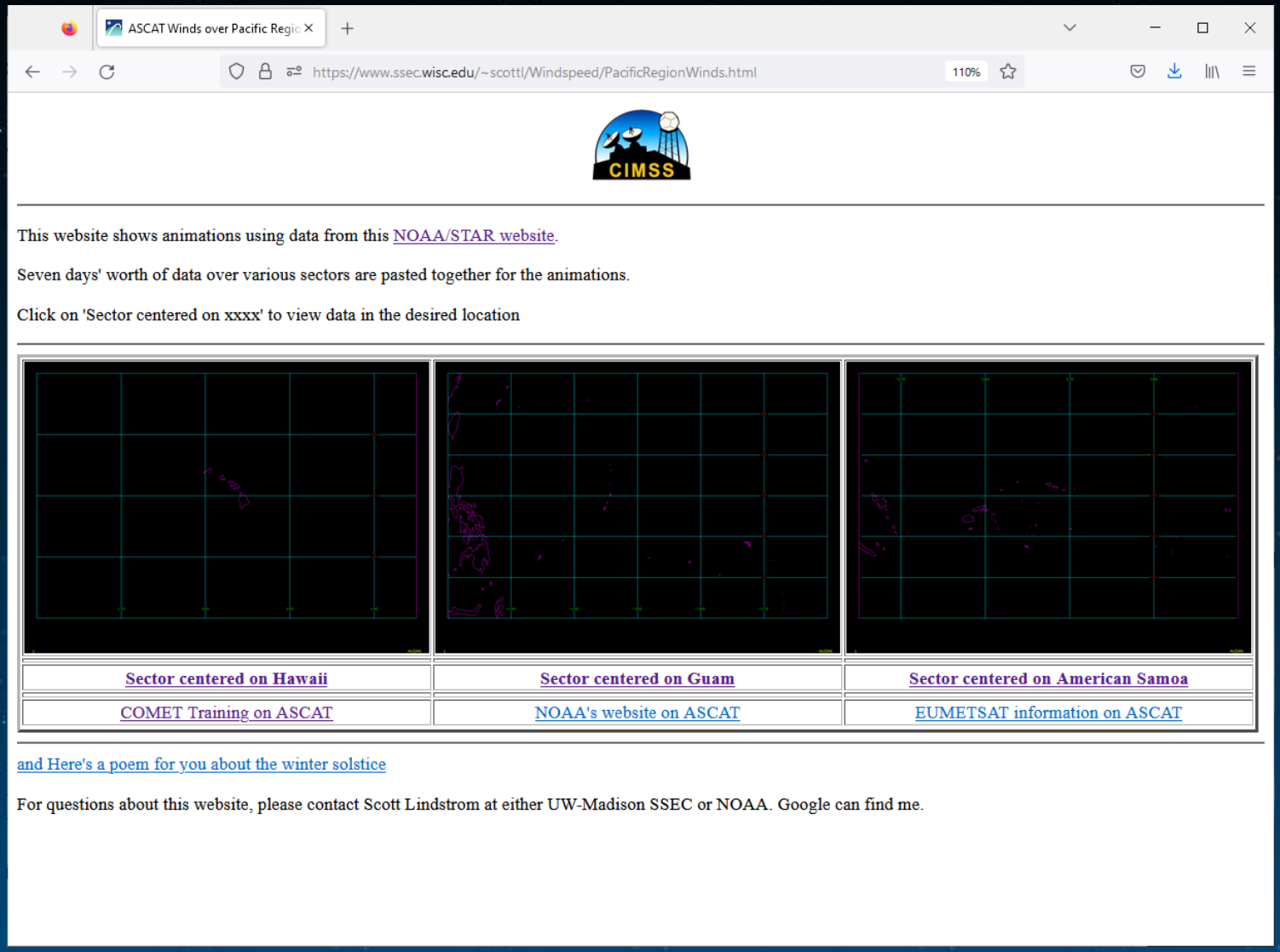
https://manati.star.nesdis.noaa.gov/gcom_images/arch/wdsp/GC2022305/zooms/WMBas62.png



AMSR-2 winds from GCOM-W1

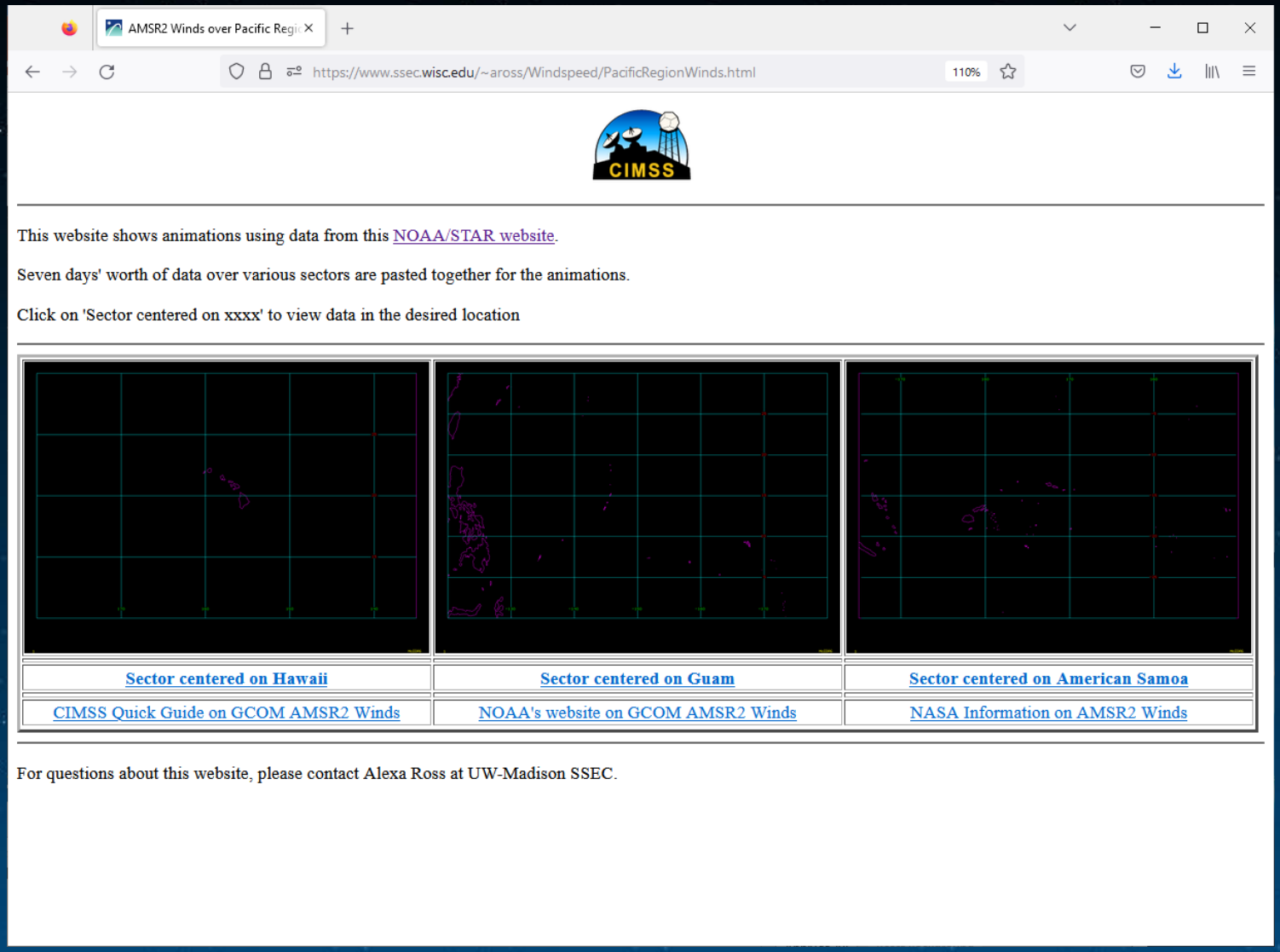
Website for ASCAT winds

https://www.ssec.wisc.edu/~scottl/Windspeed/PacificRegionWinds.html



Website for AMSR2 winds

https://www.ssec.wisc.edu/~aross/Windspeed/PacificRegionWinds.html



Summary

- NOAA/NESDIS/OSPO 'manati' website is chock full of useful information
- It's easy to reformat the information at that website to create larger domains, and long(ish) animations
- This allows a user to view how things like winds and waves are evolving with time in a more simple format
- Questions?
  - scott.lindstrom@noaa.gov (I can share the shell script that does all the work if you want – it does use ImageMagick to manipulate the imagery)