

# HFIP Annual Meeting Notes

Day 1: Tuesday Nov 17, 2020

12 noon - 5 pm ET

Notetakers: Sikchya Upadhayay and Karen Keith

**Tuesday, November 17, 2020**

**12:00 noon Welcome Remarks (Dorothy Koch)**

- Dorothy opened the meeting briefing changes within STI, brief introductions on UFS, UFS-R2O projects.
- UFS-R2O to be modeled after HFIP
- Youngsun introduced the survey and set the ground rules.

**12:10 noon - 1:10 pm: Programmatic updates**

12:10 pm HFIP Goals and Status (Frank Marks)

- Weather Act Sec 104; strategic plan 2019-2024 includes goals aligned with wx act
- Frank gave an update on each of the key strategies
- New RI metrics were set in last year's meeting
- First key strategy: Four versions of HAFS are running
- Second key strategy: (Guidance and products) documented tropical roadmap, with Hazard specific products
- Communication of risk: working to fund nine HSUP projects (slide 12)
- RDHPC enhanced bypassing Jet (24M corr hour/month for HAFS)
- Outreach on funding research to University PI's
- Briefing to SAB, need HFIP response.

**Action Item 1:** Prepare HFIP response to SAB.

12:30 pm HFIP Programmatic Updates, Plans and Budget (Youngsun Jung)

- Youngsun discussed the 2020 highlights: HREx for UFS-HAFS, HYCOM coupling, guidance for NHC's experimental 6 and 7 day forecasts; HWRF upgrades
- 3 HFIP projects were selected for the STI FY20-22 NOFO; 5 FY18 projects asked for no-cost extensions
- HFIP Budget, 2020 accomplishments, community outreach was briefly discussed
- Model dev carried out within the UFS model framework

Tamara: ESWIG are required by weather act 401 to call for mandates to call on the program that are critical to NOAA mission.

12:50 pm Hurricane Supplemental Updates (Dorothy Koch)

- 2 programs - FY18 and FY19

- Briefing on budget and the projects
- **SAB/EISWG called out for storm surge modeling and social science in HFIP strategic plan**

### **1:10 pm - 4:30 pm: Forecaster needs and Activities Supporting Operations**

#### 1:10 pm      Current forecast capabilities - NHC verification (John Cangialosi/Mike Brennan)

- GFS best individual model in the Atlantic track for 2020
- Track error trends and skills are more or less the same in last few years
- Intensity skills are going up year to year
- NATL Genesis - low bias
- EPAC intensity error guidance has downward trend
- Very busy year, no record for accuracy broken, good year for GFS and track, HWRF the best model again, no clear winner for track, genesis good in EPAC
- Day 7 forecasts: intensity errors same as day 5; good sample for 2020 and will look into it in the off season

#### 1:30 pm      NHC's analysis and forecasting challenges (Mike Brennan)

- 12 US landfall, 5 Louisiana landfall, 8 Gulf, 13 international
- Coastal watch/warning for 20 days in Louisiana
- Genesis verification, probabilities of 30-70%
- Laura: very low indication in 48 hr for TC
- Delta RI changes very challenging (slide 15)
- Nine RI storms within the watch/warning period (slide 16)
- Laura: HWRF/MON step back in the peak intensity forecast
- Marco and Laura track uncertainty
- Many challenges including unprecedented levels of TC activity and record number of landfalls; multiple forecast challenges; need more time to synthesize issues/challenges after the season

#### 1:50 pm      Verification of RI Metrics in 2020 (James Franklin)

- Goal: reduce intensity guidance errors by 50%
- Preliminary results of RI baseline better in 2020
- RIOC the most skillful
- RI guidance has improved since the baseline, probabilistic guidance is skillful in 2020.

#### 2:10 pm      Operational applications including ensemble products (Brian Zachry)

- Gave an overview of the FY20 key projects supported by HFIP
  - Statistical PP forecast improvement - focussing on AI in 21
  - AWIPS/STCF produce improvement
  - Graphical product improvement for external users
  - Storm surge
  - JHT and R2O
- Got HAFS forecast into ATCF
- FY21 projects (slide 14)

2:30 pm      JTWC TC activity, forecast challenges, and priorities (Matt Kucas)

- Two typhoons made landfall in Korea
- Track errors - straight runners in track
- Track skills - continue to increase
- Intensity errors - decrease in most lead times compared to 2019
- Intensity skills - skills decreased in 2020
- Forecasting challenges - 16W and 14W, 16W forecast was would be extratropical, but dissipated early
- Extreme RI change - 22W
- Priorities: TC intensity change, data exploitation, TC structure specification, TC track improvement, TC genesis timing and forecasts

**2:50 pm**      **Break (20 mins)**

3:10 pm      Post Processing and Verification (PPAV) Team update (David Zelinsky)

- SFMR obs showing high bias
- Upper boundary layer is too cool and dry in HWRF simulations compared to dropsonde
- AOML hurricane model viewer
- HFIP website Usage shows interest in content
- ESRL HFIP track viewer added Shield, FV3
- Display and diagnostic system very useful for NHC
- Gave an update on CIRA activities - RIPA updated, SHIP/SLGEM/RII updated.

3:30 pm      Infrastructure: ATCF and AWIPS plans (David Zelinsky/Mark DeMaria)

- Busiest season, largest number of storms, landfalls and limitations due to covid
- NAWIPS to AWIPS2 transition
  - TAFB Atlantic/Pacific - May/July 2021
  - TAFB surface desk - TBD
  - HSU - May 2022
- Issues other than covid and staffing, hardware performance, not enough workstations and single point of failure after transition
- Tools that do not use proprietary software are more likely to succeed
- Waiting for Social science recommendation for website and products
- Long term goals - model improvements lead to better TCM; ensembles statistical PP refine WSPs; improved WSPs, wind hazard recommender lead to better watches/warnings
- Testing AWIPS in the cloud

3:50 pm      Operational storm surge modeling (Andrew Penny/Laura Alaka)

- Need probabilistic storm surge rather than the single deterministic track, example is hurricane Laura
- The size of the storm matters for storm surge forecasting, P-surge upgraded to v2.8, improvements to initial storm surge, also improves the best track RMW

- New version of P-surge increases the detection rate without increasing the false alarms
- 72-hr landfall progress
- RMW forecast verification shows lower bias in new version
- Plan to add capability to address asymmetrical storms and extend the OCONUS

4:10 pm      Status of socio-economic projects (Jennifer Sprague-Hilderband)

- Cone of uncertainty study
- Three approaches: interview, lit rev, survey
- 60 Lit rev
- Cone graph mostly accessed
- Confusing interpretation within the cone and track, doesn't realise the track can change
- Interview with international meteorologist - six nations, doesn't imply impacts
- 491 responses with 75% primary decision makers, familiar with cone graphic, important for decision making

**4:30 pm - 5:00 pm: HFIP Display - A need for Unified System (Youngsun Jung & Jordan Dale)**

- Youngsun gave an overview of hftp.org's display products and emphasized the need for centralization of HFIP products.
- Jordan gave an overview of the HFIP display survey and gave a summary of the results
- Weathernerds and tropical tidbits were the most accessed sites.
- Satellite obs very important.
- Data from HWRF model going into DA is missing

**Action item 2:** Come up with Recommendations for the display system

**Recommendation:** Two experts (from tropicaltidbits and weathernerds: Onderlinde and Cowan) to chime into figuring out what is most important.

**Action item 3:** Ability to see what data gets into the model.

**5:00 pm**      **Adjourn**

Youngsun adjourned the meeting.

## Chat Log

James Franklin - NOAA Affiliate 12:14 PM

Just to clarify, Frank, the new goals were established in error space, not skill space.

Jason Sippel - NOAA Federal 12:20 PM

There was no VI or D

DA

only cold starts

Xuejin Zhang - NOAA Federal 12:27 PM

@Paul K., Which one do you use to show slides, Powerpoint or Google Slides?

You 12:29 PM

Xuejin, Paul is using Google Slides

Xuejin Zhang - NOAA Federal 12:30 PM

Ok, thanks!

Scott Sandgathe 12:40 PM

Why so many different forecast systems?

Frank Marks - NOAA Federal 12:42 PM

@Scott we are trying to evaluate which configuration provides the best guidance. So for example we are testing stand alone regional nests vs nests in the global system to see whether we can get better performance to up to 7 days. We are also testing different nesting concepts from static to moving nests.

Edward Rappaport - NOAA Federal 12:42 PM

Belated question for Frank (at end of session?) about one of his last topics: The HFIP plan was approved up through NOAA and then Congress. Now, we appear to have an intermediate level working group weighing in. Any concerns?

Scott Sandgathe 12:44 PM

Frank: Are you seeing significant differences between the systems?

Frank Marks - NOAA Federal 12:47 PM

Good question Ed. NOAA SAB was asked to evaluate all the plans NOAA put together to address the Weather Act by outside NOAA researchers. EISWG was given the charge to evaluate the HFIP plan. In

general the EISWG review was very favorable, and they felt NOAA needed to address the resources critical to the success of HFIP moving forward. I can share their report.

Edward Rappaport - NOAA Federal 12:52 PM

Thanks Frank and Tamara ( would have thought the evaluation and any changes would have occurred before going to Congress.)

Sundararaman Gopalakrishnan - NOAA Federal 1:00 PM

@Scott Kindly refer to page 10 of the HFIP annual report related to HFIP strategy with Stream 2 (HEREx).  
[http://www.hfip.org/documents/HFIP\\_AnnualReport\\_FY2019.pdf](http://www.hfip.org/documents/HFIP_AnnualReport_FY2019.pdf)

Sidney Thurston - NOAA Federal 1:00 PM

Apologies for jumping off to another meeting.

Scott Sandgathe 1:01 PM

Thanks!

Peter Black - NOAA Affiliate 1:02 PM

Are drone UAS surveys going to be part of supplemental obs improvements:

<https://www.weathernationtv.com/news/drones-helping-scientists-understand-major-weather-events/>

Tamara Battle - NOAA Affiliate 1:03 PM

Hi Ed - Unfortunately, since EISWG is comprised of external researchers and are not NOAA personnel or researchers, they are unable to view any congressional report until it has made it to Congress, since Weather Act reports are internal NOAA documents until submitted to Congress. So, in effect, the EISWG did not have access to the HFIP report until after it was submitted to Congress.

Frank Marks - NOAA Federal 1:03 PM

@Dorothy & @Mark Vincent I am concerned that the HFIP involvement in coordinating the supplemental hurricane projects is lost in the reporting out to NOAA leadership. I think it is often overlooked in the quarterly reports that go to leadership. When responding to the SAB recommendations I think this needs to be pointed out so there is not a disconnect on what HFIP's role is and has been.

Ben Woods - NOAA Affiliate 1:05 PM

Frank, certainly an opportunity to do just that in any new supplemental.

Frank Marks - NOAA Federal 1:06 PM

Thanks Ben. We boot-strapped that when we put the plans together for the FY18 supplemental by working together within HFIP teams, but it would be much better to use the HFIP strategic plan to set up new supplemental efforts.

Frank Marks - NOAA Federal 1:13 PM

Ben HFIP has done an Annual report of our activities, successes and issues for the past 11 years if people want to see how HFIP is performing they can go through these annual reports. The reports are available at <http://www.hfip.org/documents/>

Eric Blake - NOAA Federal 1:13 PM

600 forecasts. ridiculous

Ben Woods - NOAA Affiliate 1:13 PM

Thanks Frank!

Frank Marks - NOAA Federal 1:13 PM

;-)

Didn't Max retire after 2005.

Edward Rappaport - NOAA Federal 1:16 PM

Paul, thanks for moving the slides forward for us.

Scott Sandgathe 1:16 PM

Are there 7 d stats to look at? Would be nice to see where we are at 7d if we intend to improve to 5d skill.

Paul Kucera 1:16 PM

I am happy to do that.

Stanley Goldenberg - NOAA Federal 1:20 PM

With the intensity trends— would be interesting to somehow rank the years by number of cycles with rapid intensification occurring.

James Franklin - NOAA Affiliate 1:25 PM

Not much improvement in track or intensity since I retired, I see. ;-)

Edward Rappaport - NOAA Federal 1:27 PM

We're at 15 minutes, John.

Peter Black - NOAA Affiliate 1:27 PM

More RI's since you retired, James, yes?

Vijay Tallapragada - NOAA Federal 1:28 PM

only 24 verified cycles at day 5

Dorothy Koch 1:28 PM

Similar comment to Stanley - are the storms getting more challenging to forecast, is there an indicator of this?

Michael Brennan - NOAA Federal 1:28 PM

The skill metric would capture that. OCD5 errors are larger for storms that don't "behave" normally.

James Doyle1:29 PM

Is NHC not using CTCL in the EPAC? Forecasts are available.

Jason Sippel - NOAA Federal1:29 PM

Tanking HWRF skill in EPAC could be related to poor tracks

Eric Blake - NOAA Federal1:29 PM

yes we use CTCL. Maybe there were some availability problems

Michael Brennan - NOAA Federal1:29 PM

Jim - we are using it - perhaps it wasn't in the sample enough for the homogeneous sample? We can take a look.

Mark DeMaria - NOAA Federal1:30 PM

NNIC is a consensus model based on a very basic neural network approach so TSB can get their feet wet with AI techniques.

James Doyle1:30 PM

Thanks Mike and Eric

Robert Rogers - NOAA Federal1:30 PM

How have HWRF intensity errors changed since it started ingesting TDR?

Frank Marks - NOAA Federal1:31 PM

Scott for TVCN 7-day track check out

[https://drive.google.com/file/d/1I2p1tESfnCGndf\\_2gDK6TDICiVR8jdzD/view?usp=sharing](https://drive.google.com/file/d/1I2p1tESfnCGndf_2gDK6TDICiVR8jdzD/view?usp=sharing)

Christopher Landsea - NOAA Federal1:31 PM

Two years ago a couple troublemakers suggested that we may be reaching the limits of predictability for track forecasting. The 2019 and 2020 seasons appear to be confirming this hypothesis. How would this impact HFIP's 10 year goals if indeed no additional improvements in track forecasting are possible?

Scott Sandgathe1:32 PM

Frank: Thanks, but wouldn't give me access.

Jason Sippel - NOAA Federal1:33 PM

@Rob HWRF intensity has improved a lot since TDR started coming in 2013 for all kinds of reasons (physics, resolution, DA improvements, etc)

Dorothy Koch1:33 PM

What limits track forecasting predictability?

John Cangialosi - NOAA Federal1:34 PM

Jim for CTCL, we use it. As Eric mentioned, there was some availability issues for some TCs in the EP

Scott Sandgathe1:34 PM

Dorothy: Really synoptic scale predictability, both in midlats and tropics

Christopher Landsea - NOAA Federal1:34 PM

<https://www.aoml.noaa.gov/hrd/Landsea/landsea-cangialosi-bams-2018.pdf>

Dorothy Koch1:35 PM

thanks

Robert Rogers - NOAA Federal1:35 PM

Thanks @Jason

John Cangialosi - NOAA Federal1:36 PM

I'm not too worried about HWFI skill tanking late in the EP, Jason. There was only 24 verifying forecasts at 120 h in the basin

Frank Marks - NOAA Federal1:36 PM

@Scott send me a request to share and I will approve access. Sorry!

Scott Sandgathe1:36 PM

Frank: sent

Peter Black - NOAA Affiliate1:38 PM

Mike- the tracks for 2020 seem to cluster along two main paths: 1) into the Gulf or 2) up through the middle of the north Atlantic. Do shifts in long wave pattern account for this?

Xuguang Wang - NOAA Affiliate1:38 PM

why 120 h forecast of genesis is more reliable than 48h?

Levi Cowan - NOAA Affiliate1:40 PM

GFS missed Hanna rather badly in the GOM as well

Robert Rogers - NOAA Federal1:42 PM

Was 2020 a record for total number of ATL TCs that underwent RI?

Frank Marks - NOAA Federal1:42 PM

@Dorothy and @Scott that is one of the issues we are trying address with the static nest embedded in the global system. TCs are very energetic and tend to alter the downstream predictability of the synoptic patterns as they transition into the mid latitudes. So we want to see how the global system with the nest differs from the global system alone.

Jason Sippel - NOAA Federal1:43 PM

There was a GSI failure in HWRF on the morning of 25/12

Robert Rogers - NOAA Federal1:43 PM

Fascinating, thanks Mike

Frank Marks - NOAA Federal1:43 PM

@Mike we need a tool that would allow you to see what data is getting into the DA system.

James Doyle1:43 PM

Predictability issues may be a challenge too.

Robert Rogers - NOAA Federal1:44 PM

Does that argue for need for 6-hrly TDR missions?

Jason Sippel - NOAA Federal1:44 PM

@Rob - that would be huge

Robert Rogers - NOAA Federal1:44 PM

yeah....need to double the number of crews at AOC for that I'd think

Jonathan Vigh1:45 PM

CHP6 (not a deterministic model) did really well for that Iota forecast from 12z on the 15th:

[http://hurricanes.ral.ucar.edu/realtime/plots/northatlantic/2020/al312020/intensity\\_late\\_stream15/aal31\\_2020111512\\_intensity\\_late\\_stream15.png](http://hurricanes.ral.ucar.edu/realtime/plots/northatlantic/2020/al312020/intensity_late_stream15/aal31_2020111512_intensity_late_stream15.png)

Sim Aberson - NOAA Federal1:46 PM

...or get radar on the C130s

Ghassan Alaka - NOAA Federal1:46 PM

Would more frequent DA cycling (1 h vs 6 h) create an initialization more in touch with reality (and more likely to capture RI)?

Jason Sippel - NOAA Federal1:46 PM

@Sim - there's a better chance of getting 6-h P3 missions probably, but both are very low

Robert Rogers - NOAA Federal1:46 PM

yes....part of the expected benefit of APAR, but that's been under development for over 10 years I think

Jason Sippel - NOAA Federal1:47 PM

@Gus - yes. During RI the changes are extreme, and it can be difficult for DA over a larger window

Xuguang Wang - NOAA Affiliate1:47 PM

hourly DA or 4D DA approach that accounts for background error variation

@Gus

Levi Cowan - NOAA Affiliate1:47 PM

I'm curious if the current version of EPS has a quantifiable left-of-track bias compared to previous versions. Subjectively, it has seemed to this year

Robert Rogers - NOAA Federal1:48 PM

does 1-h cycling for obs collected every 12 h measurably improve forecasts as opposed to obs collected every 6 h?

I guess this has been done, presumably in an OSSE framework?

Ghassan Alaka - NOAA Federal 1:48 PM

@Rob, good question.

Scott Sandgathe 1:48 PM

Isn't HWRF running on GFS boundary conditions? The loss of skill vs GFS is an indication of TC/synoptic interaction.

Jason Sippel - NOAA Federal 1:49 PM

Xuguang has examined the impact of 1-h vs 6-h cycling, etc

Robert Rogers - NOAA Federal 1:49 PM

Yeah I recall you mentioning that work @Jason

Jason Sippel - NOAA Federal 1:50 PM

@Scott - it's likely due to near-vortex asymmetries that come in with DA. Something we need to look more closely at

Stanley Goldenberg - NOAA Federal 1:50 PM

Rob – I doubt that. Other years had more MHs and therefore probably more RIs

Jason Sippel - NOAA Federal 1:50 PM

Getting all the data in improves the intensity, but it introduces challenges for track

Robert Rogers - NOAA Federal 1:51 PM

ok thanks Stan. Perhaps -- shouldn't be hard to determine I guess

Xuguang Wang - NOAA Affiliate 1:51 PM

hourly 3DEnVar improves upon 6-hourly 3DEnVar. Hourly 3DEnVar vs 6-hourly 4DEnVar still remains to be examined.

@Gus @Jason

Jonathan Vigh 1:52 PM

The CHP6 prediction for Iota from 14/12z is also very impressive:

[http://hurricanes.ral.ucar.edu/realtime/plots/northatlantic/2020/al312020/intensity\\_late\\_stream15/aal31\\_2020111412\\_intensity\\_late\\_stream15.png](http://hurricanes.ral.ucar.edu/realtime/plots/northatlantic/2020/al312020/intensity_late_stream15/aal31_2020111412_intensity_late_stream15.png)

Ghassan Alaka - NOAA Federal 1:52 PM

@Xuguang, thanks. That is very important work!

Stanley Goldenberg - NOAA Federal 1:53 PM

Please ask James to speak louder somehow

Eric Blake - NOAA Federal 1:54 PM

I'd love to have drones everywhere that the P3s can not. if you want to make forecasts better , get better analyses. If no TDR, then cover the ocean with sondes. Getting the depth of the forming TC isn't easy, and it can be very relevant for the future track.

James Doyle 1:54 PM

@Ghassan Allen Zhao at NRL is working on All Sky radiance assimilation with a 15 min cycle with promising results

Stanley Goldenberg - NOAA Federal 1:54 PM

Not much better but at least he tries

Brian Zachry - NOAA Federal 1:54 PM

@Stanley please try to increase the volume on your end

Stanley Goldenberg - NOAA Federal 1:55 PM

I did but he seemed whiter than others

Robert Rogers - NOAA Federal 1:57 PM

Thanks @Eric -- understood for sure. Maybe this is outside the scope of HFIP, but observing strategies, whether new tech or increased use of existing tech (or combo of both), seems like it should be part of a total approach to forecast improvement

Ghassan Alaka - NOAA Federal 1:58 PM

@Jim, excellent! Is that within COAMPS?

Jason Sippel - NOAA Federal 1:58 PM

@James -2019 results might be driven by Dorian and huge negative bias due to its extreme intensity

Jonathan Zawislak - NOAA Affiliate 1:58 PM

@Eric...perhaps one viable strategy for formation would be adding in an "invest" flight pattern like the lawnmower in the NHOP to be flown as high as our C-130s and P-3s can fly or use the G-IV pre-genesis, getting more sondes over larger depths?

Jason Sippel - NOAA Federal 1:59 PM

@JZ - could be done at IHC, but of course we need P3 hours to fly the P3 :)

Jonathan Zawislak - NOAA Affiliate 2:00 PM

@Jason...the G-IV having a functioning TDR is also a great tool with sondes for pre-genesis sampling over a large area

Jason Sippel - NOAA Federal 2:01 PM

Agreed - changing how the planes are used should definitely be on the table as we move into the future  
Levi Cowan - NOAA Affiliate 2:01 PM

@JZ My sense is that deeper sondes would indeed be very helpful, since assessing moisture and shear below the cirrus canopy is generally difficult for remote sensing instruments. Sondes help solve that problem for model analyses

James Doyle 2:02 PM

@Ghassan Yes, EnKF cycling with COAMPS-TC

Sim Aberson - NOAA Federal 2:03 PM

Similar results with EnKF cycling in HEDAS.

Eric Blake - NOAA Federal 2:03 PM

Rob- I'm all about reducing forecast errors. And I can tell you no doubt we have had some big errors this year because we had some large analysis errors, and it is hard to play catch up. We tend to struggle with the forecasts when it is directly tied to marginal conditions (see Sally), and the more observations the better. We haven't tended to focus much on this.

Ghassan Alaka - NOAA Federal 2:04 PM

Thanks @Jim. @Xuguang, are there any plans to test sub-hourly cycling for HAFS?

Stanley Goldenberg - NOAA Federal 2:04 PM

To James — is it possible longer lead time are better since method might not predict timing well but is seeing that RI will happen?

Robert Rogers - NOAA Federal 2:05 PM

@Eric -- yeah, good points. The challenge with marginal conditions makes me think of the difficulties with moderate shear like with Joaquin.

Xuguang Wang - NOAA Affiliate 2:06 PM

@Gus We hope HAFS has configurable DA cycling frequency so sub-hourly can be examined.

Michael Brennan - NOAA Federal 2:07 PM

On the aircraft perspective, this was the most challenging season we've ever had for aircraft tasking and availability. There were significant gaps and times where we wished we'd had better data, but we were fortunate to get what we had this year. Definitely need a discussion about increasing availability of TDR in storms, but need more planes, more people and more flight hours.

Robert Rogers - NOAA Federal 2:08 PM

Thanks @Mike, agree 100%

Jason Sippel - NOAA Federal 2:08 PM

@Mike - what you just said sounds like a problem Congress needs to address because we can't really other than to show the need

James Doyle2:10 PM

Another approach is to use high-altitude balloons using either remote sensors or deploying dropsondes. Loon Inc (Alphabet) has shown remarkable ability to steer their balloons and to some degree loiter. Just a thought outside the box.

Jason Sippel - NOAA Federal2:11 PM

@James - yeah, sondes have a big impact on the forecast for sure (I have impact assessments to prove it), and data like that would be really valuable if you can get it near the storm

Robert Rogers - NOAA Federal2:11 PM

Thanks @Jim. I know Kerry has a similar kind of idea (or maybe it's that?). His idea as I recall was to have a high-altitude balloon loitering for a month or longer at a time.

Zhan Zhang - NOAA Federal2:12 PM

@Gus Current HAFS DA system can only do 6hrly cycling, high frequency cycling options will be gradually added to the system

Jason Sippel - NOAA Federal2:12 PM

one of the big problems out away from recon areas is we just don't have good analyses, and it wreaks havoc on the forecasts

this is especially true in MDR

Sim Aberson - NOAA Federal2:12 PM

These balloons are good options, but remember that they get only a small percent of the coverage you would get with aircraft

James Doyle2:13 PM

@Sim You could have a network of them in the MDR for genesis monitoring. I don't think they could replace aircraft, but aircraft can't be everywhere

Scott Sandgathe2:14 PM

@Jason: One of the things we tried in the NPAC years ago was using recon for synoptic tracks to improve the model impact. Very successful but recon folks hated it.

Jason Sippel - NOAA Federal2:14 PM

@Jim - yeah MDR is where a big percentage of our huge busts happen.. either completely failed RI forecast or RI forecast that never happens

Robert Rogers - NOAA Federal2:15 PM

Spaceborne sampling of course would be optimal for this. NEXRAD-in-space, for example, would be great for kinematic fields, though that's been on the "drawing board" for I think 20+ years. Cloud-track winds are certainly helpful.

James Doyle 2:15 PM

@Rob Might be similar to Kerry's plan. We've talked with the Loon people and they are open to these sort of ideas, although the technology to deploy drops would need to be developed. Their balloons last months typically

Frank Marks - NOAA Federal 2:16 PM

@Jason & @Rob I think this is a challenge that we need satellite DA to help with as it is too far out for aircraft sampling

Robert Rogers - NOAA Federal 2:16 PM

Thanks @Jim

Scott Sandgathe 2:17 PM

@Jim: ESRL developed a balloon dropsonde system that carried 100+ dropsondes several years ago.

Robert Rogers - NOAA Federal 2:17 PM

Agreed @Frank, plus of course the observations to actually assimilate :-)

Edward Rappaport - NOAA Federal 2:17 PM

Good continuing discussion. If anyone has a question for the current speaker, please start with their name, e.g., "For Brian:"

Jason Sippel - NOAA Federal 2:17 PM

@Frank - yes there has been plenty of work to show that cloudy radiances can be a huge help, and I'd argue the ability to do that well needs to be in the IOC for HAFS

Frank Marks - NOAA Federal 2:18 PM

@Jason agreed!

Ghassan Alaka - NOAA Federal 2:18 PM

@Jason, definitely

Frank Marks - NOAA Federal 2:19 PM

@Brian have any of these new products been evaluated through SBES approaches (e.g. FACETSs) like the Surge products were.

Christopher Landsea - NOAA Federal 2:19 PM

We used Time of Departure from HVX (Hurrevac) text values for briefing US Coast Guard. Very important for their life-saving mission. Having a graphic would even be more valuable.

Ghassan Alaka - NOAA Federal 2:21 PM

A big thanks to Steph for helping get the HFIP forecasts to NHC in near-real-time!

James Doyle 2:23 PM

@Scott The NCAR balloon dropsonde system never seem to work very well since they couldn't steer it and reliability was an issue

James Doyle 2:24 PM

Agree regarding the importance of All Sky radiance assimilation. Also, assimilating the high-temporal resolution AMVs

Frank Marks - NOAA Federal 2:25 PM

@Dorothy & @Mark Vincent JHT is another effort that is integrated into the TC product development strategies, but is outside HFIP. I think we need to figure out a way to leverage all of these efforts trying to improve TC forecast guidance into a complete story to sell for \$ increase. Unfortunately because of the timing when these efforts were implemented has made it look like a patchwork effort rather than an integrated plan.

Dorothy Koch 2:25 PM

Too bad we aren't in person, we would have a big HFIP party for Mark D!

Frank Marks - NOAA Federal 2:25 PM

@Dorothy Definitely

Mark DeMaria - NOAA Federal 2:26 PM

Thanks!

Xuguang Wang - NOAA Affiliate 2:28 PM

@Frank @Jim @Jason @Gus agree with the importance of getting both clear air and cloudy radiances effectively assimilated along with effective use of other obs.

Peter Black - NOAA Affiliate 2:28 PM

Will there be an enhanced effort to establish usefulness of Ryan Torn's product to plan dropsonde locations with model uncertainty/ sensitivity made possible with his product now running on AWIPS? Also using GFS uncertainty product produced by emc  
feed back issue!

Jason Sippel - NOAA Federal 2:30 PM

@Pete - ultimate evaluation will come through the impact of those drops

Stanley Goldenberg - NOAA Federal 2:30 PM

As for aircraft -- global hawk -- sigh

Peter Black - NOAA Affiliate 2:31 PM

ok thanks Brian

Jason Sippel - NOAA Federal 2:31 PM

@Pete - anecdotally, the impact of environmental sondes improved a lot from 2017 to 2019 as the way we use the GIV changed

as evaluated in the basin-scale HWRF

Peter Black - NOAA Affiliate 2:31 PM

Yes, Jason. Look forward to that

Peter Black - NOAA Affiliate 2:34 PM

Jason- results not so great with operational GFS, however, I think.

Jason Sippel - NOAA Federal 2:34 PM

2019 was better than 2017 there as well

Frank Marks - NOAA Federal 2:38 PM

@Jason I think we need to work with Lidia to see if we can get the NOSC to support the OSE on TDR and dropsonde impacts

Jason Sippel - NOAA Federal 2:39 PM

@Frank - I was just talking with Gus offline about this - we need to be ready to hit a grand slam for whatever supplemental comes up. Show them the impact and then ask for something huge

Frank Marks - NOAA Federal 2:39 PM

I also think if we work with NHC to raise the bar at the NOSC we could get their support making it a slam dunk.

Peter Black - NOAA Affiliate 2:39 PM

Hi Matt- great to hear from you. Question is why does there appear to be a lag in peaks and troughs between yearly total storms and 5 year running mean? Looks like autoregressive running mean used rather than a centered average?

Jason Sippel - NOAA Federal 2:40 PM

but some of these things can't be solved through supplementals

Jason Sippel - NOAA Federal 2:41 PM

e.g., they need consistent, baseline funding (like for crews, flight hours, etc)

Frank Marks - NOAA Federal 2:44 PM

@Vijay is HWRF in the WPAC coupled to ocean?

Jason Sippel - NOAA Federal 2:44 PM

it's coupled everywhee  
everywhere

Hyun-Sook Kim - NOAA Federal2:44 PM

@Frank, yes. It is coupled HYCOM.

Peter Black - NOAA Affiliate2:44 PM

Frank, Jason- All favor for this to happen. Suggest keeping GIV when GV becomes operational with routine twice per day synoptic flights. Sequential sonde flights at 12 hr intervals have greater impact than sporadic sampling. Shorter, more frequent and higher flights would be best.

Frank Marks - NOAA Federal2:44 PM

Excellent performance on the Gustavo Goni case.

Hyun-Sook Kim - NOAA Federal2:45 PM

Yes!

Michael Brennan - NOAA Federal2:45 PM

@Pete - the last I heard is that the G4 won't be retained once the G5 comes onboard, but that was a while ago.

Peter Black - NOAA Affiliate2:46 PM

:(

Jason Sippel - NOAA Federal2:46 PM

isn't it coming up to the end its usable life?

Frank Marks - NOAA Federal2:46 PM

@Matt what is the best structure guidance at JTWC?

Scott Sandgathe2:46 PM

@Matt: How good is the wind radii model predictions now?

Edward Rappaport - NOAA Federal2:47 PM

Matt, we're at 15 minutes.

Peter Black - NOAA Affiliate2:48 PM

G4 could be rehabbed like P3's, yes? Possibly impractical cost -wise?

Eric Blake - NOAA Federal2:51 PM

Matt did you notice any dropoff of ECMWF performance in 2020 vs 2019?

Frank Marks - NOAA Federal2:51 PM

@Pete G-IV refurb is very costly (e.g. Gulfstream)

Peter Black - NOAA Affiliate2:51 PM

ok- maybe email?

Jiayi Peng2:54 PM

How good the ACCESS global model track forecast is?

James Doyle2:54 PM

Matt can you comment on how you use the new COAMPS-TC ensemble? Are the probabilistic products useful?

Michael Brennan - NOAA Federal2:54 PM

We are using the regional models in our wind radii consensus here at NHC.

Buck Sampson2:55 PM

you also have a GPCE for it and we included DRCL in that consensus ... for both agencies.

James Doyle2:58 PM

Thanks Matt

Peter Black - NOAA Affiliate2:58 PM

will log off and try to cure feedback

Frank Marks - NOAA Federal3:02 PM

@Sikchya & @Youngsun I think we need to establish a process to alert folks that their presentation time is up. Vijay gave me a 5 min warning, but Ed was trying to get Matt's attention through the chat. I suggest that we instruct the session chairs do what Vijay did and give a verbal time warning say 5 min or 2 min.

Matthew Kucas3:02 PM

Jiayi - we just started receiving the ACCESS global model forecasts this season. No firm statistics at this point.

Frank Marks - NOAA Federal3:02 PM

@Pete I hope you and Ada are doing well, staying safe and healthy.

Happy Thanksgiving

Edward Rappaport - NOAA Federal3:03 PM

Frank, I sent chat messages when we got close and if that wasn't enough then I broke in. Didn't seem to be an issue.

Frank Marks - NOAA Federal3:04 PM

OK thanks Ed. It just seems like we should provide guidance to the following session chairs based on what works and doesn't

Frank Marks - NOAA Federal3:05 PM

It is hard to see the chat and do the presentation at the same time for some folks, especially those unused to this virtual format.

ames Franklin - NOAA Affiliate 3:08 PM

I can confirm that. I was not looking at the chat during my talk. I needed to keep my attention on the slides.

Peter Black - NOAA Affiliate 3:08 PM

Hi Frank- yes- but it has been a rough week with Peruvian congress staging a coup and thousands taking to the streets. Calm now with new president.

Frank Marks - NOAA Federal 3:11 PM

@Pete I was hoping that was the case after hearing about the coup.

Edward Rappaport - NOAA Federal 3:14 PM

James, your talk was short enough I didn't need to write and potentially later say that time was running low. Frank, provide guidance as you think best.

Dorothy Koch 3:15 PM

Youngsun is addressing

Frank Marks - NOAA Federal 3:16 PM

@Dorothy Great!

Ghassan Alaka - NOAA Federal 3:16 PM

Nice graphics, @Andy!

Xuguang Wang - NOAA Affiliate 3:21 PM

These structural verification data will be very useful for R&D (data assimilation, physics etc). Are these verification data archived somewhere for R&D community to use?

@ David Zelinsky

Robert Rogers - NOAA Federal 3:23 PM

@Andy, @Gus, can you send the link for the model diagnostics to @Xuguang ?

Frank Marks - NOAA Federal 3:23 PM

@Xuguang I think we also need a product that displays what data gets into each model cycle so the forecasters can get an idea of how well the observations impacted the analysis.

Robert Rogers - NOAA Federal 3:24 PM

@Frank, can we put out the ftp address for the radar analyses?

Paul Reasor - NOAA Federal 3:24 PM

<ftp://ftp.aoml.noaa.gov/pub/hrd/data/RTradar> @Rob for TDR

Frank Marks - NOAA Federal3:24 PM

@Rob I do not see any reason not to.

Robert Rogers - NOAA Federal3:24 PM

thanks @Paul

Frank Marks - NOAA Federal3:24 PM

Thanks Paul.

Xuguang Wang - NOAA Affiliate3:24 PM

@Frank totally agree

Ghassan Alaka - NOAA Federal3:26 PM

@Xuguang, we can share those structural metrics with you. They should be up on the AOML Hurricane Viewer soon, but they aren't there yet. I think Andy Hazelton has stored them a Google Drive folder.

Frank Marks - NOAA Federal3:26 PM

@Xuguang Paul Reasor just provided link to the real-time TDR analyses. The AOML Model viewer has the model products that Dave showed. Andy Hazelton or Gus Alaka can point you to the links.

Xuguang Wang - NOAA Affiliate3:28 PM

@Paul @ Frank @ Gus thanks

Xuguang Wang - NOAA Affiliate3:29 PM

@Gus @Andy please email me the links xuguang.wang@ou.edu Thanks

Peter Black - NOAA Affiliate3:30 PM

Geo-polar blended SST products appears to be one of the best, and most detailed, SST products out there for detecting TC wake cooling, doing a good job in cloud masking.

Robert Rogers - NOAA Federal3:30 PM

@Dave this is fantastic, and something we're more than happy to work with you on

Ghassan Alaka - NOAA Federal3:30 PM

@Xuguang, On the AOML Viewer, click the "View All Graphics" button. Then, choose your model, forecast cycle, and storm. Then, go into the Graphic menu to find sub-menus for all of the various graphics. You can change the Region too (preset).

<https://storm.aoml.noaa.gov/viewer/>

Peter Black - NOAA Affiliate3:32 PM

Re SFMR, several storms this year showed sonde launch in one quadrant with splash 180 deg around the eyewall, suggesting many so-call SFMR errors are due to mislocation of SFMR ob vs 'ground' truth' (sea truth)

Frank Marks - NOAA Federal 3:33 PM

@Pete Heather is looking into that as part of her project.

Jason Sippel - NOAA Federal 3:34 PM

One thing this SFMR issue reveals is we have a ways to go in interpreting how all the data is related

Peter Black - NOAA Affiliate 3:35 PM

Excellent points on COVID effects, Dave. Amazing! Combine all of what you said with similar impacts with aircraft ops at AOC and the 53rd, and bottom line result at NHC is truly amazing.

Frank Marks - NOAA Federal 3:35 PM

@Jason & @Pete that is what Heather will address with her new JHT/JTTI project

Dorothy Koch 3:35 PM

Start em young!

Brian Zachry - NOAA Federal 3:35 PM

Vincent writes the best discussions!

Stanley Goldenberg - NOAA Federal 3:36 PM

Well — at least the family can help! Sadly many of us hav to totally depend on our personal computers

Peter Black - NOAA Affiliate 3:37 PM

Dave- Have a 10-mo old granddaughter co-worker similar to your baby

James Franklin - NOAA Affiliate 3:40 PM

Pete, a reminder that the SFMR data are also frequently at odds with the FL data. This is more than a dropsonde-translation issue.

Frank Marks - NOAA Federal 3:41 PM

@James I agree 100%

Jason Sippel - NOAA Federal 3:45 PM

@James I'd hope that an outcome of Heather's work is some kind of quantitative assessment of what are reasonable values of SFMR are given the other available data (FL, drops, TDR) and intrinsic structural variability

Peter Black - NOAA Affiliate 3:45 PM

Yes James and for good reason. Sometimes the flight level and surface winds are at odd with each other, meaning they violate the sacred 0.9 factor as wind shear between the two layers rotates the

asymmetries- which is the reason for having an SFMR. Need to know when flight level and surface wind fields are at odds with each other and are unexpected. Agree need further work to learn how to differentiate between unexpected obs errors and unexpected natural differences.

Sim Aberson - NOAA Federal 3:46 PM

And there is no reason that the rotation of the sonde around the eyewall should lead to a bias.

Robert Rogers - NOAA Federal 3:46 PM

The intrinsic structural variability is an area ripe for research

Shirley Murillo - NOAA Federal 3:47 PM

@Dave - Is NHC exploring using AWIPS2 in the cloud? Is that in the plans?

James Franklin - NOAA Affiliate 3:50 PM

Pete, I'm not talking about individual pairings of FL and sic winds. I'm talking about systematic, repeated biases between the peak winds measured by a larger sample of FL and sfc estimates.

James Franklin - NOAA Affiliate 3:51 PM

Jason, Heathers Hurricane Supplemental work is limited in scope to a recalibration of the SFMR.

Shirley Murillo - NOAA Federal 3:51 PM

@Dave, Thanks for responding.

Brian Zachry - NOAA Federal 3:51 PM

Shirley, we can talk more offline too

Jason Sippel - NOAA Federal 3:51 PM

Well right, but she has other JHT work that also involves TDR

Peter Black - NOAA Affiliate 3:51 PM

One option is to do a separate validation for large eyewalls, with less azimuthal sonde advection, and the small eyewalls that we have seen a lot of this year. Another is to fly both P-3s with fig 4 flight tracks rotated by 45 deg or so to enhance eyewall sonde coverage.

Shirley Murillo - NOAA Federal 3:52 PM

ok, yes we can @Brian.

Ghassan Alaka - NOAA Federal 3:52 PM

To Frank's point, I see the AOML Viewer as a testing ground for researchers to create/refine products with the goal of getting them into AWIPS

Shirley Murillo - NOAA Federal 3:54 PM

@Gus, I agree with you. I like how you are thinking ahead.

JungHoon Shin - NOAA Affiliate 3:55 PM

@James. Hello James, very interesting topic about SFMR.

As far as I know, SFMR (high-biased wind speed) issue arose after 2017 (e.g., Maria 2017, Jose 2017, Dorian 2019). Were there any similar SFMR issues before 2017?

James Franklin - NOAA Affiliate 3:59 PM

The calibration of the SFMR has been constantly changing over the years (one of the forecasters' greatest gripes about it, actually). The current concern about a possible high bias for major hurricanes began to be noticed under the current calibration during 2017.

Jason Sippel - NOAA Federal 3:59 PM

Well it had been a long time prior to 2017 that we'd had a storm as intense as some of these recent storms, right? There was Matthew in 2016, but before that you have to go back quite a way don't you?

Frank Marks - NOAA Federal 4:00 PM

@James in more intense storms the dropsondes will move further downwind than in weaker systems as well.

James Franklin - NOAA Affiliate 4:01 PM

True, but the FL data don't drift. ;-)

Frank Marks - NOAA Federal 4:02 PM

No they don't. Just the drift angle increases

James Franklin - NOAA Affiliate 4:03 PM

Jason, no obvious pre-2017 cases come to mind, although we relied on the SFMR if I'm not mistaken for Dean and/or Felix, perhaps over-enthusiastically.

Peter Black - NOAA Affiliate 4:05 PM

Gus- Good point. One example right now is how to integrate recent SWH (significant wave height) measurements from the KaRA instrument on 42RF and the WSRA on 43RF. This would be a great tool to use even during the flight since both data streams are now real time. WSRA data is available to forecasters on AWIPS. would be helpful for HRD researchers to be evaluating for NHC in real time.

Jason Sippel - NOAA Federal 4:05 PM

I forget the details of what Heather's TDR work under JHT is going to produce, but I'll go back to my previous statement. We need a quantitative assessment of what's reasonable given other data and the structural variability that occurs.

Jason Sippel - NOAA Federal 4:07 PM

She had a much bigger JTTI project submitted to look at this, but it got turned down

James Franklin - NOAA Affiliate 4:09 PM

Jason, the errors in any particular SFMR observation are not dependent on what other data are available, nor on the values reported by other sensors. So I'm not sure whether what you're asking for is feasible. Seems to me all you can get is an understanding of potential SFMR errors from first principles and leave it to the forecaster to consider that in the context of other obs. But perhaps I'm misunderstanding what you're asking for.

Frank Marks - NOAA Federal 4:10 PM

@Andy Does the RMW evolve during each PSURGE run, or is it static?

Jamie Rhome - NOAA Federal 4:10 PM

It evolves Frank

Frank Marks - NOAA Federal 4:10 PM

Thanks Jamie

Jason Sippel - NOAA Federal 4:14 PM

What I'm suggesting is that other observations tell you something about the structure of the vortex at different locations, so if you take all those other pieces of information in addition to information regarding the intrinsic variability (e.g., one example would be the variance from the 0.9 rule, or the degree to which that structure varies with intensity) you can deduce if SFMR values are reasonable or not.

Jason Sippel - NOAA Federal 4:15 PM

I'm just not convinced one way or the other. It's conceivable to me at the really high intensity like that of Irma, Dorian, perhaps Maria the structure IS fundamentally different.

Frank Marks - NOAA Federal 4:17 PM

TDR profiles suggest you are correct.

Jason Sippel - NOAA Federal 4:17 PM

@Frank one limitation of TDR is in the lower BL... we need a ton of IWRAP in cat-5 conditions

but yeah, it helps

Frank Marks - NOAA Federal 4:20 PM

They certainly exist! I think Paul Reasor is collaborating on a proposal from Steve Guimond to add IWRAP obs for DA.

Mark Vincent - NOAA Federal 4:30 PM

Great job Jen!

Jessica Schauer - NOAA Federal 4:30 PM

Agreed. Thanks, Jen.

Dorothy Koch4:30 PM

Jen - where is the social science report at this point?

Jennifer Sprague - NOAA Federal4:31 PM

Dorothy, ERG has our (NWS/NHC) final report edits/comments and we should receive before Thanksgiving. I expect this week.

Dorothy Koch4:31 PM

The SAB seemed unaware of a social science strategy by NOAA

Frank Marks - NOAA Federal4:32 PM

@Jen Nice summary of the cone project. I covered all the SBES projects in my HFIP summary, but it was nice to have a deep dive into one of them.

Frank Marks - NOAA Federal4:33 PM

@Dorothy Jen and Gina Eosco are leading the hurricane supplemental SBES projects. I think it would be good to have a summary of all the projects and how they are supported to use in our response to the EISWG report on the HFIP Plan.

Dorothy Koch4:34 PM

@Frank - sounds good

Jennifer Sprague - NOAA Federal4:34 PM

@Dorothy, familiar with the SAB EISWG Report. As an aside two of the authors have received funding relating to the Hurr Supplemental SBES. There is now a clause in the Report stating so.

Dorothy Koch4:36 PM

@Jen Interesting disclosure

Jennifer Sprague - NOAA Federal4:36 PM

@Frank and @Dorothy, we are awaiting the request to provide the NOAA Response to the SAB EISWG Report. I flagged for NOAA's Chief Economist and others to ensure we articulate in the NOAA Response to the SAB EISWG Report what has been done and what is in play with the four (4) Hurr Supp projects.

Frank Marks - NOAA Federal4:37 PM

@Jen do you think you and Gina can provide such a summary? It would also be great to add a section to the HFIP Annual Report this year that covers these SBES projects and their progress to date. It would be important for us to identify what we need to do next. For example what how can we apply the findings to improve TC products, and what are the next steps for the SBES folks to tackle. I don't think we have clearly articulated the goals for the SBES projects in the plan and that needs to be done

Frank Marks - NOAA Federal4:39 PM

@Jen I am expecting that request in the next 1-2 months and trying to start outlining how to respond.

Jennifer Sprague - NOAA Federal 4:39 PM

Frank, let's chat later this week. I am sure Gina and I can help in some way.

Dorothy Koch 4:40 PM

@Frank and Jen - I second the need for "next steps". We also need to be aware of how much more NHC can absorb

Frank Marks - NOAA Federal 4:41 PM

Thanks Jen. May be hard with the sessions going every day to 5 PM and then the holiday next week.

Sundararaman Gopalakrishnan - NOAA Federal 4:41 PM

@Frank.. Jen usually provides a section to our report. Perhaps we could enhance that section this year. Anyway looking at the huge developments with HAFS and an extremely active season I am thinking of revising the report format this year, anyway.

Frank Marks - NOAA Federal 4:43 PM

@Gopal Thanks. I think we need to based on the what we are expecting from the SAB recommendations

Sundararaman Gopalakrishnan - NOAA Federal 4:45 PM

@Frank & @Sikchya You bet Frank. Sikchya and I will initiate a meeting with the management before starting next report in that case.

Frank Marks - NOAA Federal 4:49 PM

@Matt and @Levi way to go!

Matthew Onderlinde - NOAA Federal 4:52 PM

haha, thanks Frank

Frank Marks - NOAA Federal 4:52 PM

@Youngsun very interesting because the creators of Tropical Tidbit and WeatherNerds website work for NOAA.

Mark Vincent - NOAA Federal 4:52 PM

great job Jordan!

Paula McCaslin - NOAA Federal 4:54 PM

Most of the hits 160K to [hfip.org](http://hfip.org) and [ruc.noaa.gov/tracks](http://ruc.noaa.gov/tracks) are from tropical tidbits. Easy URL.

Stanley Goldenberg - NOAA Federal 4:55 PM

That's like my favorite place to go for record of season is the Atlantic Hurricane season page on Wikipedia! (Anyone know who updates those pages)

Xuguang Wang - NOAA Affiliate 4:56 PM

I second on including "observations" displayed!!!  
in the display

Paul Reasor - NOAA Federal 4:57 PM

Yes, @Jason ... I sometimes wonder whether TDR data is getting in... ;-)

Xuguang Wang - NOAA Affiliate 4:58 PM

I'd suggest to include (1) obs that show storm structure (2) # and types of observations assimilated in the display @Youngsun @Jordan @ Jason @ Frank

Edward Rappaport - NOAA Federal 5:02 PM

NHC prioritizes operational products and services over summary/climo stuff. No time.,

Stanley Goldenberg - NOAA Federal 5:06 PM

Ed— I certainly understand and I wasn't NHC needed to do it. Just that I like using it