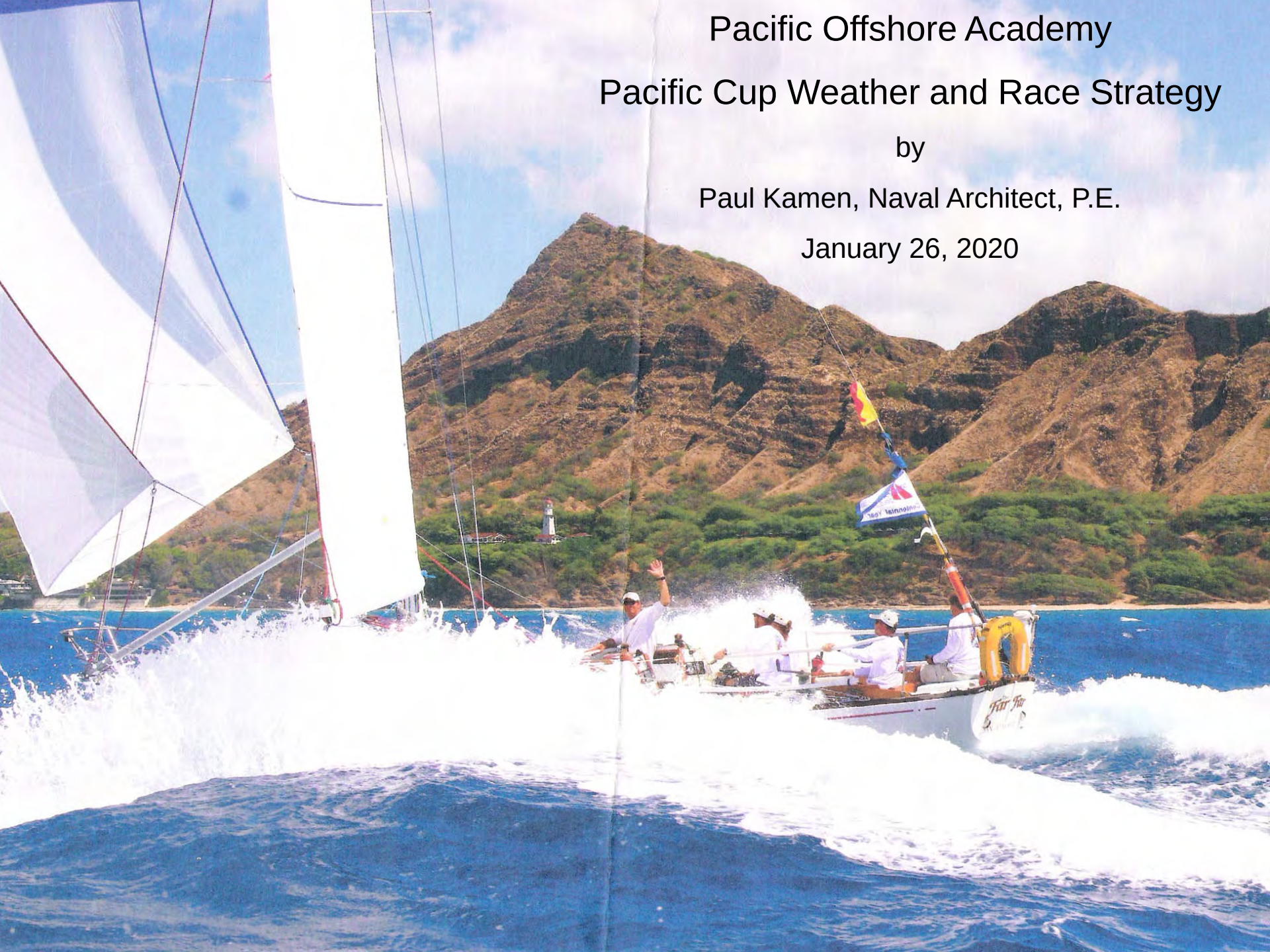


Pacific Offshore Academy

Pacific Cup Weather and Race Strategy

by

Paul Kamen, Naval Architect, P.E.

January 26, 2020

Phase 1: The Start

20 ROOM TO TACK AT AN OBSTRUCTION

20.1 Hailing

A boat may hail for *room* to tack and avoid a boat on the same *tack*. However, she shall not hail unless

(a) she is approaching an *obstruction* and will soon need to make a substantial course change to avoid it safely, and

(b) she is sailing close-hauled or above.

In addition, she shall not hail if the *obstruction* is a *mark* and a boat that is *fetching* it would be required to change course as a result of the hail.

20.2 Responding

(a) After a boat hails, she shall give a hailed boat time to respond.

(b) A hailed boat shall respond even if the hail breaks rule 20.1.

(c) A hailed boat shall respond either by tacking as soon as possible, or by immediately replying ‘You tack’ and then giving the hailing boat *room* to tack and avoid her.

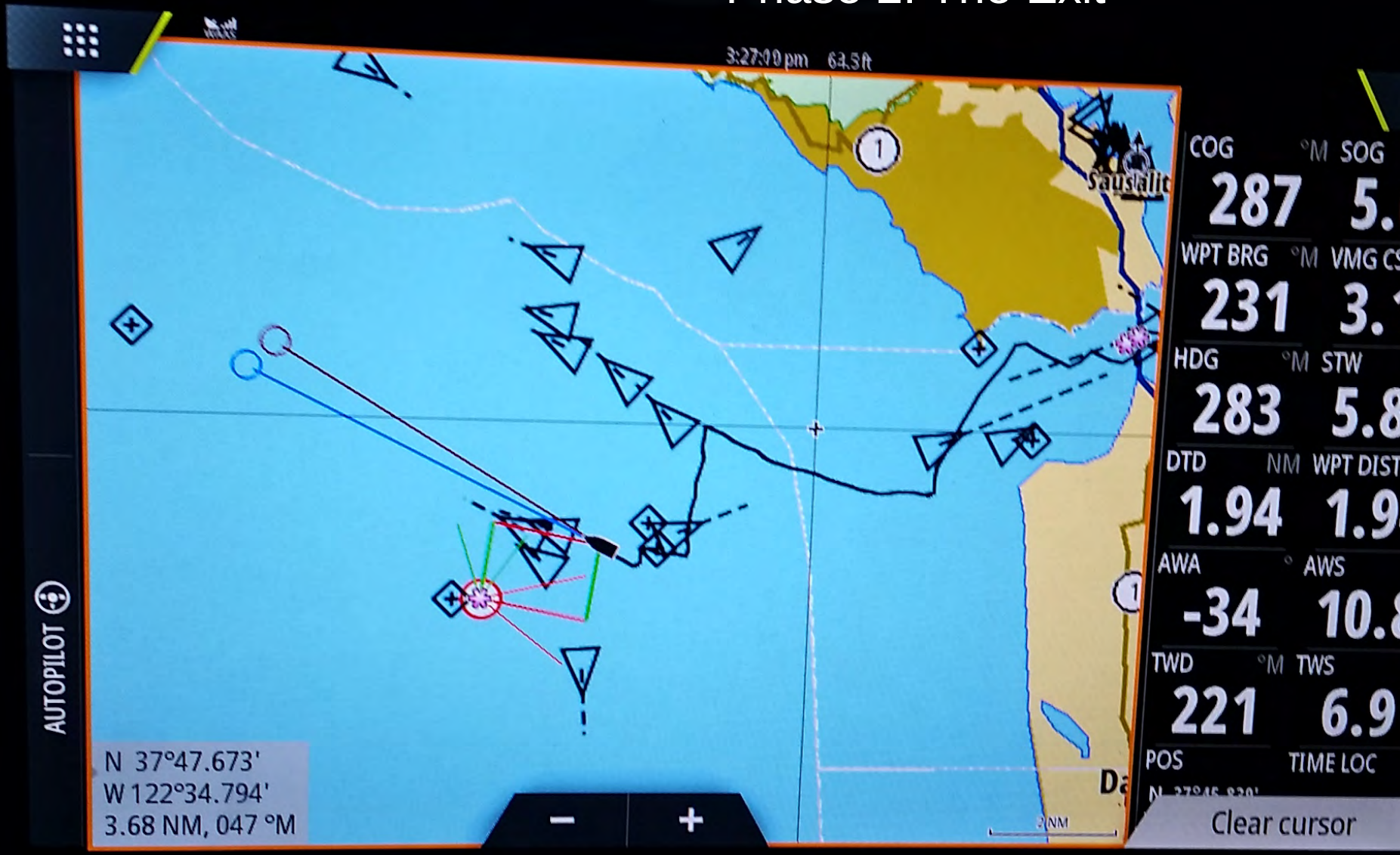
(d) When a hailed boat responds, the hailing boat shall tack as soon as possible.

(e) From the time a boat hails until she has tacked and avoided a hailed boat, rule 18.2 does not apply between them.

20.3 Passing On a Hail to an Additional Boat

When a boat has been hailed for *room* to tack and she intends to respond by tacking, she may hail another boat on the same *tack* for *room* to tack and avoid her. She may hail even if her hail does not meet the conditions of rule 20.1. Rule 20.2 applies between her and a boat she hails.

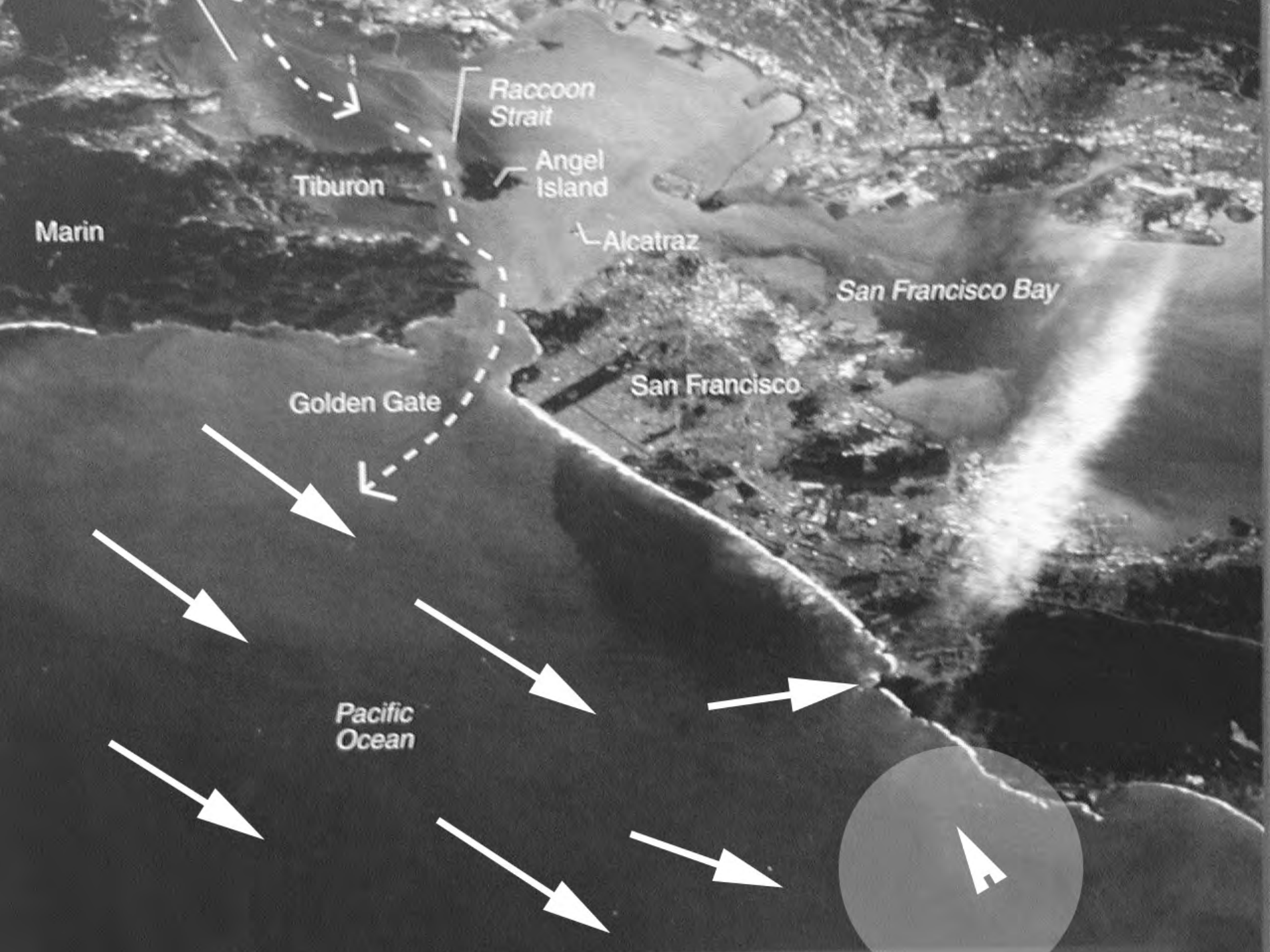
Phase 2: The Exit




Raccoon
Strait
Angel
Island
Tiburon
Marin
Alcatraz
San Francisco Bay
San Francisco
Golden Gate
Pacific
Ocean


Raccoon Strait
Angel Island
Tiburon
Marin
Alcatraz
San Francisco Bay
San Francisco
Golden Gate
Pacific Ocean


Raccoon
Strait
Angel
Island
Tiburon
Marin
Alcatraz
San Francisco Bay
San Francisco
Golden Gate
Pacific
Ocean

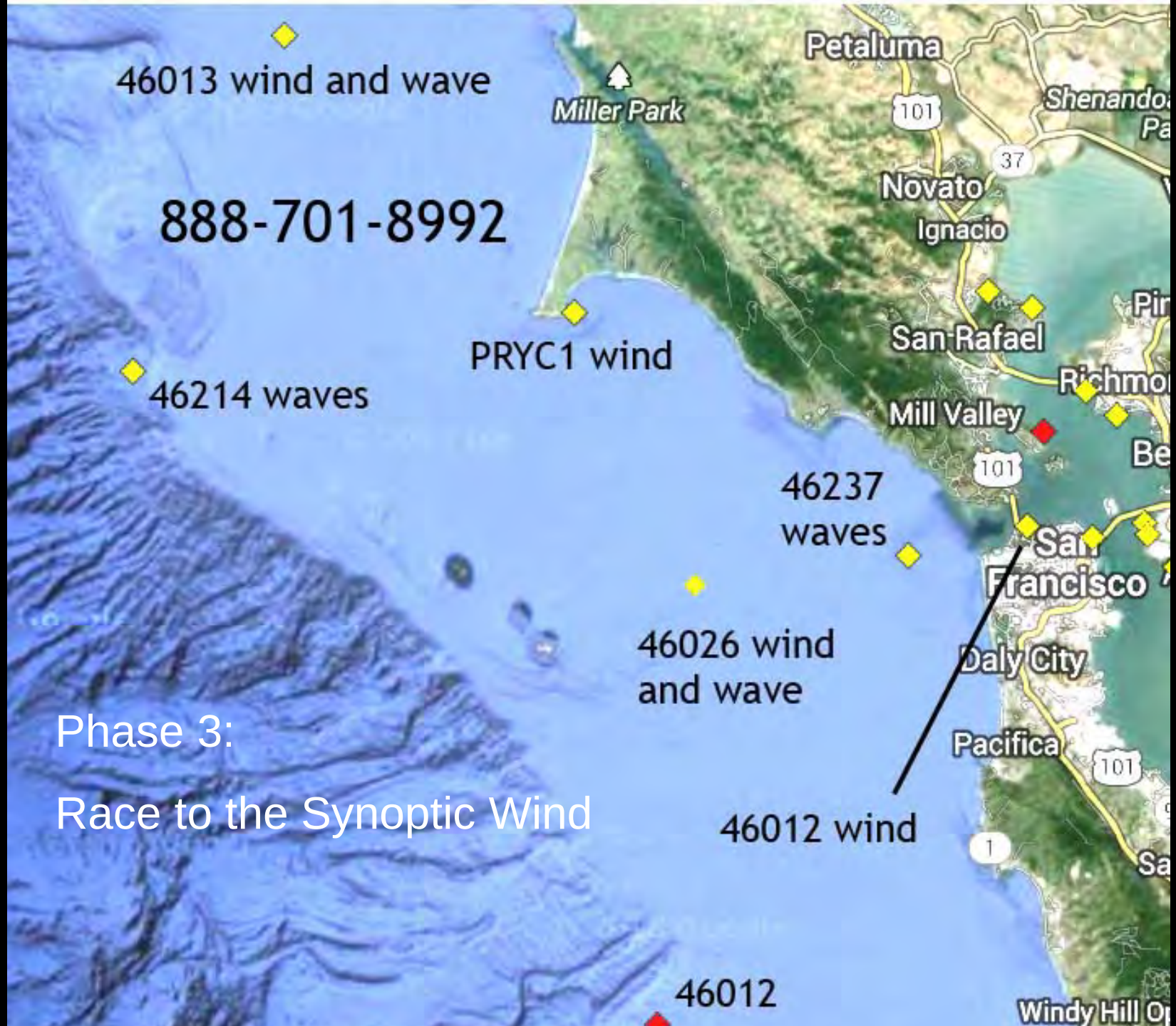

Raccoon
Strait
Angel
Island
Tiburon
Marin
Alcatraz
San Francisco Bay
San Francisco
Golden Gate
Pacific
Ocean

Dial-A-Buoy

Call 888-701-8992
Commercial 301-713-9620


WAVE BUOY
TUXE-CH. 1


NOAA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Miller Park
Petaluma
101
37
Novato
Ignacio
888-701-8992
PRYC1 wind
San Rafael
46214 waves
Mill Valley
101
46237
waves
Francisco
46026 wind
and wave
Daly City
Pacifica
101
Phase 3:
Race to the Synoptic Wind
46012 wind
1
46012


Los Angeles
Malibu
Santa Monica
Channel Islands National Park
Long Beach
Anaheim
Riverside
Temecula
Carlsbad
Escond
San Dieg
Tijua
Map
Satellite
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710
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215
5
46252
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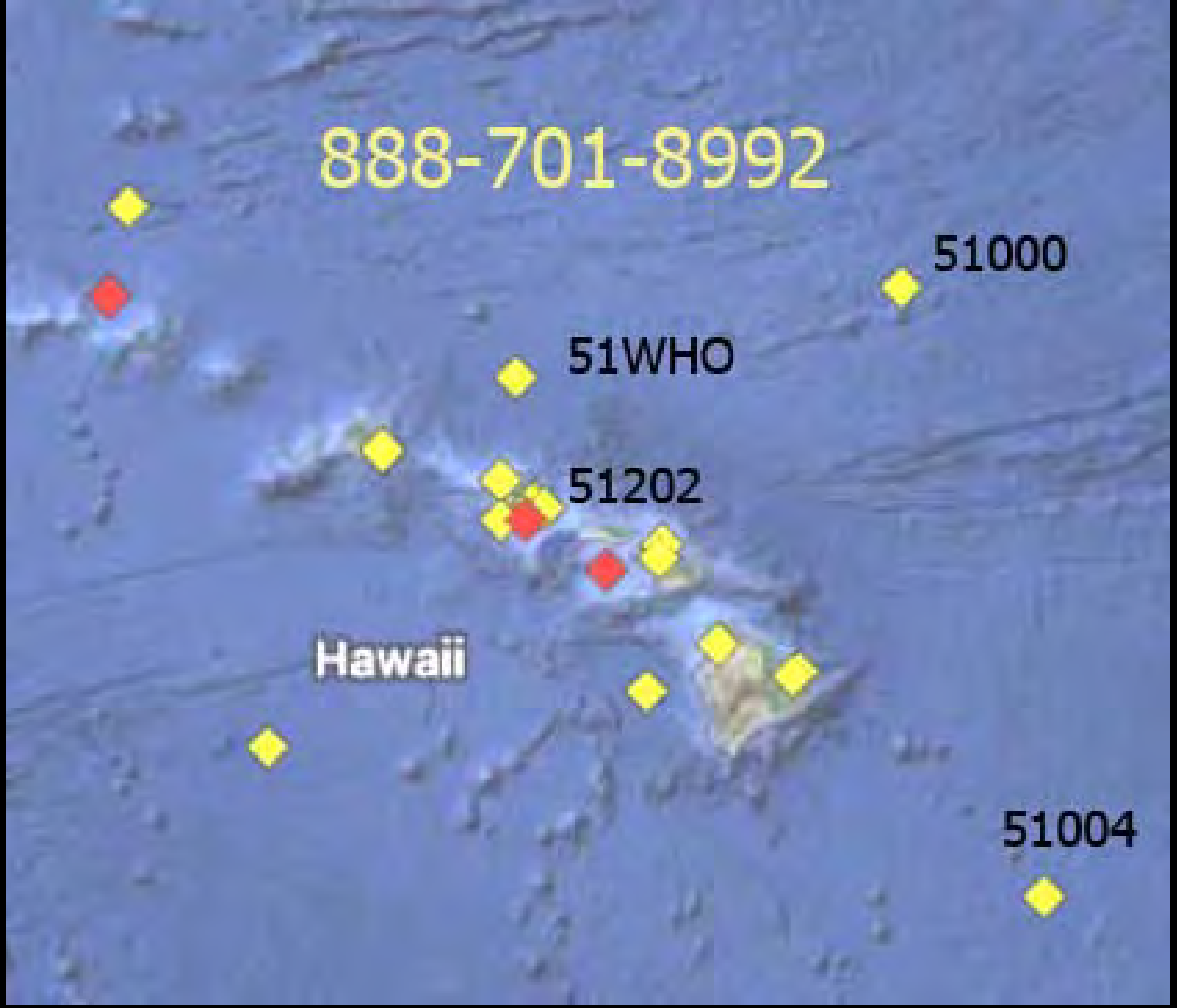
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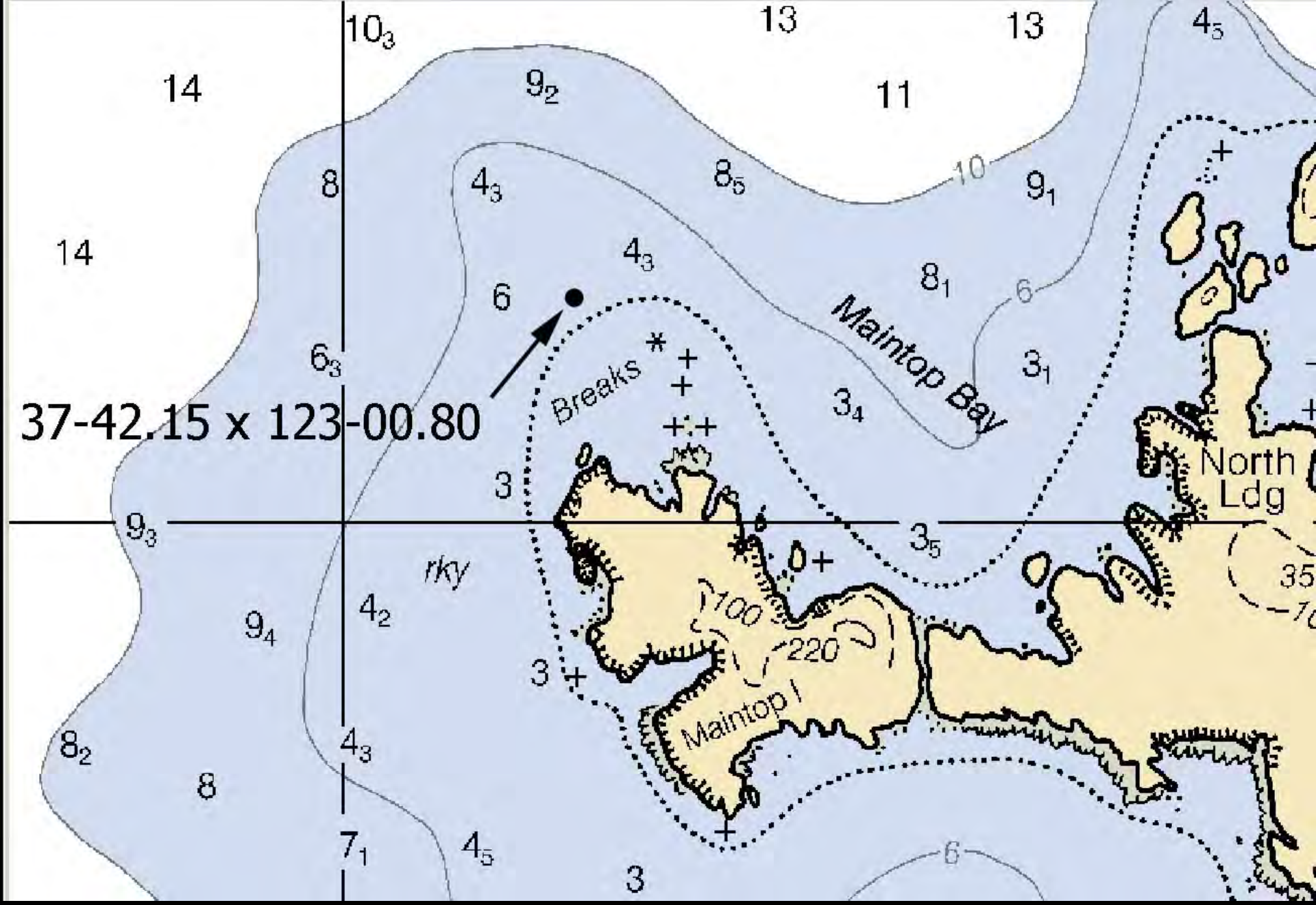
51202
Hawaii
51004


37-42.15 x 123-00.80
Breaks
Maintop Bay
North Ldg
Maintop I
rky
100
220
10
6
3
35

US Army Corps of Engineers

SHORE PROTECTION MANUAL

VOLUME II

Coastal Engineering Research Center

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631
Vicksburg, Mississippi 39180

1984

Prepared for

DEPARTMENT OF THE ARMY
US Army Corps of Engineers
Washington, DC 20314

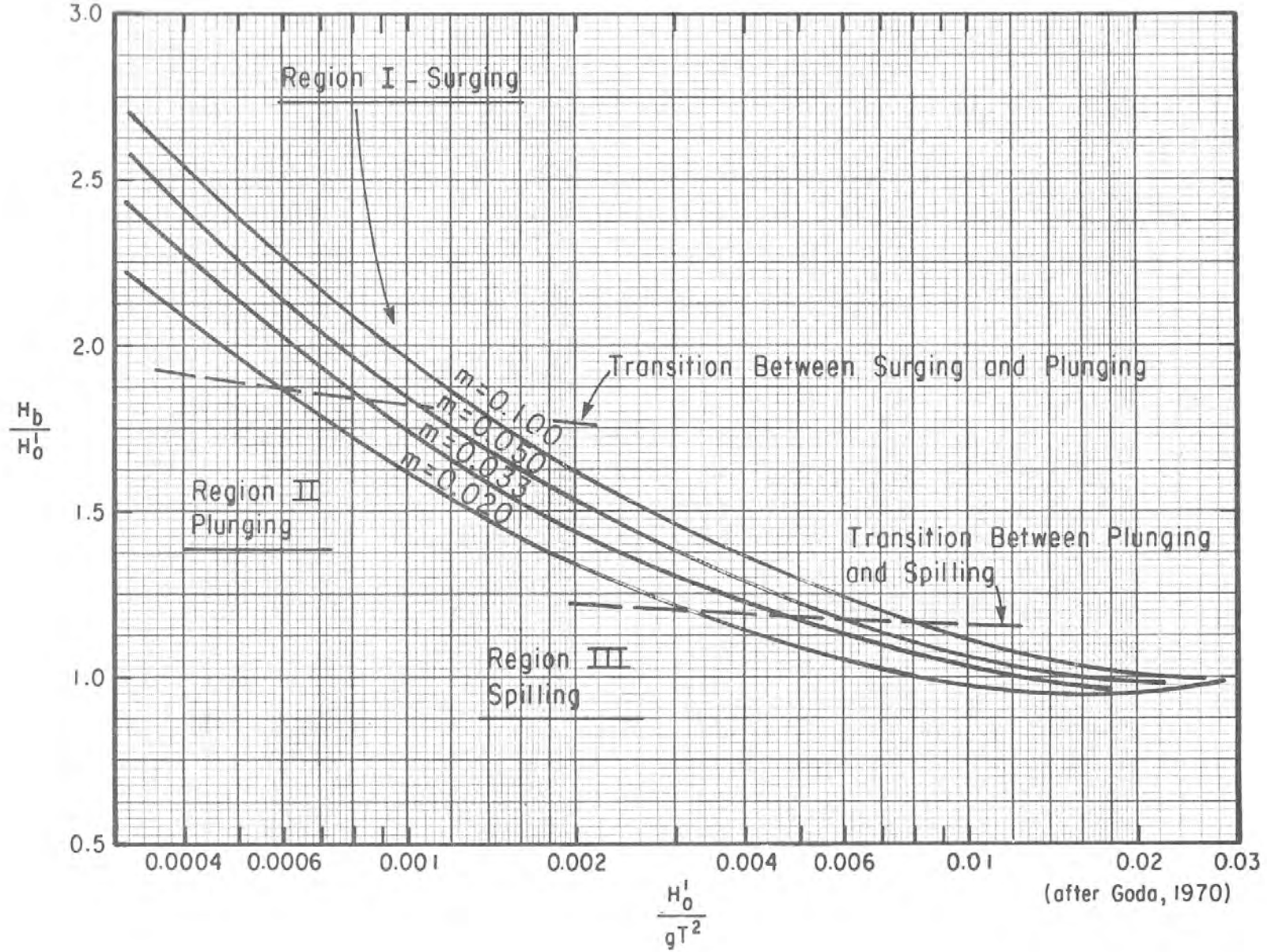


Figure 2-72. Breaker height index versus deepwater wave steepness, H_o/gT^2 .

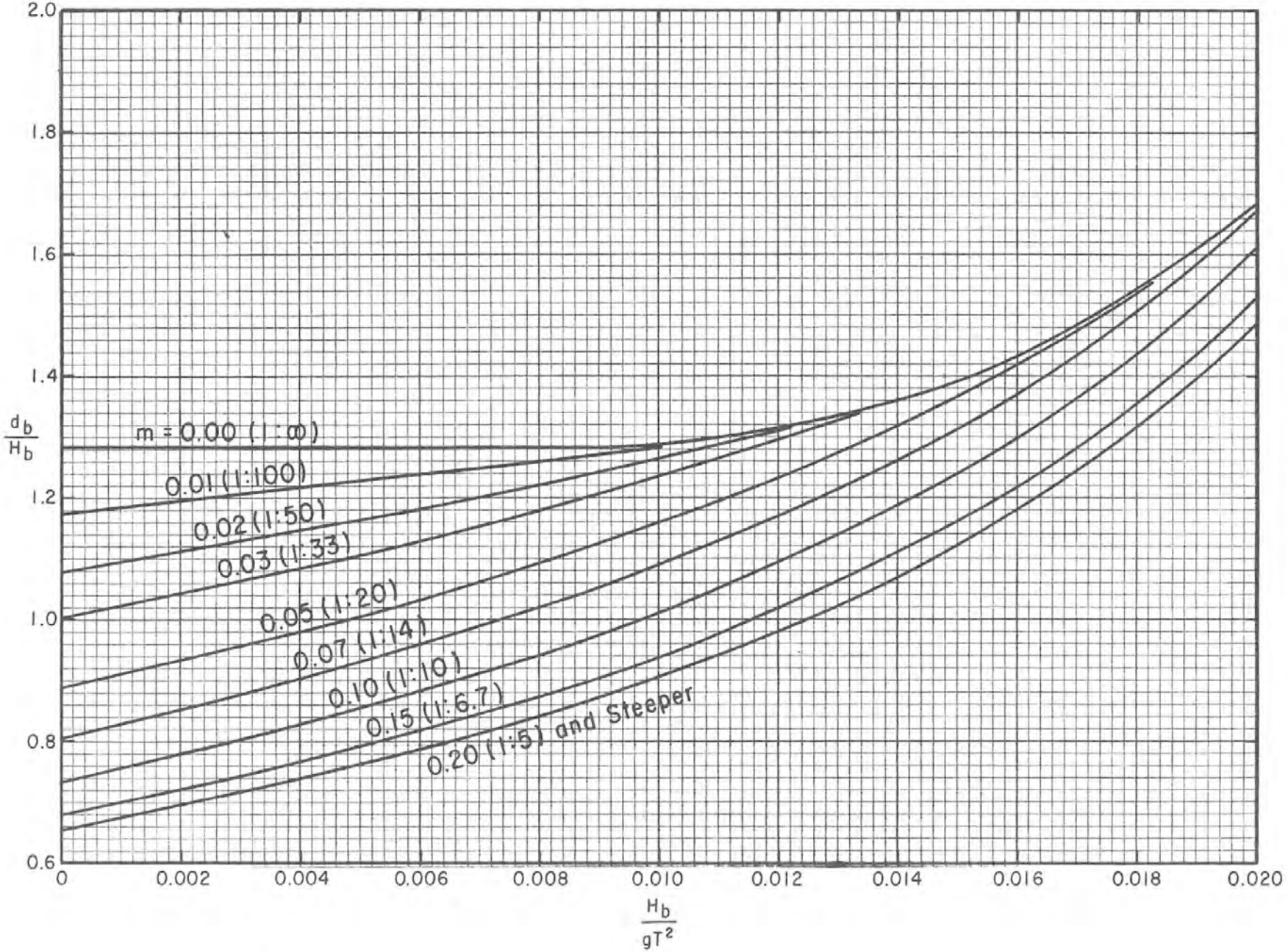
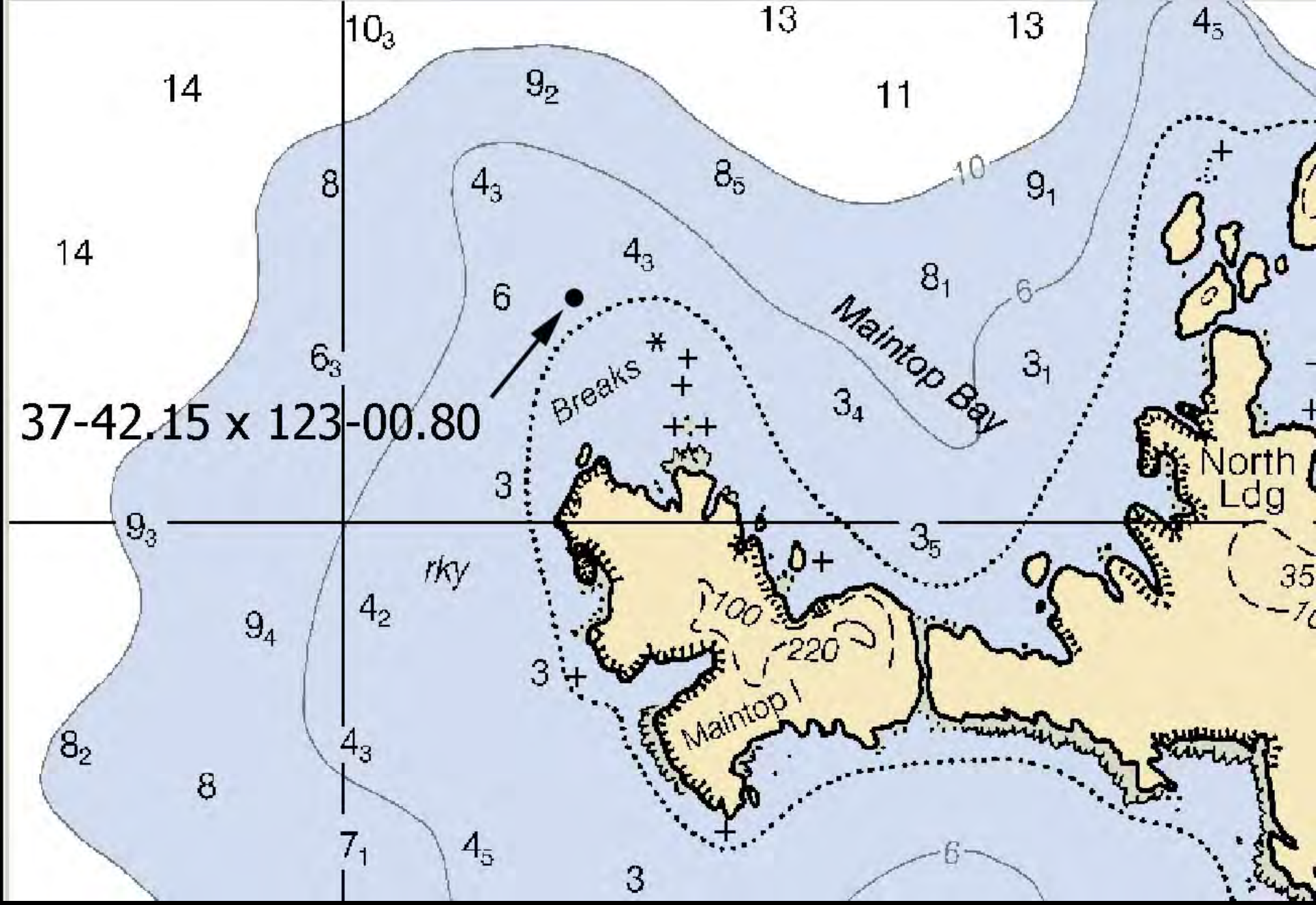


Figure 2-73. Dimensionless depth at breaking versus breaker steepness.


Image USDA Farm Service Agency
© 2012 Google
Data CSUMB SFML, CA OPC
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
1688 ft
Imagery Date: 4/24/2010
2005
lat 37.700475° lon -123.008913° elev -17 ft
Eye alt 7143 ft
Google earth


37-42.15 x 123-00.80
Breaks
Maintop Bay
North Ldg
Maintop I
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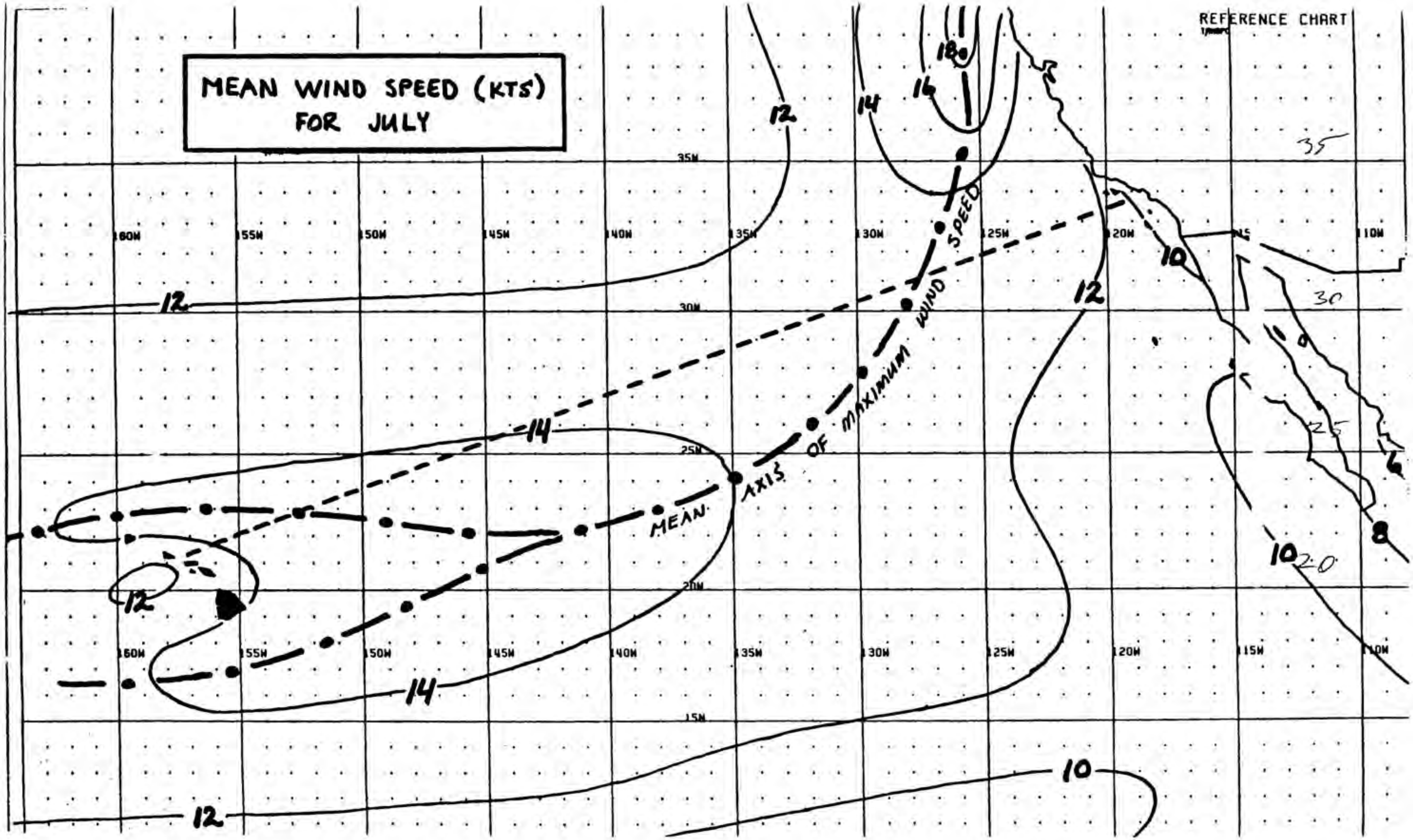
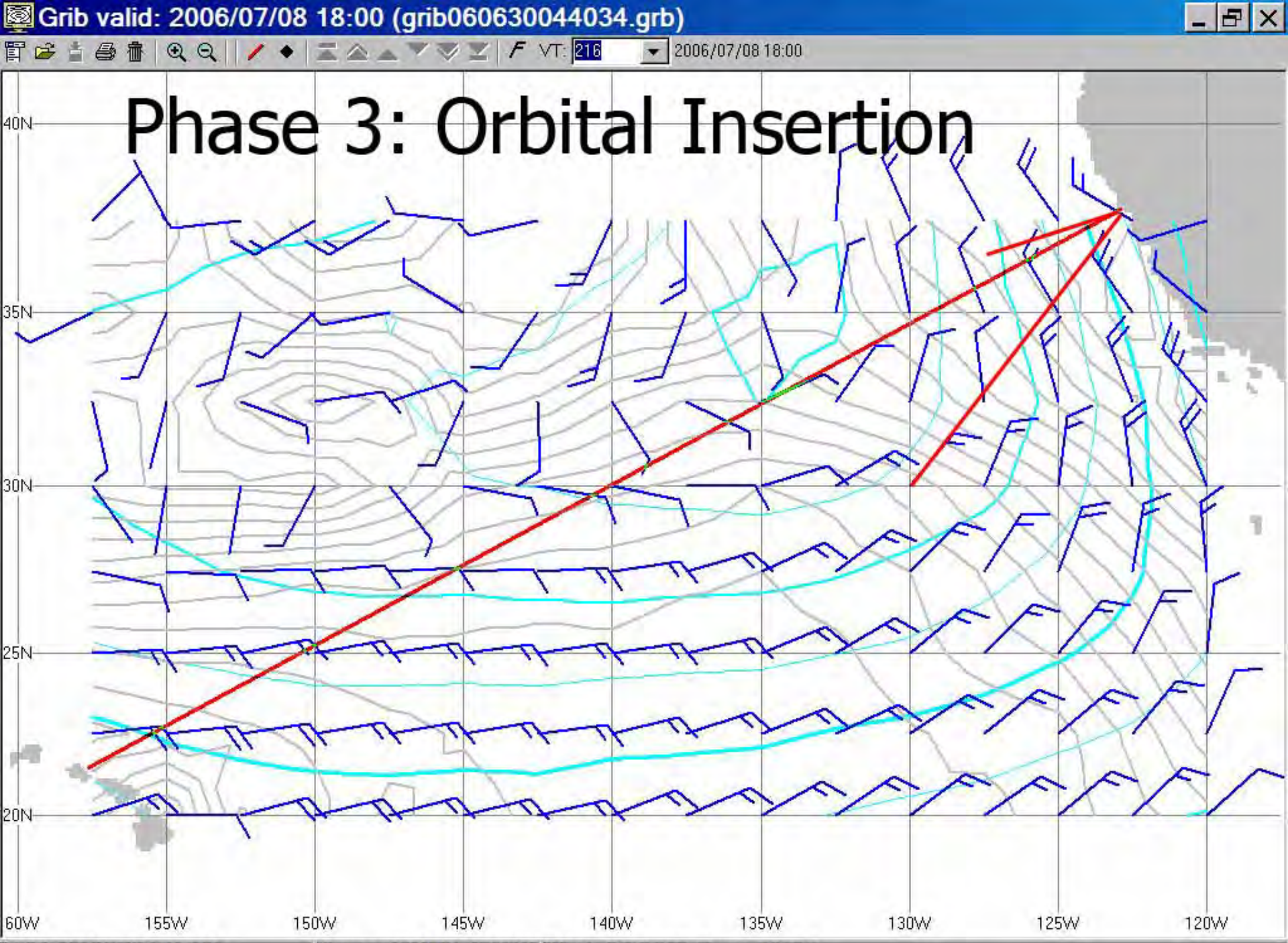


REFERENCE CHART
MEAN WIND SPEED (KTS)
FOR JULY
MEAN AXIS OF MAXIMUM WIND SPEED
35N
30N
25N
20N
15N
160W
155W
150W
145W
140W
135W
130W
125W
120W
115W
110W
12
14
16
18
10
8
6
35
30
25
20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VT: 216
2006/07/08 18:00
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35N
30N
25N
20N
60W
155W
150W
145W
140W
135W
130W
125W
120W
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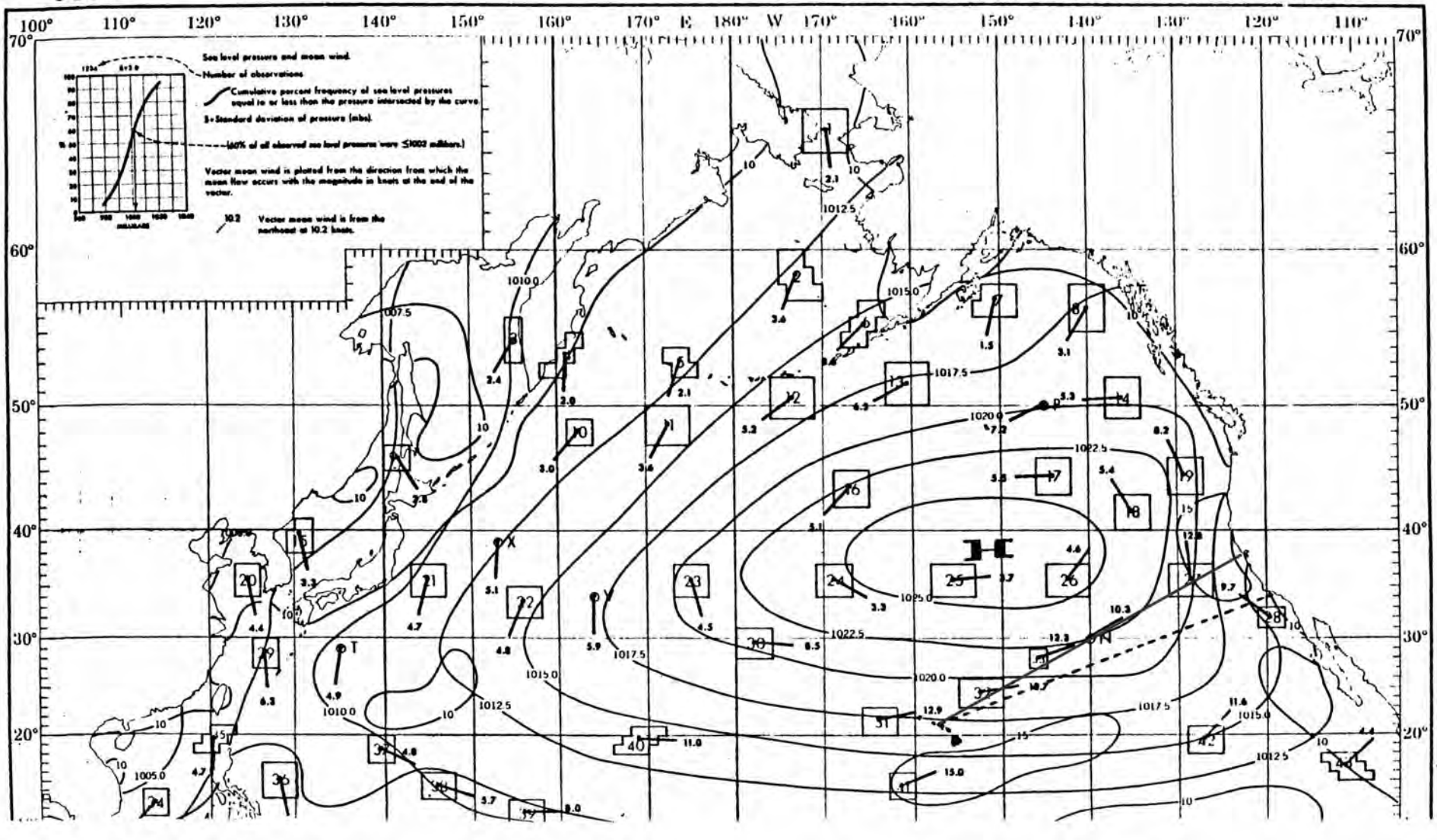
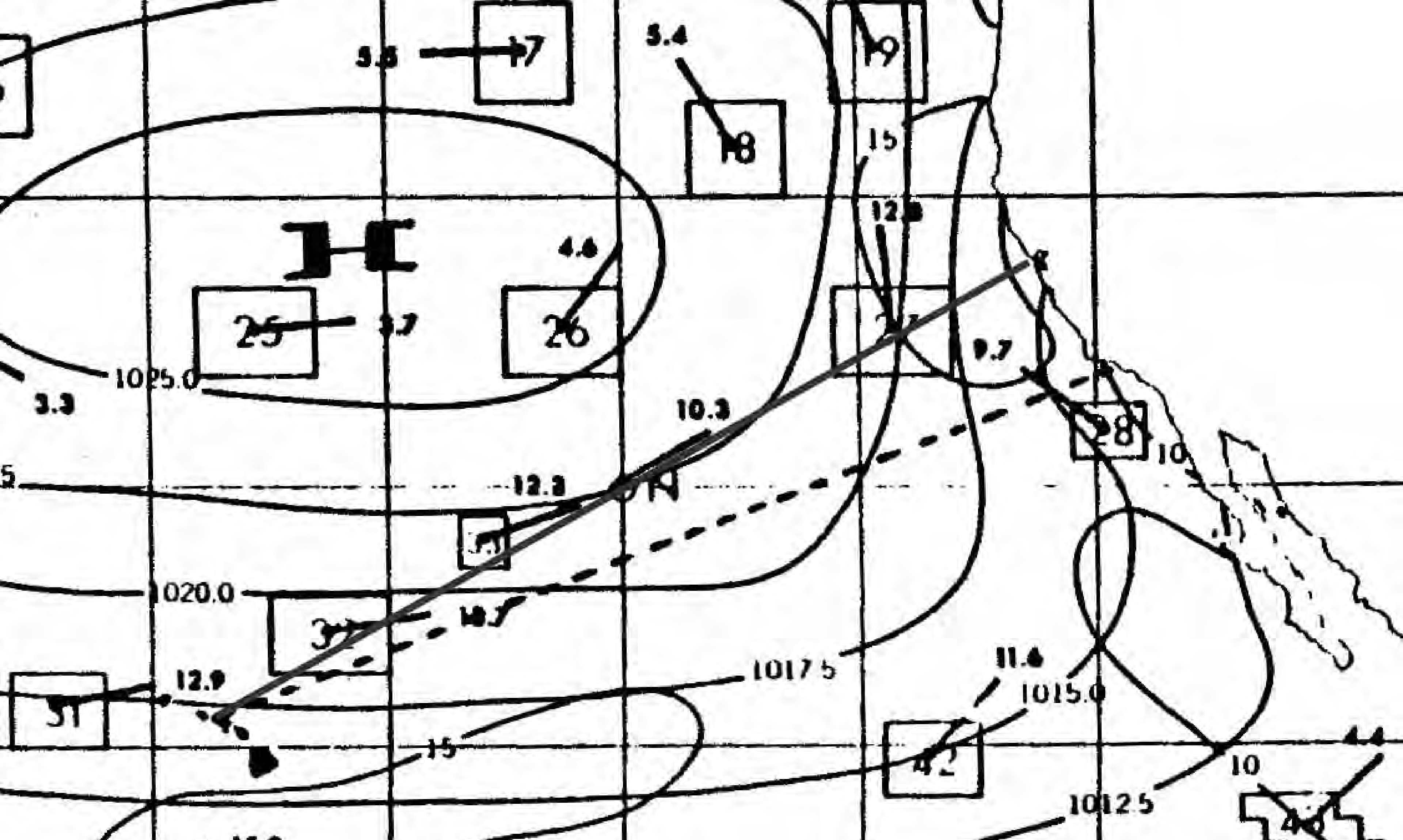
Wind: 0.0@000 Press: 1023.0

JULY

SEA LEVEL PRESSURE AND MEAN WIND





17
5.4
18
19
15
H
4.6
25
26
9.7
28
10
3.3
1025.0
10.3
1020.0
12.9
31
1017.5
11.6
1015.0
15
42
10
1012.5
4.4

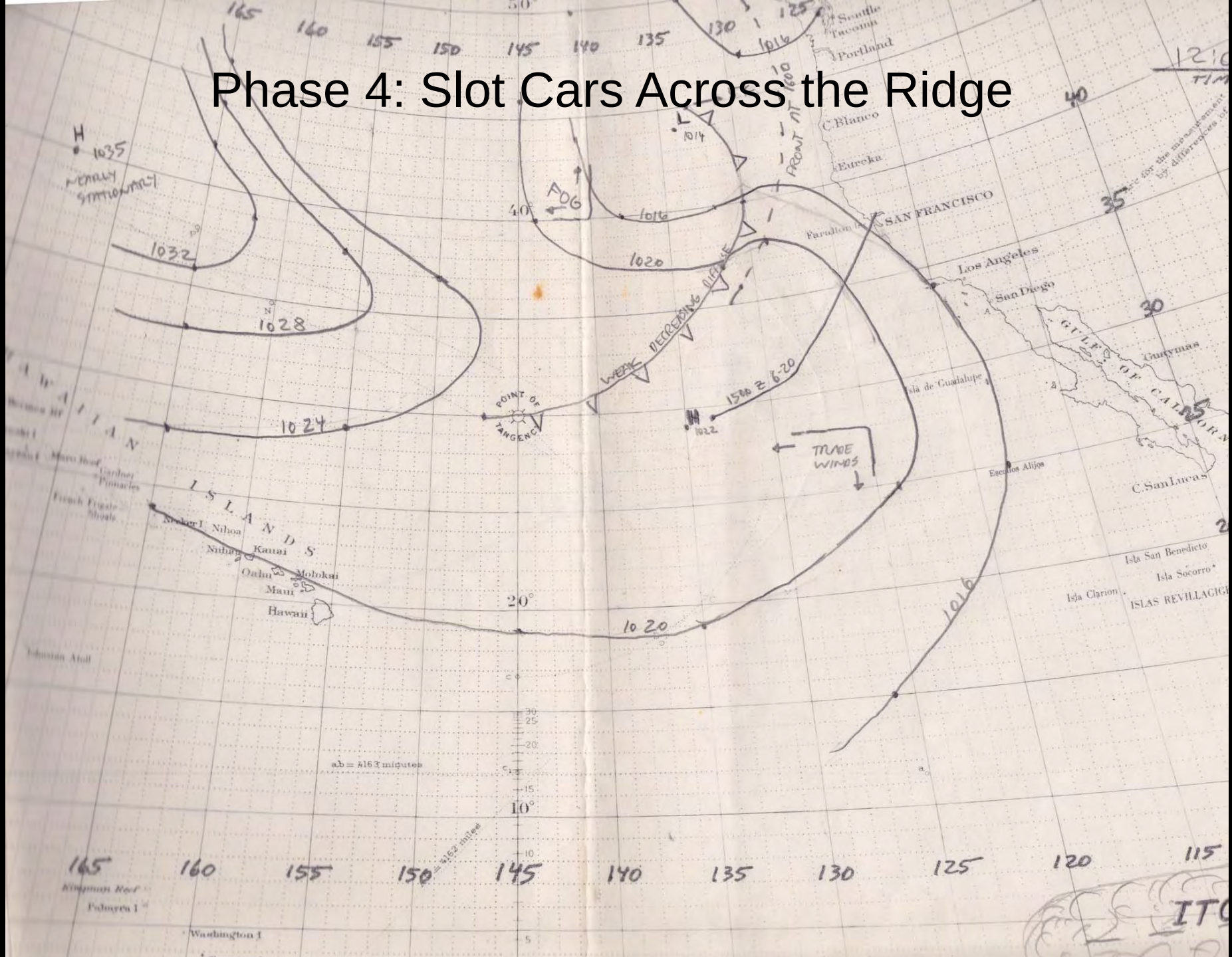
Rules of Thumb (from Stan Honey)

Never trust rules of thumb

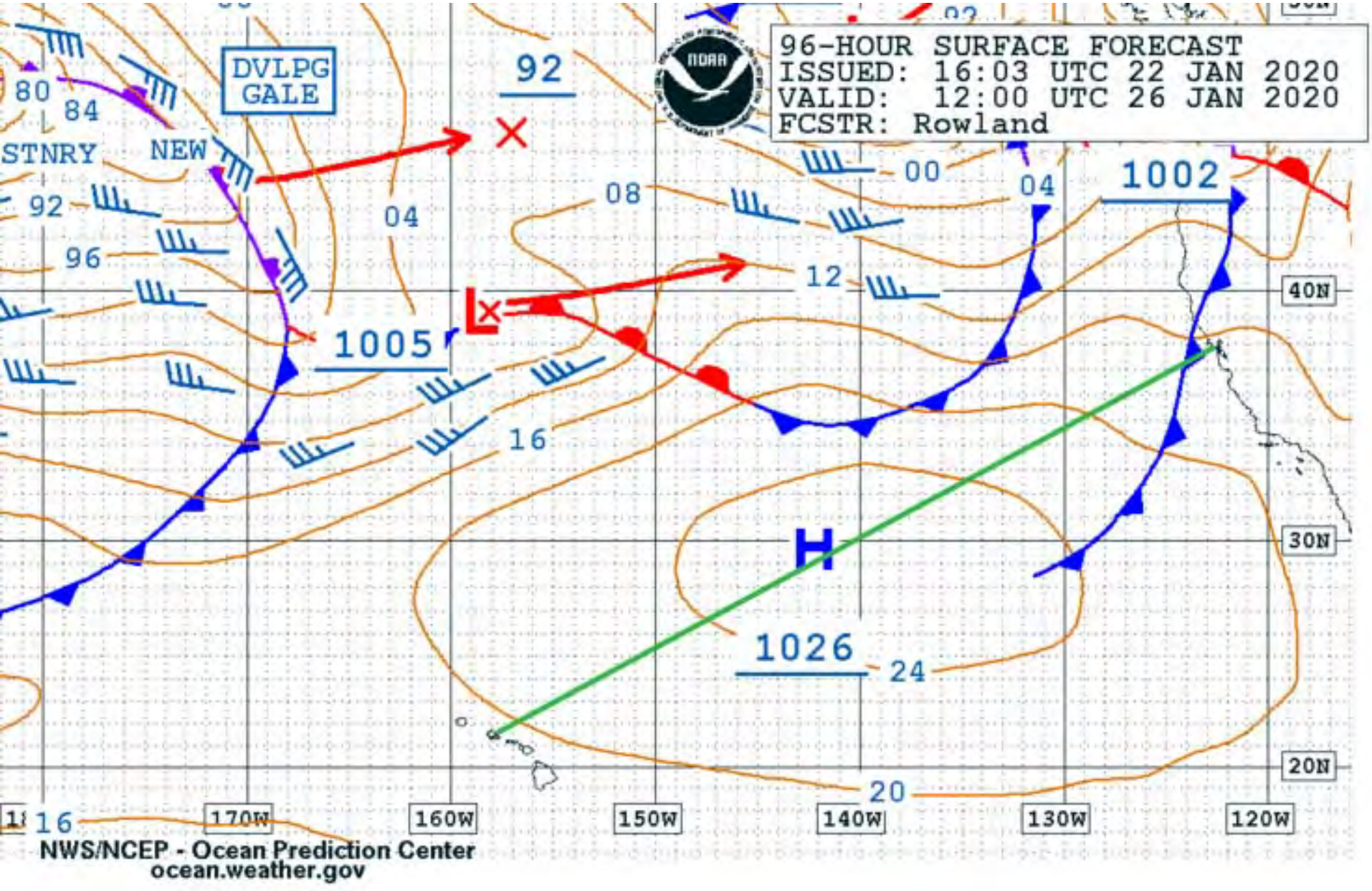
Normal High, try to be 5-6mb away at the closest point.

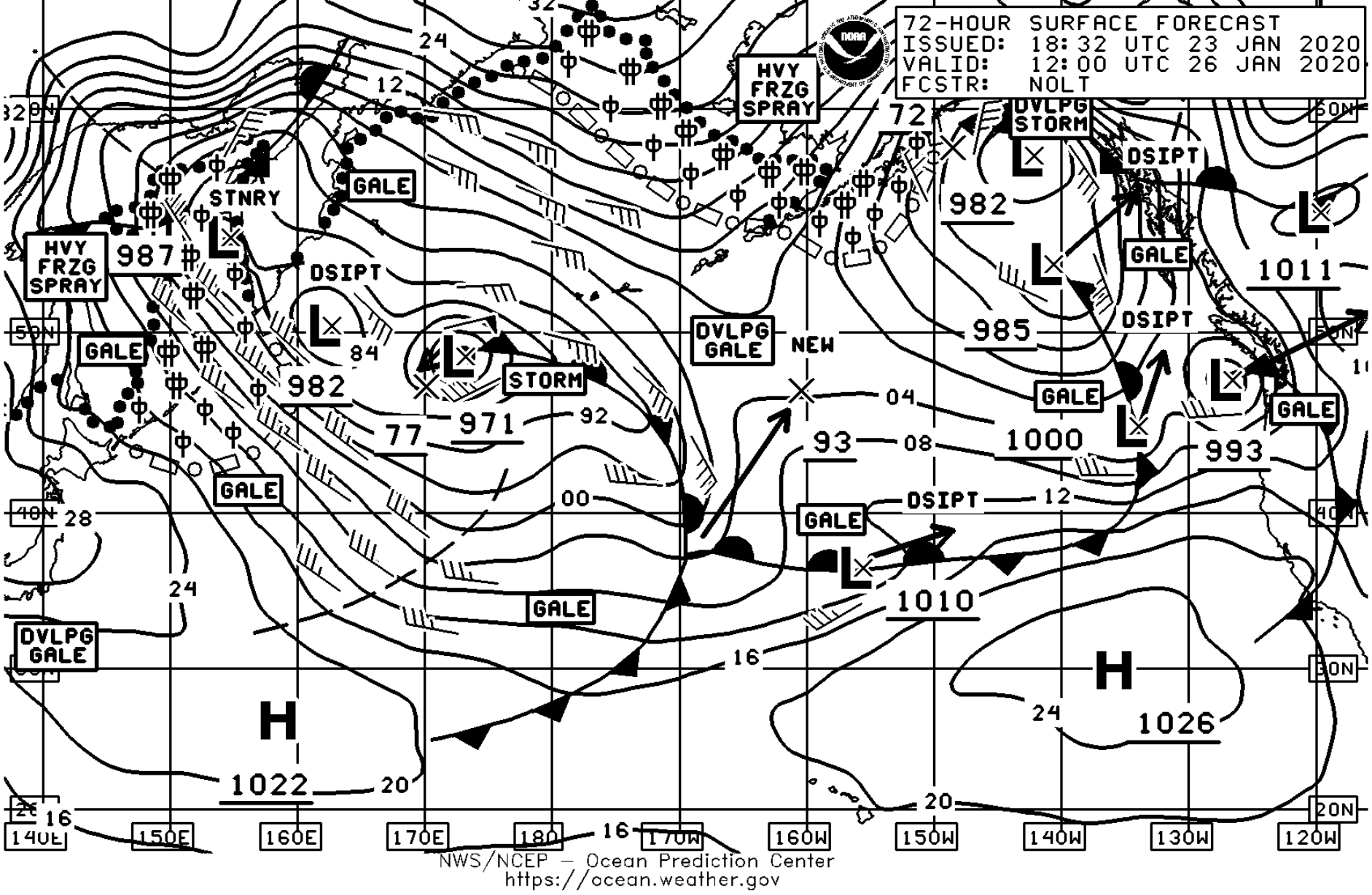
4mb is dicey but ok if strong Omega Block, no mid-lat lows on their way, and High moving N.

7-8 mb might be good if zonal UL flow, incoming mid-lat lows to N, or H sagging S.


Phase 4: Slot Cars Across the Ridge
H
1035
NEARLY STATIONARY
1032
1028
1024
1020
1016
1014
1022
FOG
FRONT
WEAK
DETREADING
POINT OF TANGENCY
TRADE WINDS
SAN FRANCISCO
Los Angeles
San Diego
Eureka
C. Blanco
Portland
Seattle
Tacoma
Farallon Is.
Isla de Guadalupe
Escollos Alijos
C. San Lucas
Isla San Benedicto
Isla Socorro
Isla Clarion
ISLAS REVILLAGIGE
GULF OF CALIFORNIA
Guaymas
HAWAIIAN ISLANDS
Nihoa
Kauai
Oahu
Molokai
Maui
Hawaii
Gardner Pinnacles
French Frigate Shoals
Johnston Atoll
Kingman Reef
Palmyra I.
Washington I.
a,b = 4163 miles
165
160
155
150
145
140
135
130
125
120
115
50°
40°
30°
20°
10°

Phase 5: Strategy





NWS/NCEP – Ocean Prediction Center
https://ocean.weather.gov

bycwifi key = berkeley1939

Also see:

https://people.well.com/user/pk/POA2020/

Weatherfax charts via internet:

https://tgftp.nws.noaa.gov/fax/marine.shtml

(Go to the Point Reyes charts for race coverage)

Send the GRIB request string to:

Query@saildocs.com

send gfs:15N,50N,120W,160W|1,1|0,6..384|PRESS,WIND

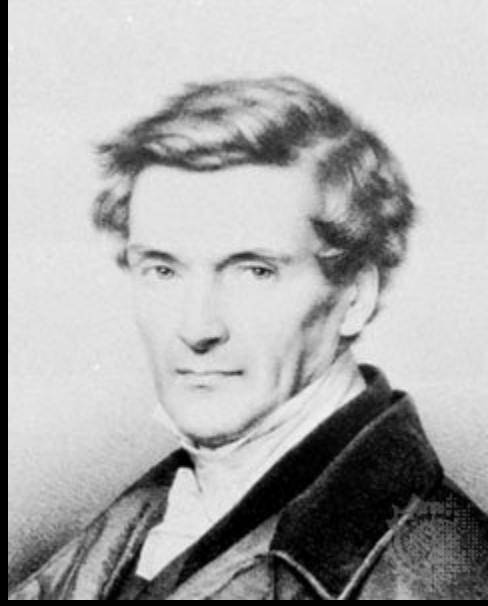
Download qtVlm from:

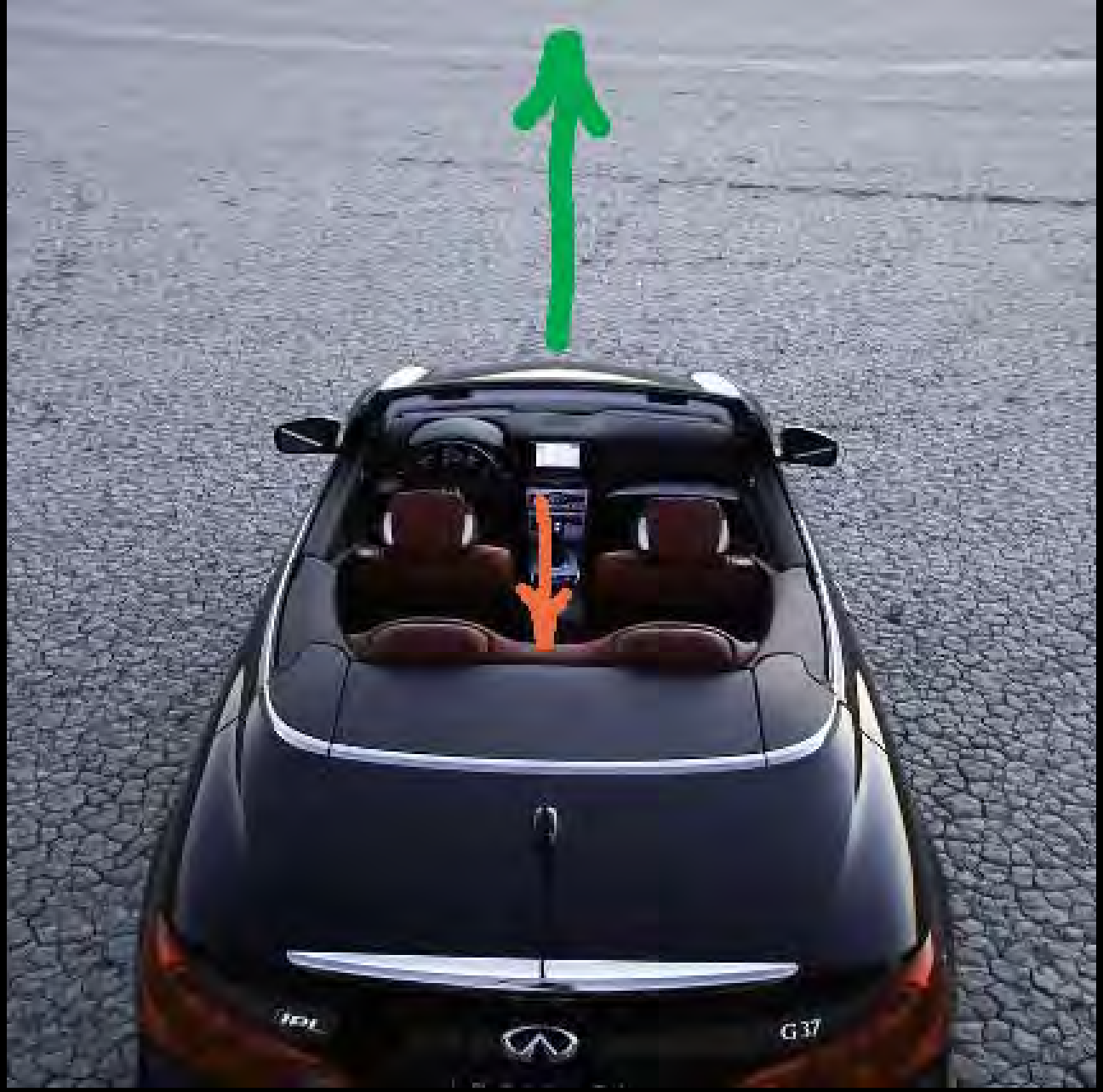
https://www.meltemus.com/index.php/en/download

Install in default location and run.

First time it runs, allow it to download map database

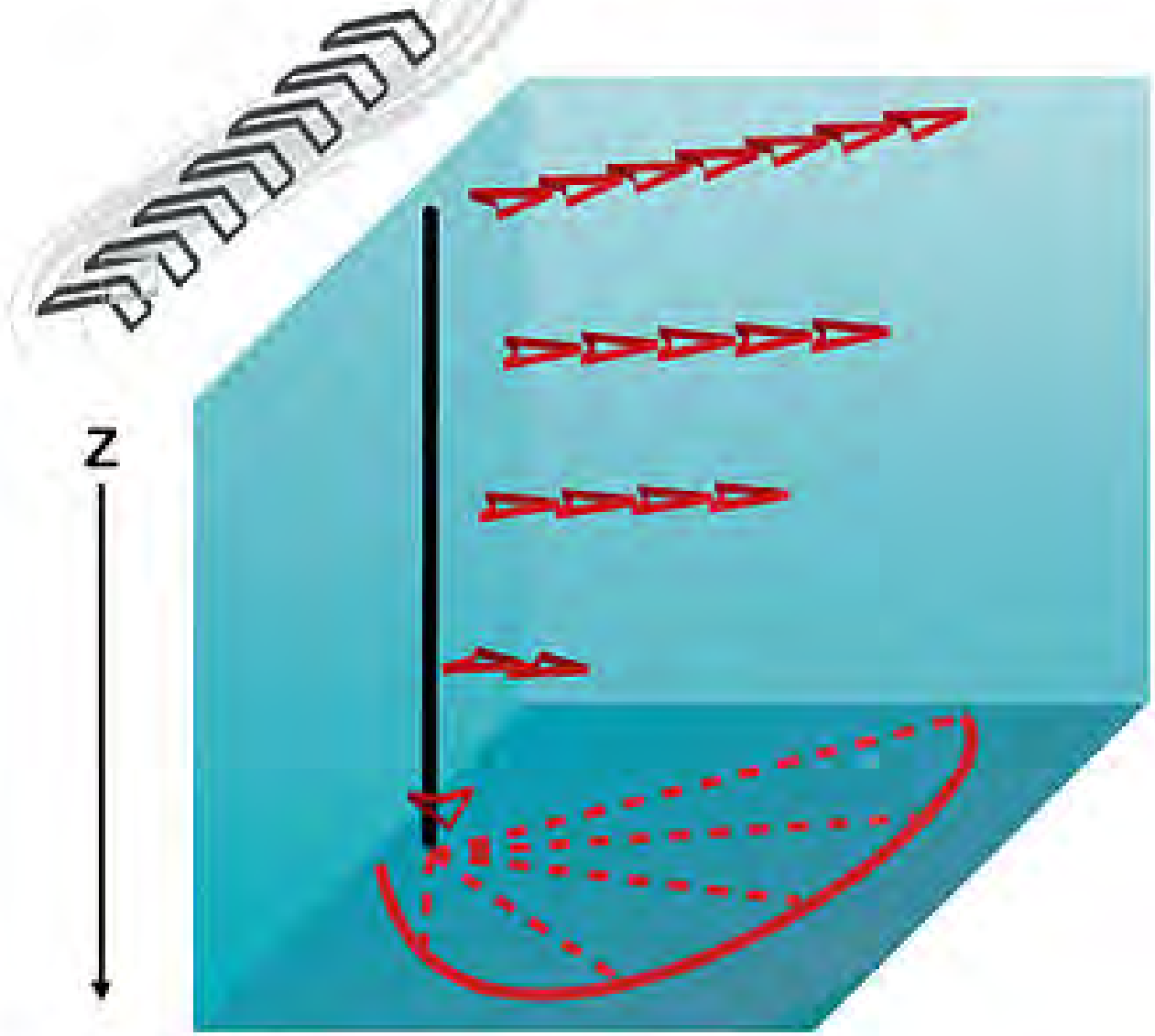
A few words from
Gaspard-Gustave de Coriolis (1792–1843)

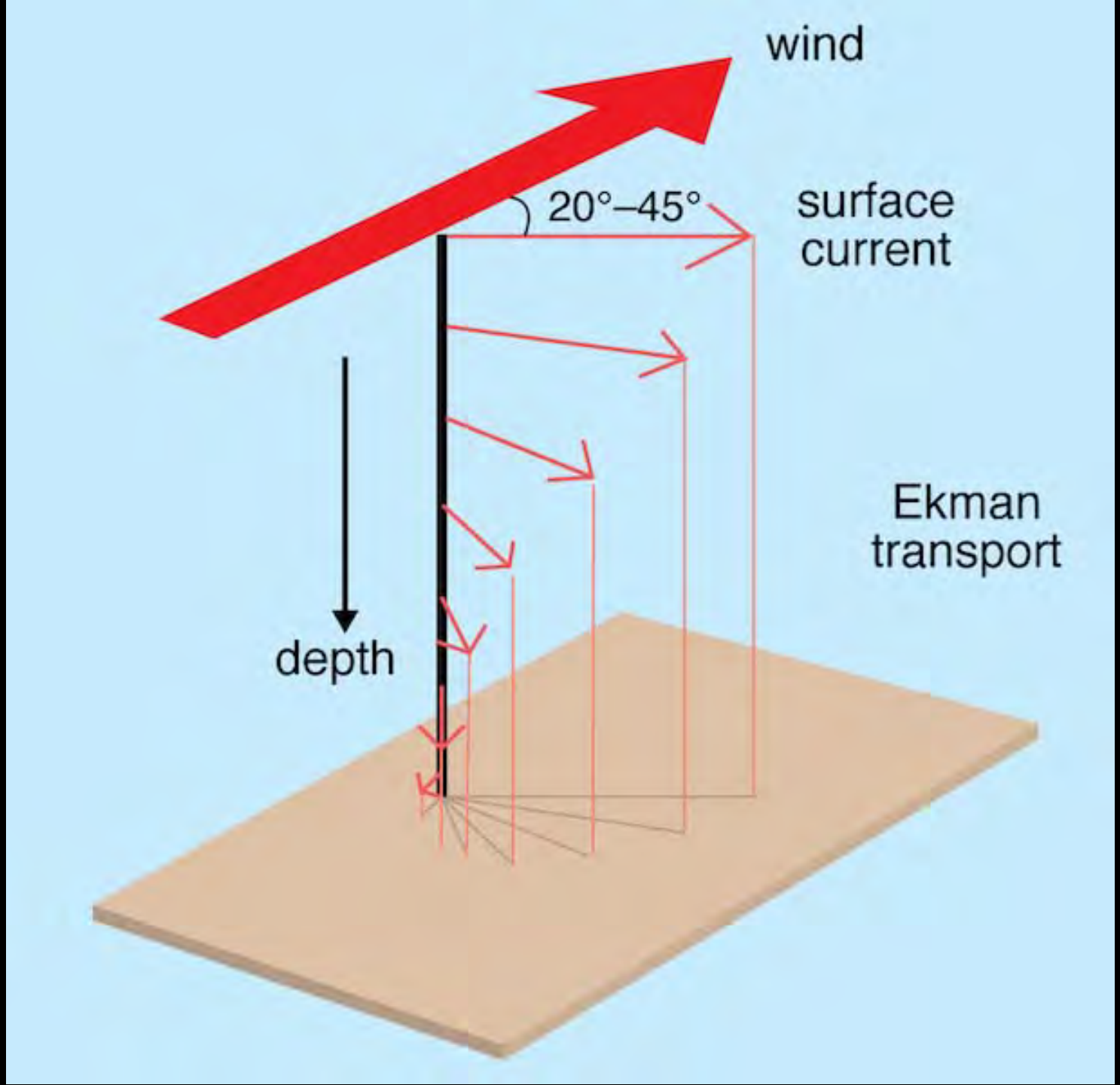


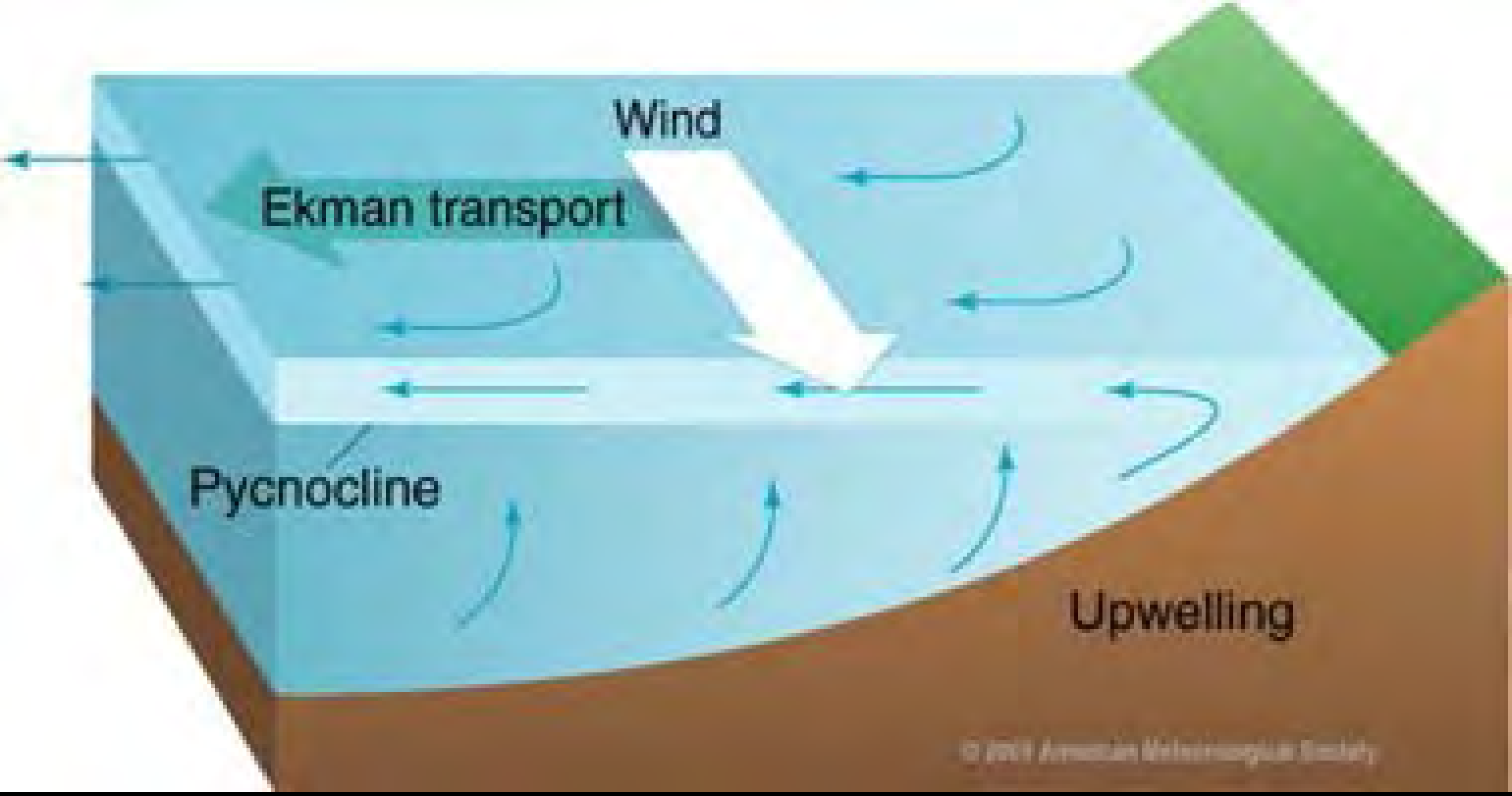

IPL
G37

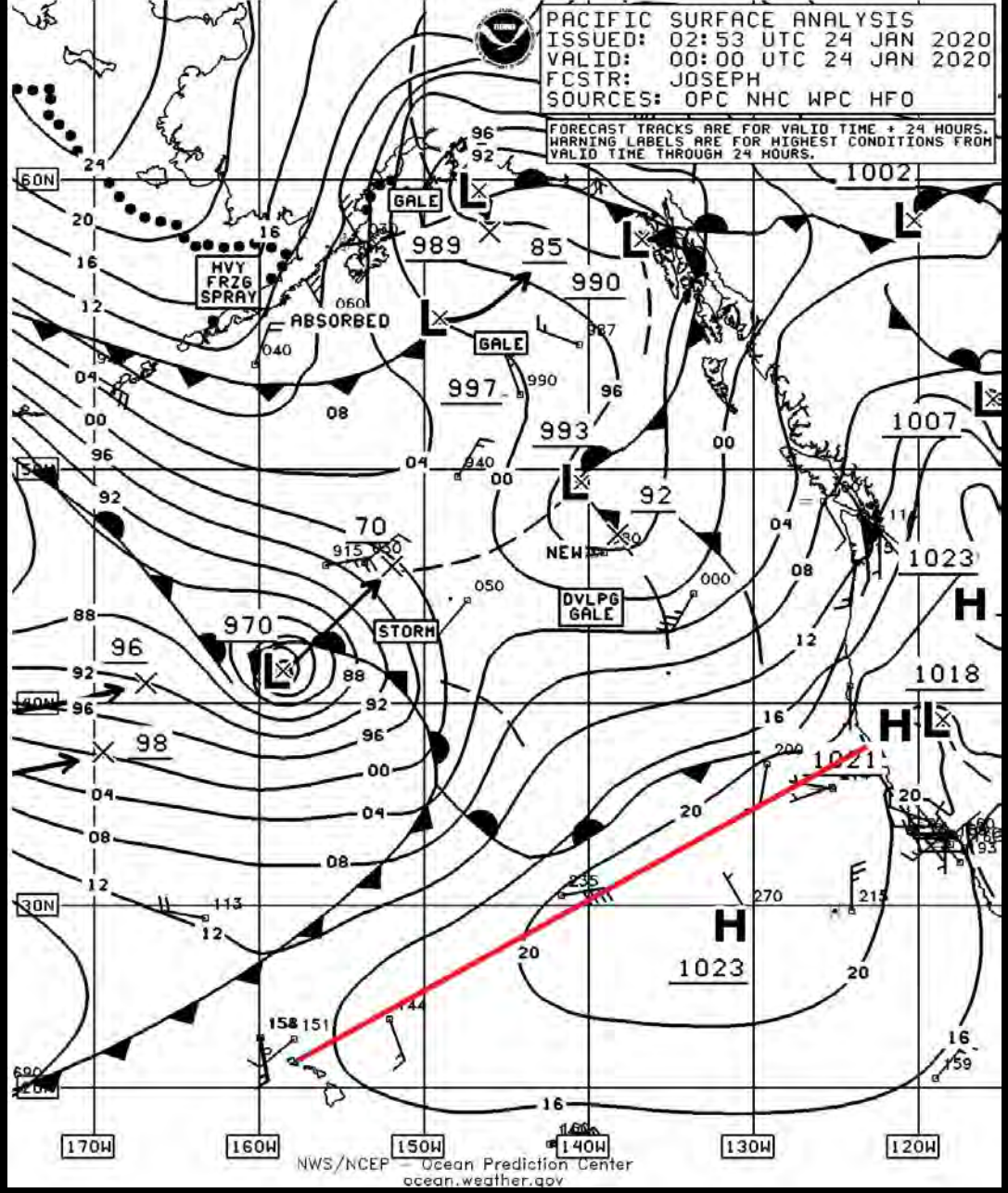

G37

More from
Vagn Walfrid Ekman (1874 – 1954)




wind
20°–45°
surface
current
Ekman
transport
depth


Wind
Ekman transport
Pycnocline
Upwelling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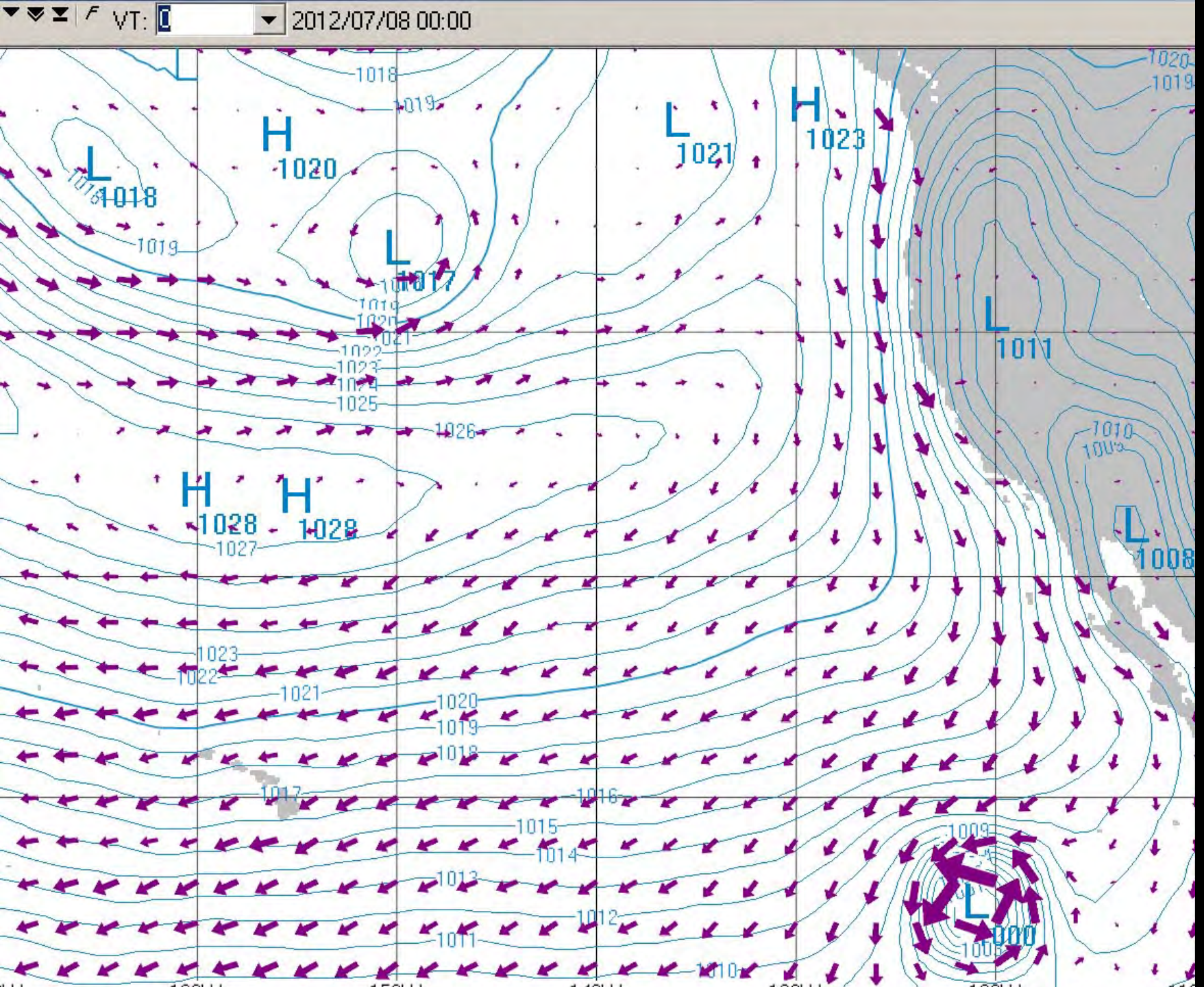
VALID: 00:00 UTC 24 JAN 2020
FCSTR: JOSEPH
SOURCES: OPC NHC WPC HFO
FORECAST TRACKS ARE FOR VALID TIME + 24 HOURS.
WARNING LABELS ARE FOR HIGHEST CONDITIONS FROM VALID TIME THROUGH 24 HOURS.
60N
30N
170W
160W
150W
140W
130W
120W
GALE
HVY FRZG SPRAY
ABSORBED
STORM
NEW
DVLPG GALE
989
990
997
993
970
1002
1007
1023
1018
1021
H
L
NWS/NCEP — Ocean Prediction Center
ocean.weather.gov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H
1020
L
1018
L
1021
H
1023
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1017
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1011
H
1028
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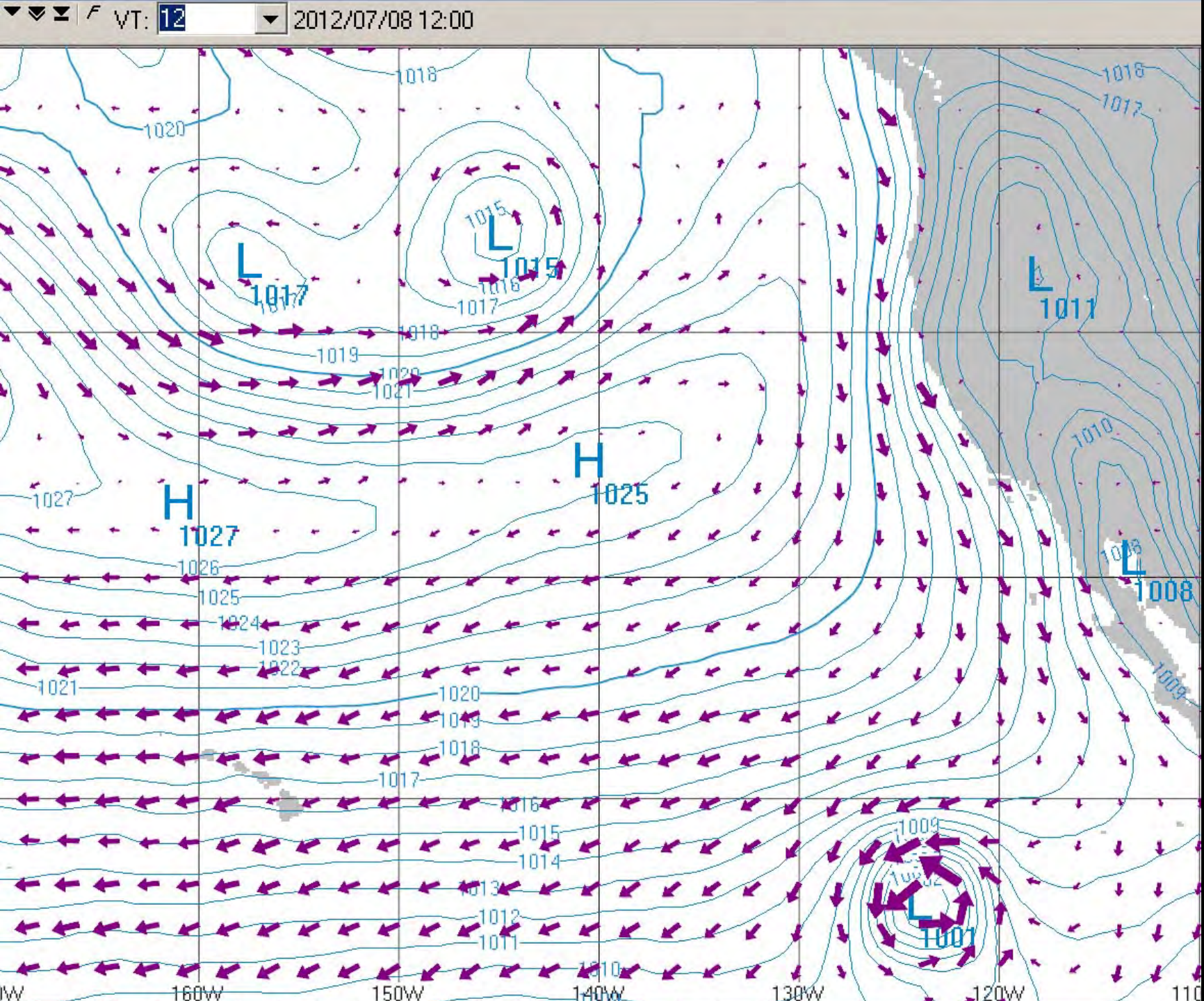
1008
L
1000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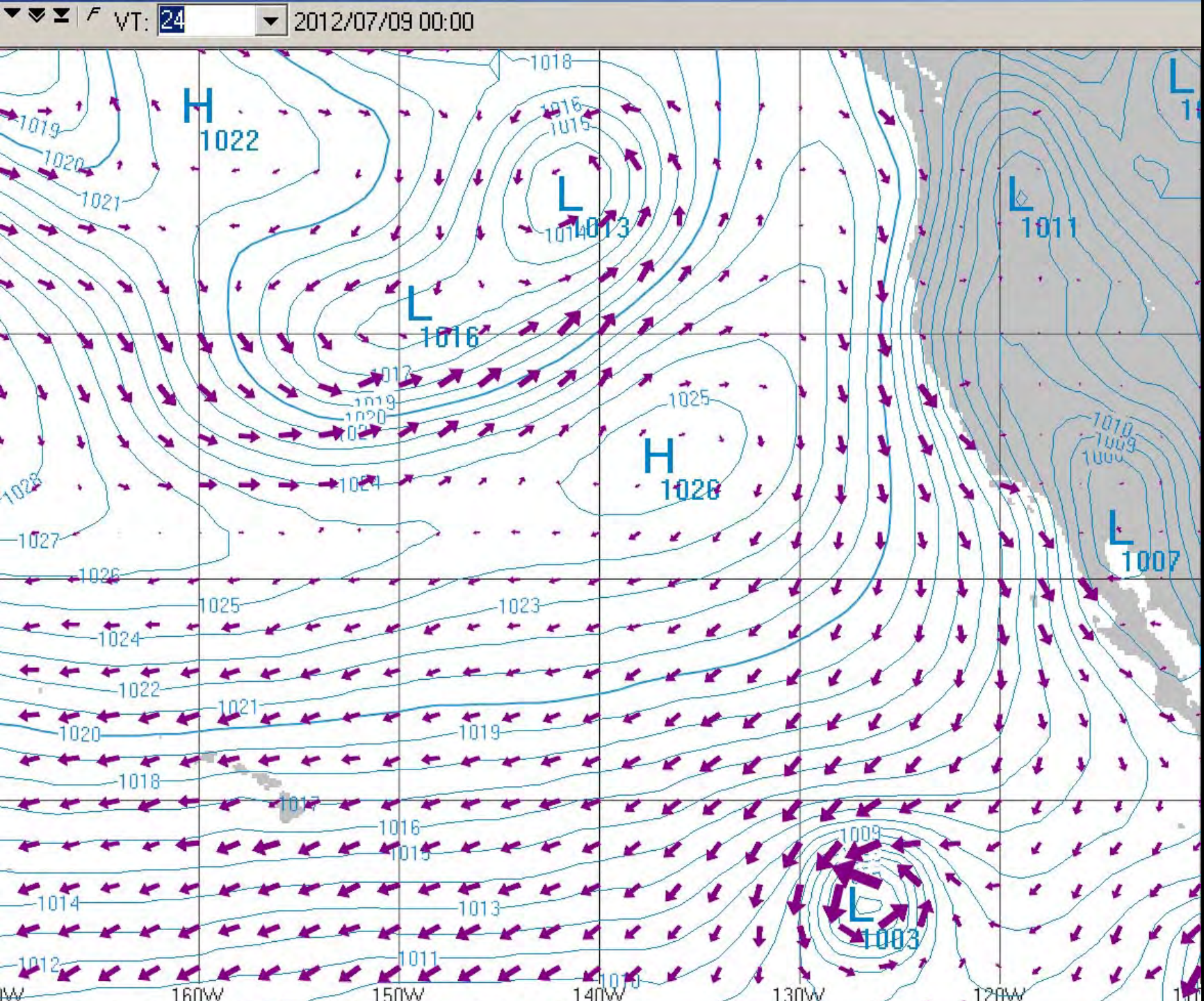
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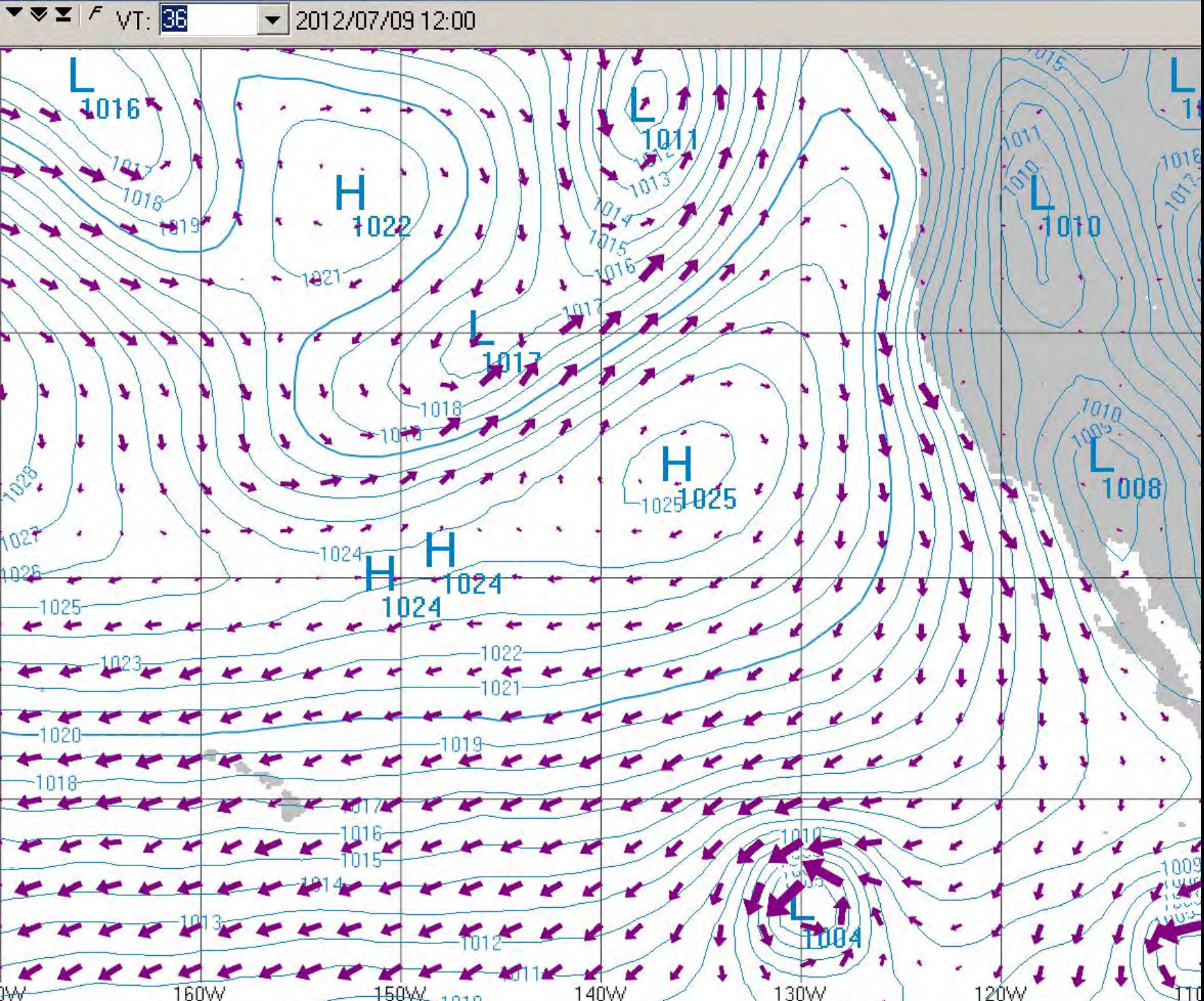
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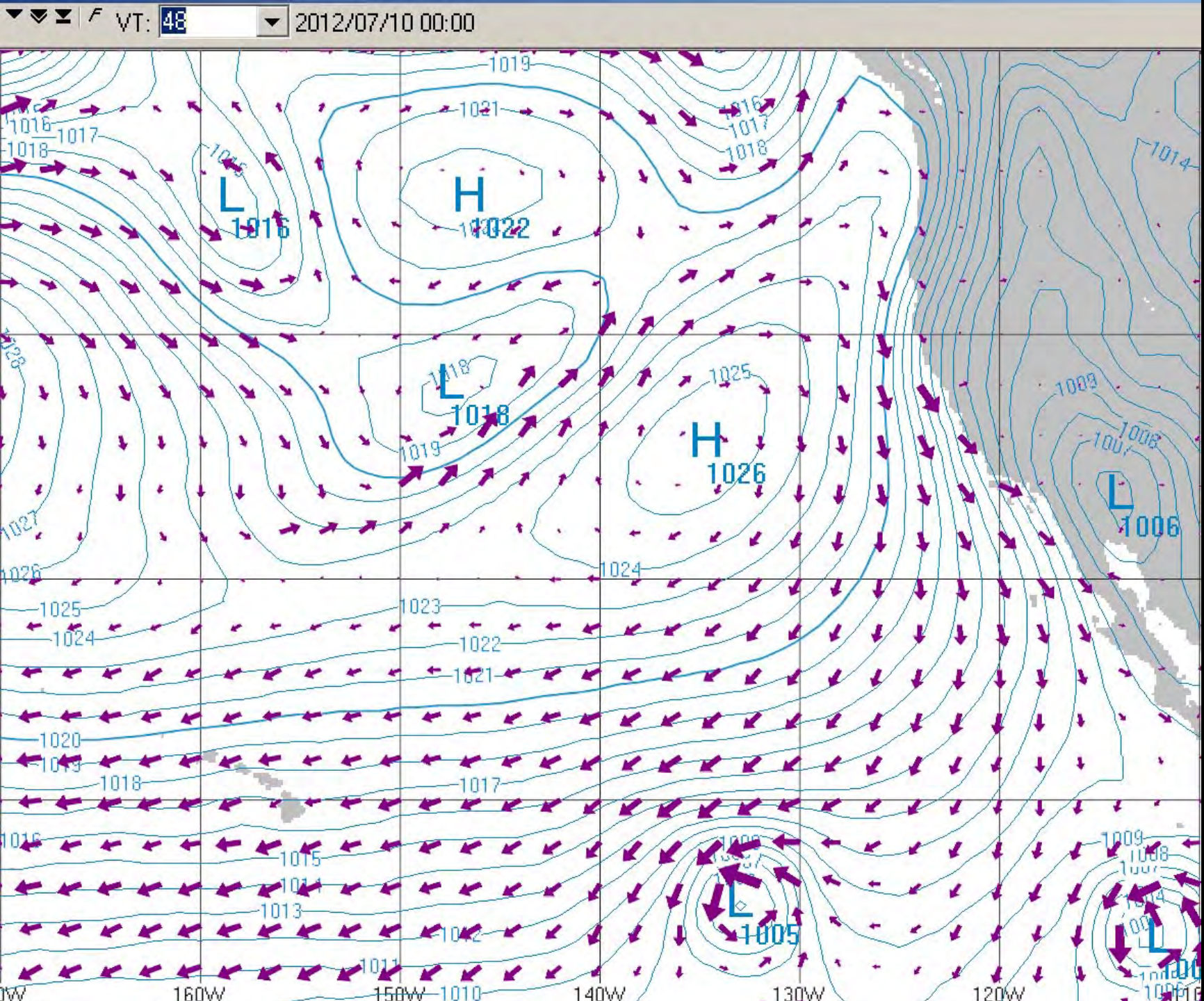
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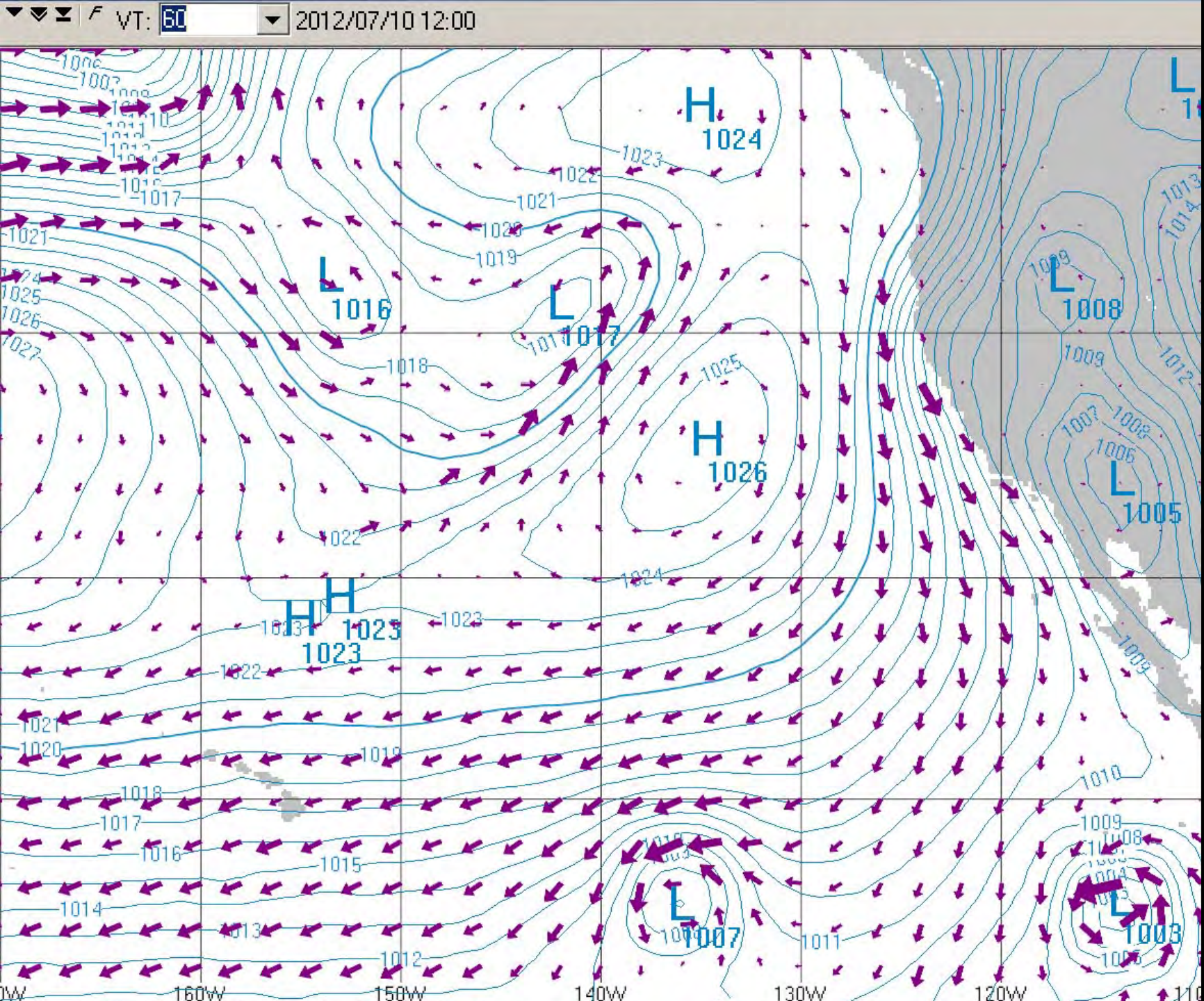
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1016
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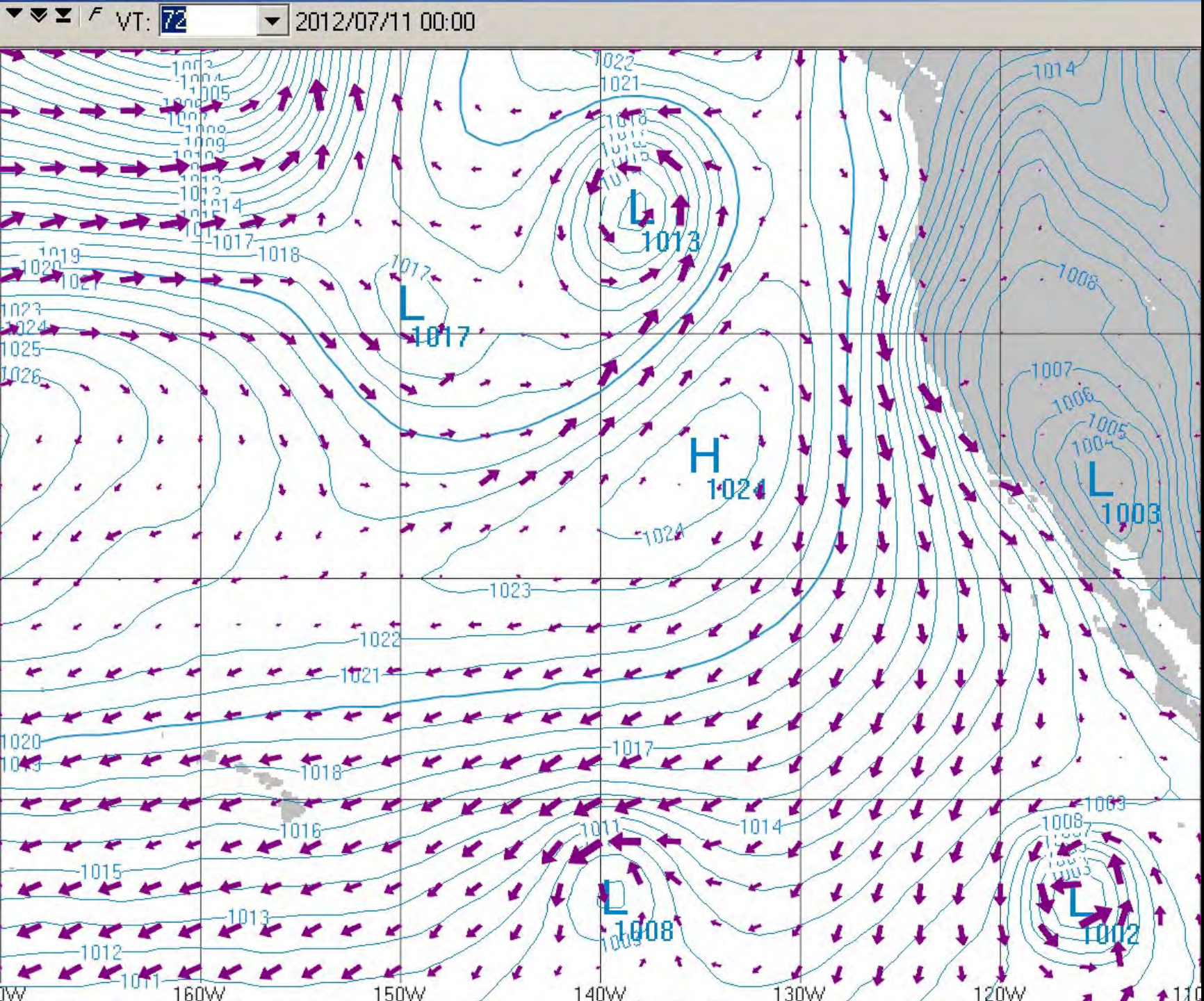
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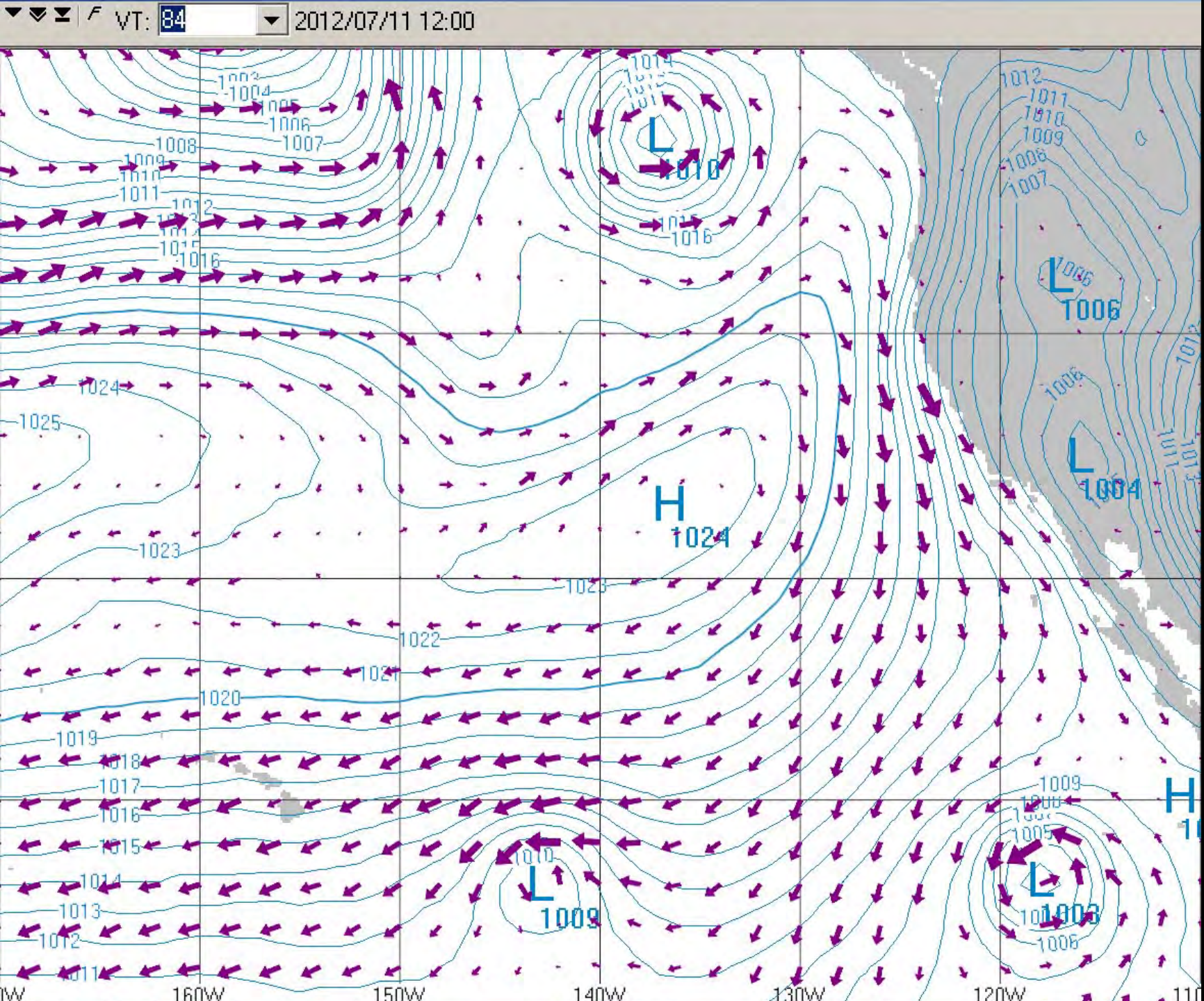
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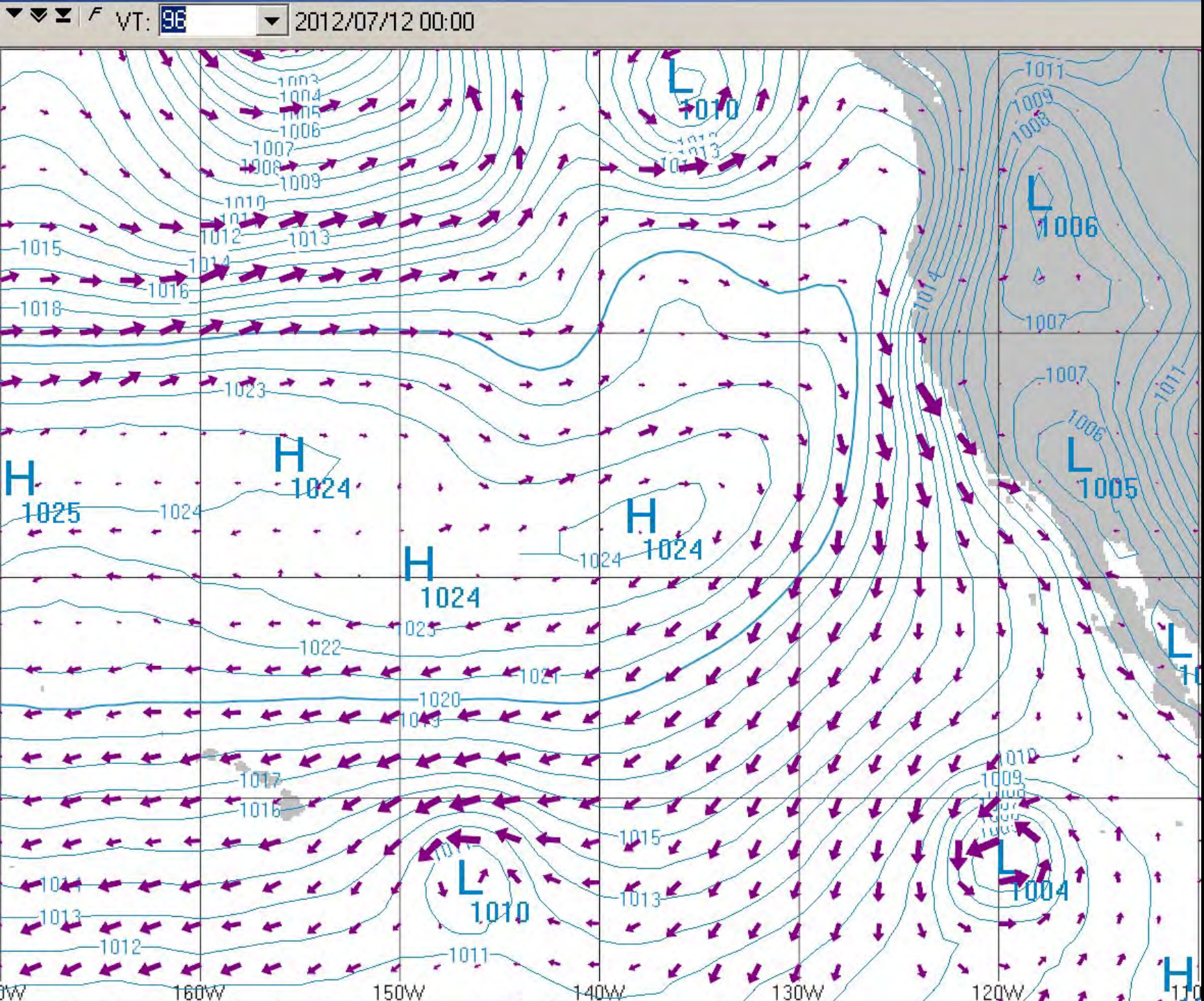
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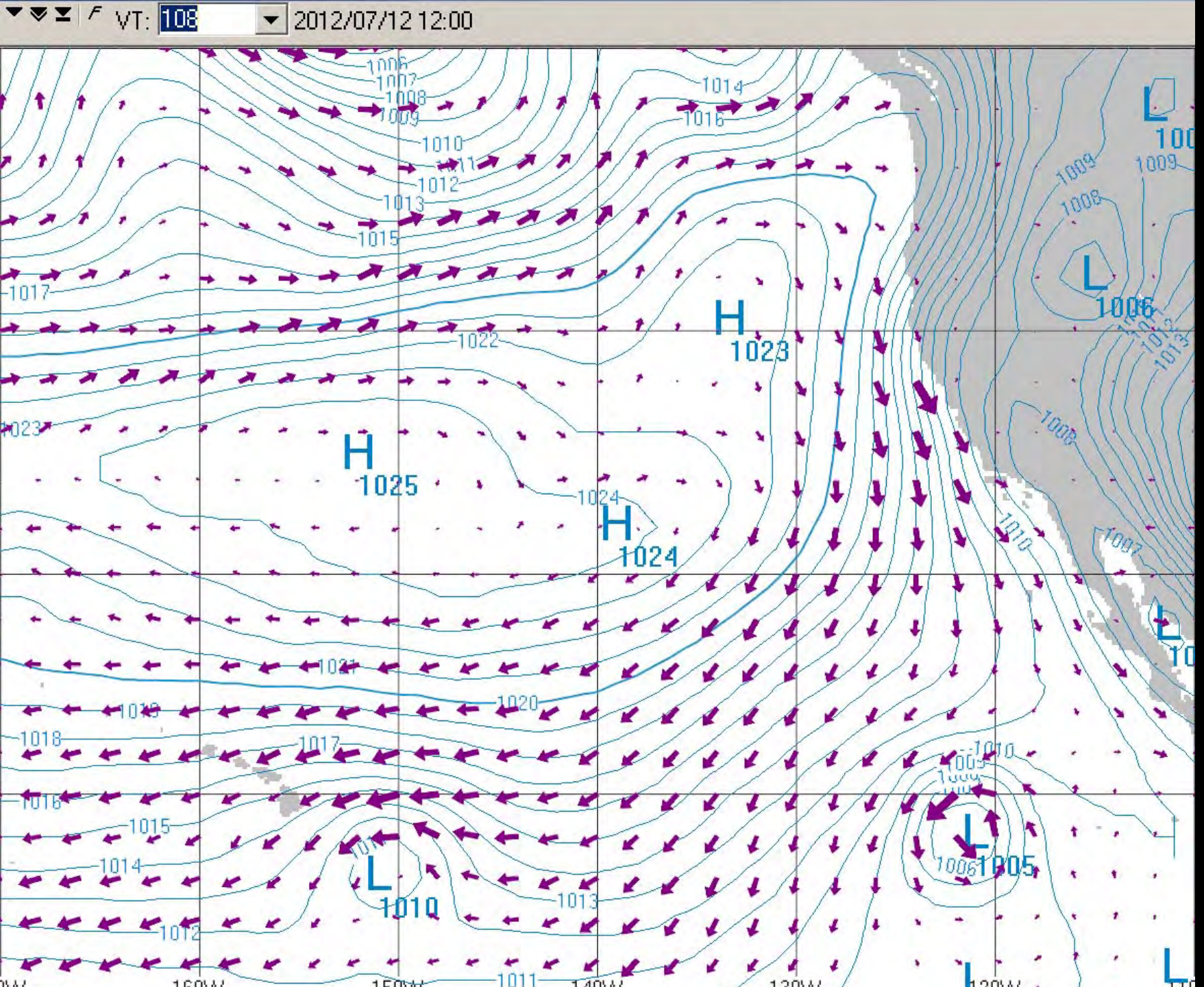
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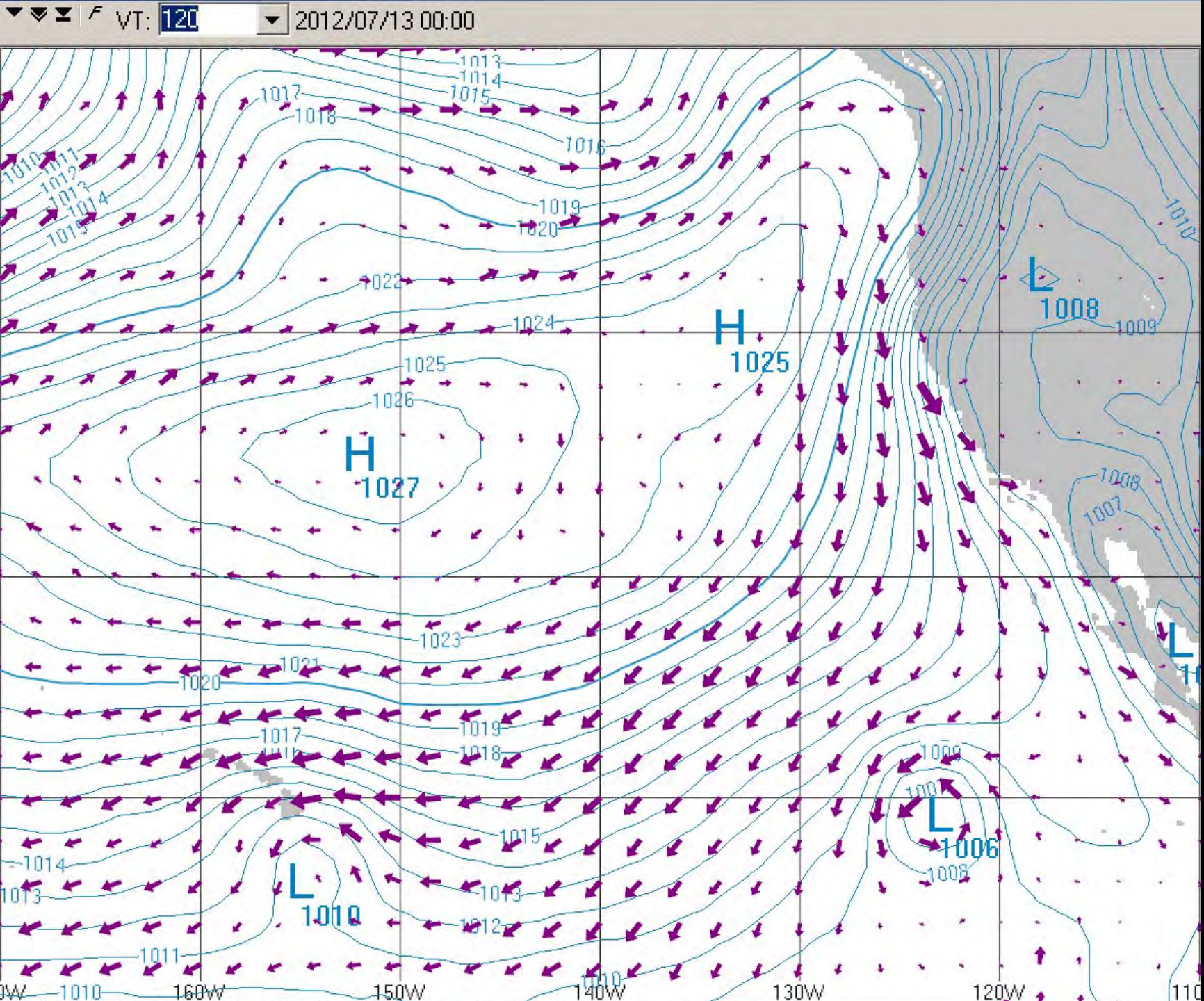
1005
L
1006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1027
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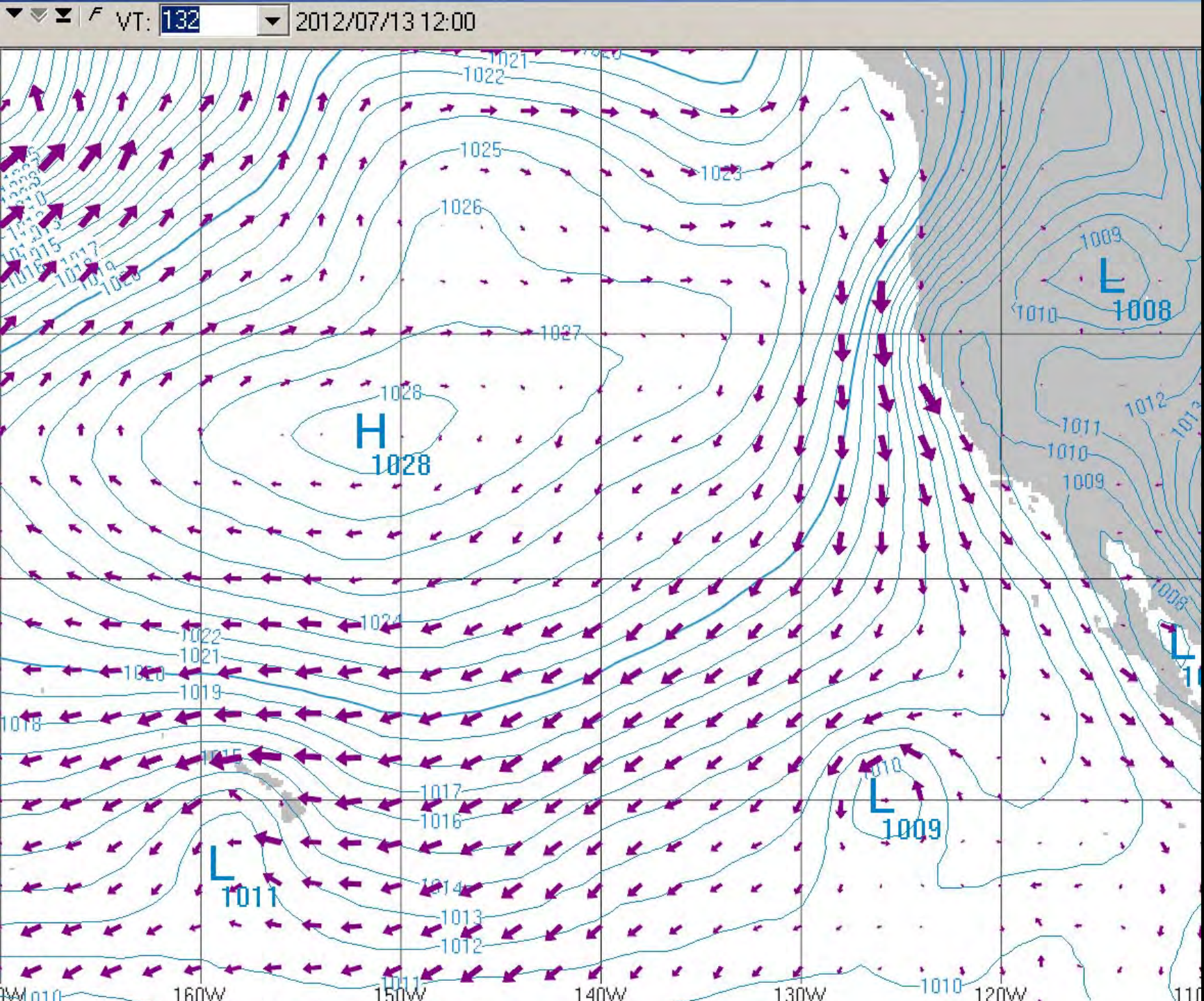
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1028
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1011
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1009
L
1008
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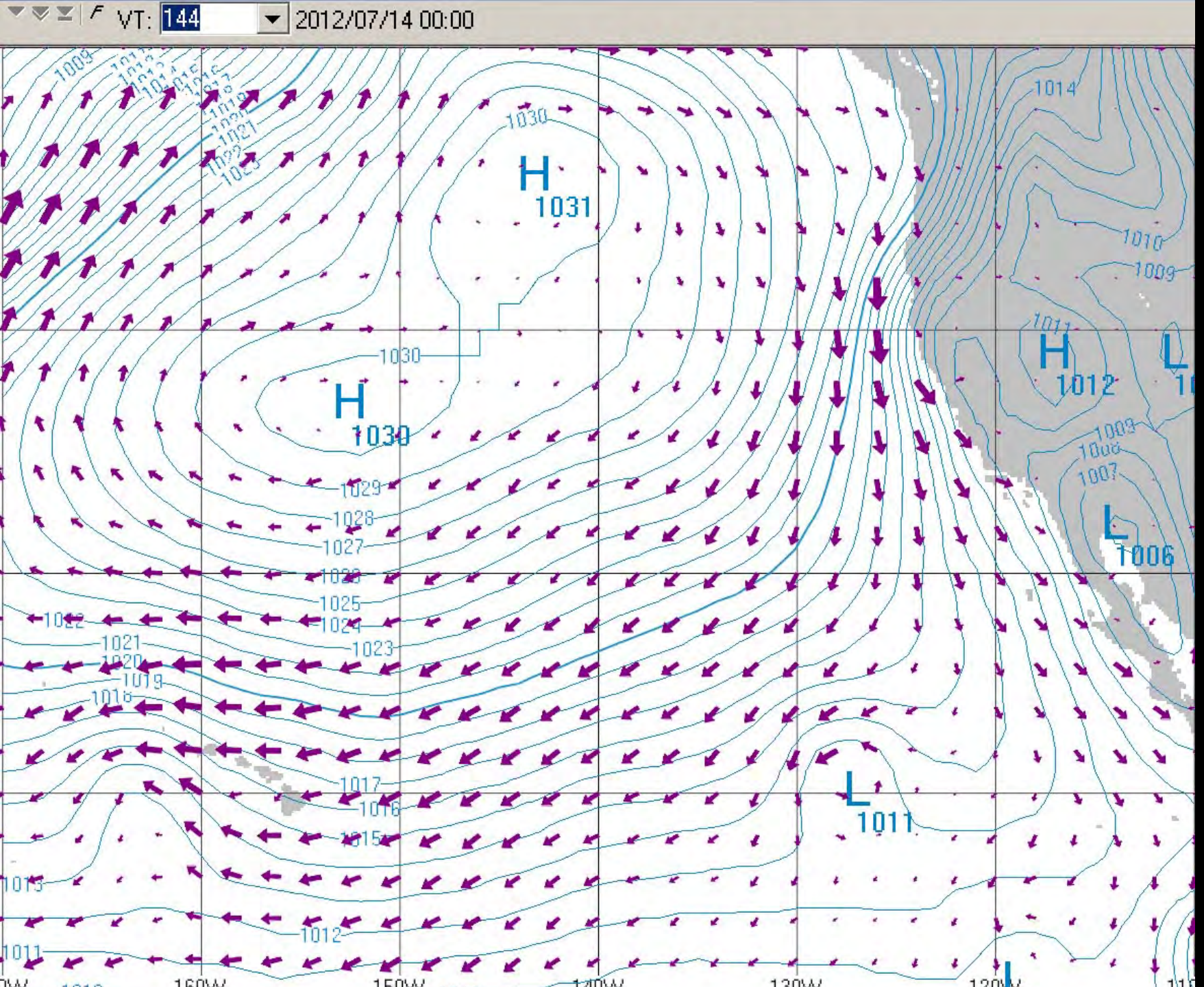
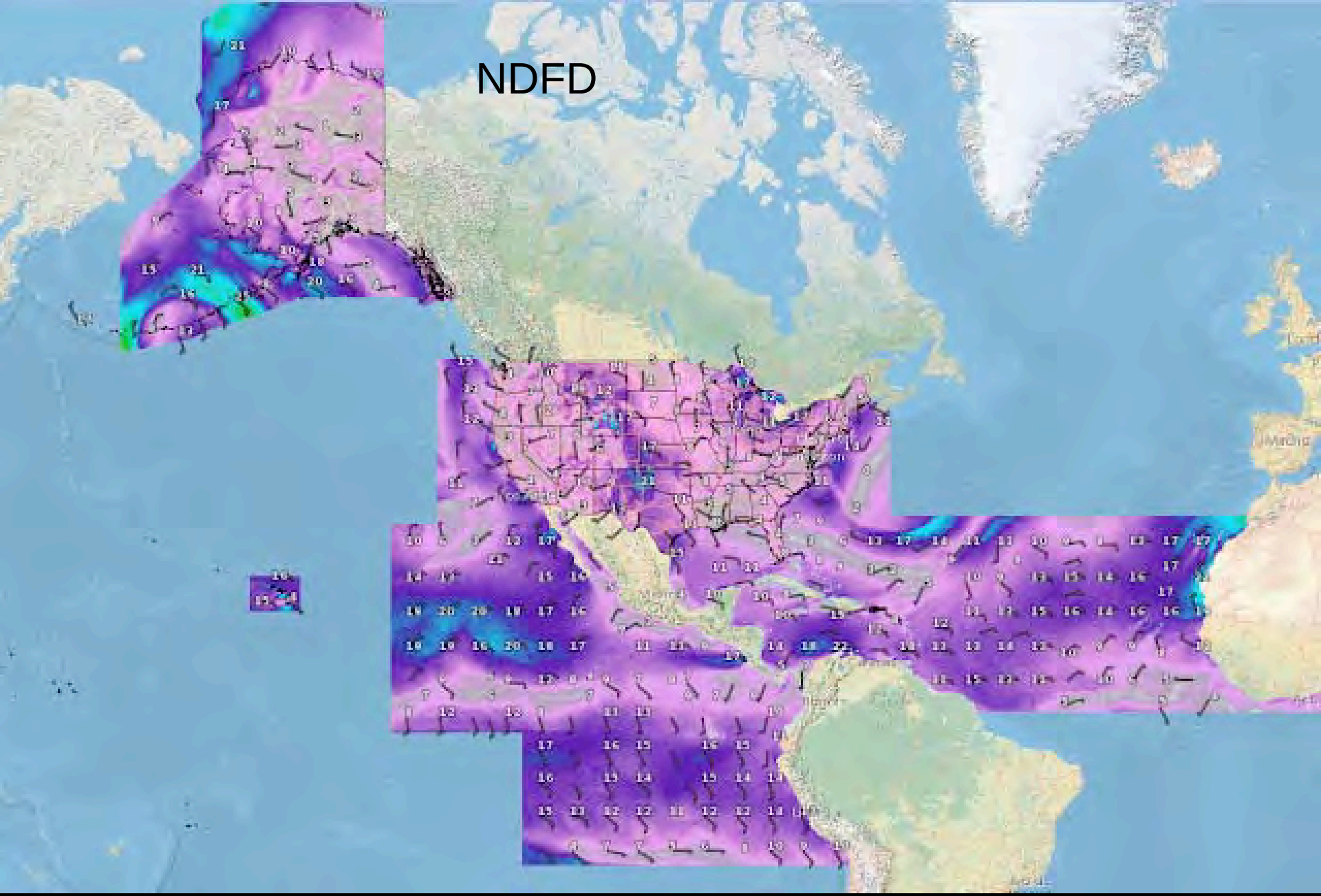
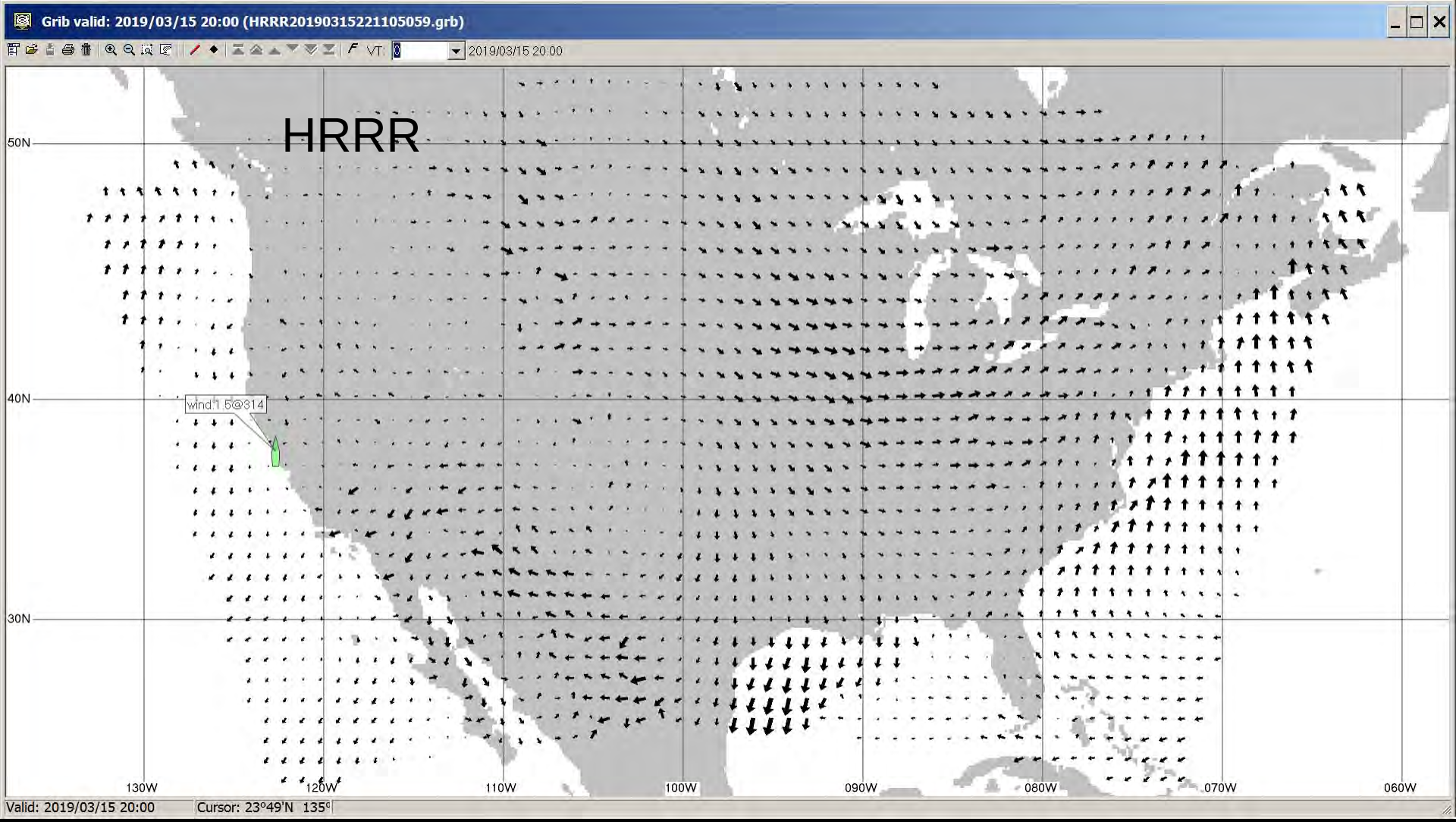
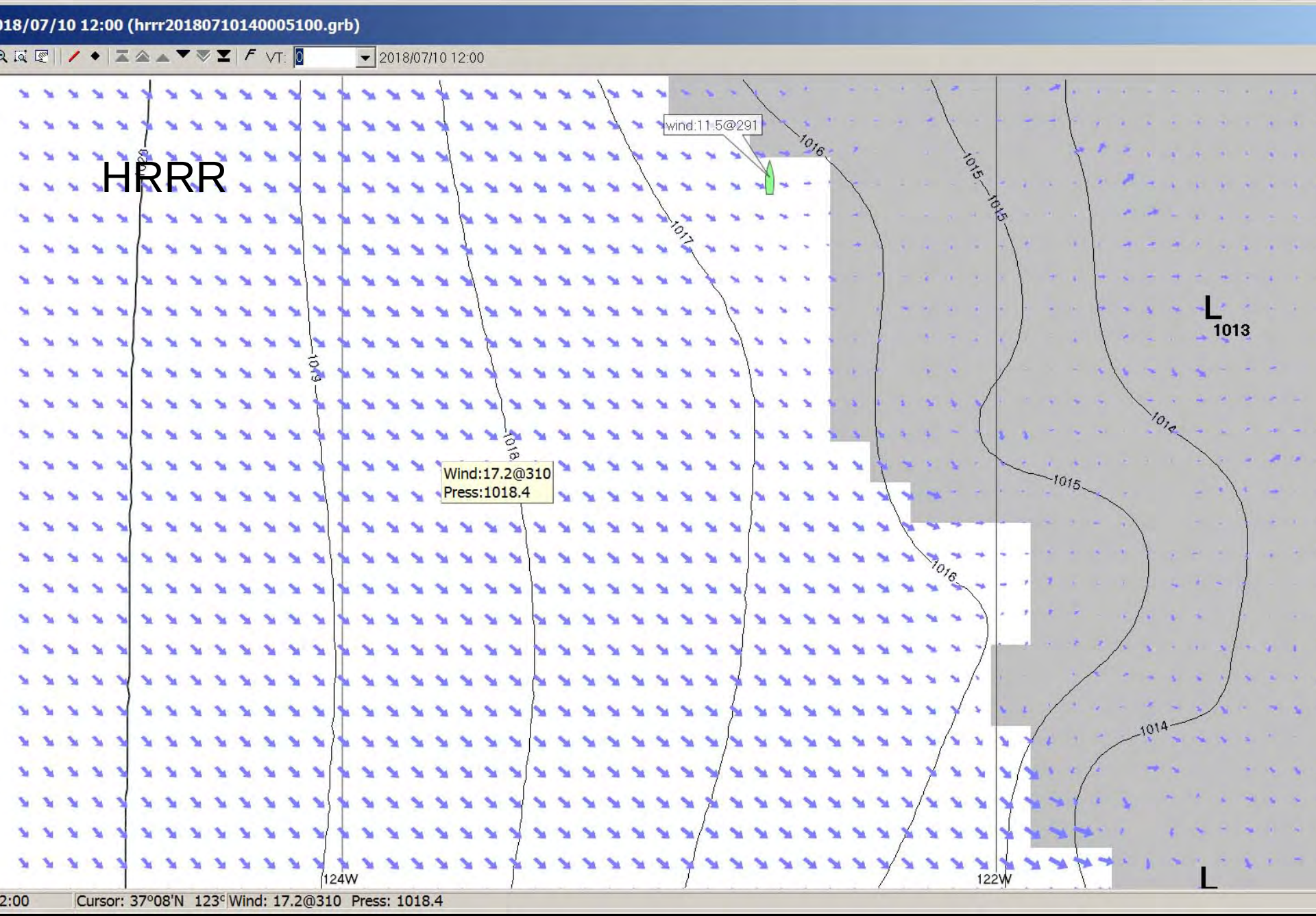
130W
120W


VT: 144
2012/07/14 00:00
H
1031
H
1030
H
1012
L
1011
L
1006
1030
1029
1028
1027
1025
1024
1023
1022
1021
1020
1019
1018
1017
1016
1015
1014
1013
1012
1011
1010
1009
1008
1007

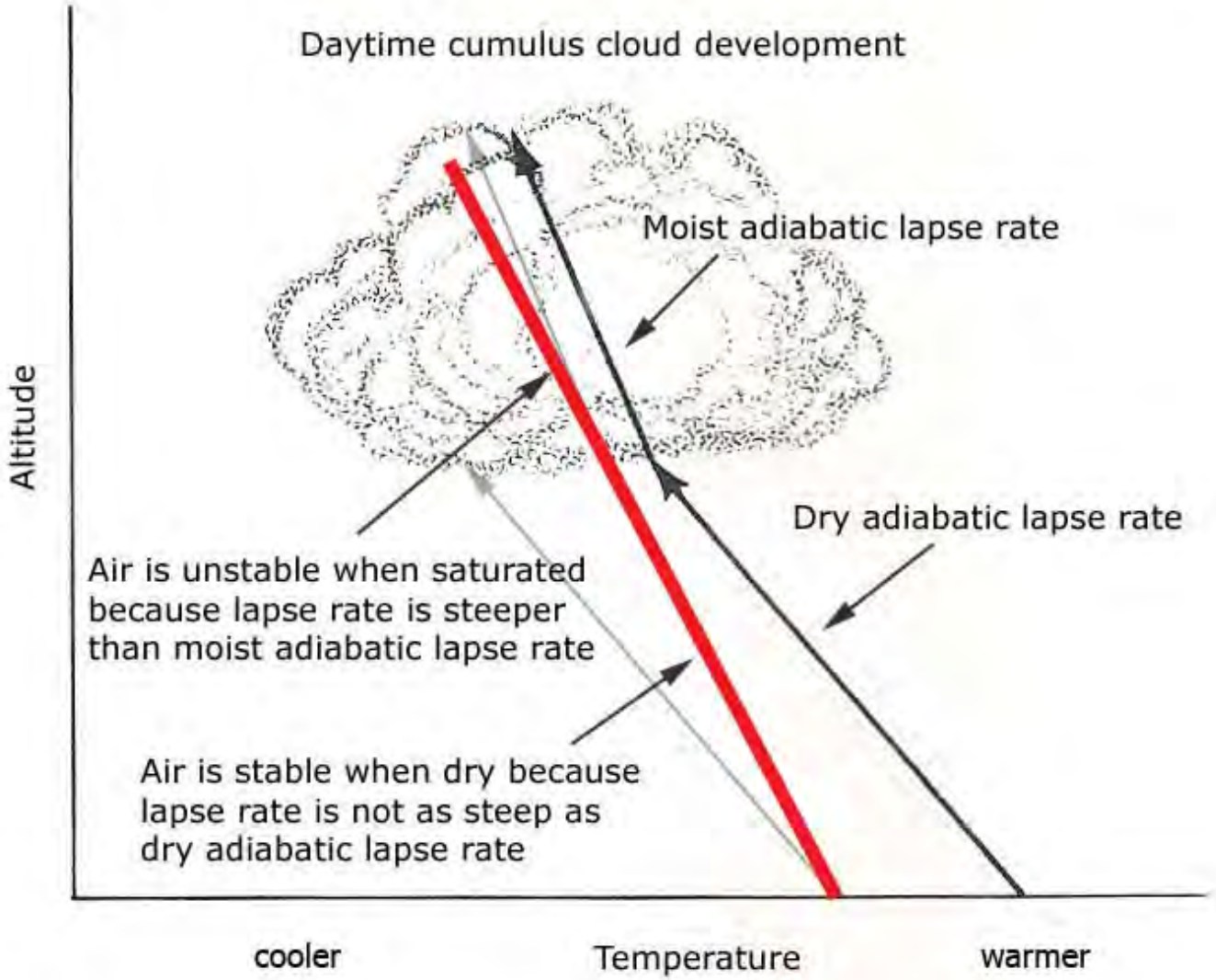
- Forecast update times in Pacific Daylight Time:
- GFS: 04:00, 10:00, 16:00 22:00 PDT
  (10:00 and 22:00 might be more complete model runs)
- NAVGEM: 05:00, 11:00, 17:00 23:00 PDT
- NDFD: 06:00, 12:00, 18:00 24:00 PDT
- HRRR: Hourly updates
- COAMPS: 3-hour intervals (update times not given)

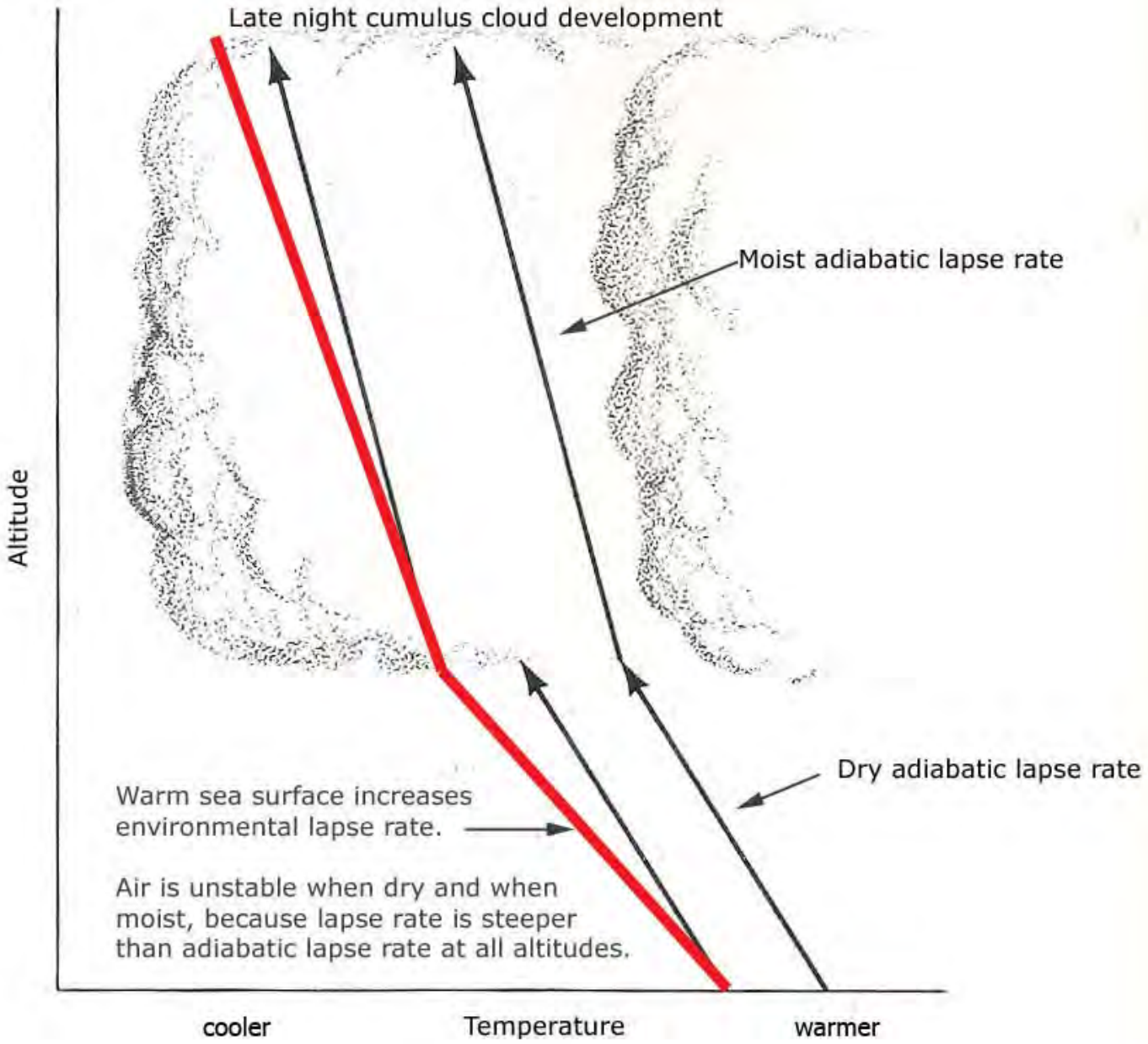

NDFD

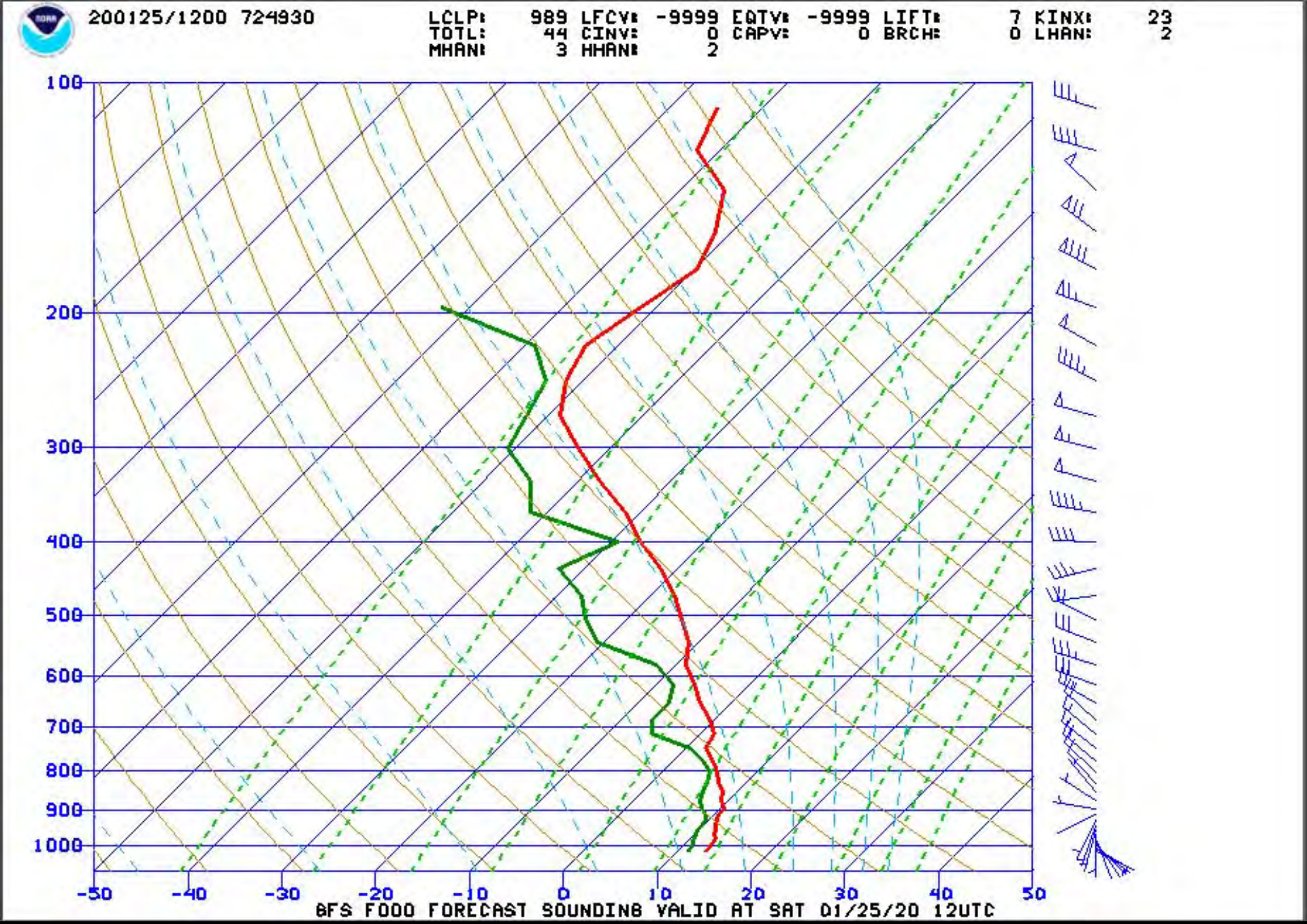

Grib valid: 2019/03/15 20:00 (HRRR20190315221105059.grb)
VT: 0
2019/03/15 20:00
HRRR
50N
40N
30N
wind 1.5@314
130W
120W
110W
100W
090W
080W
070W
060W
Valid: 2019/03/15 20:00
Cursor: 23°49'N 135°

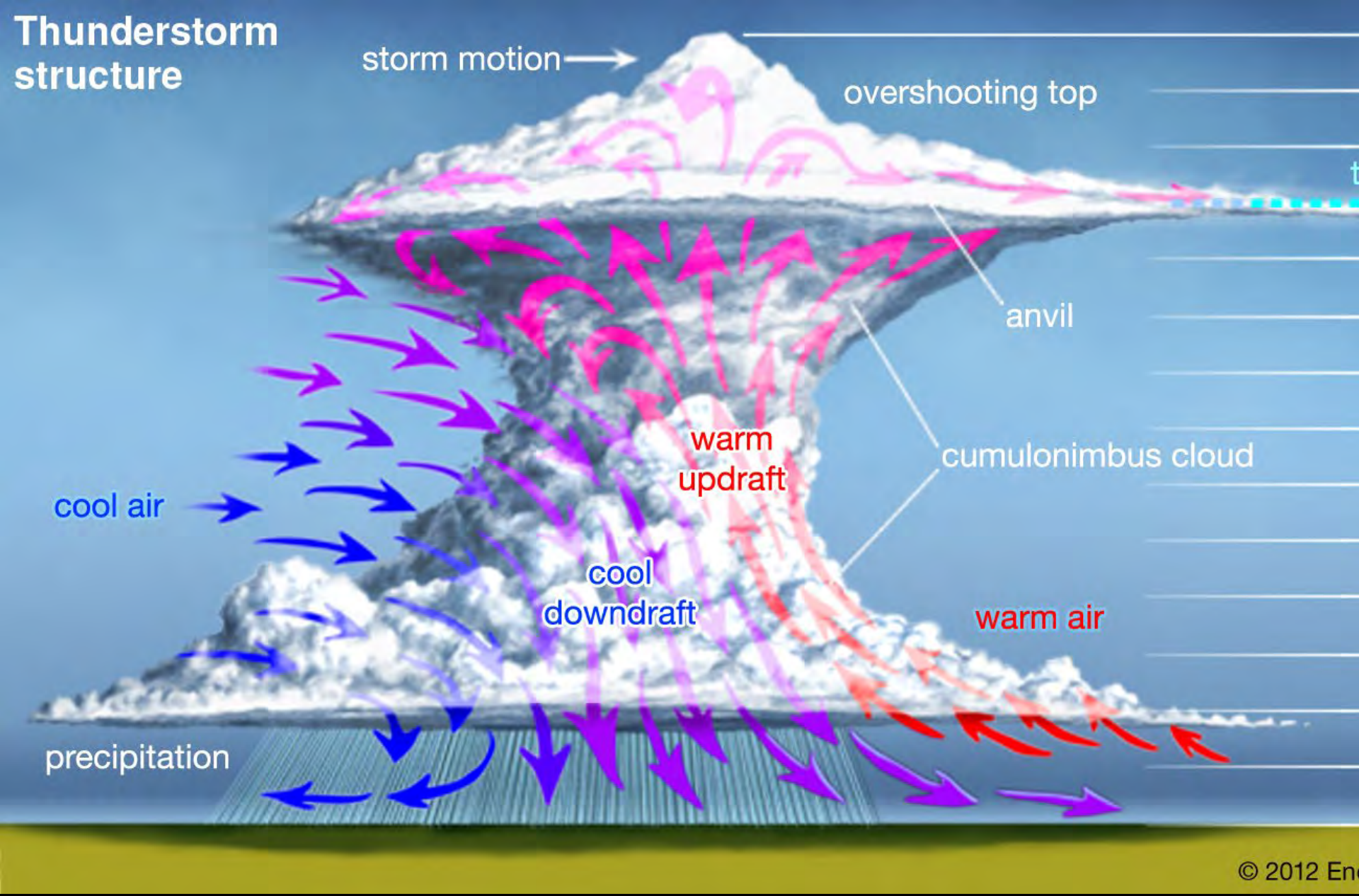

018/07/10 12:00 (hrrr20180710140005100.grb)
VT:
2018/07/10 12:00
HRRR
wind:11.5@291
1016
1015
1015
1017
1013
1019
1018
Wind:17.2@310
Press:1018.4
1015
1014
1016
1014
124W
122W
2:00
Cursor: 37°08'N 123°
Wind: 17.2@310 Press: 1018.4

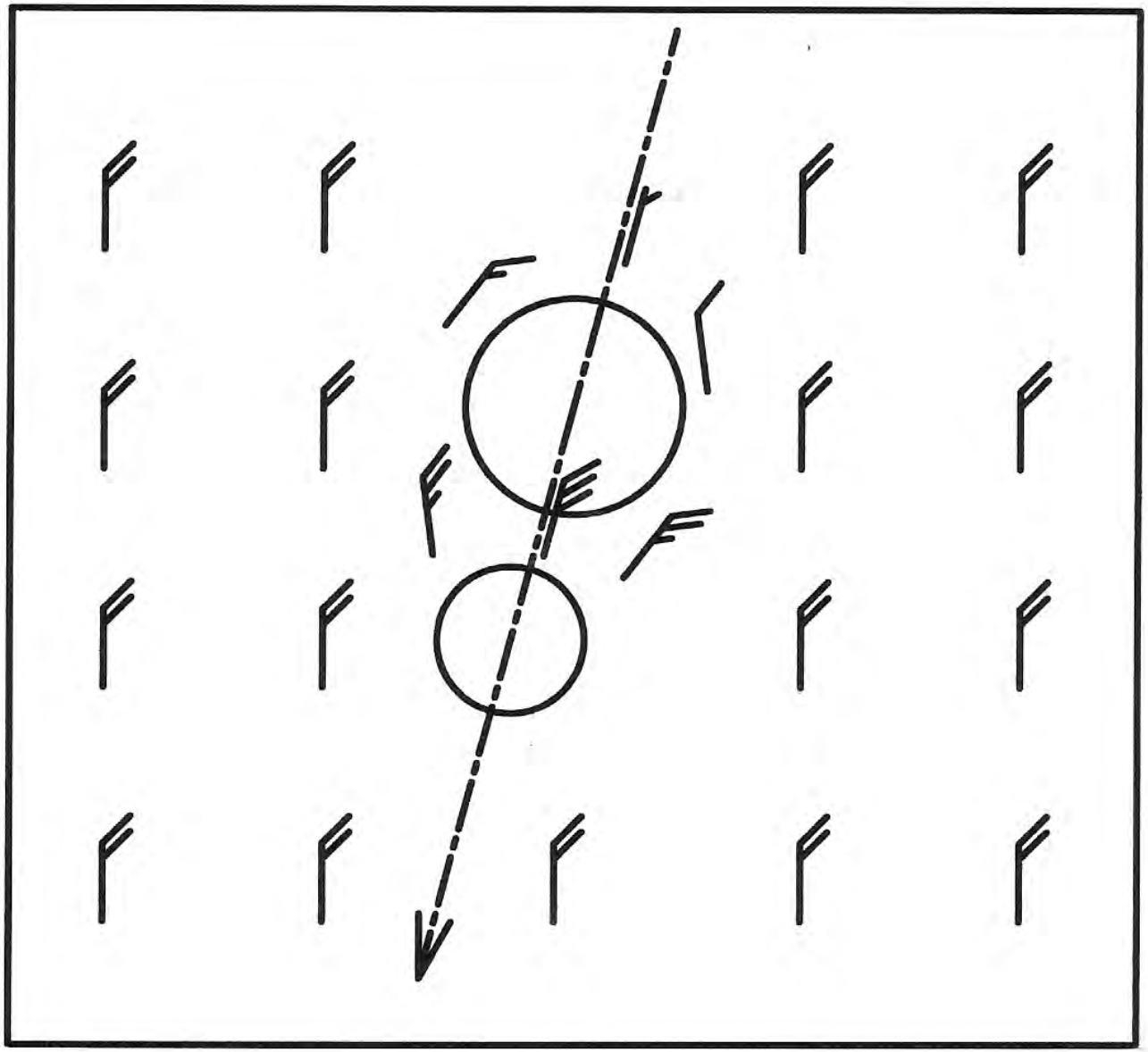
Pase 6: *Squalls!*


Daytime cumulus cloud development
Moist adiabatic lapse rate
Dry adiabatic lapse rate
Air is unstable when saturated because lapse rate is steeper than moist adiabatic lapse rate
Air is stable when dry because lapse rate is not as steep as dry adiabatic lapse rate
Altitude
cooler
Temperature
warmer


Late night cumulus cloud development
Moist adiabatic lapse rate
Dry adiabatic lapse rate
Warm sea surface increases environmental lapse rate.
Air is unstable when dry and when moist, because lapse rate is steeper than adiabatic lapse rate at all altitudes.
Altitude
cooler
Temperature
warmer

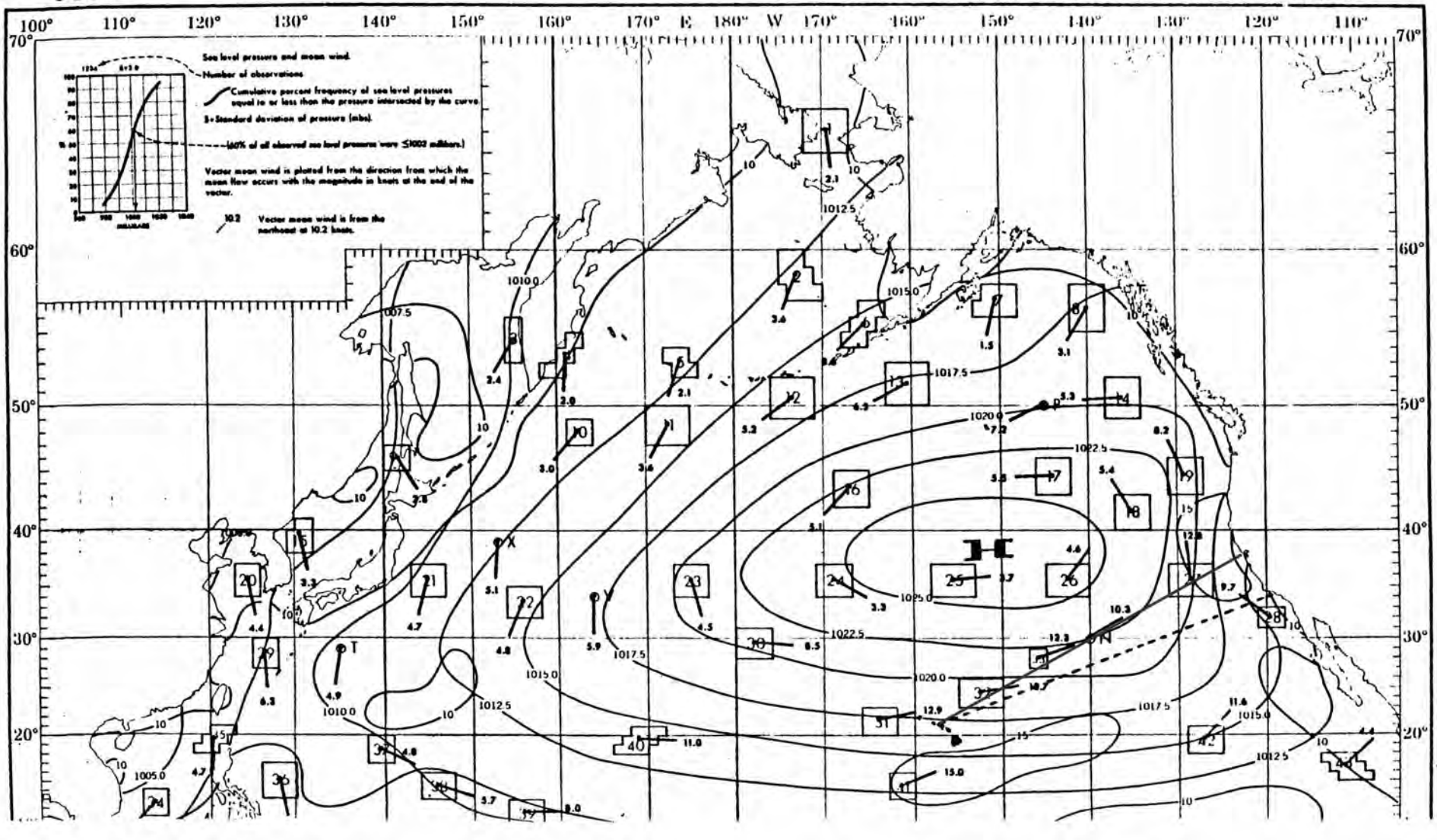

200125/1200 724930
LCLP: 989 LFCV: -9999 EQTV: -9999 LIFT: 7 KINX: 23
TOTL: 44 CINV: 0 CAPV: 0 BRCH: 0 LHAN: 2
MHAN: 3 HHAN: 2
100
200
300
400
500
600
700
800
900
1000
-50
-40
-30
-20
-10
0
10
20
30
40
50
GFS FOOO FORECAST SOUNDING VALID AT SAT 01/25/20 12UTC

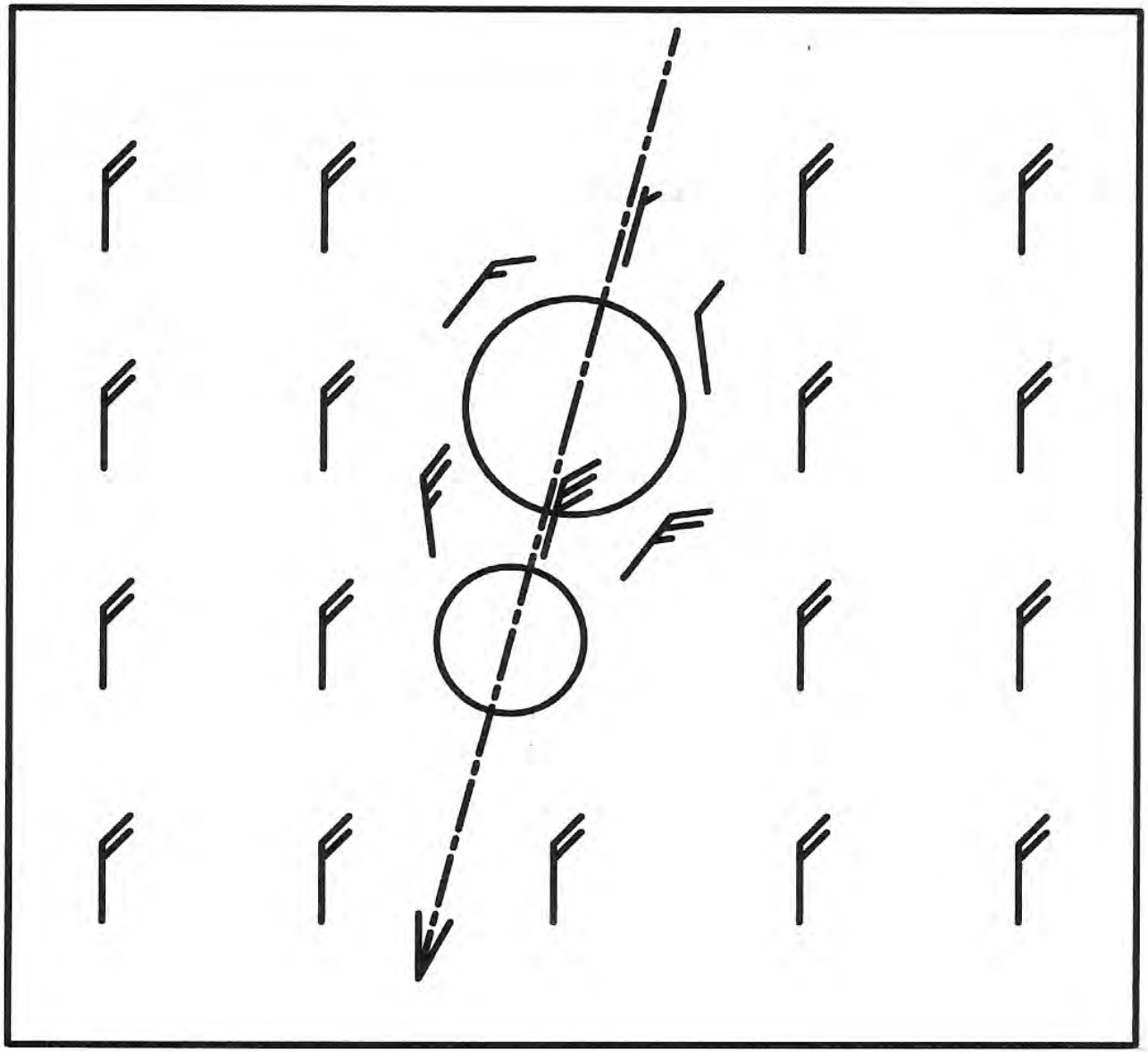

Thunderstorm structure
storm motion
overshooting top
anvil
cumulonimbus cloud
warm updraft
cool air
cool downdraft
warm air
precipitation
© 2012 En

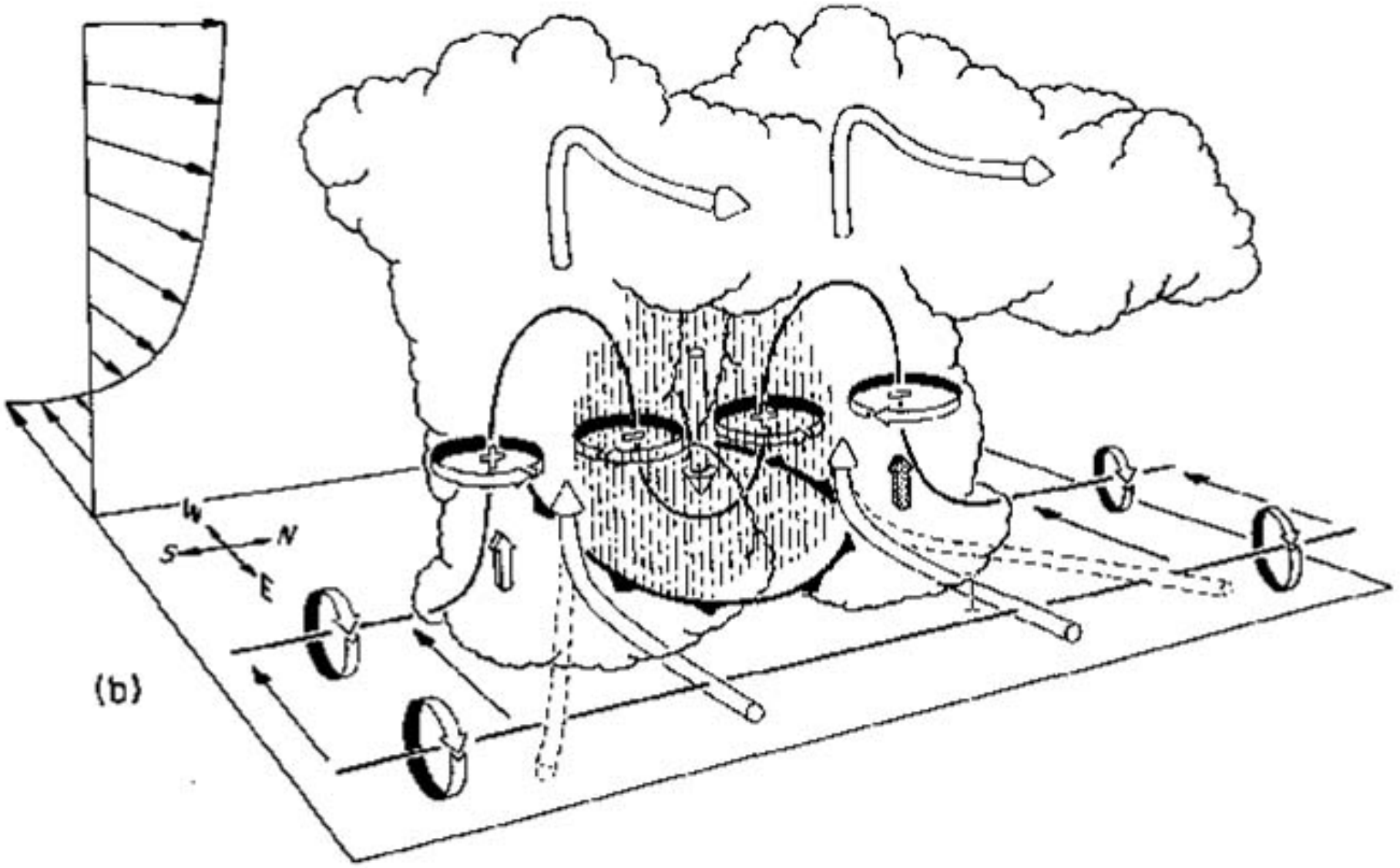


JULY

SEA LEVEL PRESSURE AND MEAN WIND

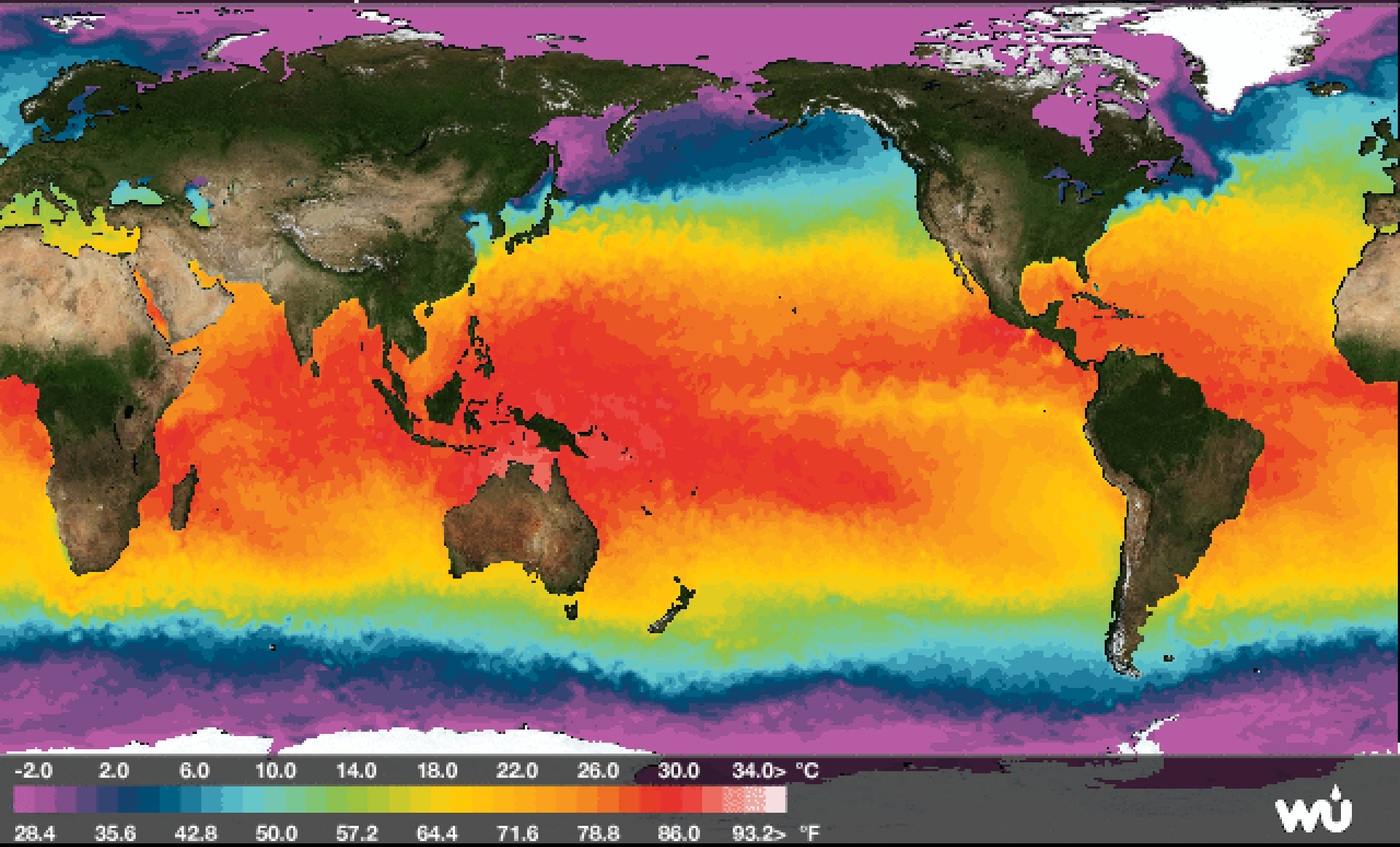





W
N
S
E
(b)

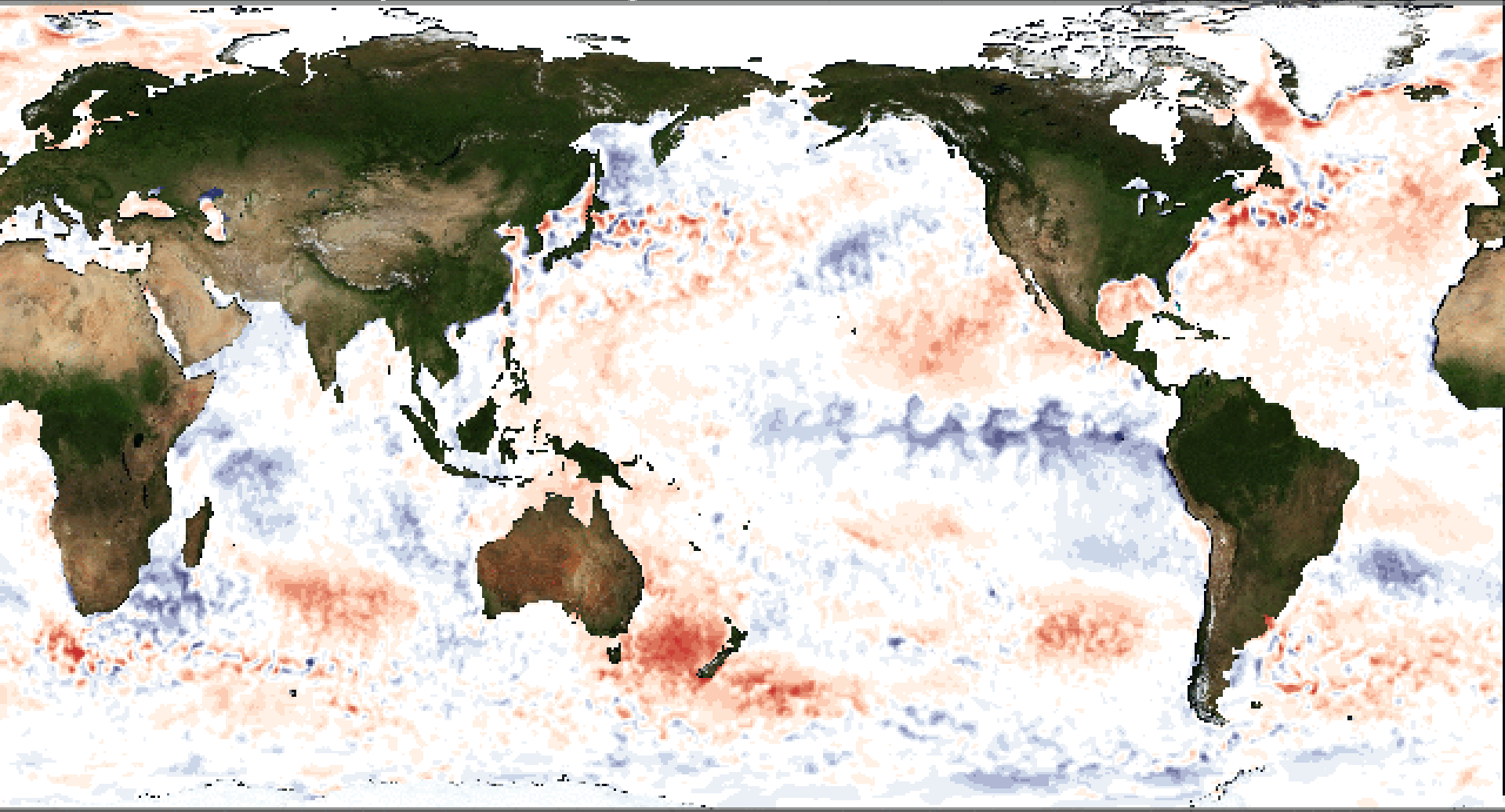
Global Sea Surface Temperature

Generated Fri Mar 15 16:40 UTC 2019



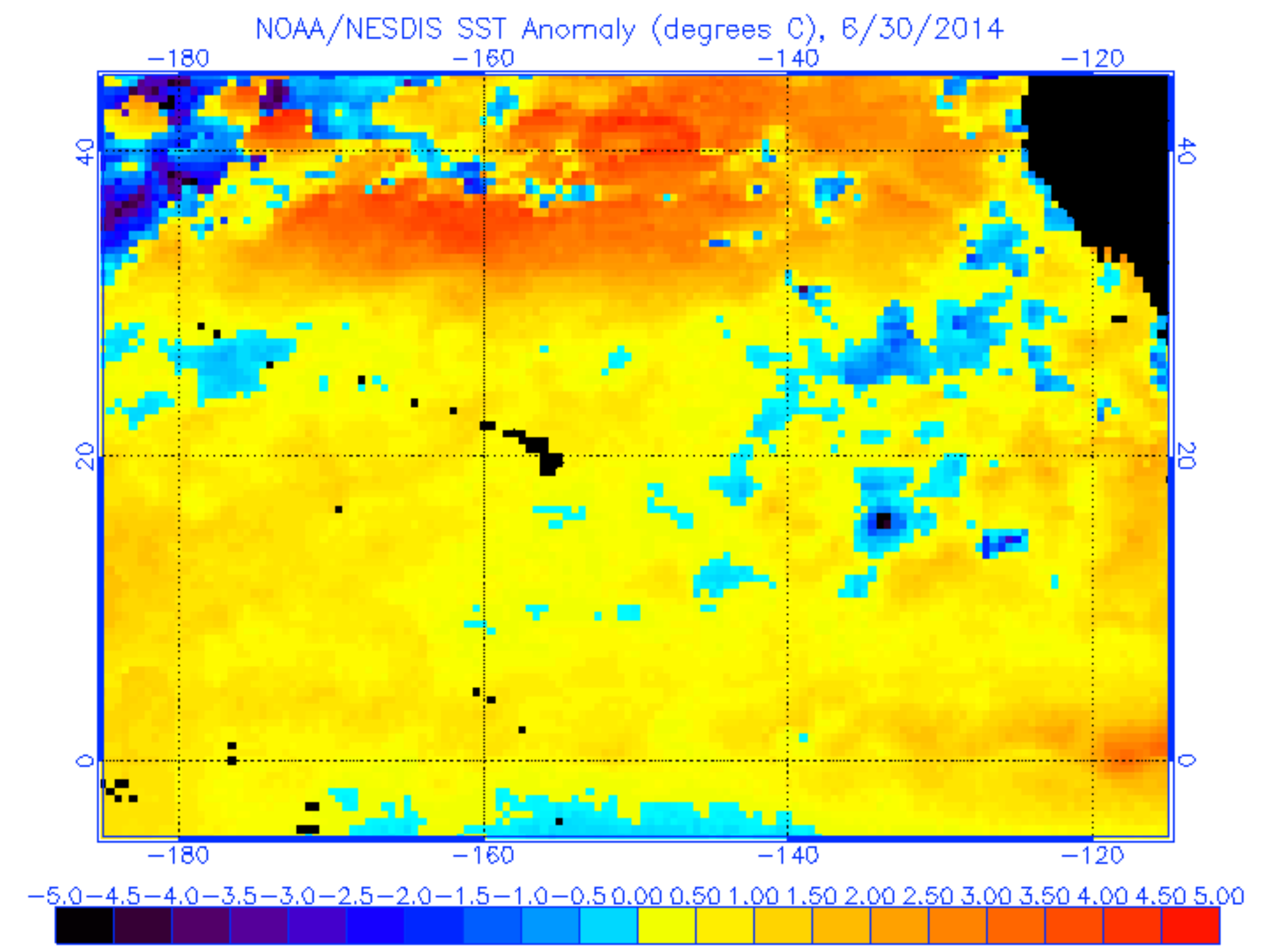
Global Sea Surface Temperature Anomaly

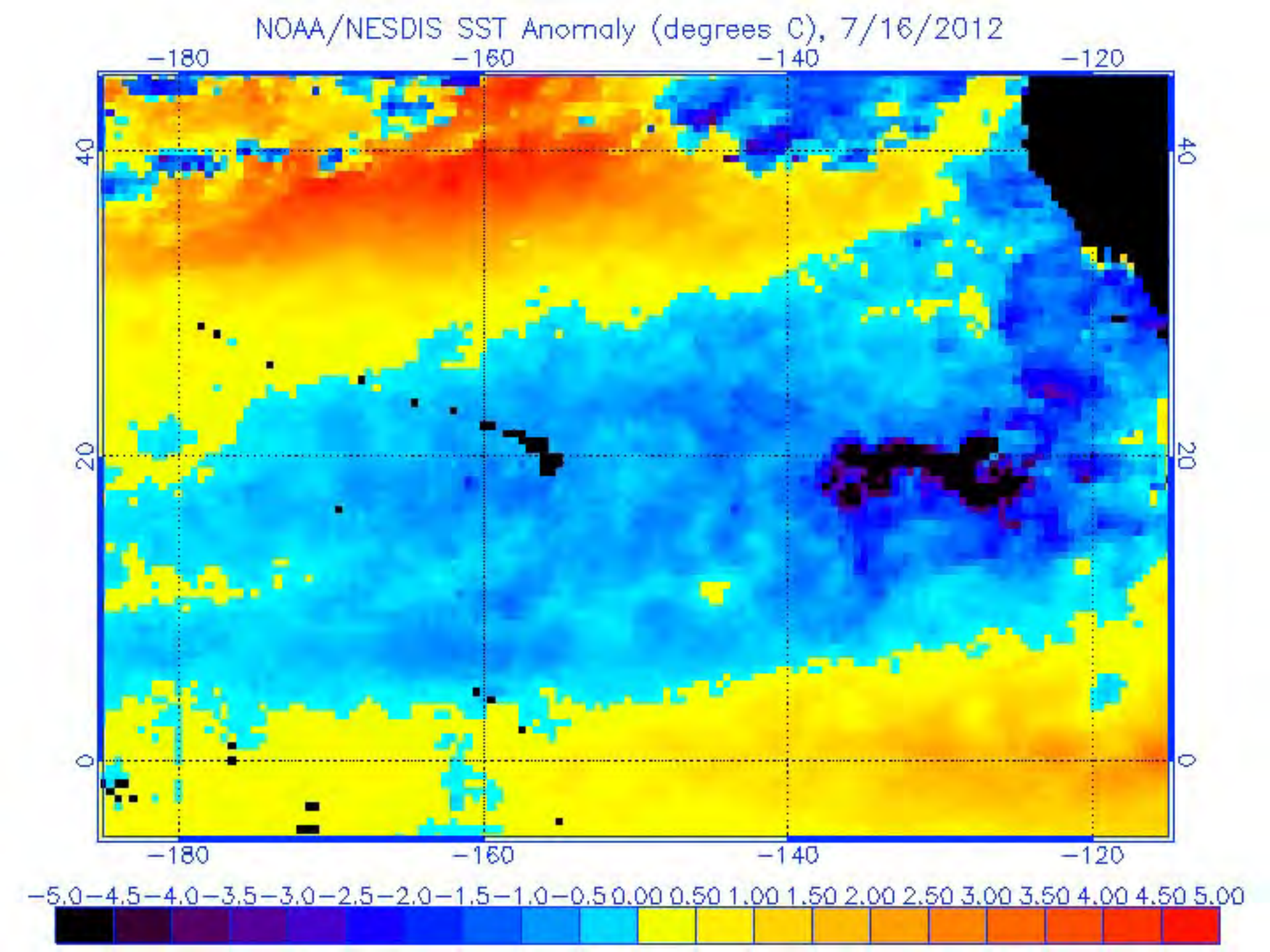
Generated Fri Mar 15 16:40 UTC 2019



-5.0 -4.0 -3.0 -2.0 -1.0 0 1.0 2.0 3.0 4.0 5.0 °C

-9.0 -7.2 -5.4 -3.6 -1.8 0 1.8 3.6 5.4 7.2 9.0 °F


NOAA/NESDIS SST Anomaly (degrees C), 6/30/2014
−180
−160
−140
−120
40
20
0
−5.0 −4.5 −4.0 −3.5 −3.0 −2.5 −2.0 −1.5 −1.0 −0.5 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00

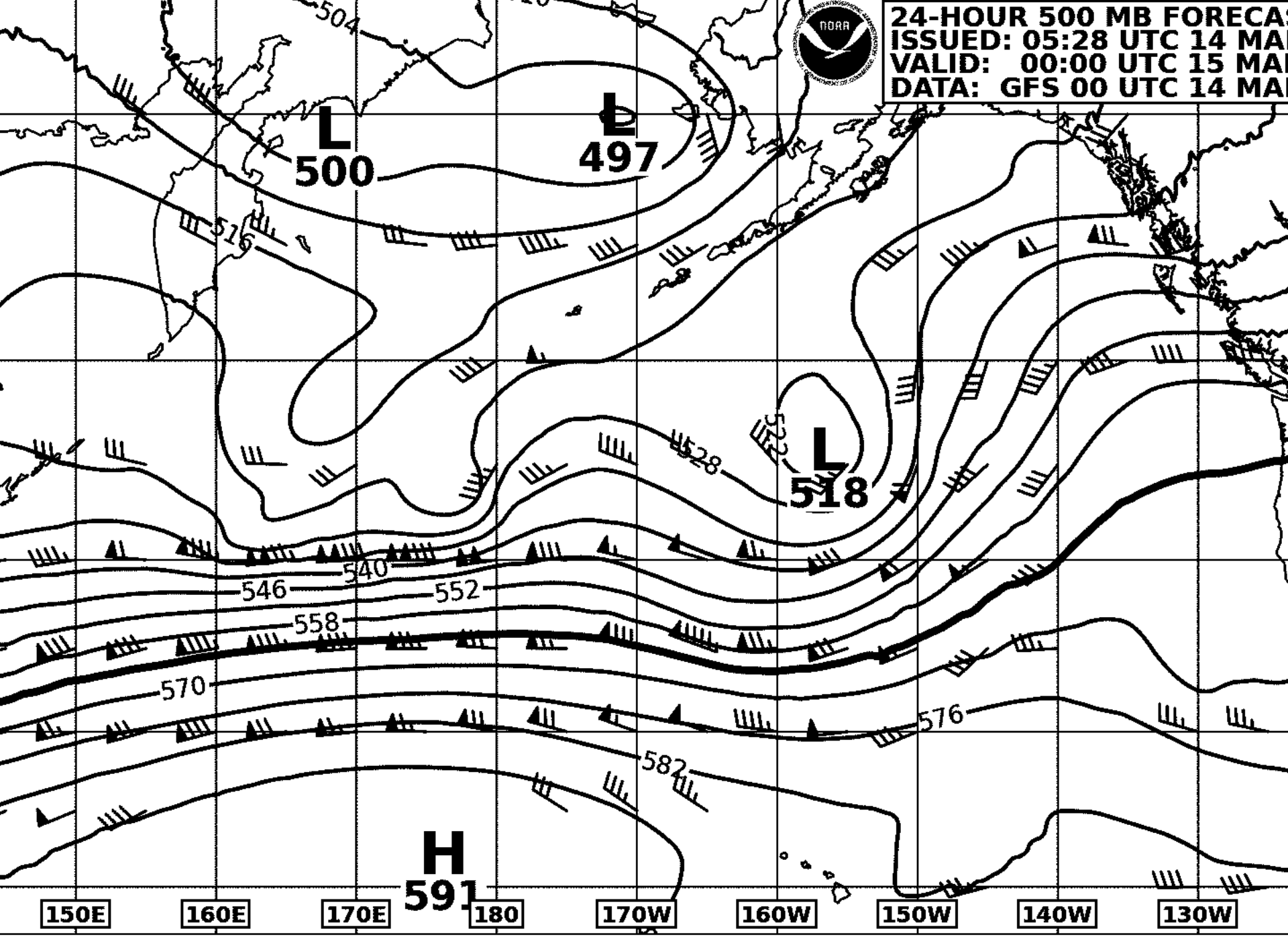

NOAA/NESDIS SST Anomaly (degrees C), 7/16/2012
−180
−160
−140
−120
40
20
0
−5.0 −4.5 −4.0 −3.5 −3.0 −2.5 −2.0 −1.5 −1.0 −0.5 0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00


67614

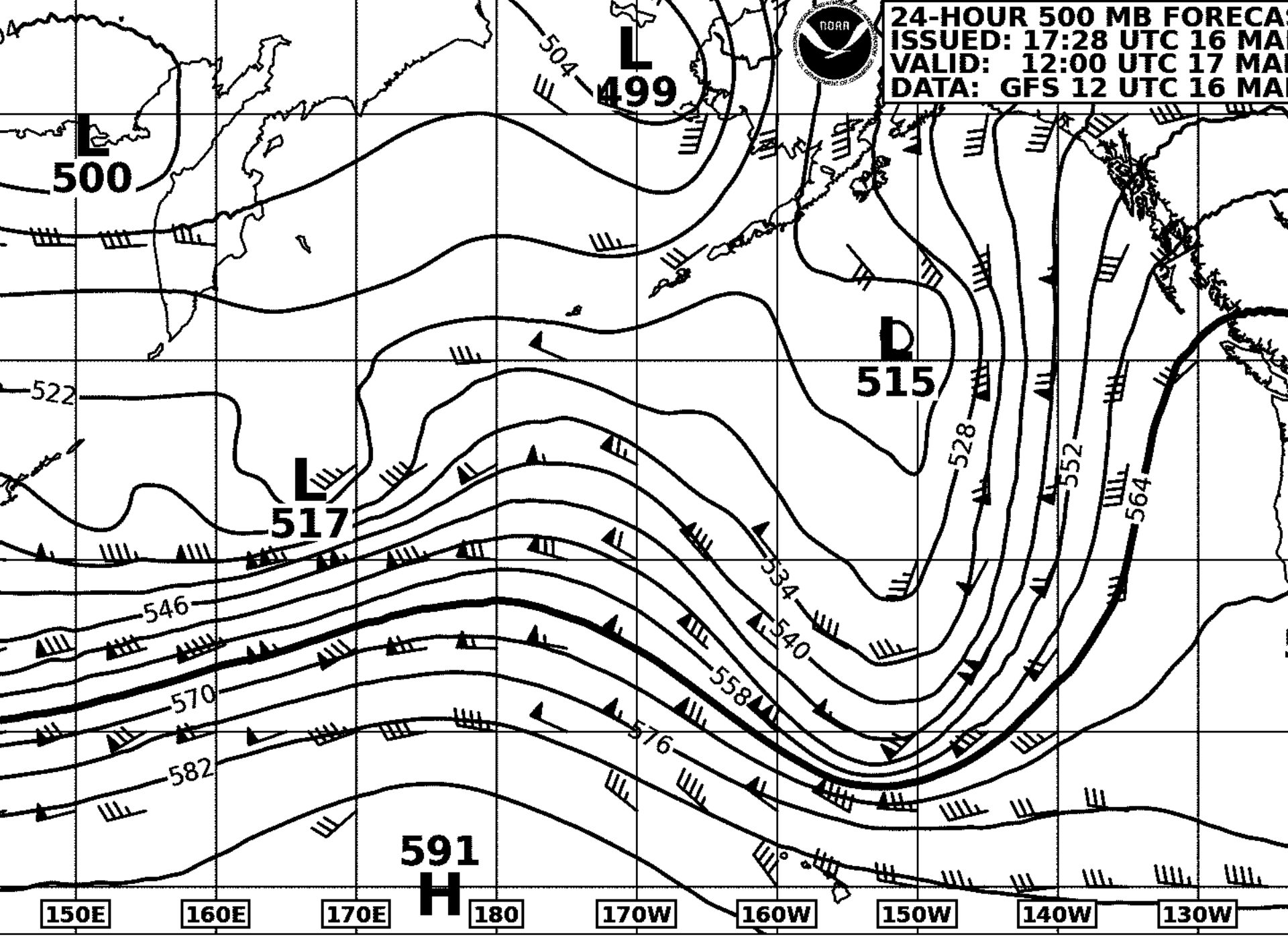

7-person watch rotation (non-dogging)

	AM		PM							AM											
	8	10	12	14	16	18	20	22	23	24	24:45	1:30	2:15	3:00	3:30	4:00	4:30	5:00	5:45	6:30	7:15
skipper	ON		S-1	S-2	OFF			ON		S-1	S-2	OFF		ON			S-2		OFF		
crew 1	OFF	ON		S-1	S-2	OFF			ON		S-1	S-2	OFF		ON		S-1		S-2	OFF	
crew 2	OFF		ON		S-1	S-2	OFF			ON		S-1	S-2	OFF		ON			S-1	S-2	OFF
watch captian	OFF			ON		S-1	S-2	OFF			ON		S-1		OFF		ON			S-1	S-2
crew 3	S-2	OFF			ON		S-1	S-2	OFF			ON				OFF			ON		S-1
navigator	S-1	S-2	OFF			ON		S-1	S-2	OFF			ON				OFF			ON	
crew 5	ON	S-1	S-2	OFF			ON		S-1	S-2	OFF			ON				OFF			ON
	8	10	12	14	16	18	20	22	23	24	24:45	1:30	2:15	3:00	3:30	4:00	4:30	5:00	5:45	6:30	7:15

notes: S-1 = Standby 1: geared up and ready to be on deck in seconds
S-2 = Standby 2: in bunk, can be undressed, next one up after S-1

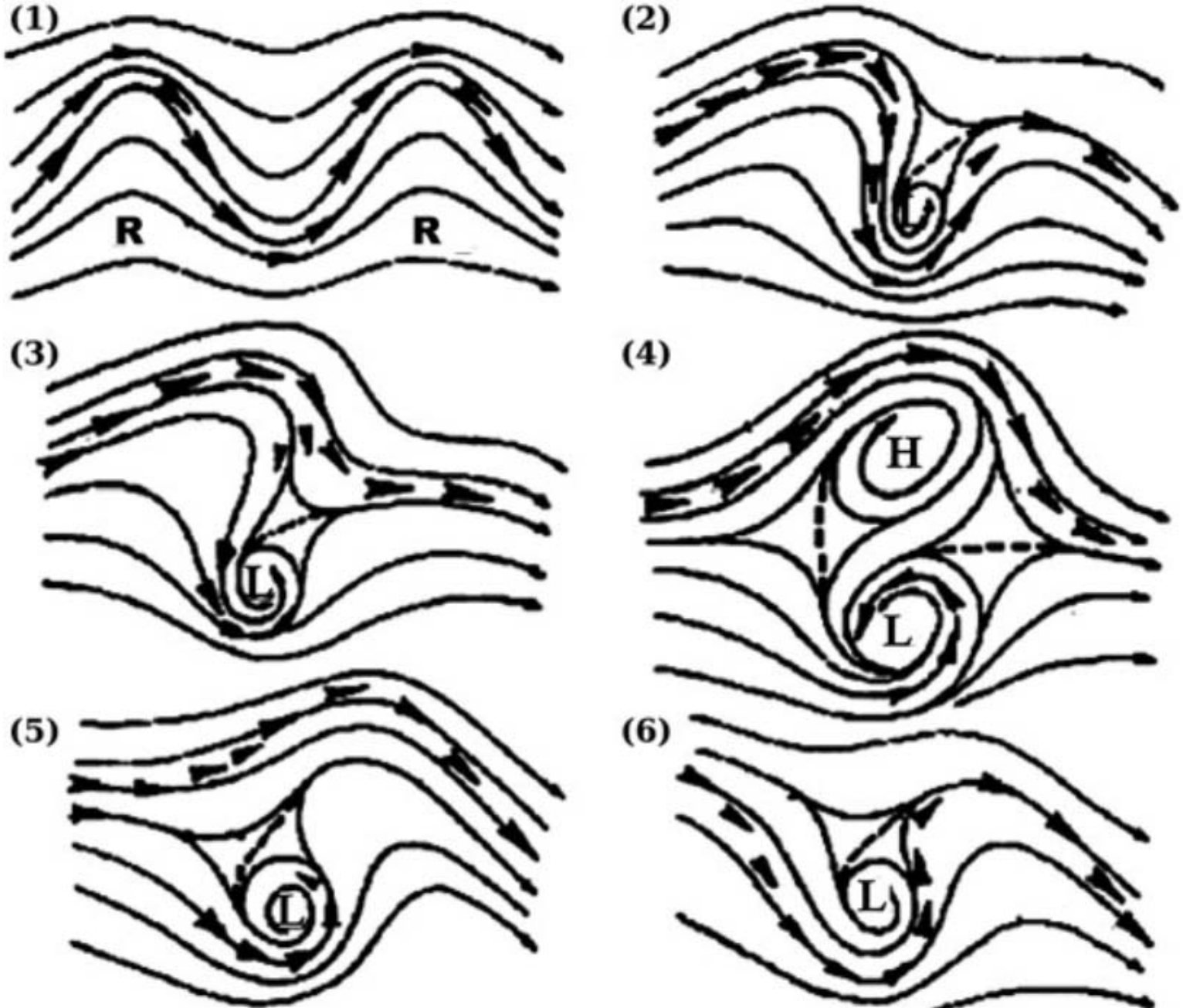


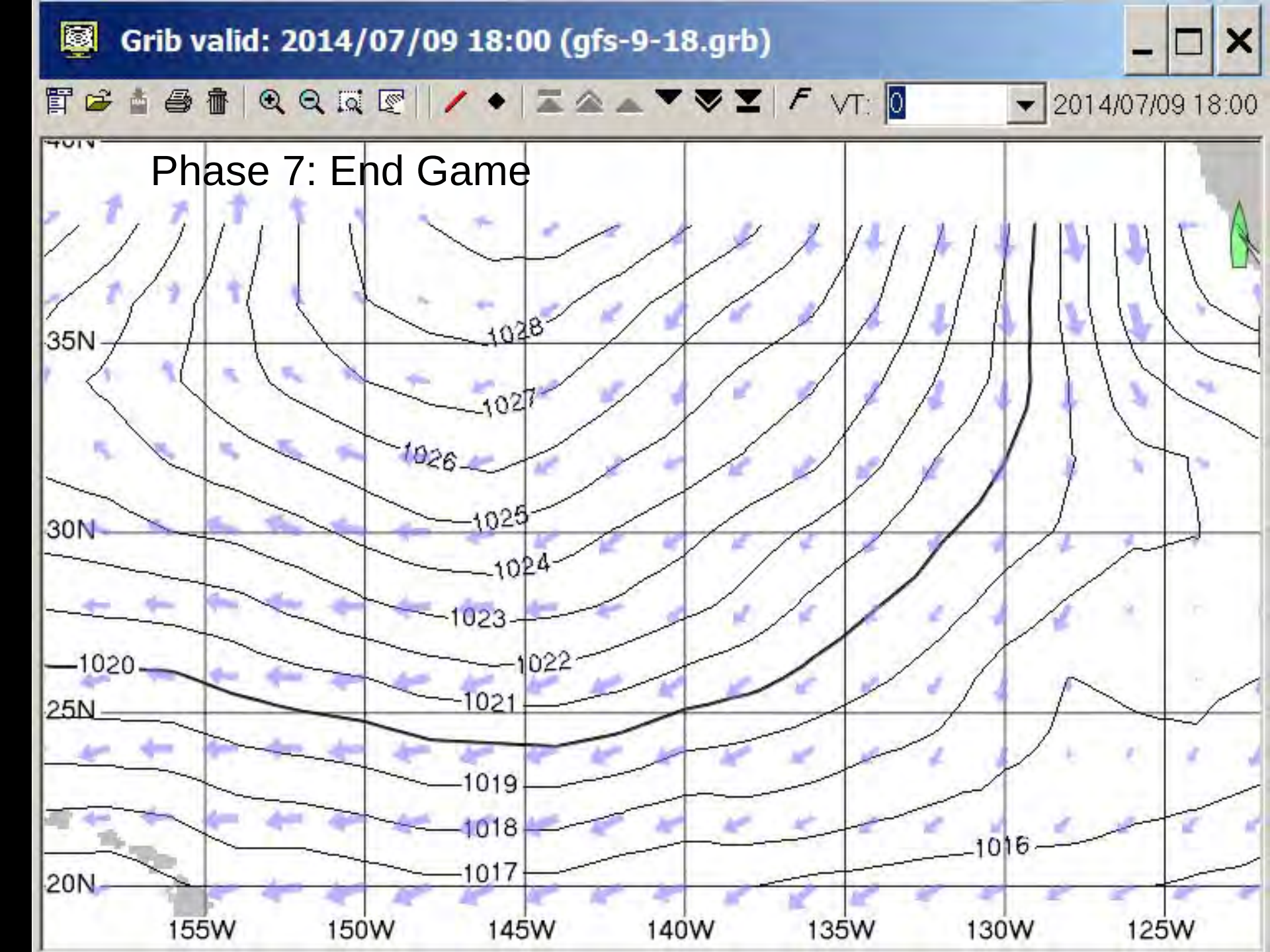
NWS/NCEP - Ocean Prediction Center
https://ocean.weather.gov

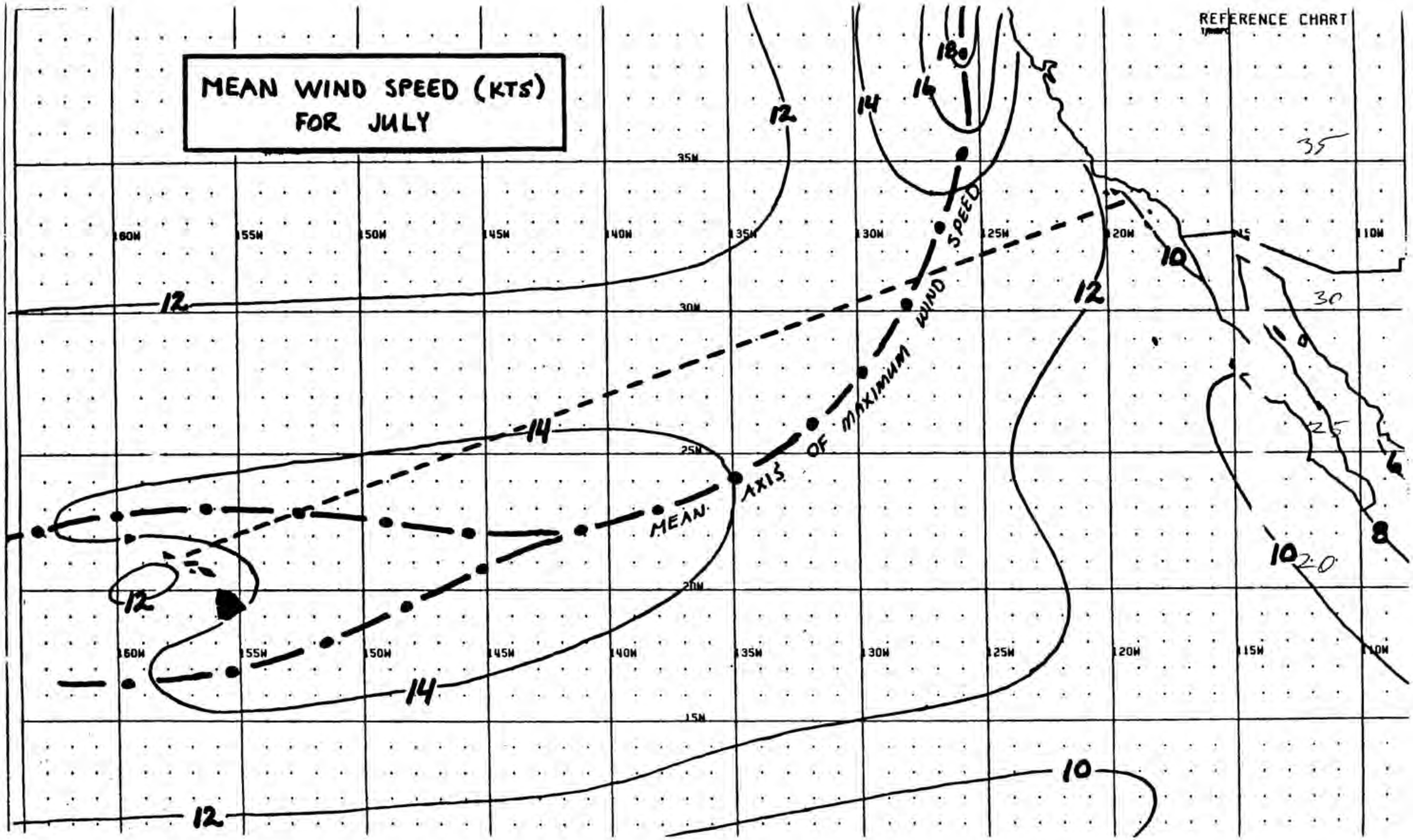


NWS/NCEP - Ocean Prediction Center
https://ocean.weather.gov

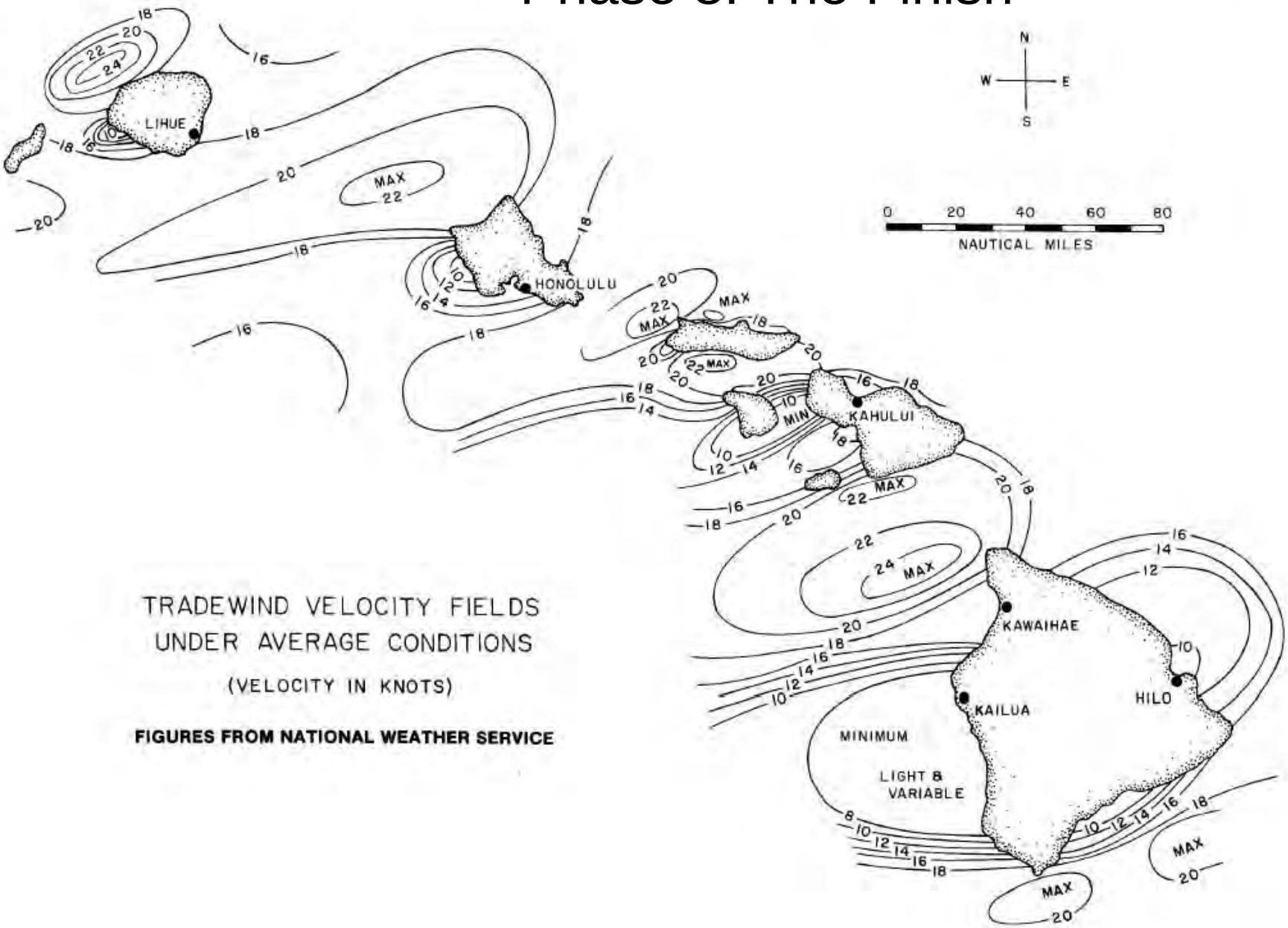
TYPICAL SCHEME OF COL DEVELOPMENT




Grib valid: 2014/07/09 18:00 (gfs-9-18.grb)
VT: 0
2014/07/09 18:00
Phase 7: End Game
1028
1027
1026
1025
1024
1023
1022
1021
1020
1019
1018
1017
1016
35N
30N
25N
20N
155W
150W
145W
140W
135W
130W
125W


REFERENCE CHART
MEAN WIND SPEED (KTS)
FOR JULY
MEAN AXIS OF MAXIMUM WIND SPEED
35N
30N
25N
20N
15N
160W
155W
150W
145W
140W
135W
130W
125W
120W
115W
110W
12
14
16
18
10
8
6
35
30
25
20

Phase 8: The Finish

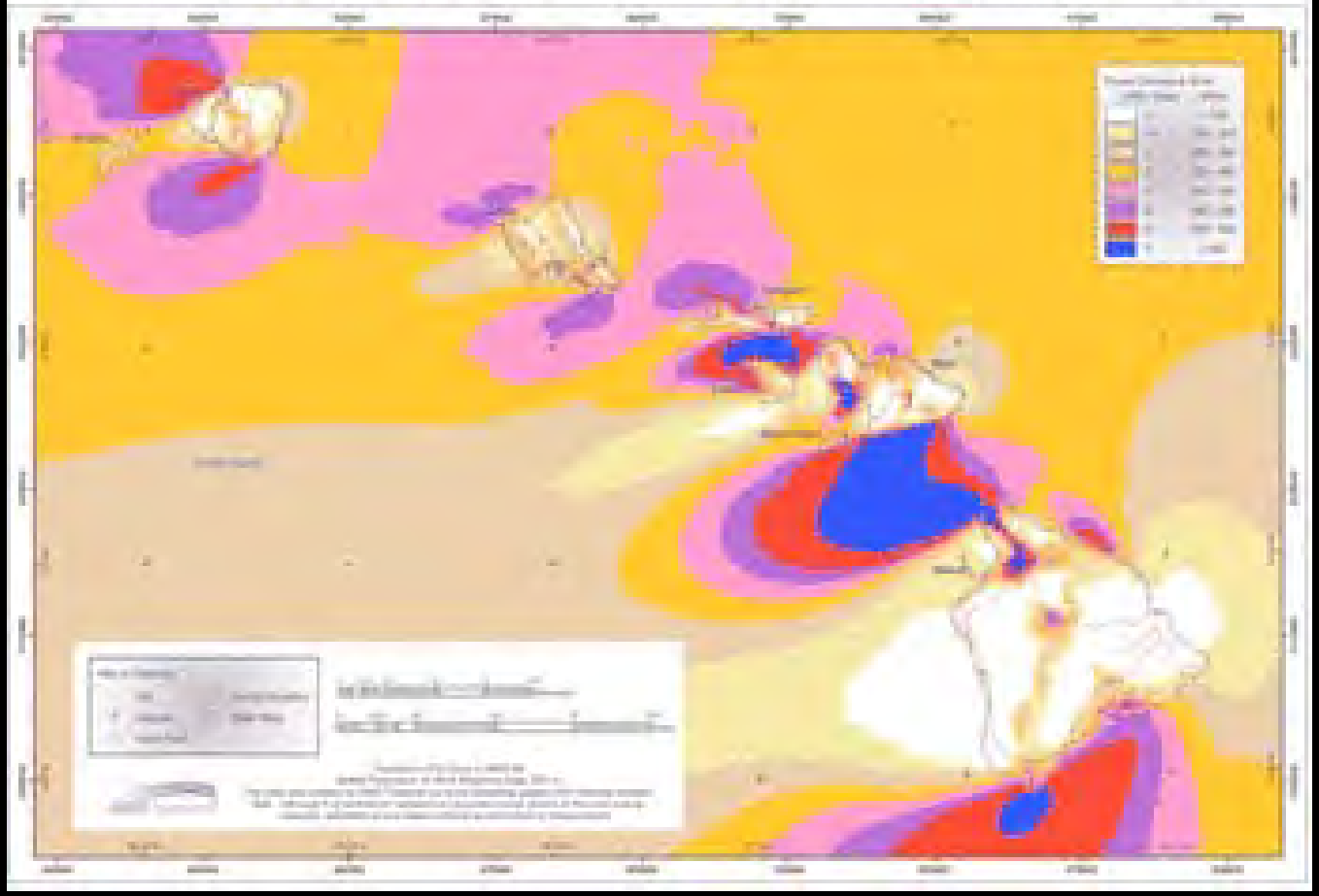


TRADEWIND VELOCITY FIELDS
UNDER AVERAGE CONDITIONS

(VELOCITY IN KNOTS)

FIGURES FROM NATIONAL WEATHER SERVICE

WIND POWER DENSITY IN HAWAII AT 40 METERS



Pacific Cup 2018 Finish Waypoints

Finish Approach Waypoint: 121-31.00 x 157-44.10

Restricted Area north limit: 21-29.0
Restricted Area east limit: 157-44.0
Restricted Area west limit: 157-47.5

Pacific Cup Finish NW end: 21-29.84 x 157-46.44
Pacific Cup Finish SE end: 21-29.60 x 157-46.24
Pacific Cup Finish mid-line: 21-29.72 x 157-46.34

Pacific Cup Escort: 21-28.64 x 157-46.24

Kaneohe Bay Tides
July 2020
at Moku o Loe, 21-26.0 N x 157-47.4 W
Times are HST, heights in feet

Sun	05	01:18	1.1	08:04	-0.5	15:51	2.6	22:45	0.9
Mon	06	02:02	1.1	08:41	-0.4	16:27	2.5	23:25	0.9
Tue	07	02:45	1.1	09:18	-0.2	17:02	2.4		
Wed	08	00:06	0.8	03:30	1.0	09:52	0.0	17:36	2.3
Thu	09	00:49	0.8	04:23	1.0	10:26	0.2	18:08	2.1
Fri	10	01:32	0.7	05:34	0.9	10:59	0.5	18:38	1.9
Sat	11	02:15	0.6	07:23	0.9	11:36	0.8	19:04	1.7
Sun	12	02:54	0.5	10:01	1.1	12:37	1.1	19:27	1.6
Mon	13	03:30	0.4	11:41	1.4	15:30	1.3	19:49	1.4
Tue	14	04:05	0.2	12:22	1.6	18:26	1.3	20:17	1.3


Salty Hotel

Weather URLs

- NOAA Ocean Prediction Center. Analysis, warnings, forecasts
  https://ocean.weather.gov/Pac_tab.php

- Pacific Briefing Package
  https://ocean.weather.gov/shtml/P_brief.php

- Fleet Numerical Meteorology and Oceanographic Center
  Links to Sea Surface Temperature Anomoly, cyclone images, etc.
  https://www.metoc.navy.mil/fnmoc/fnmoc.html

- Global GFS website
  http://www.weatheronline.co.uk/
  "weather maps" "expert charts" "Pacific (NE)"

- Low-bandwidth GRIB files
  http://www.saildocs.com/

- Sample request strings. Email to query@saildocs.com:
  "send gfs:32N,40N,116W,126W|.5,.5|0,6..36|PRESS,WIND“
  "send coamps:32N,40N,116W,126W|.2,.2|0,6..36|PRESS,WIND"

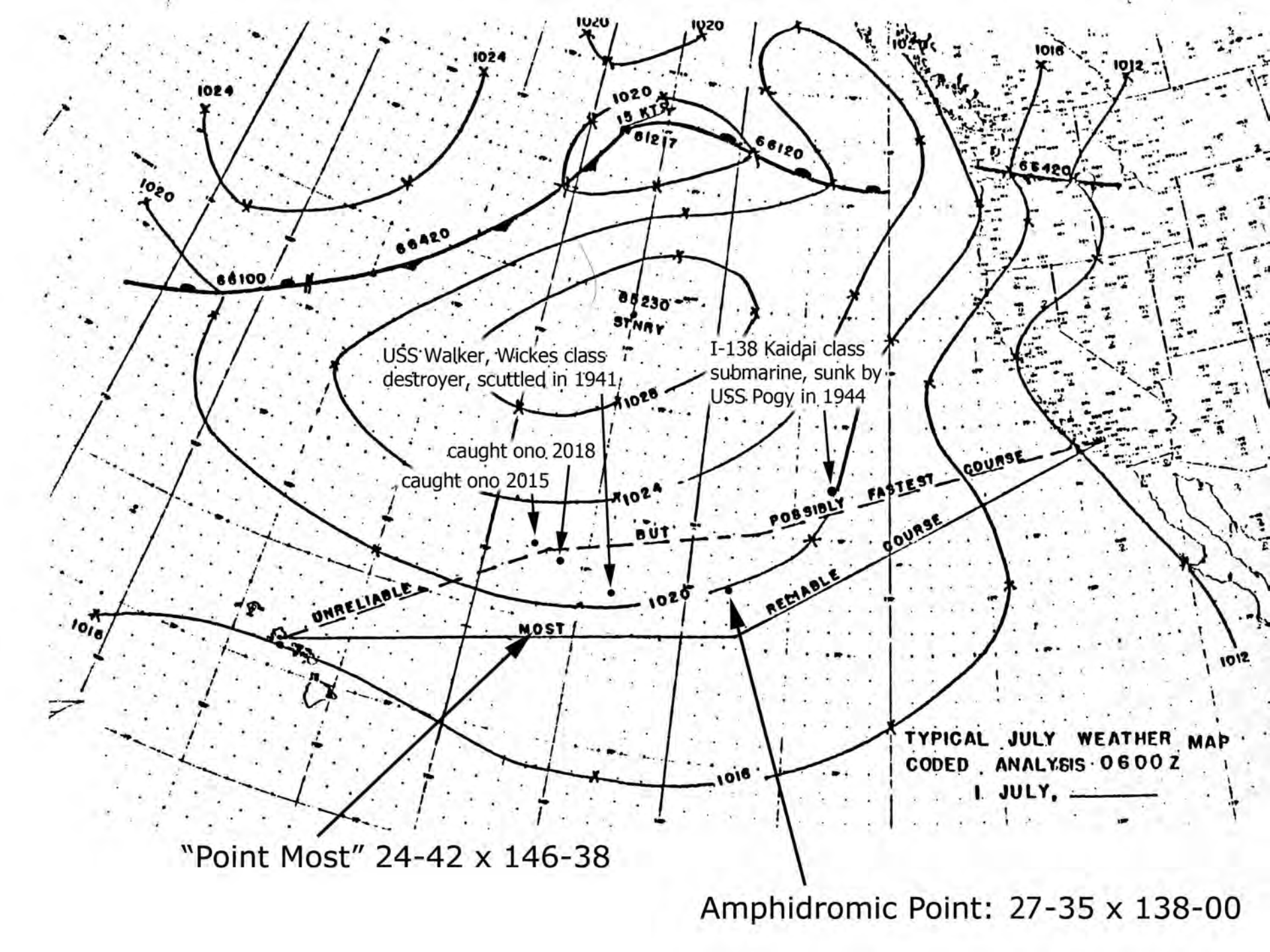
- NOAA weatherfax charts
  https://tgftp.nws.noaa.gov/fax/marine.shtml
- Forecast discussion for San Francisco
  http://www.wrh.noaa.gov/forecasts/display_special_product_versions.php?sid=mtr&pil=afd
- Atmospheric balloon soundings and Skew-T chart
  https://mag.ncep.noaa.gov/sounding-model-area.php
- Dial-a-Buoy: 888-701-8992
  http://www.ndbc.noaa.gov/dial.shtml
- Global buoy locations
  http://www.ndbc.noaa.gov/
- Schedule of voice SSB high seas weather and warnings
  http://www.docksideradio.com/SSB%20Voice%20WX.htm
- Global windstreaks
  https://earth.nullschool.net/

Stan Honey on ocean race navigation preparation:

https://www.youtube.com/watch?v=lbrKrjvwfbg

Stan Honey's Lecture Notes:

https://pacificcup.org/sites/default/files/kbfiles/Pacific%20Cup%20Weather%20and%20Tactics_0.pdf


USS Walker, Wickes class destroyer, scuttled in 1941
I-138 Kaidai class submarine, sunk by USS Pogy in 1944
caught ono 2018
caught ono 2015
POSSIBLY FASTEST COURSE
BUT
RELIABLE COURSE
UNRELIABLE
MOST
TYPICAL JULY WEATHER MAP
CODED ANALYSIS 0600Z
1 JULY,
"Point Most" 24-42 x 146-38
Amphidromic Point: 27-35 x 138-00

Roll over image to zoom in

Tecsun PL-660 Portable AM/FM/LW/Air Shortwave World Band Radio with Single Side Band, Black

by Tecsun

4.3 out of 5 stars 449 customer reviews | 122 answered questions

Amazon's Choice for "PL-660 tecsun"

List Price: $150.00
Price: $131.00 prime
You Save: $19.00 (13%)

Pay $21.83/month for 6 months with your Amazon Prime Rewards Visa Card

- Dual Conversion, AM, SW-SSB, AIR Band reception
- SYNC detector for AM with selectable sideband reduces adjacent channel interference and fading distortion at night
- Convenient rotary dial or Auto Tuning Storage Function (ATS) For FM, MW, LW & SW Band; six tuning modes in all
- Built In Dc 5v USB Jack, Earphone Jack, FM & SW Antenna Jack, Built-In Charging System To Charge the supplied Ni-Mh Rechargeable batteries
- Includes stereo earphone, wire antenna, and carrying pouch

$131.00
prime

FREE Delivery by **Sunday**
if you order within 7 hrs 59 mins.
Details

Only 12 left in stock - order soon.

Qty: 1

Add to Cart

Buy Now

Sold by I do radio and Fulfilled by Amazon. Gift-wrap available.

Add a Protection Plan:

- 4-Year Protection for $9.33
- 3-Year Protection for $5.49

Deliver to Paul - Berkeley 94708

Add to List

HF SSB / Voice Weather Forecast Schedule

(NOAA's National Weather Service Marine Forecasts Broadcast by USCG)

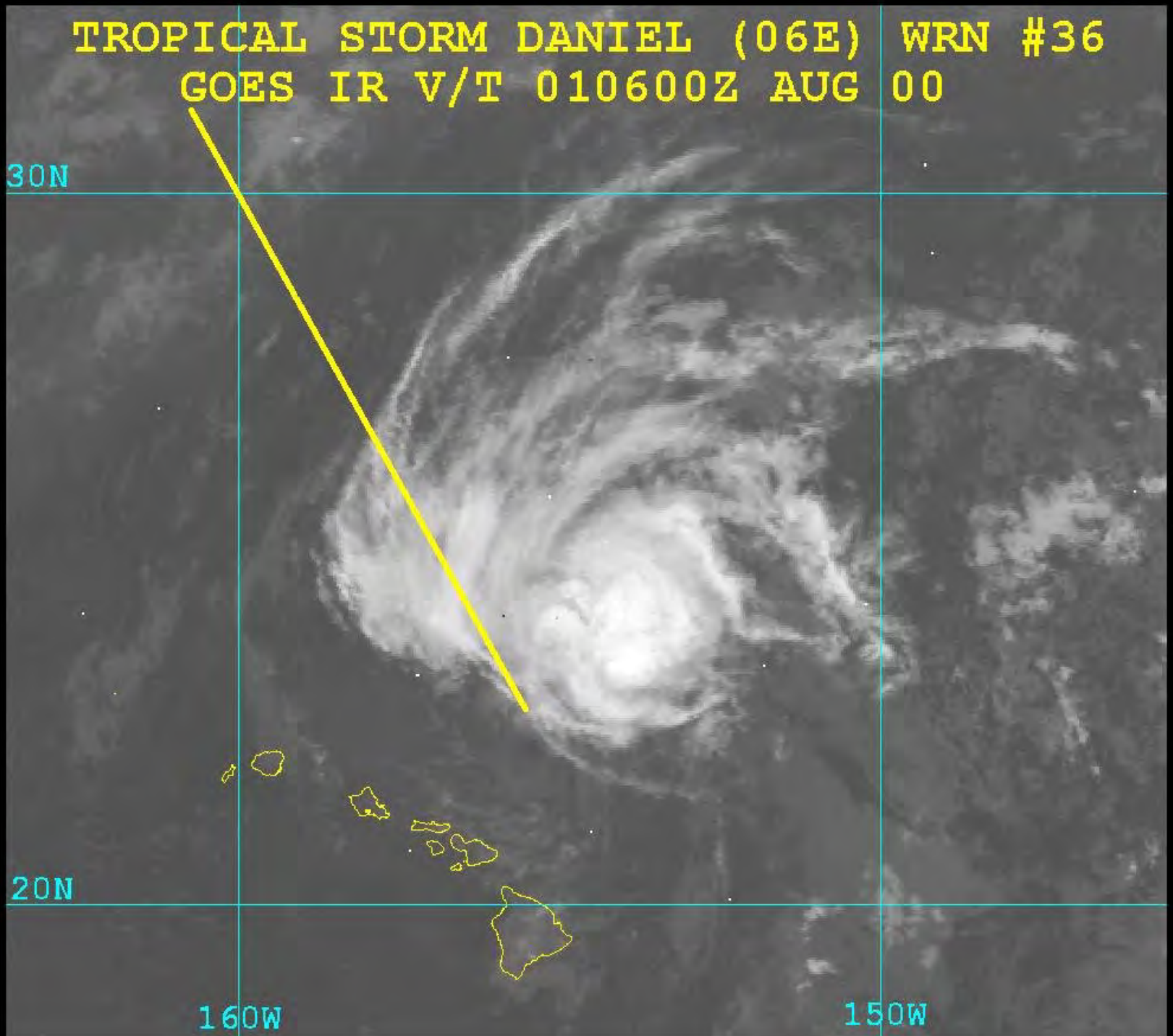
Pacific Region

NMC - Pt Reyes CA (PYE), NMO - Honolulu HI (HNL), NRV - Guam

Broadcast Time GMT (Zulu)	Station Location	Station Call Sign	Frequency (kHz, USB)		
0005Z	HNL	NMO	8764	13089	---
0330Z	Guam	NRV	13089	---	---
0430Z	PYE	NMC	4426	8764	13089
0600Z	HNL	NMO	6501	8764	---
0930Z	Guam	NRV	6501	---	---
1030Z	PYE	NMC	4426	8764	13089
1200Z	HNL	NMO	6501	8764	---
1530Z	Guam	NRV	6501	---	---
1630Z	PYE	NMC	8764	13089	17314
1800Z	HNL	NMO	8764	13089	---
2130Z	Guam	NRV	13089	---	---
2230Z	PYE	NMC	8764	13089	17314

Source:http://www.nws.noaa.gov/om/marir

Note:	ITU Channel numbers for the above listed frequencies are:	4426 kHz	#424	13089 kHz
		6501 kHz	#601	17314 kHz
		8764 kHz	#816	


TROPICAL STORM DANIEL (06E) WRN #36
GOES IR V/T 010600Z AUG 00
30N
20N
160W
150W


60061
CF 6759 EK

Navilight Tricolor 2NM w/Navimount Base

by NAVISAFE

4.0 out of 5 stars 10 ratings

Price: $71.19 & **FREE Shipping**

Your cost could be $61.19. Eligible customers get a $10 bonus when reloading $100.

Note: Not eligible for Amazon Prime.

- Compatible with Navisafe navimount System
- Floats to 66 feet
- Operates with 3 AAA batteries (not included)
- Navimount base lights will work with railblaza mounting systems, when used with the railblaza 932 converter

New (33) from $71.19 + FREE Shipping

Report incorrect product information.

$71.19

& **FREE Shipping**

Arrives: **Jan 29 - 31**

Paul - Berkeley 94708

Only 4 left in stock - order soon.

Qty: 1

$71.19 + Free Shipping

Add to Cart

Buy Now

Ships from and sold by PrimeMarineTackle&Gun.

Add a Protection Plan:

- 3-Year Protection for $7.99
- 2-Year Protection for $5.99


THE NATION'S CHARTMAKER SINCE 1807
UNITED STATES - WEST COAST
CALIFORNIA
GULF OF THE FARALLONES
Mercator Projection
Scale 1:100,000 at Lat. 37°46'
North American Datum of 1983
(World Geodetic System, 1984)
SOUNDINGS IN FATHOMS
(FATHOMS AND FEET TO ELEVEN FATHOMS)
AT MEAN LOWER LOW WATER
TIDAL INFORMATION
POLLUTION REPORTS
RADAR REFLECTORS
CAUTION
AUTHORITIES
AIDS TO NAVIGATION
SUPPLEMENTAL INFORMATION
NOTE B
NOTE C
NOTE D
PRECAUTIONARY AREA
NOAA WEATHER RADIO BROADCASTS
HEIGHTS
CAUTION
SUBMARINE PIPELINES AND CABLES
ANCHORING
Bolinas Lagoon
Bolinas
Duxbury Reef
BOLINAS BAY
Stinson Beach
Middle Peak
Mt. Tamalpais
Mill Valley
MARIN
PENINSULA
Richardson Bay
Martin City
Bonita Channel
Point Bonita
Fort Point
SAN FRANCISCO BAY
Alcatraz I.
Horseshoe Bay
GOLDEN GATE BRIDGE
Presidio of San Francisco Golden Gate National Recreation Area
SAN FRANCISCO
Golden Gate Park
Mt. Sutro
FOURFATHOM BANK
GOLDEN GATE
MILE ROCKS LT
MAIN SHIP CHANNEL
Seal Rocks
Lime Pt
Duxbury Reef
Gull Rock
Pussy Cove
Terrace Cove
Muir Beach
Rodeo Cove
Wolf Ridge
Point Stuart
Point Diablo
Point Bonita
Fort Cronkhite
Rodeo Lagoon
Tennessee Cove
Tennessee Point
Golden Gate Park
Windmill
Lincoln Blvd
Marin Headlands
Golden Gate Bridge
Alcatraz Island
Fort Point
Presidio
Richardson Bay
Sausalito
Tiburon
Belvedere
Angel Island
Point Stuart
Point Diablo
Point Bonita
Fort Cronkhite
Rodeo Lagoon
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NORTH
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