

Public Contribution

2010 Sea Ice Outlook August Report

Charles Wilson

New Outlook: Averages 4 Calculations = 2.5 million square kilometers.

The Dominant Change is 2010's change from an El Nino (hot Equator) to a La Nina (cold).

Next time, the finding of Wayne Davidson's work on this will allow us to PREDICT: after a El Nino heats the Water, & next a Cloudy LULL ... WHEN a La NINA will VANISH THE CLOUDS. **Wayne Davidson's work says a quick TRANSITION is what made 2007's Mega-Melt.** My July 14 Update was Mostly a discussion of alternatives for how long the "lull" will last (see below). (a June 30 E-mail unfortunately got published, so I append my "real" July Update at the end)

Four Models: (the first is the Original)

1.0 million sq. km = If Melt is proportionate to the strength of 2010 & 2007's El Ninos, the loss Volume of Ice is $1.8/1.1 \times 2007's\ 4000\ km^3 = 0$ left - - so the Area must decline to ONLY the stationary 30 foot thick Ice "always" attached to the Greenland & the Canadian Islands.

... Clouds, were specified as the Major Uncertainty.

What Happened ?

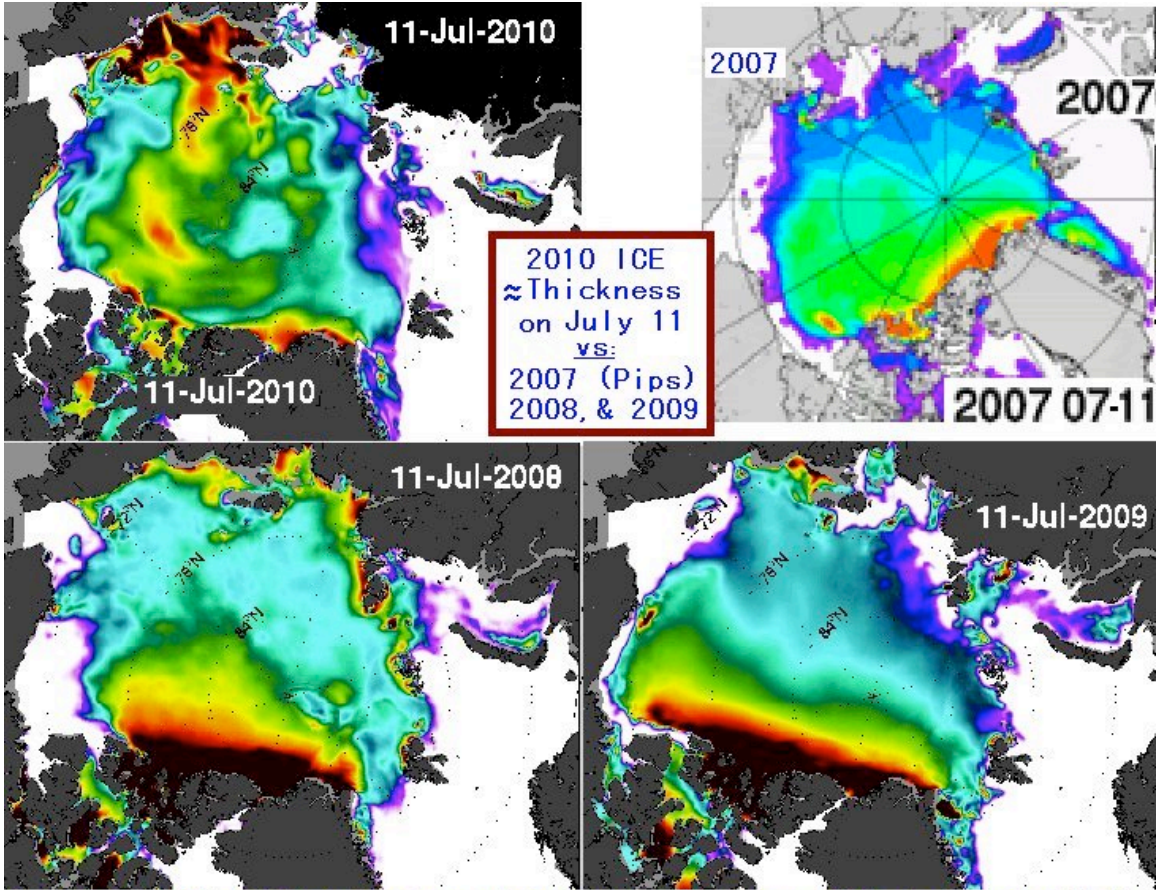
First, the Ice that 'Never breaks off' -- broke off.

Second, the Clouds came & kept Sun off the Ice since late June.

& Third, Low Pressure reversed the Winds & spread the Ice out.

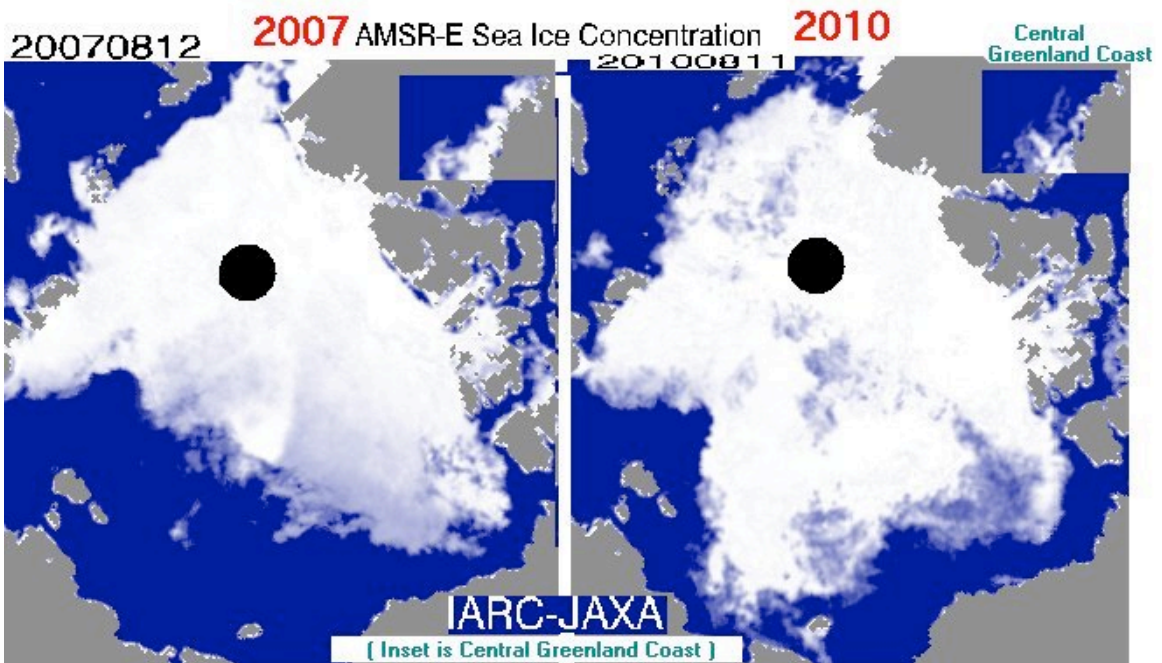
Also: Lowest Temps ever in mid-year at Pole, & Russian Peat fires.

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The wide "BAR" of Thick Ice Rotated Straight "UP", Rammed Siberia & Broke UP ?

Note: the 3 Topaz maps are "hice", but Pips' is derived from Concentration (used as 2007 Topaz not available). It has more Data Points but is less directly a true thickness.



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Look at all the Holes in 2010 !! Is there More Ice or not ?



So likely 1.0 is WRONG. But to further test the Basic Principle
- - that **a VERY strong El Nino trumps the Normal Modelling**
- - I will average several Other ways to use my Basic Principle thus:

4.4 m. km² = By the Rapid transition to La Nina

... by repeating the conditions of 2007: Melt should be the same as 2007's from this date, times the strength ratio 1.8/1.1. Since I am using the JAXA data this is just a hair ABOVE the 2007 Melt (4.3 to 4.25).

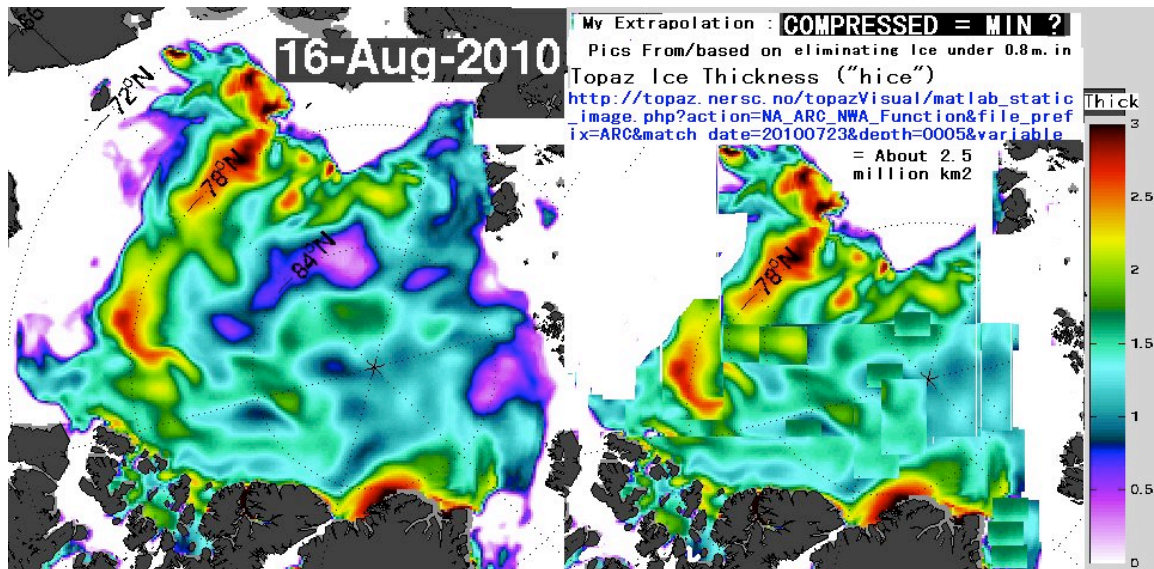
2.2 m. km² = By Volume measure:

... Piomas has the Anomaly at -10,150 km³ on 31 July ... implying 4,400 as I write & 3400 or less at minimum i.e. 13,400 Median for September, see:
http://psc.apl.washington.edu/ArcticSeaIceVolume/images/PIOMAS_daily_mean.png. . However, the Anomaly HAS been getting Smaller since -11,300 peak in Late June & -10,600 July 17. Nonetheless, we should have about HALF 2007's & we MIGHT get a "Cascade Melt" as in Hudson Bay earlier this year. Again, a LOT less likely as the Sun is so much nearer the Horizon now, being August.

2.6 m. km² = Compression halves Area (see Topaz map):

... The TRANSITION put a weather "Low" (=Clouds) over the Arctic, REVERSING all normal Ice motion so UNLIKE 2007 the Ice was __DISPERSED__ with wide gaps (see pic). - - Wayne Davidson's work on this transition -- 25 years at Resolute in the Canadian Arctic -- implies this is a Permanent recent return to High Pressure & long Range forecasts indicate a Dipole Anomaly next week - - so 2007 is back. As I looked at previous years, Ice less than 0.8 meters disappeared between now & minimum, so I just cut & pasted a Map to squeeze it out, as shown in another pair of pics below.

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PREVIOUS OUTLOOK HISTORY:

June Outlook: 1.0 m. km2 - - Assumed volume of Ice varies by El Nino strength = 0 ice save the Coastal Stuff that never moves. Submitted May 30.

June 30 E-mail: 1.0 m. km2 - - The Coastal Ice has rotated like the hour Hand on a Clock, Rotation Center = Greenland.

6 July : NSIDC (not me), using Mr. Maslanik's excellent Maps, sees the Old Ice, now a Curve, is sheltering the vulnerable Thin Ice inside its curve, & (correctly) foresees a slowing of the rapid melt.

July (14) Outlook: 1.0 m. km2 - WAYNE DAVIDSON's ZERO ICE FORECAST & Consequences:

... As he was unaware of the El Nino being a "Modoki" which fades slower, his conditional "IF the La Nina swiftly follows the El Nino" ... must expect a TIME-LAG.
... Just in July, the Month with nearly half the Ice-loss by Volume. My July Update (which I give as an appendix, in the confusion over Mr. Overland giving up the reins at Arcus, the wrong "Outlook" got published) .. I gave 3 Scenarios:

Lag =

1. 3 Weeks - - by the speed Weather Fronts Move
2. 6 weeks - - by the CTI index
3. 9 weeks - - = 2 months by the usual El Nino indexes.

... I thought (2) most likely as the Cold Tongue Index is specifically designed for La Ninas ... What we actually got was NOT just 1 correct result:

3 weeks = TEMPerature dropped ... below ANY year back to at least 1958 (cf DMI pic).

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6 weeks = High Pressure Returns
7 weeks = Fram Strait Export resumes (see Navy Pips website)
7.5 weeks = Dipole anomaly Returns (tomorrow ?)
9 weeks = ????
20+ weeks = Hot water from the Pacific finally stops coming.

...ALL Possibilities seem to DO some thing.

It's like Vitamins: they all do different things.

The WORST is if the normally-Cold La Nina gives Clear Skies = SUN = Ice-albedo effect, **while the HOT WATER is still coming**, poking along at its measly 3-5 mph all the way around Africa. Which takes MONTHS. In fact the water is still coming long after the AIR has changed, & I expect Melt to continue INTO OCTOBER -- if slowly.

... There are a LOT of Requirements for what I fear most - - the RAPID MELT. Apparently, an El Nino cannot be a "Modoki" for even though the skies clear, it will be too late. Although given our Lack of certainty, a fraction of a percent Chance still exists of a Great Disaster.

Note the La Nina should cause VERY rapid build-up of ICE due to Clear Skies this winter. However, we may have lost another 40%. It is up in the air -- literally -- whether the Ice will build up more than 2010's melt. The 2 La Ninas the last 2 years built up 15% more volume than 2007 & remember the Long-term trend -- LESS 2007 -- is only a 2% loss per year. 15% is a LOT. And the 60-year PDO says we will be getting twice the number of La Nina as El Nino -- plus: stronger -- for the next 27 more years. But ... another 2010 would finish the job. Easily. HALF a 2010.

The Greenland/Canada "Attached" Ice cannot ride again to save the Day. It's been used up. Nonetheless, even if it builds up again, remember the 60-year Pacific Cycle will cause the Ice to Thin again -- plus whatever Global Warming gives us -- and, if Cap & Trade CONTINUES to encourage soot (which darkens the Ice) by "forgiving" it if it reduces CO₂, and discourages replacing the 1/1,000 th of our Sulfur cuts that are high-altitude & thus beneficial (according to NASA's Drew Shindell this combo QUADRUPLES Arctic Warming) ... in 50 years we will face a VERY SCARY time again.

PS: UNKNOWN EFFECT - - Russian Peat Fires. From late July, there HAVE been some Clear days but the melts seemed maybe 2/3rds what a Clear Day ought to have done. The Smoke Pall MIGHT be the Reason. However Next year this might make for Dirty Ice = easier to melt.

Executive Summary:

Wayne Davidson's Work showed CLOUDINESS responds to the El Nino-La Nina transition which, as this year's El Nino lasted longer than usual, produced a LULL in melting right at the most rapid-melting part of the Year.

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This cancels the "Hot Arctic" scenario = 300mph Winds. At least 2 expected Cold years before the next Warm one MAY restore the Ice enough to avoid the "slow" consequences drying out California, etc, as well (see REAL July Outlook). But we WILL have half the Ice we did Last year at Minimum (by Volume), even if it LOOKS like more because the thick stuff along Greenland spread out & covered the Basin.

A less-Western, or oddly, a WEAKER El Nino, would have melted MORE in the RIGHT MONTH.

We dodged a Russian Roulette Bullet here (Similarly this El Nino made Hurricanes do the opposite of what was expected, because like 1998's it was SO STRONG it ignited Saharan Dust Storms, which quelled the "Hot Spot" off Africa - - Weather is just - - COMPLICATED).

But ask New Orleans about how many times you can IGNORE a weather Danger before it hits you between the Eyes.

There is NOTHING in the Warming, that has danger like Melting the Arctic off.
>> We must establish some Procedure for dealing with Dangers that are not 100%
However, after this year, I think we can SPECIFY WHEN A SUPER-MELT WILL HAPPEN.

Just Remember everything I got wrong:

>> Attached Ice need not not stay that way

>> An El Nino's strength is not as important as WHEN it transitions to a La Nina.

>> The various "parts" of 2007's Melting Recipe have different Time-Lags.

APPENDIX: WILSON ["REAL"] JULY OUTLOOK

[Any changes from Aug 16 email to helen@arcus in Brackets]

[PS: I was a little over the top on Wayne as 'like a Nobel Prize Winner' : think of Me as an "armchair" general sitting in with the Real Generals/Modellers (thank you, by the way). Wayne is like a Master Chief Sergeant or Petty Officer (as so many Modellers came form the Navy) with **Experience** of a kind that Generals & Admirals can Respect. But in a Different if related field - - Weather, not Climate. But it has relevance, here. Myself, I try to be a "Synthesist" as proposed by A.C.Clarke: I bring in bits of knowledge from another Expert's field. This should be "helpful" but often is unwanted.]

2010 Sea Ice Outlook (July)

Charles Wilson

1. September 2010 Ice Extent Projection = 1 million Square km (essentially: an Open Arctic, save the 30 foot thick land-fast Ice of, & near, Greenland)
2. Methods:

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2a. Statistically, I use 2007 as a base & compute Ice Loss from the relative strength of each's El Nino (Pacific Heat Index) & 2010's (the 4th strongest in 60 years). Using: 6000 cubic km (ICESAT figure for September 2007)

4000 cubic Km (ICESAT's number for 2007's reduction from Previous year Volume)

El Nino rating = 1.8 (2009-2010 El Nino) / (divided by) / 1.1 (2006-2007's peak ONI rating)

Thus:

$6000 \text{ km}^3 - (4000 \text{ km}^3 \times 1.8/1.1) = - 545 \text{ cubic km}$

= ZERO ... PLUS, the negative amount means it will melt off EARLY.

If I used the 2009 PIOMAS estimate of 5800 km³ for 2009's minimum, it would be negative 745.

The Million km² is because SOME Ice is up to 30 feet thick & will take years to melt.

2b. Heuristically, as I use 2007 as a base - - I check each unique characteristic of 2007, the "Year that Melted 20 years's Decline in One", & see if it has recurred.

2c. ... And I found a Meteorologist who ALSO predicted Zero Ice -- by August (!) - - and he is Famous in his field - - like a Nobel Prize Winner in Science ! ... I've asked him to submit an Outlook himself, but as he fills a Gap in my ignorance of Clouds, I Quote him below.

3. Rationale:

2007 had more change than the average DECADE & so I multiply 2007's Ice Loss by the ratio between 2007's El Nino & 2010's. The Small changes of 1980-2006 made the Ice thin enough for large areas to melt off & SUNLIGHT to heat the dark Water ("Deep Blue Sea" = 3 to 4 times Ice & Snow's absorbance -- remember, they REFLECT most Sunlight) - - producing a FEEDBACK effect. But Now, an EL Nino does not just thin the ice a bit - - it may melt it ALL OFF.

>> Heuristics: since I am using 2007 as a Model, I can check DETAILS:

2007's El Nino did 3 things to melt off 40% of Ice Volume relative to 2006:

3-a. 2007 was Hot ... 2010 was MORE so: December was the highest monthly anomaly ever, Feb

was #4, March #10, April #7 (& the warmest April ever), May #8, but June ... only half as much over normal as the others (save January).

(I use figures from the Satellite (uah) Lower Troposphere breakout for N. Polar OCEAN)

3-b. Winds pushed Ice to form Open Water areas the size of the Great Lakes ... the Most SPECTACULAR melting of 2007 came from the New Siberian Islands Polynnya which in the week after August 26 seemed like it would roll up the entire basin like a Carpet.

>> In June: all 3 of 2007's Polynnya formed, and at the Same Places.

[pic deleted, showed 3 spots similar in 2007 & 2010, & not in other years]

(3-b2) The Nares Ice Dam broke, however NSIDC says it has not exceeded 2007's flow. Yet.

3-c Clouds: 2007 Cloudiness was 16% Less than Norm.

In June I considered this the Wild Card.

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Then I discovered the famous "Resident Meteorologist of the Arctic": Wayne Davidson, 25 years at Resolute. In September 2009 he stated: "If El-Nino persists till the spring, and La-Nina follows, ships at the Pole will wander unobstructed in August 2010".

More recently:

"Big blue is expanding everywhere in the high Arctic" ... "This will accelerate the melting tremendously, since it [is] occurring at the solstice, very high sun, and will further demolish previous ice extent records. Everything is coming about as expected.... Unfortunately....

WD June 18 2010"

W.D. considers Clouds PRIMARY -- and a RAPID shift from El Nino to La Nina as 2007's BIG Gun.

... However, he did NOT expect this El Nino to linger (the west-more are called El Nino "Modoki" & this is apparently standard).

The Shift is LATER in the Year - - but happening Faster than 2007, perhaps.

This implies a Lag as the two switch over - - remember the North Atlantic is warmed by the Pacific waters that left many months ago - - at 3 knots - - totally aside from his "anvil-Cloud-seeding" Theory - - we can see where a rapid shift can give us El Nino (hot) water & La Nina (cool) skies, due to the time-lag.

To summarize: the Clear Skies of 2007 that encouraged the Melt -- especially by causing the 40 degree (F) water near the NORTH end of the New Siberian Islands Polynnya -- WILL return.

Now I know for sure.

But now ... I don't know WHEN.

Two ENSO/El NINO/LA Nina Indexes

-- 2007's accelerated melt from clear La Nina Skies began about July 1

-- CTI implies 6 weeks but the Standard Indexes maybe 9-10 weeks ?

-- over 8 weeks might leave the ice there too late - - the September Sun is almost a Twilight (see below) - - but then, if the Transition is FASTER, the Wait might be, say, halved.

Then again the effects could be Very fast, as they come by AIR & the weaker 2007 June came about because there was a "lull" that month, in the coldness of the La Nina. That would mean WHEN June 2010's -.28 doubles, we get the Clear Skies.

>>> Bear in Mind: 2007's Big SUN months were JULY & AUGUST.

Cold tongue index (CTI) = SST anomalies over 6N-6S, 180-90W

<<http://jisao.washington.edu/data/cti/>>

(Better for La Nina watching)

2006 -65 -46 -51 -27 -2 -4 -1 31 61 62 94 93

2007 55 15 -7 -25 -30 -36 -45 -50 -72 -121 -137 -119

2008 -157 -128 -98 -86 -58 -53 -14 -6 -24 -35 -37 -75

2009 -59 -61 -54 -15 23 17 30 39 67 66 103 119

2010 111 85 58 30 -11 June

Here are the Standard Indexes but I have added an "Average"

YEAR_Average_____at:

<<http://www.cpc.ncep.noaa.gov/data/indices/sstoi.indices>>

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2007 1 +.72_ NINO1+2 ANOM NINO3 ANOM NINO4 ANOM NINO3.4 ANOM

2007 2 +.26_ 26.24 0.21 26.45 0.09 28.62 0.61 26.81 0.12

2007 3 -.07_ 25.74 -0.73 26.79 -0.30 28.57 0.48 27.18 0.03

2007 4 -.24_ 24.30 -1.18 27.13 -0.27 28.70 0.30 27.78 0.10

2007 5 -.58_ 22.73 -1.60 26.35 -0.70 28.86 0.21 27.57 -0.19

2007 6 -.40_ 21.59 -1.44 25.83 -0.55 28.98 0.34 27.55 0.06

2007 7 -.60_ 20.27 -1.55 24.79 -0.79 28.81 0.24 26.79 -0.29

2007 8 -.78_ 19.16 -1.64 23.86 -1.10 28.58 0.12 26.20 -0.50

2010 4 +.69_ 26.05 0.57 28.05 0.65 29.25 0.84 28.36 0.68

2010 5 +.14_ 24.28 -0.05 26.97 -0.09 29.03 0.37 27.68 -0.09

2010 6 -.28_ 22.81 -0.22 25.87 -0.51 28.69 0.06 27.06 -0.43

The ONI ratings are 3 month averages & cannot show a transition in enough detail for here.

4. Discussion:

- - -

Beyond the Projection:

4. Effects of a 1-year Melt-off are Dire: Possible Ocean Current Shutdown.

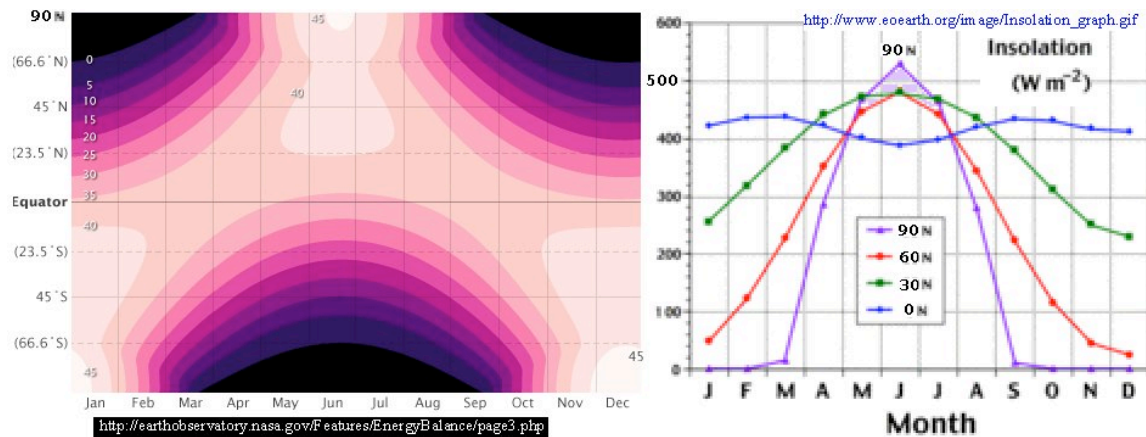
> IF ... 2007's cloudlessness (3c above) was from it's El Nino AND is Proportional &

> IF ... our currents today are close enough to those 11,000 years ago for Ocean Current

Shutdown, & 300 mph winds (as occurred then)

The KEY is that the Long Polar Summer DAY actually provides more SUNLIGHT than the Equator -- for 3 months. From:

<<http://earthobservatory.nasa.gov/Features/EnergyBalance/page3.php>>



Thus IF the center area melts off, it can heat up HOTTER than the area SOUTH of it, or at least close enough to destroy the Temperature gradient that powers the Currents' South-to-North heat Transfer. Even a large part of it: there is a Weak Area right Now north of Russia's Taimyr Peninsula stretching well past 85 degrees North. At any Moment, this could GO CRAZY - -

From: <<http://www7320.nrlssc.navy.mil/pips2/index.html>>

[Topaz pic same as above, showing THICK Ice attached to Greenland UNTIL 2010]

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Consequences:

A general "Open Polar Sea" occurred in Summer from the End of the Ice age until 5-to-6 thousand years ago -- it formed beaches, only recently discovered -- and you cannot do that with ANY Ice left -- you cannot have any Landfast Ice at all or the Surf cannot reach the Beach. But of course, only in Summer. In Winter it Ices up -- there is NO SUN AT ALL.

-- This was part of the 1960's Ewing-Donner Theory & predicted a Wet Sahara: And a Sand Dune Desert in Kansas & Nebraska. If you watch History's Mysteries, you will have heard that that area was UNINHABITABLE.

>> Simple calculation shows that 3% of the Earth's surface changing from 80% reflective to 20%, accounts for the temperature jump at the end of the Ice Age: 12 degrees F for the Northern Hemisphere over a 3 year period -- heating the Earth about 6 degrees F -- typically the South only reacts on Millennial scales (3000 years in this case).

1st Precautionary Action: Prepare for emergency use of massive "Hydrogel" mats to cover those states. (H. is used in Diapers). California will also lose half its water. But the WORST Consequence is if the Transition is LIKE the one that started it: at the End of the Last Ice Age.

>See "Climate Crash" by Cox, interviewing the Greenland Ice Core crews: wee, wee, wee, wee, BOING! WEEP! WOP! ... and then it stayed down."

-- that is the sound of "Pegging the meter" = winds higher than ANY Hurricane ... as those sounds were made by a ph meter every 22.5 days: we have both High winds & what appears to be 3 WEEKS in ZERO wind = the EYE of a Storm -- leading to the supposition these storms stretched from Arctic Circle to the Nearer Tropic.

As the Oceans weigh 1900 times the air, but only a tenth is involved in the Great Conveyor Belt Currents which move at 3mph but meander due to Coriolis & shorelines

... IF the Conveyor STOPS = winds must travel at $1900 \times .1 \times 3 \times .5 = 300$ mph roughly, to convey the same Heat.

= Destruction of nearly ALL aboveground structures North of 10 Degrees Latitude

= 99% Deaths in USA, Europe, etc. within 2 years.

... In the Worst Case:

Immediate Action can create Clouds with: Airplane contrails, seawater mists, or highaltitude

sulfur (e.g. heightening Smokestacks at Norilsk).

But it needs to be done in the next few Weeks - - - months before we can be sure an Early Melt WILL happen.

But is it CERTAIN ?????

Now OPEN water above 85 degrees will reverse the currents in Summer -- because of the 24-hour-a-day SUN.

In Winter there will be no Warm current to slow temperature's fall -- which will go all the way to freezing out the Atmosphere because there is NO SUN. For six Months.n Every Night the temp falls a couple degrees ...

BUT:

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> SHUTDOWN was feared when salinity flipped around 2000. You see, currents move for Both salinity & temperature reasons
- - - I suspect it needs BOTH salinity & temperature to be reversed, for the current to reverse totally ...
Overall, It is a fair toss-up whether:
-- it will go SUNNY soon enough not to just Melt, but for a 50 degree F Ocean.
-- Salinity cooperates
-- The Ocean Currents "see" only whether there is Ice Cover over the Arctic OCEAN. It OUGHT to respond like the Arctic is Covered, ie, in an Ice Age.
But are we identical to then? Certainly not, exactly. So... maybe...
... I'm giving it a bit over 1-in-8 because "weak" area North of the Taimyr may melt, then heat, and stop the Currents even if #1 does not happen. A Local melt at Just the WRONG spot -- even without a General melt.

Overall:

>> Is Volume Loss Occurring ?:

The Piomas model at the Polar Science Center has not been updated in nearly a Month (Ouch)

Here is summation of the last Update: in cubic km (km3)

----- ICESAT / PIOMAS

'06-7 Change: 4000 ----- 2700 Change

(ie next 2 rows will show Piomas 1300 "high")

2007 Sept. ___ 5050d ----- 6350 km3 Left @ minimum

2007 Nov. ___ 6000 ----- 7300 km3 Left "

2009 Sept. ---- ? ----- 5800 km3 Left " (P+I)

..Zero Ice at __-14200 Anomaly

2010 17 Apr. ___ -7800 An.=6400 km3 Left @ " (P+I)

2010 18 June ___ -10700 An.=3500 km3 Left "

Thus in 62days: 6400 -3500 = LOSS OF 2900 km3

= LOSS RATE of 327.4 km3 lost/week = in 10.7 weeks = 0

P+I = Piomas + Icebridge

(Better Data as add Airplane-Laser Measured Thicknesses)

d = derived by subtracting Sept -to- November change (assuming it is the same as Piomas' 950) from ICESAT's 6000 for November (ICESAT only available in March & November due to damage)

[Pic removed to save space - - it showed my effort to derive a "ZERO" from the website pic, but as Princeton Consultants came to a similar conclusion (Zero = 14,400, Me = 14,200) I don't need it. The PSC's Daily Mean Chart (at website below, see graphs' captions) says September mean = 13,400 ... but the "Zero" is the minimum, not September's monthly mean -- and it does sound like the big Dots are Monthly Means, not 1st of the Months -- but that could be, its ambiguous. I now have 6 different lines of reasoning, but most imply 2007 was near 5000 km3 at minimum so leave it at that, I guess]

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... From Superimposing the 2 graphs on the Webpage

<<http://psc.apl.washington.edu/ArcticSeaIceVolume/IceVolume.php>>

Is PIOMAS Accurate? It did match ICESAT's numbers almost perfectly -- except once -- in late 2007. So, IF the Central Arctic Ocean melts, PIOMAS will understate the Melt (as in 2007) as PIOMAS sums up airplane, ship & shore data for thickness - - and while satellites are overhead, who risks flying so far from shore ? E.g. Icebridge has stopped except over Greenland.

I sent an E-mail that Cryosat 2 should share preliminary data with PIOMAS - - I've heard Nothing. If there is no Satellite DATA - - WE NEED ICEBRIDGE BACK.

... If we do not have confirmation that WE WILL LIVE...

The Military Point of view I learned says: PREPARE, just in case.

It's life & Death of 6 BILLION ! . . . MAYBE. POSSIBLY.

Executive Summary:

Overall, I stand by my Calculation that 2010's Strong El Nino has done enough more than 2007's to FINISH the Ice, based on the total VOLUME of Ice being so Low an Ice-albedo feedback will Occur.

Wayne Davidson echoes my prediction with his Much greater Experience & fills my knowledge-gap in Re: Clouds.

In the Day-to-Day Saga, June was a Record Melt in every way ... but suddenly SLOWED in Early July at the Crossover between El Nino & La Nina. El Nino gives THIN ICE. La Nina: CLEAR SKIES. If Wayne is right, it WILL get SUNNY. Given the low VOLUME of Ice left ... the END will come VERY QUICKLY -- like Hudson Bay when it melted so early this year.

A "Bar" of thicker Ice may remain but further towards Alaska than the 2007 Ice-Front ... its persistence may avert - - or its being too far West may encourage -- Ocean Current Shutdown/or Reversal.

Actions Needed: Circle Planes over un-clouded Open Water (Contrails = artificial Clouds), Resume Icebridge, stockpile Hydrogel, Heighten Smokestacks at Norilsk & increase July-August output there.

Volume of Ice & Icesat numbers at the Polar Science Center

<<http://psc.apl.washington.edu/ArcticSeaIceVolume/IceVolume.php>>

ONI ratings are at:

<http://www.cpc.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml>

Also see:

uah Arctic Ocean air temp: <<http://vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt>>

Wayne Davidson Website: <<http://www.eh2r.com/>>

<<http://www.ngu.no/en-gb/Aktuelt/2008/Less-ice-in-the-Arctic-Ocean-6000-7000-years-ago>>

The Following may be superfluous:

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These 4 pics from 4 years show HOW different that "Bar" breaking loose makes 2010 look:

Note how the "Bar" squashed the Siberian part of the Behring Strait Polynnya:

Note also the "Blue Corridor" of weak ice in 2010 Pointing near the Pole:

PS: Beaches Older than 7000 years were not found but as the Great ICECAP had not completely melted off & Sea Level was 100+ feet below today's -- they would be underwater. Ends of Ice Ages occur 101,000 years apart & are NOT triggered by Milankovitch as the Longer Vostok cores showed transitions happening 50,000 years off (the cycle is 108,000 years but Ice Ages cycle @ 101,000 average, but vary to match the Jupiter Orbit cycle EXACTLY. Besides, Milankovitch's requires a mysterious disappearing Augmentation Factor - - that no one has ever found - - and which must apply only to the 108,000 year cycle & not the 41,000, etc.

--- Although Jupiter's Plane of orbit EXACTLY matches the ICE AGE TIMING in He3 studies, the DUST theory that Jupiter proponents used has just a month ago been proven orders of magnitude too weak. Then How do Ice Ages End? Well, we KNOW, from Comet Shoemaker-Levy, that getting BETWEEN Jupiter & Io produced a "Zap" & Auroral Display equal to a Month's Solar Radiation. This is FACT. That the Ends of Ice Ages MATCH the Jupiter/Earth/Sun eclipse date, and the 11,000 B.P. Numerical temperature Increase, MATCHES what an Open Polar Sea creates -- are FACTS. Thus I argue: the Ice Ages are now Explained. Period. Well: the ENDS, anyway. I considered whether I should mention this -- too much New, at one time = Scientific indigestion ? But Science is not about being Politic, and it is relevant... partly.