

0. 1°C Global Temperature Rise could cause the Climate Becoming Wild.

0. 1°C Global Temperature Rise $\doteq 8.6 \times 10^{22}$ Joule heat energy increase

How much energy for making a hurricane ? $\doteq 1.8 \times 10^{20}$ Joule.

Even we could display the recent many severe climate disasters (draughts, big floods, hurricanes, typhoons, ..) in the now world. Then someone could deny those of climate collapse by exploiting past many similar disasters. However, by comparing following energy amounts, you could see that we still have been in rather safety zone. We would have seen more and more climate collapses in coming few years of 0.1°C global temperature rise.

It is nothing, but now that could save this world.

2012/8/11, 14

[1] : How much energy for making a typhoon ? $\doteq 5.2 \times 10^{19}$ J/day ~ 1.8

$\times 10^{20}$ Joule. <http://www.aoml.noaa.gov/hrd/tcfaq/D7.html>

(1) Typhoon and hurricane are made from heat of oceans surface with water evaporation. Uprising air flow in eyewall is accelerated by heat input by coagulation heat of the moisture, which is to turn to strong rain fall. Then bottom of eyewall is to sink more winds from neighbour to make typhoon eddy flow.

(2) Thus typhoon has max thermal energy of water evaporation and coagulation $\equiv Q = Mh$.

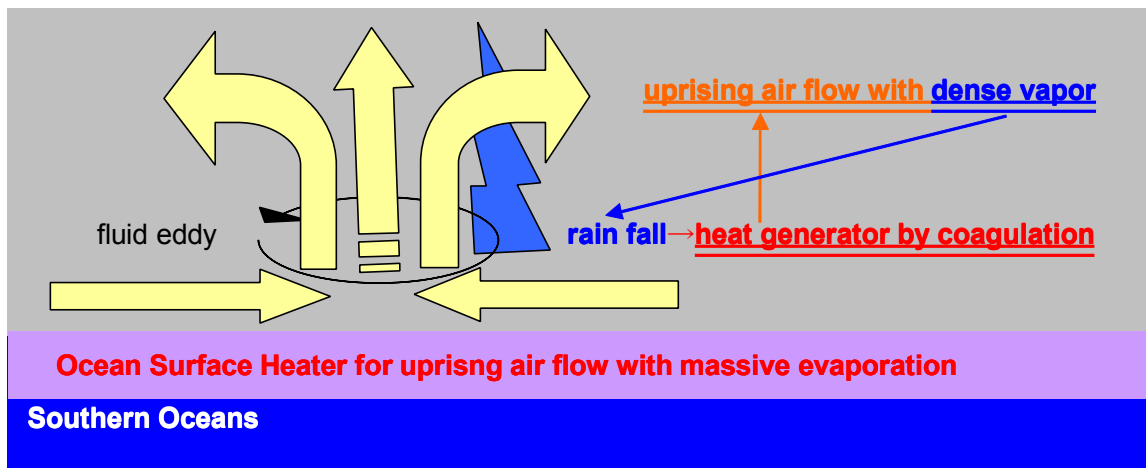
Total rain fall mass $\equiv M$, evaporation and coagulation heat $= h = 9.717 \text{ kcal/mol} \times 4.19 \times 10^3 \text{ J/mol} = 4.07 \times 10^4 \text{ J/18g} = 2.26 \times 10^9 \text{ J/ton}$.

http://www.cbr.mlit.go.jp/kawatomizu/tenpenchii/pdf/06shiryo_04.pdf

$M = 800,000,000 \text{ ton}$, $h = 2.26 \times 10^9 \text{ Joule/ton}$, $Q = mh = 1.8 \times 10^{20} \text{ Joule}$.

(3) As you know well typhoon has max kinetic energy of wind $K = \text{sum of all } \rho v^2/2$ at a time in typhoon volume S . $\rho = \text{mass density of air}$, $v = \text{wind velocity in typhoon}$. In general $K \ll Q$, so K could be neglected in coarse estimation.

(4) Typhoon-Hurricane and strong rain fall are co-body for heat engine.



[2]: How much energy for 0.1°C Global Temperature Rise $\doteq 8.6 \times 10^{22}$ Joule.

(1) Global Heat Capacity ($\equiv C_G$) = heat energy for 1°C rise. = heat input/temperature rise ($\equiv \Delta Q/\Delta T$).

(2) Global Debt Heat Input/year ($\equiv \Delta Q$)

= {global heat input from sun – cooling radiation output from global surface}

\equiv radiative forcing (1.6 J/s.m^2) \times global area ($4\pi R^2$) \times years time ($3600 \times 24 \times 365 \text{ sec}$)

$= 1.6 \text{ W/m}^2 \times 4\pi (6.38 \times 10^6 \text{ m})^2 \times 31536000 \text{ sec} = 2.58 \times 10^{22} \text{ J}$. < 1.6 W/m^2 : IPCC data >

(3) Observed global temperature rise/year ($\equiv \Delta T$) $\doteq 0.03^\circ\text{C/y}$.

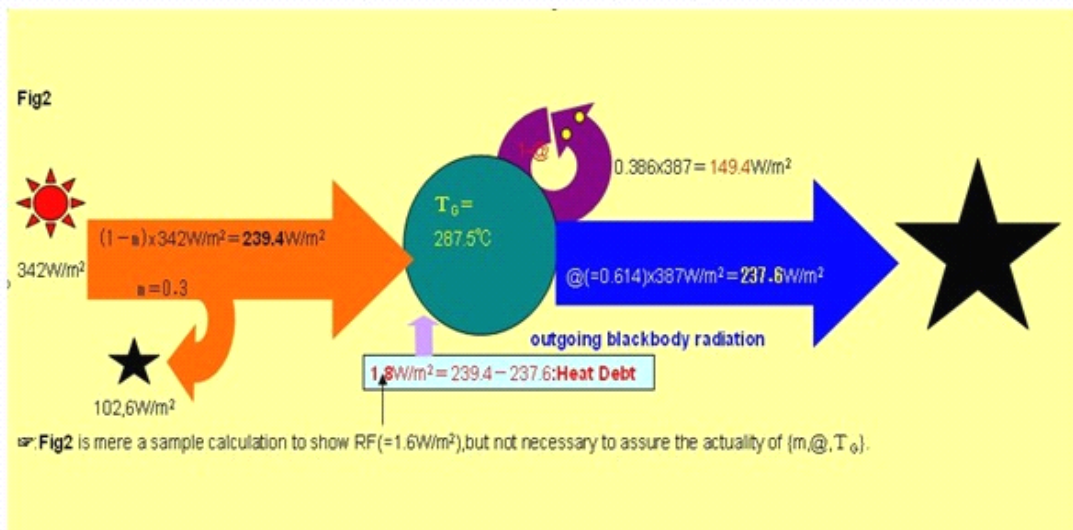
$\Delta T \doteq 0.02 \sim 0.04^\circ\text{C/y}$. in various data, <see Appendix_1>.

(4) Global Heat Capacity : $C_G \doteq 8.6 \times 10^{23} \text{ J/T}$. <land & atmosphere are negligible as 1/1000>

The huge energy is stored in global oceans of surface $361.3 \times 10^{12} \text{ m}^2$ with depth about 600m.

* seawater density = 10^3 kg/m^3 , specific heat = 4.18 kJ/Kg . $C_G(600\text{m}) = 9.06 \times 10^{23} \text{ J/T}$.

Heat Debt = (Incoming Heat – Outgoing Heat)
= the surplus heat causing global heat up.
(heat imbalanced equation).



(6) Heat energy for 0.1°C rise $\equiv E(0.1^\circ\text{C}) \doteq 8.6 \times 10^{22} \text{ J}$.

(7) It is this accumulated heat that could cause climate wild !!!

Then note that typhoon energy/ $E(0.1) \doteq 1.8 \times 10^{20} / 8.6 \times 10^{22} \text{ J} = 0.002 \doteq 1/500$.

That is, as for $E(0.1^\circ\text{C})$, it is not so difficult to supply energy to make a typhoon.

As for 0.1°C rise, it may take about 3 or 5 years. These interval may impress us climate become wild. If $E(0.2^\circ\text{C})$, it would cause more and more wild climate in decade .

[3] : Arctic Methane the Most Emergency Task at now World !!!!!.

(1)We have been facing extinction event that could be caused by massive methane eruption form Arctic ocean flor due to the ocean warming.Now Arctic sea ice lid has entirely been vanishing due to self- positive feedback mechanism.That is,white seaice lid retreat would cause more solar ray input into black ocean,which cause more seaice lid retreat.

They(AMEG the Group)have been warning that point of no return would be in 2015!!.

<http://www.ameg.me/>

Look the scientist smiling with frozen beard,but with sever pain !!.

<http://www.realclimate.org/>

Look this pricuture with temporal calm,but with indicating coming supreme hell. !



(2)Planet Cooling Technology !!.

(a)**Arctic Geoengineering for intercepting methan catastrophe(method of coming heat shielding and heat output enhancing as for ice lid in Arctic).**

This effective technology must be established within this year 2012!!!,

Author beg all of your cooperations !!!!!!

example)Simple method,but Outrageous Scale of solar relfecting sheets implementation.

(b)**Emergent non carbon energy=A possibility of Hydrogen Gas generation by CDW(charge density wave radiated by nothing energy by N.Tesla).**

$$0 = + E(\text{available energy}) - E(\text{negative gravity field energy}).$$

CDW could break chemical bonding in water to generate hydrogen gass.

<http://www.777true.net/BWG.pdf>

<http://www.777true.net/Water-Electrolysis-by-Charge-Density-Wave-could-Create-Energy>.

Author beg all of your cooperation !!!!!!

APPENDIX_1:Data sources.

(1)Global Temperature Record Sources:

http://www.env.go.jp/earth/ipcc/4th/syr_spm.pdf(P3).

<http://data.giss.nasa.gov/gistemp/graphs/>

<http://www.cru.uea.ac.uk/cru/info/warming/>

<http://www.sciencedaily.com/search/?keyword=global+temperature>

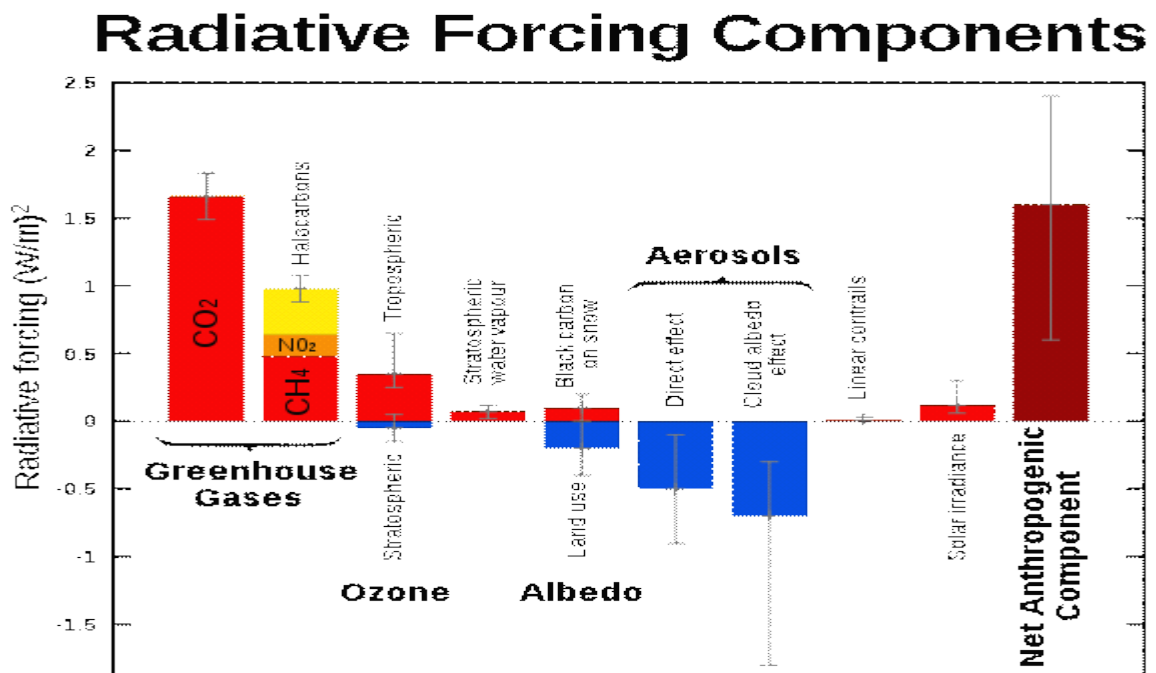
<http://www.sciencedaily.com/releases/2010/07/100718233311.htm>

<http://www.google.co.jp/search?q=global+temperature&hl=ja&client=firefox-a&rls=org.mozilla:en-US:official&channel=np&prmd=imvns&tbn=isch&tbo=u&source=univ&sa=X&ei=hswhUPCxMMvkmAX7q4CoAQ&ved=0CFwQsAQ&biw=1280&bih=825>

(2)radiative forcings.

http://en.wikipedia.org/wiki/Radiative_forcing

2005 radiative forcings as estimated by the IPCC.



http://www.eoearth.org/article/Radiative_forcing

Radiative forcing of carbon dioxide is estimated to be about **1.55 watts** per square meter. albedo of about **30%**,

<http://www.nature.com/nclimate/journal/v1/n1/full/nclimate1068.html>

(3) **How much energy does a hurricane release?**

<http://www.aoml.noaa.gov/hrd/tcfaq/D7.html>

Hurricane Development: From Birth to Maturity

<http://www.hurricanescience.org/science/science/development/>

Global Tropical Cyclone Activity

<http://policlimate.com/tropical/>

Surprisingly regular patterns in hurricane energy discovered

<http://esciencenews.com/articles/2010/07/12/surprisingly.regular.patterns.hurricane.energy.discovered>

(4) **What Causes Big Floods?**

None is found.

(5) **What Causes Droughts? .**

<http://geography.about.com/od/globalproblemsandissues/a/drought.htm>

<http://weather.about.com/od/drought/f/droughts.htm>

(6) **Ocean Size.**

<http://en.wikipedia.org/wiki/Ocean>

http://www.oceansatlas.com/unatlas/about/physicalandchemicalproperties/background/see_more1.html

APPENDIX_2 :The cause of big floods and strong draught (revised 2012/8/14).

Following site(4) is persuasive.

(1) See [2] : (4) **Global Heat Capacity** : $C_G \doteq 8.6 \times 10^{23} \text{J/T}$.

Note land and atmosphere heat capacitor are negligible small as about 1/1000. The huge heat energy is stored in global oceans of surface $361.3 \times 10^{12} \text{m}^2$ with depth about 600m.

* 0 ~200m depth = mixed layer of equi warm temperature.

* 1000m < depth = deep ocean of equi cool temperature.

Then global surplus heat has been going toward **Arctic** the lowest temperature zone.

(2) It is certain that vapor evaporation from warmer oceans is increasing in recent years.

So huge amount of atmospheric vapor would cause strong rain to big floods in coastal region.

(3) **Collision Frequency Increasing of cold and warm atmosphere at middle latitude (midst of north pole and equator) = global chaotic-nization.**

Then note that to make rain fall, it is necessary to encounter cold atmosphere.

Also note the role of massive collection of cold Arctic atmosphere, which recently tends to be pushed out from north pole by higher pressure due to warmer north pole temperature (**Arctic warming**). Consequently global warming is to cause **pardox** that random cold weather is to go down to even southern zones. This is one of cause that climate becomes wild.

(4) **Arctic climate change causing droughts, floods and heat waves outside the north**

<http://www.climatecentral.org/news/arctic-warming-is-altering-weather-patterns-study-shows/>

* jet stream = high speed westerly wind (east to west) pipe line around northern sphere.

While arctic wind from pole to south is to collide jet stream to meander, which cause.....

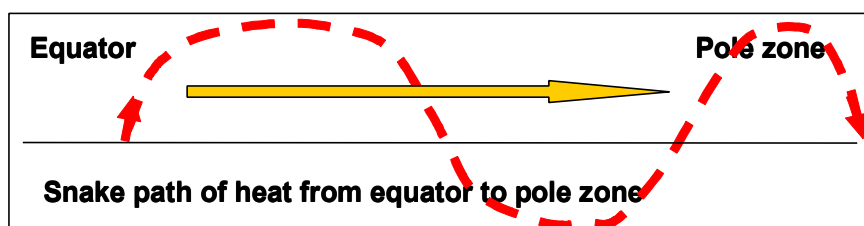
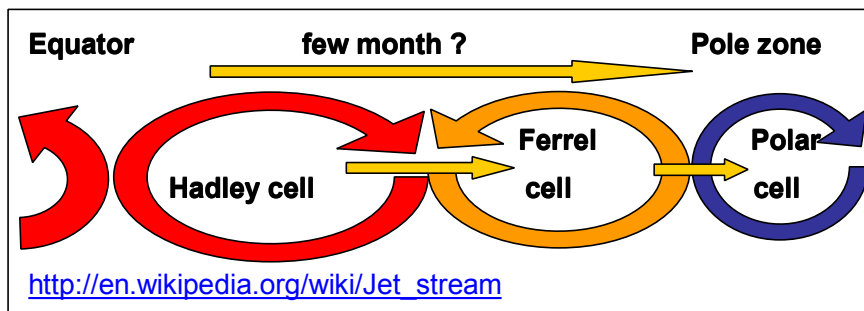
http://en.wikipedia.org/wiki/Jet_stream

APPENDIX_3 : Global Heat Flows from equator to pole zone (Arctic & Antarctic) .

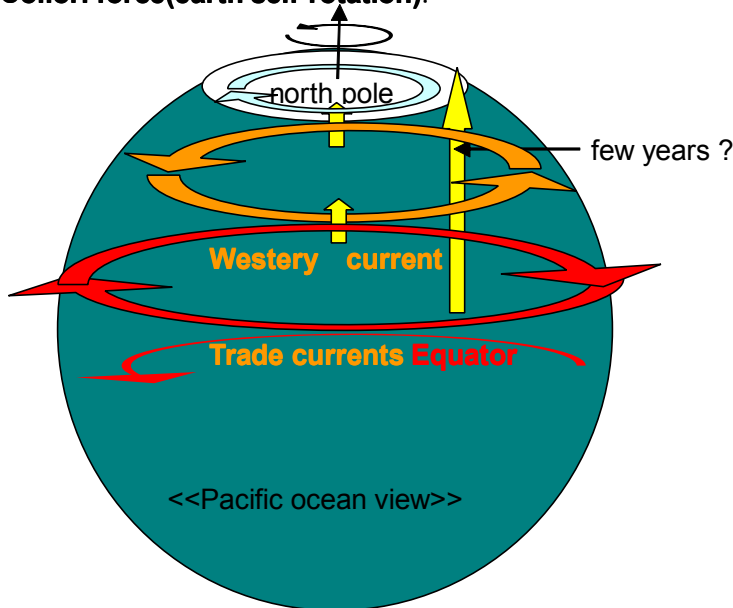
Global warming has been transferring heat from **equator (the highest temperature zone)** to **Arctic zone (the lowest temperature zone)**, which have caused various abnormal climates in recent world. It was the first cause of **the Arctic collapse** by sea ice surface vanishing. Now sea ice vanishing itself has been accelerating most fatal of the ocean warming to the **Methane Catastrophe**. Following are all of author's imagined answer, but not that by experts.

(1) **Massive atmospheric convection heat flow from equator to Arctic (Antarctic).**

Heating up fluid become lighter, which drive upwelling current. Cooling down fluid become heavier, which drive downwelling current. Note eddy contacting point is location where heat transfer occurs (→) by **stirring**. Atmospheric heat flow is less amount than that of ocean, but velocity is higher than ocean. Heat transfer amount is told almost same order by both ocean and atmosphere.



(2) **Massive horizontal ocean heat flow from equator to Arctic(Antarctic)**
by Coliori force(earth self-rotation).



Trade current is driven by earth self rotation(**strongest Coliori force at Equator**),while westery current is driven by dragging force toward east by upper portion of trade current . So called "Thermohaline Circulation in ocean bottom " is too slow to reveal its thermal effect.

(3) **Breaking down of Arctic stability now has been causing climate wild.**

The past stabilized Arctic had been confining cool atmosphere within Arctic.

Now north pole became higher temperature to cause outer flow of cool wind by higher pressure.This has caused paradoxical cooling in northern hemisphere in global warming.

This serious fact indicate that,in global warming,there would be sever hot and cool climate alternatively,which would cause difficulty in weather forcasting due to the chaotic nature.

APPENDIX_4 :Macroscopic Climate Fluctuation is

caused by accumulated microscopic random dynamics of fluid particles.

Observed climate data has large random fluctuation in short term view, but decisive trend in long term view. Therefore climate debate must be cautious on this fact.

(1) You never can trace smoke trajectory in whole time.

Those (smoke particles) would become low density to become invisible at last.

(2) Climate (weather) is stage phenomena of **atmospheric (oceanic) fluid field** which is massive collection of air (sea water) particles, which are originally microscopic quantum particle. Those fluid flow is described by **Navier-Stokes Equation**.

(3) Physical society of world admitted essential probabilistical behavior of quantum particle, but not causalistical one. Quantum Dynamics of particles collision is entirely probability theory. Therefore macroscopic fluid trajectory also can not completely be causalistical in whole time (vanishing trajectory in final stage is called **chaos due to massive particles collision process**).

(4) Long term weather prediction by **NS fluid equation** become difficult due to chaos.

Following are rather expert orient.

(5) Newtonian Dynamics of a mass is complete causalistical enabling long term prediction.

$$d(M\mathbf{v})/dt = \mathbf{F} \quad \text{time derivative of (mass} \times \text{velocity)} = \text{force on mass.}$$

(6) Newtonian Dynamics of a fluid is incomplete causalistical enabling short term prediction.

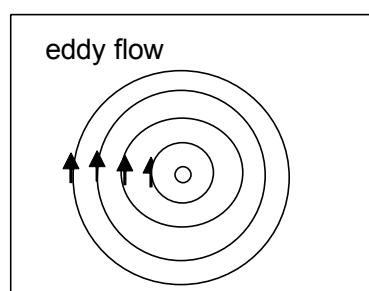
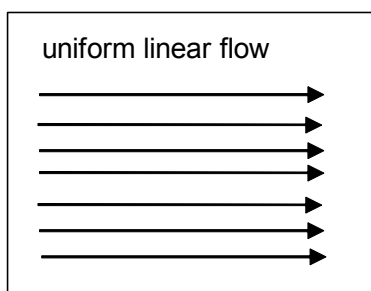
$$D(\rho \mathbf{v})/Dt = \mathbf{F} \text{ (causalistical force of internal pressure gradient} = -\text{grad } P \text{ and gravity} = g)$$

$$+ \mathbf{F} \text{ (incausalistical force of friction one} = \text{random force)}$$

$$D(\rho \mathbf{v})/Dt = -\text{grad } P + \rho \mathbf{g} + \mu \nabla^2 \mathbf{v}. \quad \langle \mathbf{v} = \text{velocity, } \rho = \text{mass density} \rangle$$

$$\langle \nabla^2 \equiv \partial^2 / \partial x^2 + \partial^2 / \partial y^2 + \partial^2 / \partial z^2 \rangle.$$

(7) Does fluid prefer becoming uniform motion or eddy flow ?!. $\nabla^2 \mathbf{v} = 0$. (complete fluid)



Those are complete synchronized swimmers.

Fluid seems not to prefer **stirring** ($\mu \nabla^2 \mathbf{v}$), which convert dynamic energy into thermal one.

This is **entropy increasing** proces. This is equivalent to **information loss** on dynamic system.

(8) **Large scale view** by scaling transformation (Reynolds analogy law) .

Fluid equation could be transformed into new space and time variables $\{x', t'\}$ from $\{x, t\}$ by $\{x = Lx', \mathbf{u} = U\mathbf{u}', t = (L/U)t', p = U^2 p'\}$

$$\begin{aligned} \rho \{ \partial u_i / \partial t + \sum_k u_k \partial u_i / \partial x_k \} &= -(\partial p / \partial x_i) + \mu \nabla^2 u_i + g_i \rho \quad \langle i=1, 2, 3 \rangle \\ \rho \{ (U^2/L) \partial u'_i / \partial t' + (U^2/L) \sum_k u'_k \partial u'_i / \partial x'_k \} \\ &= -(U^2/L) (\partial p' / \partial x'_i) + \mu (U/L^2) \nabla'^2 u'_i + g_i \rho . \\ \rho \{ \partial u'_i / \partial t' + \sum_k u'_k \partial u'_i / \partial x'_k \} &= -(\partial p' / \partial x'_i) + (\mu / UL) \nabla'^2 u'_i + (L/U^2) g_i \rho . \end{aligned}$$

Then taking $U=1, L=\text{larger}$ could make $(\mu / UL) \equiv \mu'$ **smaller**, and gravity become larger.

This is to make fluid equation more causalitcal one in **large scale view**.

This might be a certification for global climate model calculation.