Continental Physical Oceanography and Climatic Effects on Human Lives and Infection Diseases

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Abstract

Title: Continental Physical Oceanography and Climatic Effects on Human Lives and Infection Diseases The author watches mechanism shifts caused by climatic influences and active era of seismic energy. Thermal power is stored and released through factors of ocean temperature and evaporation. Those affect human lives and virus vectors in the fields of ocean-atmosphere interaction and seismic oceanography. My presentation includes such research topics: Inundations of max assumed tsunamis and storm surges affect human risks in seashore mega cities SST dipole-effects to global crop production through stomata closing Advection effects from SST anomalies by high potential evaporation causing dry air and losses of human lives as well as houses by forest fires Ocean Impacts to Infection Diseases through Seasonal Climate change: New Applicable fields from Geo-Health linked to continental oceanography comparing to the traditional micro-and-genetic approaches. Ocean impacts to propagation of infection diseases through seasonal climate change such as fundamental air temperature and precipitation for plants and animals Climatic influences on vectors such as mosquito (like malaria, dengue fever, etc.) through blood, virus from breath (COVID-19), and bacteria from mouth, along with the potential risks by fatal viruses of Avian (Bird) Influenza and Classical Swine Fever etc. New recognized other important factors of mega cities by continental bird's fly-routes, wild animals multiplication and increased travel flows of global human-lives Ecological transitions of deforestation and afforestation in low land or wet-land for wild birds and animals. Satellite sensing and photosynthesis-model mapping for vegetation growth in country-scale, continental, and global watching, by monitoring microbiological diseases through insect habitats, bird's passages and animal movements. Intensive approaches using data assimilation and synthesizing among meteorological, geophysical, biological, and hydrological factors Related Divisions: Ocean Sciences, Geo-Health, Science and Society, Natural Hazards, Hydrology, BioGeosciences

Continental Ocean Sciences and Impacts to Inland Human Lives and Habitats

Daijiro KANEKO
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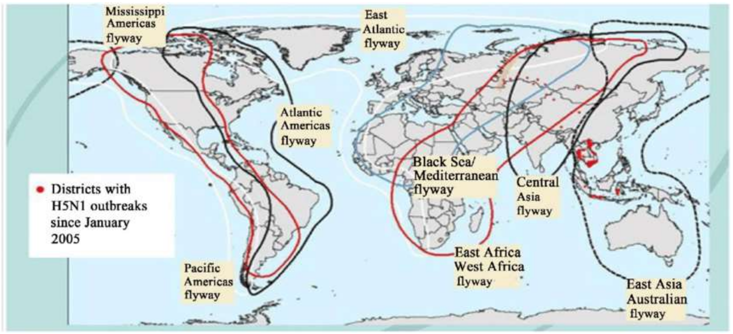
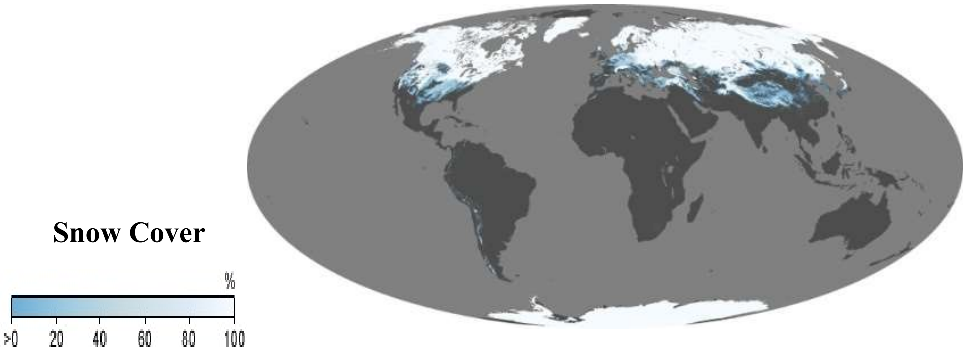
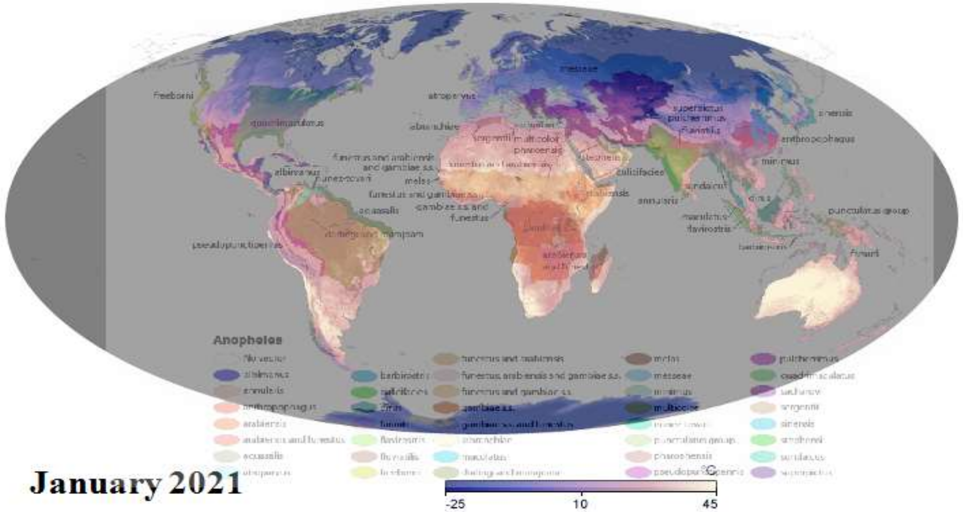






RSEM, JAPAN

Title: Continental Ocean Sciences and Impacts to Inland Human Lives and Habitats

My presentation includes Ocean Sciences and Geo-Health including such research topics:

•Inundations of max assumed tsunamis and storm surges affect **human risks** in seashore mega cities

•SST dipole-effects to global crop production through stomata closing

•Advection effects from **SST anomalies** by high potential evaporation causing dry air and losses of human lives as well as houses by forest fires

•**Ocean Impacts to Infection Diseases through Seasonal Climate change:**

New Applicable fields from Geo-Health linked to **continental oceanography** comparing to the traditional micro- and- genetic approaches.

- ・Ocean impacts to propagation of infection diseases through seasonal climate change such as fundamental air temperature and precipitation for plants and animals
- ・Climatic influences on vectors such as mosquito (like malaria, dengue fever, etc.) through blood, virus from breath (COVID-19), and bacteria from mouth, along with the potential risks by fatal viruses of Avian (Bird) Influenza and Classical Swine Fever etc.
- •New recognized other important factors of mega cities by continental **bird's fly-routes**, wild animals multiplication and increased travel flows of global human-lives
- ・Ecological transitions of deforestation and afforestation in low land or wet-land for wild birds and animals.
- ・Satellite sensing and photosynthesis-model mapping for vegetation growth in country-scale, continental, and global watching, by monitoring microbiological diseases through insect habitats, bird's passages and animal movements.
- ・Intensive approaches using data assimilation and synthesizing among meteorological, geophysical, biological, and hydrological factors

The Author considers that climatic influences on mosquito (like malaria, dengue fever, etc.) through blood, virus from breath, and bacteria from mouth are more important. Especially malaria is well-known for climatic effects of the expansion to northern hemisphere. However, we have now recognized other important factors of continental bird's fly-routes and global human-travel flows.

Continental Ocean Sciences and Impacts to Inland Human Lives and Habitats

Daijiro KANEKO
Remote Sensing Environmental Monitor, Inc., President, Dr.

Composition of Subjects

1. Discussions on Risks of Human Lives and Habitat

(1) How should we designate this emerging new class of terrible continental- and global-scale natural disasters?

(2) What are the key factors leading to the extreme nature of these water hazards?

2. The effects of climatic variations on hazardous phenomena

(1) What are the risks to human lives from complex system of Earth based on Gaia hypothesis?

1) Oceans facilitate energy conversion and transportation

2) Climatic factors on natural hazards and the propagation of viruses

3) Climate effects on infectious disease distribution through circulation of virus vectors

3. Points of argument in the session of human lives and habitats

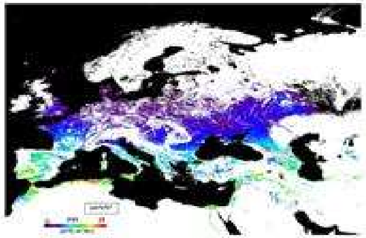
(1) The author's opinion to the NOAA meeting on their policies

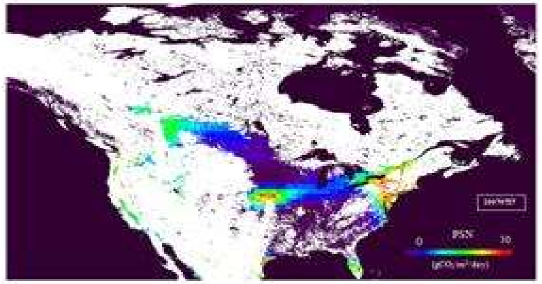
(2) What is the explanation for the mechanisms producing increasingly drastic impact from natural disasters and the increased threat of biological pandemic?

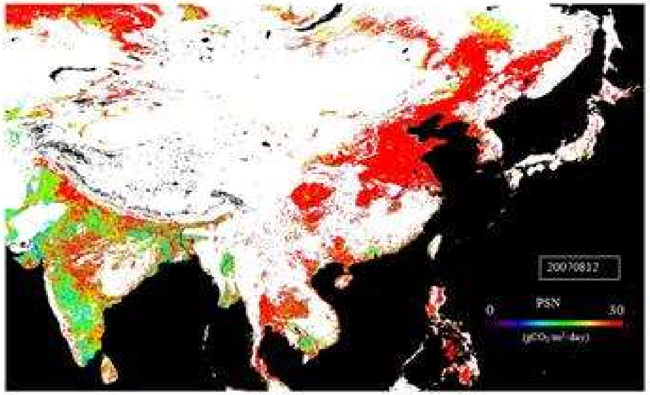
(3) Where are the emerging areas of natural disasters and pandemic diseases?

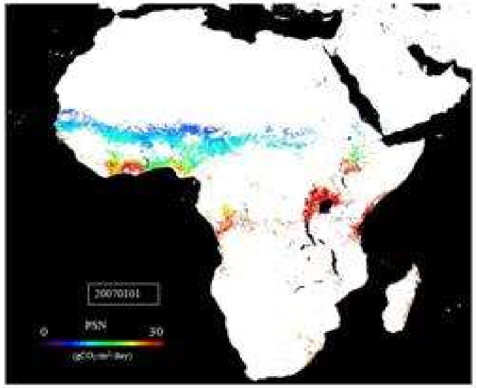
(4) What are the mechanisms of climate effects on human lives and ecosystems?

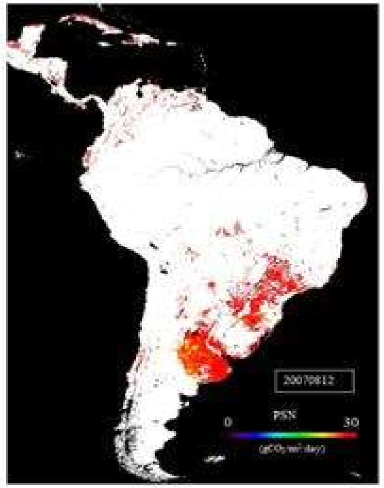
Analysis by Geophysical and Biochemical Global Modeling dividing into Precise Continental Agricultural Phenomena

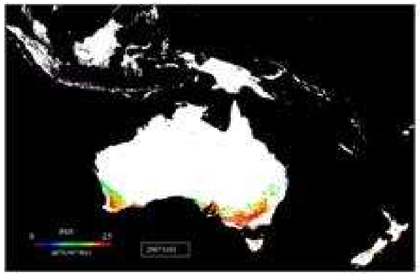












RSEM, JAPAN

Global Effects of SST Anomalies on Downwind Continental Crop Yields Using Satellite-Based Photosynthesis Models

Daijiro KANEKO

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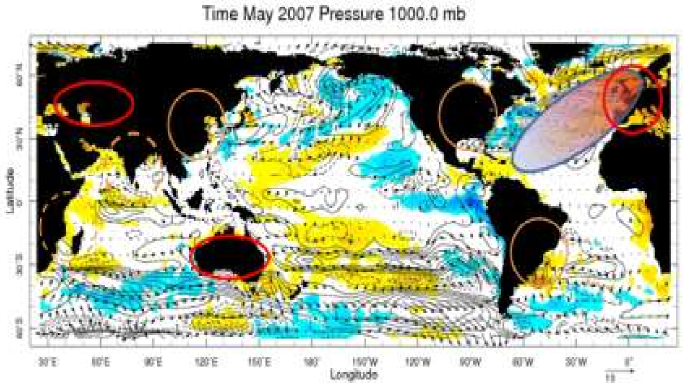
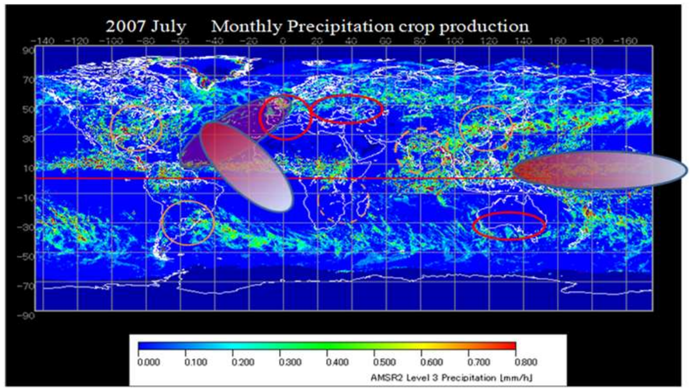
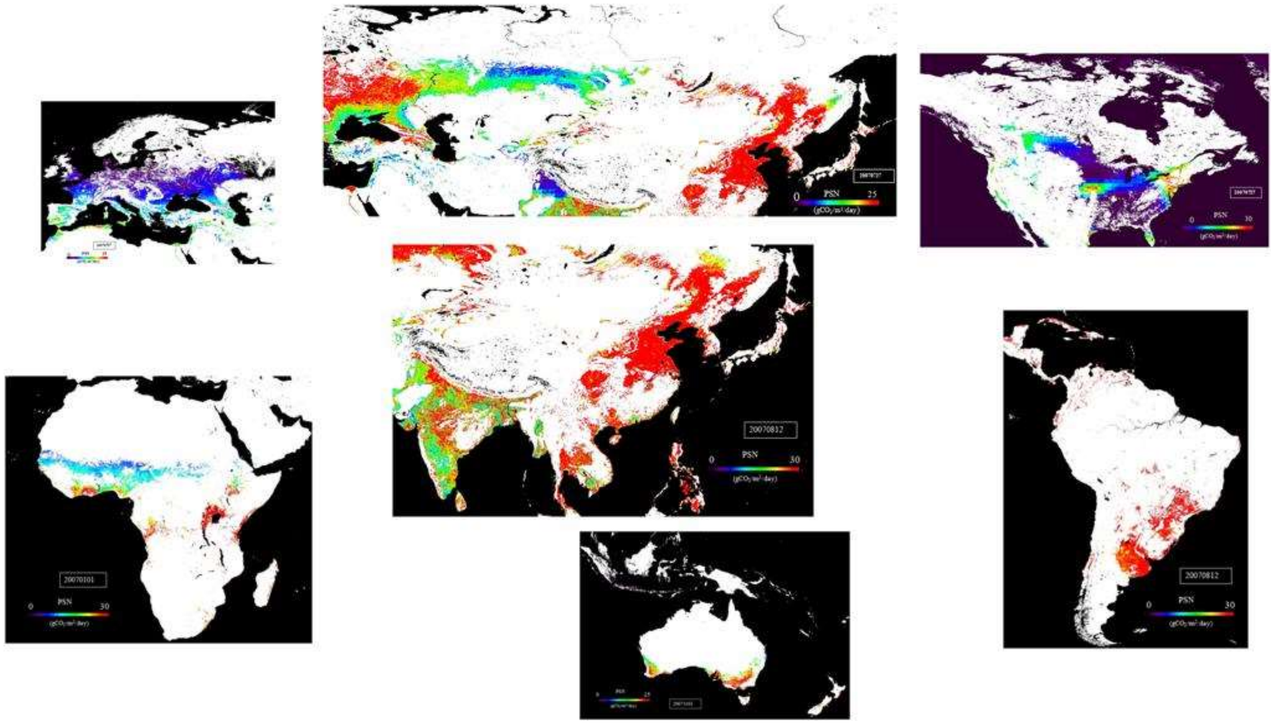
SST, Wind & Precipitation





Continental Photosynthesis-Rate Distributions



RSEM, JAPAN

Global Modeling of Photosynthesis in the All Vegetated Areas Combined with the Advection Effects of the Climatic SST Dipoles against the Last Restraint of Drought

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1. Objectives

1. This study investigates the global distribution of the photosynthesis activity, biomass, and drought-induced poor harvesting areas, which are affected by El Niño-Southern Oscillation (ENSO), Atlantic oscillation, and Indian dipoles, to understand the effects of Sea Surface Temperature (SST) anomalies that are caused by climate variations.
2. The objectives of this study are to understand the recent trends related to crop production, grass grazing, and frequent forest fires, with respect to the restraints that are caused by droughts against the yields with plural effects of genetically modified plants even if drought tolerant plants and sufficient fertilization exist.
3. Global carbon-based photosynthesis models have been developed for crop production and for complete vegetated areas along with seven continental modes, which combine the effects of the SST dipoles on evapotranspiration, photosynthesis, and crop production using a complementary energy conservation model.

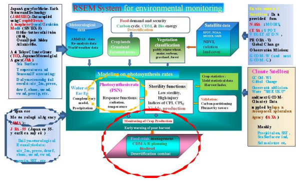
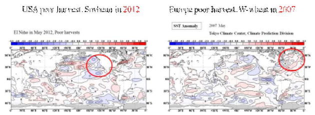
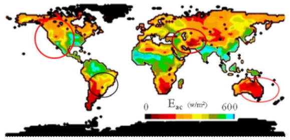
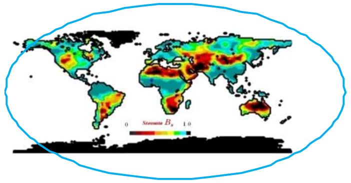
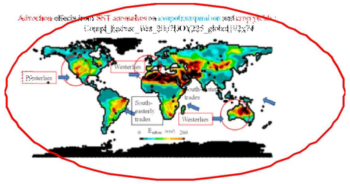


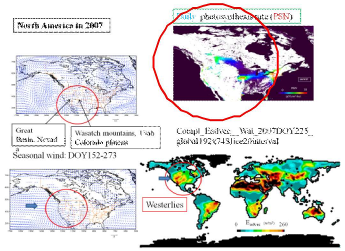
Figure 1. Expanded RSEM System for crop production monitoring.











2. Modeling and Validation

The authors have developed an environmental research system named Remote Sensing Environmental Monitor (RSEM) for carbon sequestration by vegetation and grain production. The photosynthesis rate (PSN) of the rice model in the system is defined below in Eq. (1) with a Prioul and Chartier type of radiation response function f_{rad_pc}, which properly fits the curve of the photosynthesis rate for paddy rice[1]:

(1)

$$N = f_{rad} \cdot f_{Syn}(T_c) \cdot \beta_s \cdot eLAI \quad (1a)$$

where PSN is the photosynthesis rate (gCO_2/m^2/day), PAR denotes the photosynthetically active radiation (MJ/m^2), β_s is the stomatal opening T_c represents the canopy temperature (°C), eLAI stands for the effective leaf area index, a_{pc} is the Prioul-Chartier constant, PSN_{max} is the maximum PSN, and c_c is the curve convexity constant.

The temperature response function of the photosynthesis rate f_{Syn} is such that the rate PSN falls at low air temperatures. The function f_{Syn} shows an S-shaped curve defined by Eq. (2), which is well known as the sigmoidal logistic type function:

(2)

where T_{hv} is the temperature parameter at half of the maximum photosynthesis rate (°C), and k_{syn} is the gradient constant of the relation between the function $f_{Syn}(T_c)$ and the canopy temperature, which is approximated by the air temperature at 2 m above the ground surface.

The temperature response functions for the low-temperature sterility and high-temperature injury can be defined as the following equations:

(3a)

(3b)

In those equations, k_{Lster} is the low-temperature sterility constant, T_{Lster} is the low-sterility limit temperature (°C), k_{Hster} is the high-temperature injury constant, T_{Hster} is the high-injury limit temperature (°C), and T_c is the plant leaf temperature (°C). Finally, the response function of the compounded temperature sterility affects both low-temperature and high-temperature injury, as expressed in the following equation:

(4)

The integration of photosynthesis rate in Eq. (5a) over the interval from sowing t_s to harvest t_h must be multiplied by the temperature sterility function F_{Ster}.

The normalized index CPI_U is defined for crop yields without dimension

(1)

(2)

where t_f is the start time of flowering (day), and t_r is the time of ripening (day).

The CPI_U is designed to be independent against such factors as crop varieties, soils, and mixed effects of land cover.

The carbon partitioned into Grains (C_{PG}), which improve the former index CPI_U, defines carbon included in grains with normalizing CPIU:

(3)

(3b)

where, C_{PG} is the sequestrated carbon into rice grains (gC/m^2), c_{pgN} is the constant for normal carbon partitioning into paddy grains, r_{CCh} is the ratio between carbon weight and the carbon hydrate, F_{Dst} is the drought response function for yields, D_{str} is the integrated drought sterility, a_{net} is the share ratio of net photosynthesis in the CPI, CPI_N is the normal value of CPI averaged in weather conditions.

The c_{pgN} depends on varieties of crops. The C_{PG} expresses the variable not only an index for crop production but also the carbon amount partitioned into grains relating to the photosynthesis and sterility. The present study expresses the grain yield as follows:

(4)

Where Y_E is the crop yield (t/ha), C_y is the conversion coefficient of the unit (gC/m^2) to (t/ha).

The validation concept is based on using the weight of carbon that is fixed in grains by photosynthesis using the developed model. Crop yields can also provide the weight of carbon in grain according to the chemical formula of starch as $(C_6H_{10}O_5)_n$. This carbon partitioning method (CPV) method has the advantage of direct comparison of sequestrated carbon in grain yield data with computed results based on the present model

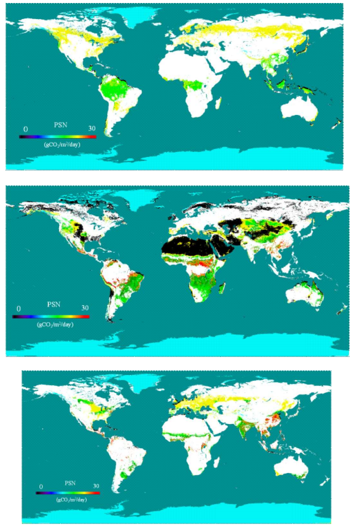
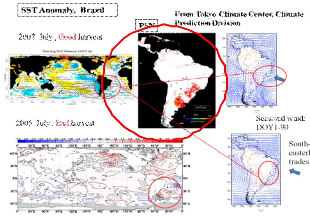
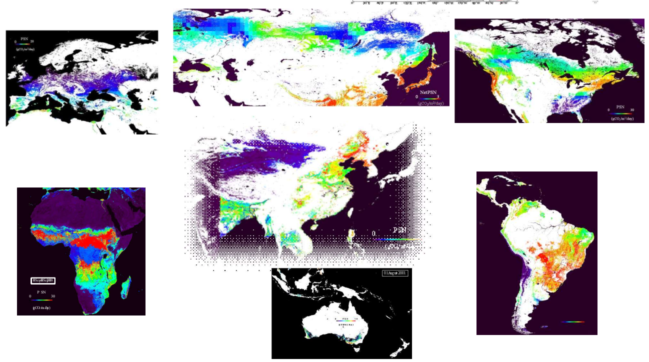
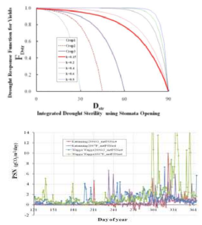


Fig. Global PSNs in forest, grass, and cropland





Global Distributions of Continental PSNs for Crop, Grassland, and Forest Monitoring



3. CONNCLUSIONS

1. The effects of the SST anomalies are expressed by advection term in the actual evapotranspiration formula, which provides improved reasonable stomata openings defined by the ratio between actual evaporation including SST effects and Penman potential evaporation.
2. To understand the manner in which the geophysical influences affect the vegetated areas in the world, the author considers that the sample figures represent global PSNs, including SST affections, such as ENSO, and the final hazardous restriction of drought effects through stomata on photosynthesis activities.

RSEM, JAPAN

1. Discussions on Risks of Human Lives and Habitats

The author observes that the world is now at risk from life-threatening events that have the potential to be much more severe than COVID-19. The catastrophic impacts of natural disasters occurring on modern coastal megacities represent a new scale of global natural hazard that is the product of the modern age.

(1) How should we designate this emerging new class of terrible continental- and global-scale natural disasters?

These can be designated as follows:

1) Indonesian mega-tsunami events, which have caused widespread severe inundation of low-lying areas, such as the 2004 Indian Ocean event, and the 2011 Tohoku earthquake (which also brought the release of radiation from the Fukushima nuclear power plant).

2) Major storm surge events, such as Hurricane Katrina and other recent examples in the Gulf of Mexico, the Pacific Ocean, and the Bay of Bengal.

3) Sustained intense precipitation events causing severe river flooding, which has threatened to destroy protective levees and release flash floods by destroying water storage dams.

All of these can be related to severe water hazards, which can easily result in tremendous loss of life in coastal mega cities. Thus, countermeasures are proving insufficient due to the large scale of natural hazards.

(2) What are the key factors leading to the extreme nature of these water hazards?

The key factors can be outlined as follows:

1) Global warming by evaporation due to recent increase in sea surface temperatures (SST).

2) Powerful mega thrust earthquakes that can dislocate ocean plate tectonics, resulting in gigantic tsunami waves capable of causing wide spread destruction of infrastructure located in and around coastal megacities.

2. The effects of climatic variations on hazardous phenomena

(1) What are the risks to human lives from complex system of Earth based on Gaia hypothesis?

1) Oceans facilitate energy conversion and transportation

We can recognize emerging trends of natural disasters and infectious diseases from the viewpoint of ocean sciences. Variations in global climate have affected the thermal storage of sea water as observed from the instances of super tropical low pressures and proliferating diseases caused by virus. Extreme water hazards including massive storm surges and heavy rains from linear rain bands are emerging as increasingly frequent phenomena.

2) Climatic factors on natural hazards and the propagation of viruses

a) Areas of warming air temperature (Northern Siberia and Alaska), leading to permafrost melting;

b) Anomalous SST;

c) Precipitation in tropical and subtropical zones, including extreme atmospheric low pressures (i.e., super hurricane, typhoon, and cyclone);

d) Ocean currents (Pacific Kuroshio Current, and the Gulf Stream);

e) Hadley Cell circulation and not expected La Niña but El Niño caused by temperature warming effects in northern Asian countries; and

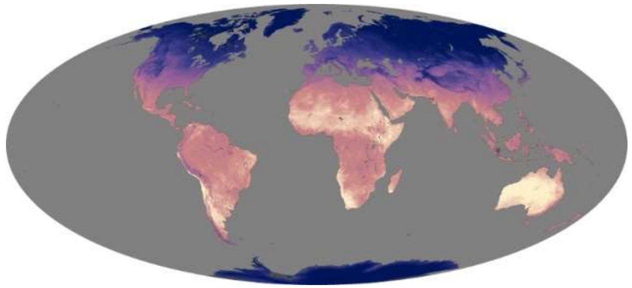
f) Meandering of the jet stream.

Viruses or Malaria Plasmodium concerning Temperature : Global Comparisons between Mosquitoes and Land Surface Temperature using high LST in most hot month in July,2020.

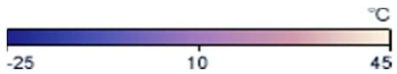
Habitats of the Vectors (mosquitoes):

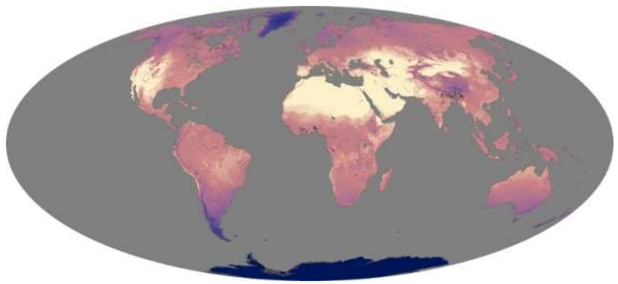
Mosquitoes prefer to stay in hot areas, LS T is one of the useful indices to predict and Monitor the habitat shifts of Viruses relating blood.

Land Surface Temperature by NASA

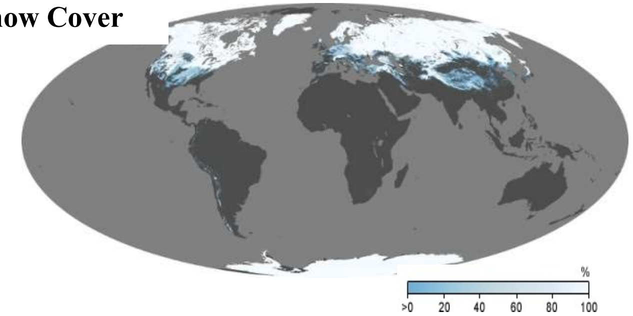


July 2020

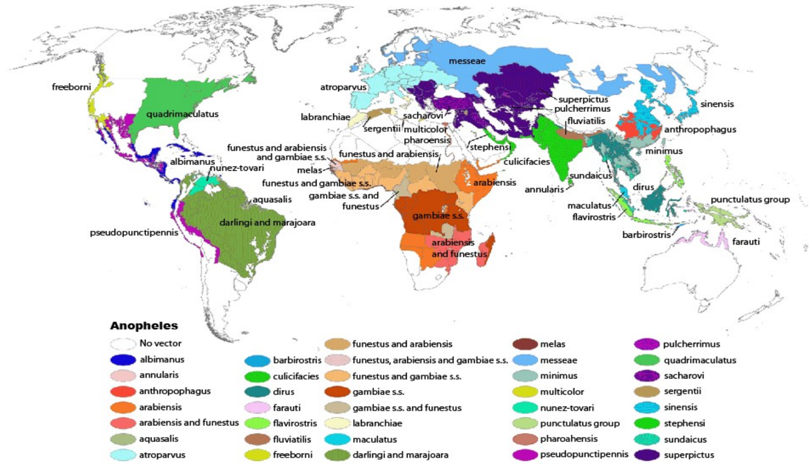




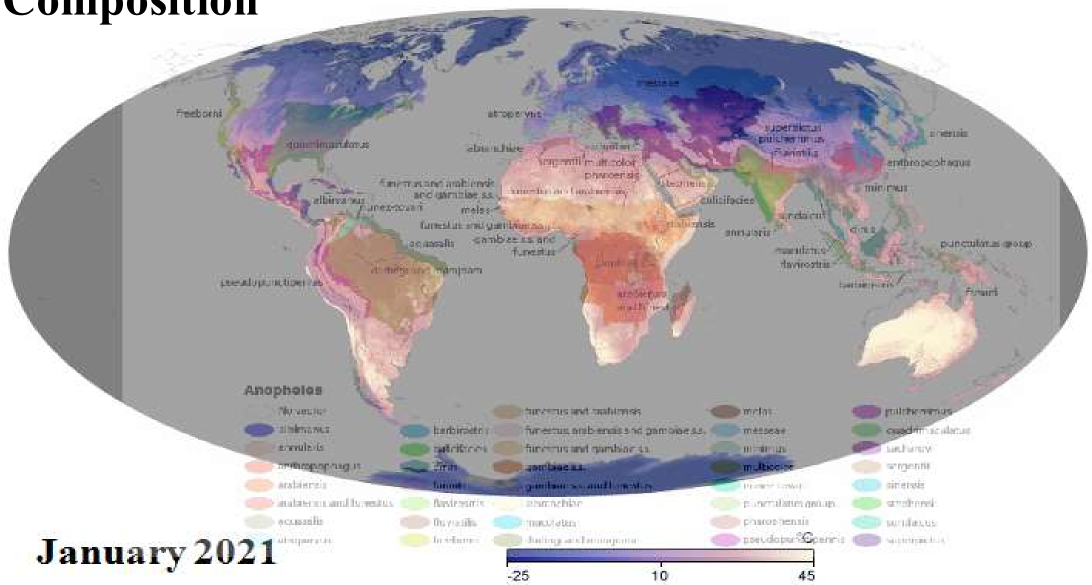
Snow Cover



Mosquito and Malaria by Malaria atlas project



Composition

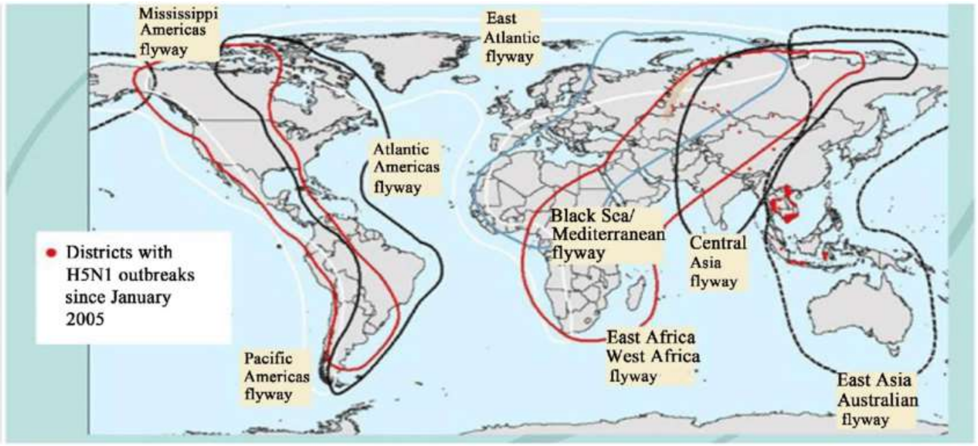


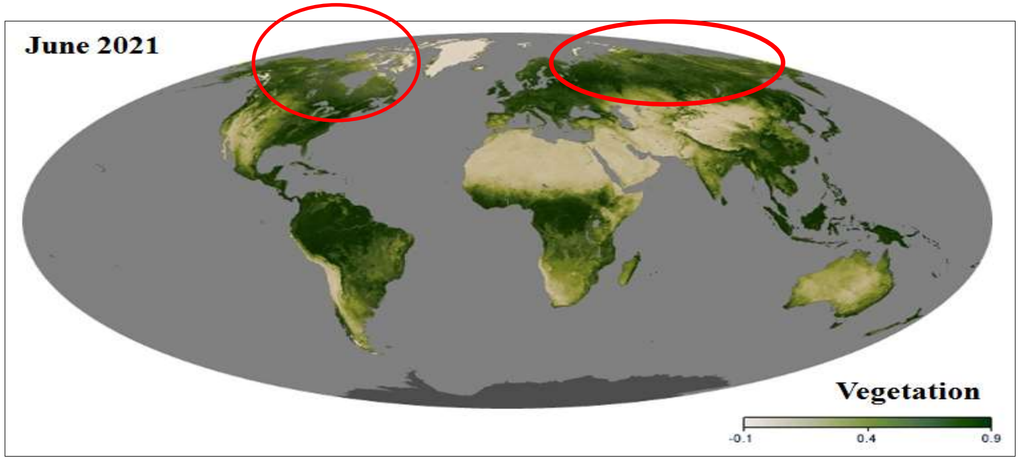
January 2021

Avian Viruses and Birds Flyways as the Vectors in this Modern GAIA:

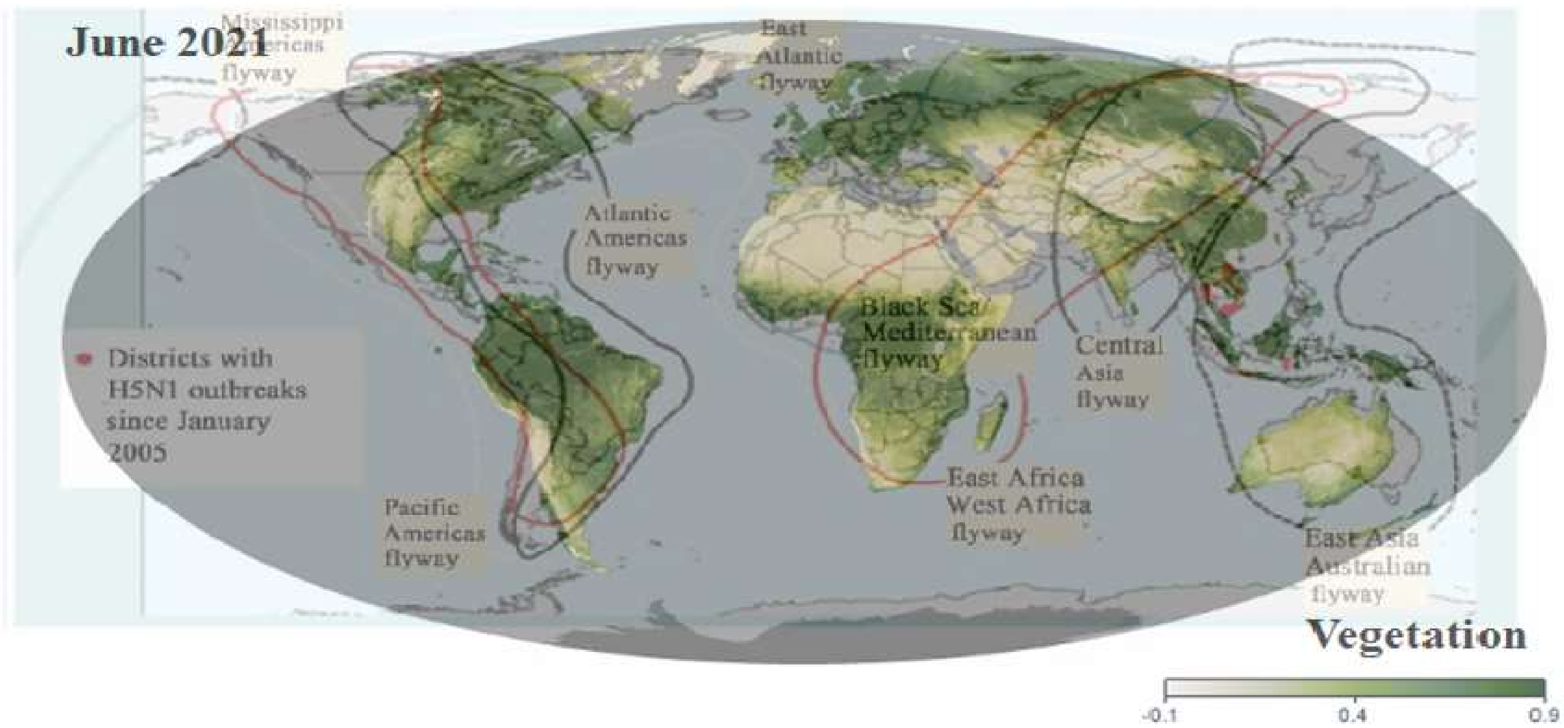
A Global Comparison between NDVI and Bird's Flyways in most vegetated month in July, 2021.

Habitats for the Birds as Virus Vectors: **Birds ecologically prefer wetlands (northeastern Siberia) for their Habitats with vegetation for their food and nests, which are represented by Normalized Vegetation Index (NDVI) and dislike hot temperature because of feathers and fleas. Or possibly connecting to Alaska.**





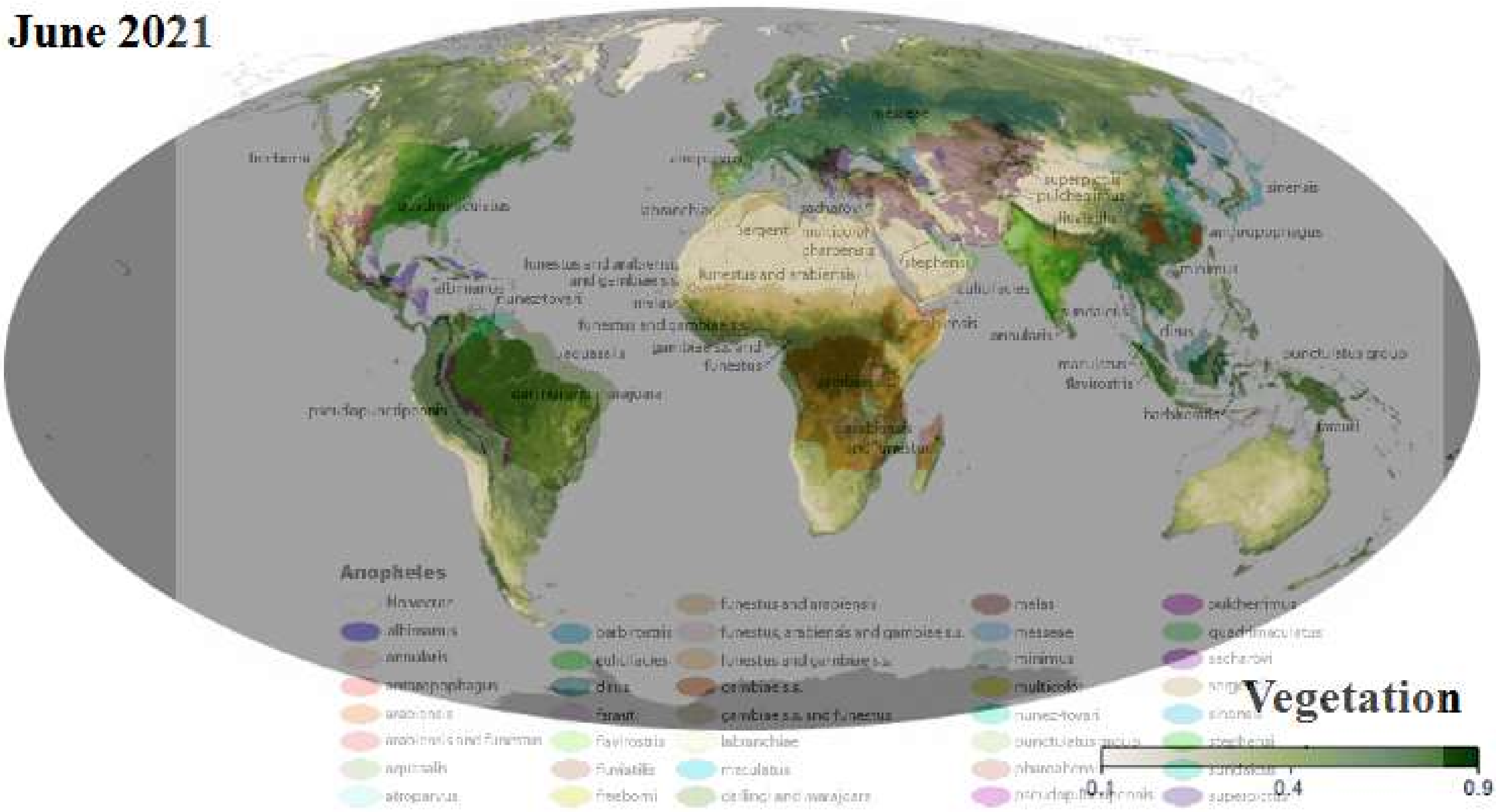
Journal of Biomedical Science and Engineering 11(12):359-381 DOI:10.4236/jbise.2018.1112030



Malaria and vectors: A Global Comparison between Mosquitoes and Vegetation using NDVI in Most vegetated month in July ,2021.

Habitats of the Vector: Despite Mosquitoes prefer to stay at wet leaves of vegetation, a typical Indices of NDVI is not one of the primary factors of Malaria vectors.

Fatal viruses:



3) Climate effects on infectious disease distribution through circulation of virus vectors

Climate influences have led to changes in the distribution of viruses.

a) Ocean temperature as the thermal indicator of the energetic storage

The effects of the SST temperature rising and ocean oscillation of SST dipoles are as follows: The oscillation is important in La Niña years because the South Asian temperature results in high SST and hot air temperature. This causes birds to migrate to northern countries. The same trend is observed for the Indian dipole, which causes high air temperatures and increased evaporation in India. Those factors will increase mosquito populations in northern countries. Sometimes, it has been reported in news from South Asia that mosquitoes transported to Japanese trade ports remain alive through the summer season, but they cannot survive the low air temperatures of the winter season.

b) Natural evidences of shifts in the migratory routes of birds and fishes seeking ideal breeding habitats

The precise viruses and infectious diseases shall be presented by the professional virus researchers whom the author invited to present in our sessions for researchers. How are viruses genetically different? Every researcher is interesting in virus host, incubation period, virulent variant, infection, infection to humans, and mutations.

First, an important question is “what kinds of diseases or new viruses are fatal?” If we cannot discriminate them, mass of human lives shall be lost. On the migration routes of animals and birds, we find the floating dead bodies of fish or only white bones on the sea bottom. Fortunately, concerning human lives, we have so much data available for examining diseases. However, new viruses often appear suddenly by quick genetic mutations.

3. Points of argument in the session of human lives and habitats

(1) The author's opinion to the NOAA meeting on their policies

What are the effects of climate on ecosystems and virus vectors? From the viewpoint of the history of five large episodes of destruction of ecosystems and subsequent recovery, the most important climatic influences are not changes in ecosystems but rather the risks of human life by natural water hazards and to geo-health due to the propagation of viruses.

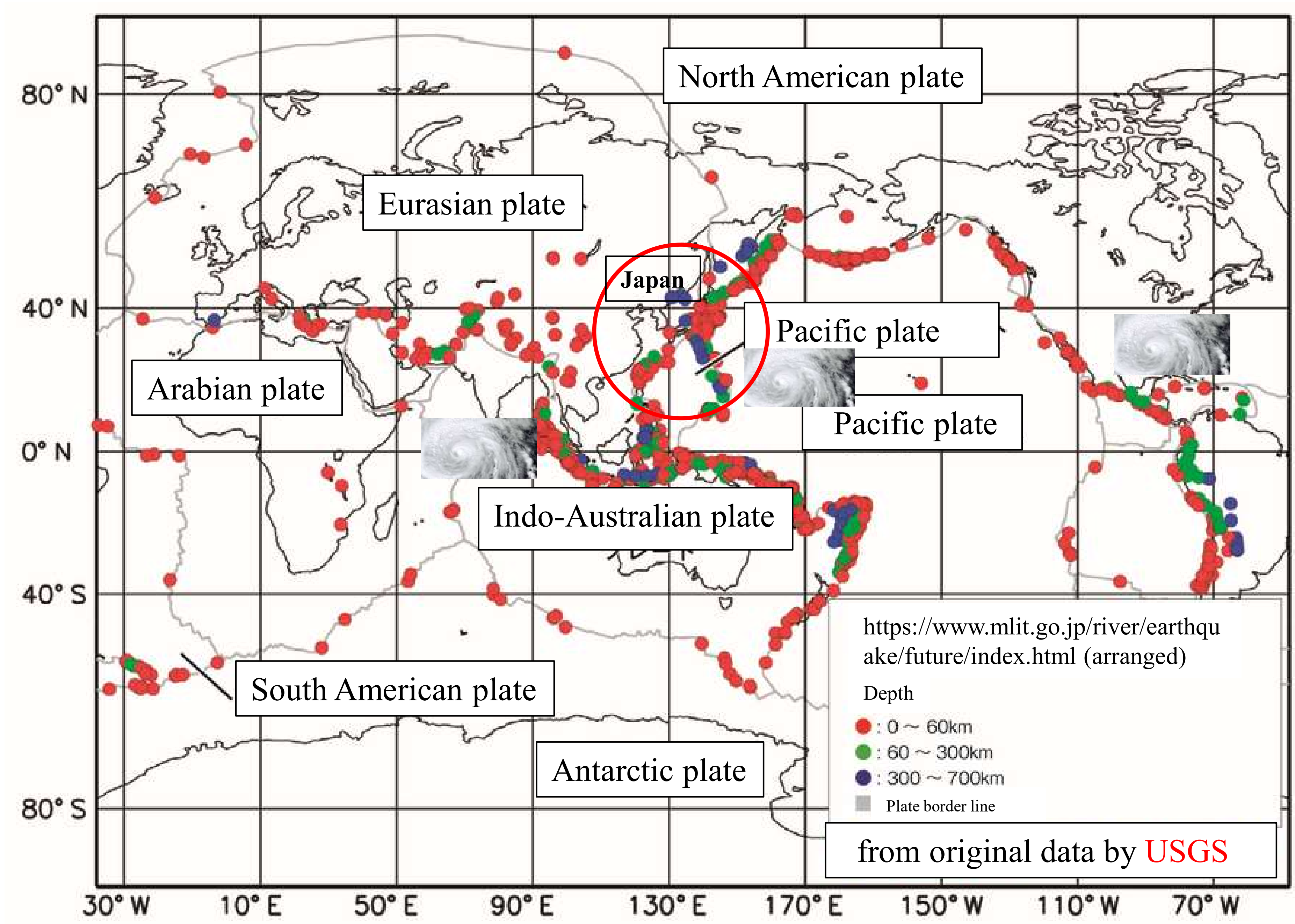
(2) What is the explanation for the mechanisms producing increasingly drastic impact from natural disasters and the increased threat of biological pandemic?

What is the state of our current understanding of the factors for risk mechanism? The severity of the effects of the virus pandemic could be due to the shifts in the virus's transportation routes. Important factors must be such as development of particularly virulent variants, overall infectivity, infectivity to humans, and rate of mutation. Seasonal migrations of birds and other animals, i.e., bats, wild ducks, wild swine (boar), mosquitoes, grasshoppers, and others, might be due to changes in ecosystems.

The author recognizes that spread of even more fatal diseases thanCOVID-19, such as Ebola, should be a concern, if they begin to propagate globally.

Such factors as increasing concentration of CO_2, global warming, gigantic storage of solar energy in seawater, increased sea water evaporation (that is energy transition into evaporation), and rainfall exposure on inland mountainous lands near coastal areas have severely affected ecosystem of vegetations and creatures. Natural water hazards can severely affect people by river flooding and tsunami in coastal regions, where high concentrations of people live in coastal megacities. Therefore, the huge cities in near seashore areas are more of a concern than rural agricultural regions from the viewpoints of risk to human life, infrastructures and the potential economic damages.

Global distribution of earthquakes greater than M5 Along with water hazards by super tropical low pressures in coastal regions



SY033-801430 NEW DESIGNS FOR COASTAL LEVEES AS STABLE AND SAFE STRUCTURES AGAINST UN EXPECTED SIZES OF TSUNAMI, STORM SURGES, AND RIVER FLOODING - EMERGING DISASTERS BY HISTORICAL M9 EARTHQUAKES AND SUPER TYPHOONS AROUND COASTAL MEGA CITIES FOR HUMAN HABITATS IN MODERN ERA -

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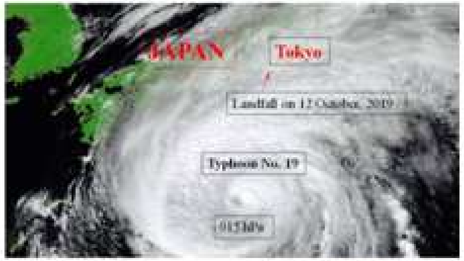
1. Background: Multiple Coastal Water Hazards

1. Super typhoons grows by climate change through much evacuation from sea, thereby risks of s river flooding, storm surge and heavy water hazards have emerged recently.
2. Ministry of construction, Land, Infrastructure, Transport and Tourism discuss the countermeasures in thee important bays of Tokyo, Ise-wan and Osaka for water hazards in low lands of **coastal Mega Cities**.
3. The Author proposes **no-collapse embankments** and improves to cut water **penetration** by stirring mixing solidification of levee foundation.
4. The proposed caisson-embedded banks are applicable to **river flooding, storm surge**, and **tsunami** inundation to urbanized coastal areas including **atomic power generation** plants

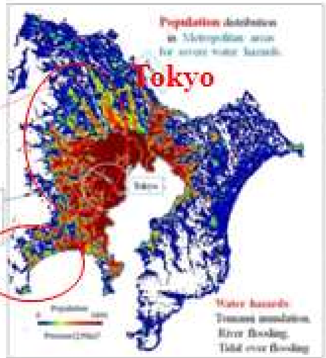
Typhoon No. 19 caused widespread damage across Japan.



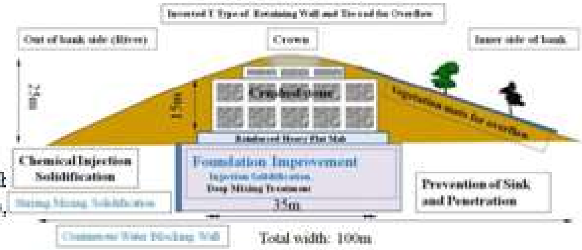
Category 5 Super Typhoon

Typhoon Number 19, 2019

1. The models for citizens and sightseers includes social and geographical data such as population density, wooden-house ratio, evacuation distance, and tsunami flooding depth to evaluate the distribution of life risk characteristics in the area.
2. Among the population of 174,050 people in Kamakura city, the risk of tsunami evacuation life was high from the southern part of Kamakura Station to Zaimokuza block, and the population was about 15,310 people.
3. There are about 26,000 people per day and about 100,000 sight sightseers on Saturdays and Sundays. On weekdays the population per mesh will increase by half of the 2,000 inhabitants.



5. Caisson-Embedded Banks for River Flood and Tsunami



Caisson-Emb
Storm Surge,

Flooding by Super typhoon No.19 in 2019 on next day around the Iruma branch river, which flows into Arakawa main river. An photo by his dangerous activity similar to a photographer in war areas, but meaningful academically. (from YouTube)

Storm Surge and River Flood in Zero-meter Low-Land Areas

Population density

2. Life-Risk Modeling

$$R_{b,k,l} = \left[\left\{ \left(\frac{D_{ak}}{D_{p0}} \right) \cdot \left(1 + \frac{AG_i}{AG_m} \right) \right\} \cdot \frac{WH_i}{WH_0} \right] \cdot \left\{ \left(\frac{D_{ed}}{D_0} \right)^2 \cdot \frac{H_T - H_{el} - H_{l0}}{H_{max}} \right\} \quad (1)$$

where, $R_{b,k,l}$: Evaluation life risk for dwellers caused by Tsunami flooding,

D_{ak}: population density on the size of dwellers,

D_{p0}: population density settled for standard dense dwellers,

AG_i: aging rate,

WH_i: wooden house ratio,

WH_0: average ratio of wooden houses,

D_{ed}: refuge distance to safe and wide specified-parks and hills,

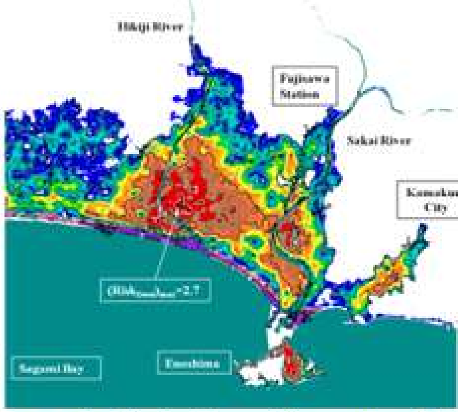
D_0: standard distance of maximum limit for safe evacuation,

H_T: height of tsunami flooding, H_{el}: elevation, H_T-H_{el}: flood depth,

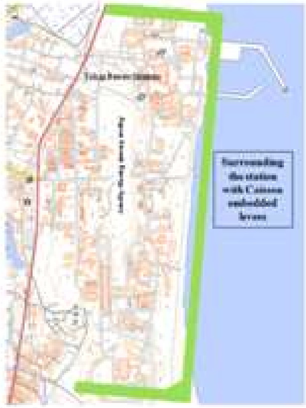
H_{l0}: flooding depth starting from lowest limit to death,

H_{max}: Eaves height.

4. Computed Results

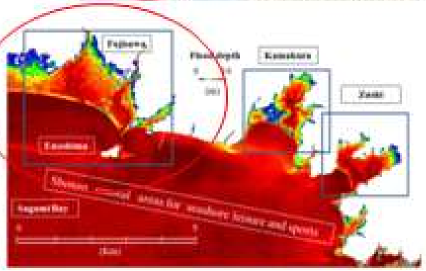


An example of the distribution of human risks in the tsunami inundation into residential areas of Tokyo



3. Date and System Flow

Elevation of the shonan coastal areas



6. Conclusions

1. This study has proposed disaster prevention measures to protect **human lives, private properties and social capitals**.
2. The author has showed the risks and the practical applications of **new levees** as effective countermeasures.
3. The new caisson embedded **embankments** can prevent multiple water hazards such as river floods, storm surges in representative industrial bays for trade and political or administrative significances such as Tokyo, Osaka and Ise bays.
4. This embankments can equip in the caissons with evacuation centers, high standard roads, and also the levees are used as a green park for citizens, drivers, and tourists throughout the year.
5. The new embankments can be applied to protect nuclear power generation plants from the tsunami inundation.

RSEM, JAPAN

(3) Where are the emerging areas of natural disasters and pandemic diseases?

Mega earthquakes and the largest tsunamis typically occur around the edges of the Pacific and Indian Oceans, including well-known historical earthquakes along the Peru/Chile Trench, San Andreas Fault, and Philippine Trench. Other specific events include the 2004 Sumatra earthquake, 2011Tohoku earthquake, 1964 Anchorage earthquake, and earthquakes in the Chishima Islands.

1) One of the answers surely must be coastal areas, the reason being that dry areas, such as rough forest and grassland, tend to have less dense human populations.

2) Traditional Ways to Predict and Mitigate Natural Disasters

a) Flooding: Construct systems to control river floods efficiently by restraining maximum discharge with a concept of whole river basins

b) Tsunamis: Install real-time observation systems on the bottom of sea bed to enable forecasting and tracking of tsunami waves

(4) What are the mechanisms of climate effects on human lives and ecosystems?

1) Vector movements by birds and insects are much more efficiently transported than virus spread through an infected population.

2) People traveling to seek out cultural experiences and enjoy beautiful landscapes.

3) Foreign trades transfer vectors with food, such as fruits and vegetables, wild animals, or woody materials.

4) In the case of viruses in marine life, fish and shellfish, such as pearl oysters and scallops, are entirely wiped out by infectious diseases, and such incidents can go undetected that whole fishing industries are sometimes obliterated due to the widespread death of a certain type of fish or shellfish. A large-scale die-off can also occur when the temperature rises more quickly than organisms such as trees, seaweeds, or coral reef can tolerate, or more quickly than the species can shift its location to a new region with more advantageous conditions.

5) Examples of fish wiped out in some areas by infectious diseases are yellowtail, salmon, and tuna. Climate warming increases the difficulty of preserving the diversity of living things and ecosystems.

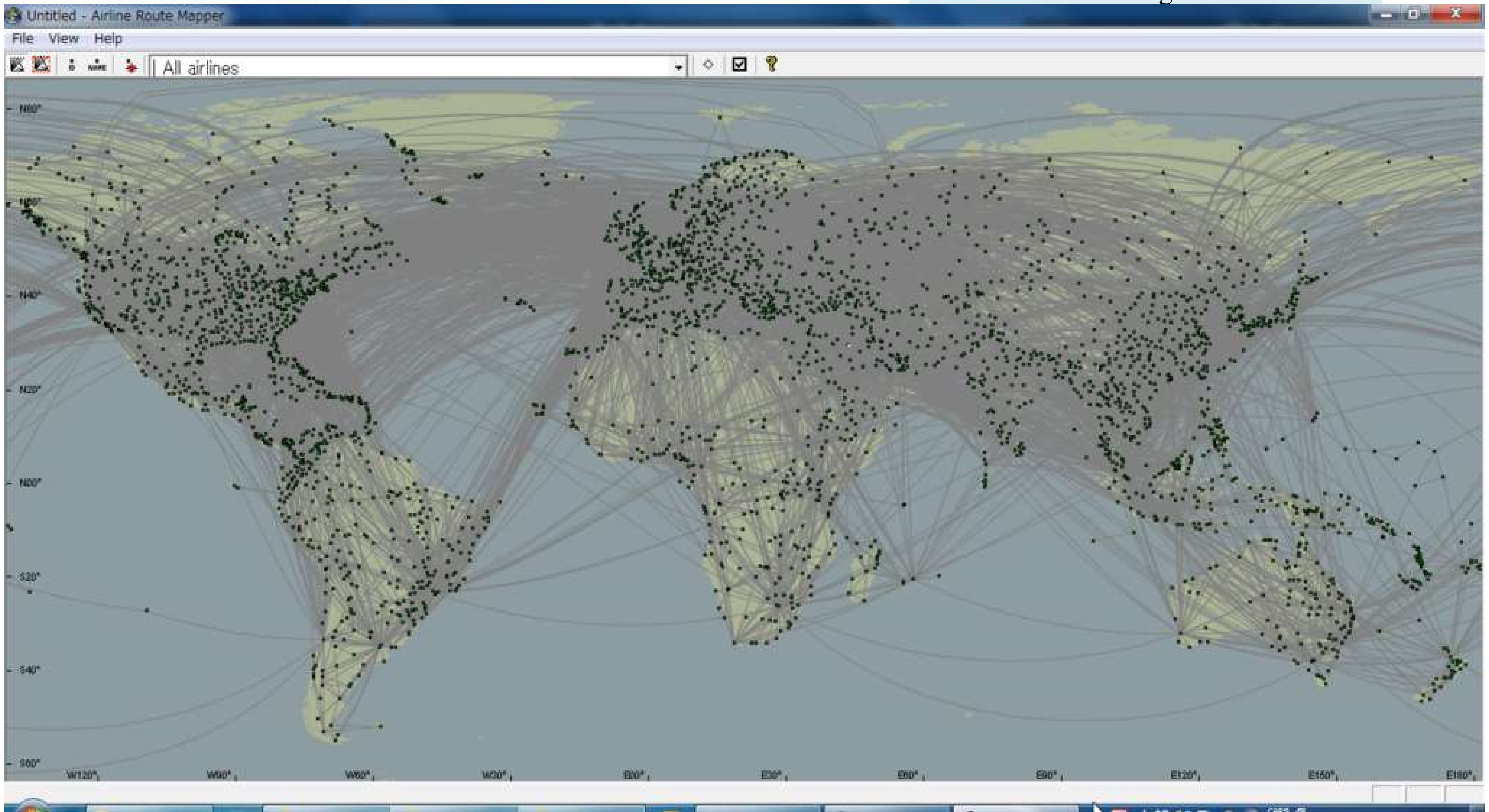
6) Migration routes of birds have shifted, and some may be threatened with extinction in recent years. Populations of migratory birds shall be increased by global warming because of favorable changes to habitats in Siberia and Alaska, with taiga and northern forests, where snow and permafrost are now melting more substantially in the summer season. Migratory birds can typically be seen in lakes and wetlands, such as around the mouth of the Danube River as well as in the Black Sea and Caspian Sea. The five Great Lakes in North America, Lake Baikal, and the Kolyma River in northeastern Siberia, which relate to Japanese winter bird habitats, are additional examples in addition to Lake Saroma, Kushiro wetland in northern Hokkaido, and tidal flats in Tokyo Bay, and so on.

7) As with the changes in distribution of a tree species over time, habitats of insects will shift along with the animals and birds as they adjust the immigration routes. These migration route changes will be mirrored by changes in the propagation of viruses. Animals such as wild birds and bats typically carry small mites, mosquitoes, and ticks. All of these can carry viruses, which can potentially be transferred to humans. Climate change can also bring the risks of large clouds of grasshoppers moving from Africa to other continents due to habitat migration, which is another potential way for viruses to travel. These phenomena are similar to the global propagation of viruses like COVID-19 on the modern Earth.

One of the **Fundamental factors** of the **expansive Phenomena** between **Human lives** and **infectious Diseases** by **Viruses** through the transportation **Network** composed of human **Flows** by **Air plains** and **Ships** for **trades** and **world tourism**

From National Institute of Maritime, Port and Aviation Technology, which the author was belonged to.

Global flight map



So many air liens to **control.**

Just close the fly lines except **necessary.**

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Continental Ocean Sciences and Impacts to Inland Human Lives and Habitats

CONCLUSIONS:

1. This presentation discuses the climatic effects on Human Lives and Habitats by views from Ocean Sciences and Geo-Health.
2. Topics are typical potential risks by Malaria, **fatal viruses** of Avian (Bird) Influenza and Classical Swine Fever etc:
3. Global land surface temperature (LST) seems to be one of good indices for malaria and as vectors of mosquitoes. As for the Vectors of Viruses or Malaria Plasmodium, **Mosquitoes** prefer to stay in hot areas, LST is one of the **useful indices** to predict and Monitor the **habitat shifts** of Viruses relating blood. Not anomaly of Air ST.
4. One of the fundamental factors is SST anomalies on viruses or bird flyways. However, the effects of La Niña seems **not clear** in Asia, even if the advection evaporation was considered. There are other atmospheric vertical and horizontal effects by Hadley circulation, arctic oscillation, Typhoon, and SST meandering. AI methods are expected.
5. **Avian virus** and **flyways** are important because the birds are vectors of infectious diseases. And also the scales of the birds **flyways** are over the **continental scale** from southern tropical regions to northern Siberia for their **habitats** of **food and nests**.
6. Human flows include so many air lines and ship cargos that just properly control them except necessary transportations during the limited terms.

Thank you for your attention.