AWARD-APR
Addressing Extreme Weather Related Diarrheal Disease Risks in the Asia Pacific Region

Newsletter
Issue 2
October 2021

Belmont Forum Collaborative Research

ADDRESSING EXTREME WEATHER RELATED DIARRHEAL DISEASE RISK IN THE ASIA PACIFIC REGION

DEAR READER,

WELCOME TO THE AWARD-APR PROJECT'S SECOND NEWSLETTER!

Since our last update, we have witnessed communities across the globe suffering from unprecedented forest fires, disastrous floods, and unbearable extreme heat events. Most recent IPCC report reaffirms that such trend will continue into the foreseeable future because of ongoing climate change.

This raises a very important question – how do we adapt to these new set of hazards as a society? This is the primary motivation that drives our work as AWARD-APR team - the need to enhance public health adaptation, the need to enhance community resilience against the threats of climate change.

We hope you enjoy reading our newsletter!

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USA

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Chuansi Gao, PhD
Project Co-PI
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Project in short

Funders

- National Science Foundation, USA
- Ministry of Science and Technology, Taiwan
- Swedish Research Council for Health, Working Life and Welfare, Sweden

Countries involved

- USA
- Sweden
- Taiwan
- India
- China
- Vietnam
- Nepal
- Bangladesh
- Indonesia
- Malaysia

Duration of the project

September 1, 2020 - August 31, 2023

Contact us

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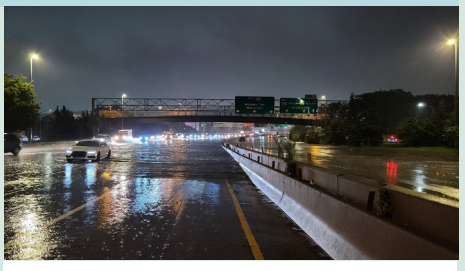
Project actuality: climate anomalies causes global flooding

17 July 2021: Floods in Europe kills over 173 people, hundreds reportedly missing. CNN News.

26 July 2021: Flood in Central China killed 302 people and about 250 000 people were evacuated. CNN News.

27 July 2021: At least 180 dead in India as rains trigger floods, landslides. CNN News.



2 September 2021: Ida turns New York City into a front line of extreme weather supercharged. CNN News.

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The AWARD-APR Project Symposium – Project Update (summary)

In order to give an update to all AWARD-APR partners on the progress made thus far and to gather partner inputs regarding enhancement of collaboration and dissemination of findings there was a two-hour online symposium organized on the 21st June 2021.

The symposium welcomed 24 participants from 10 different countries. During the event, the AWARD-APR team provided overall information about how they work, where they collect the basic data from and how they plan on using them to fulfill the aim of the project.

The organizers were happy to receive excellent ideas and comments during the Q&A part. The project partners are confident these ideas will help achieving the objectives of the project.

If you want to know more about the AWARD-APR project, please visit the following webpage: AWARD-APR Symposium

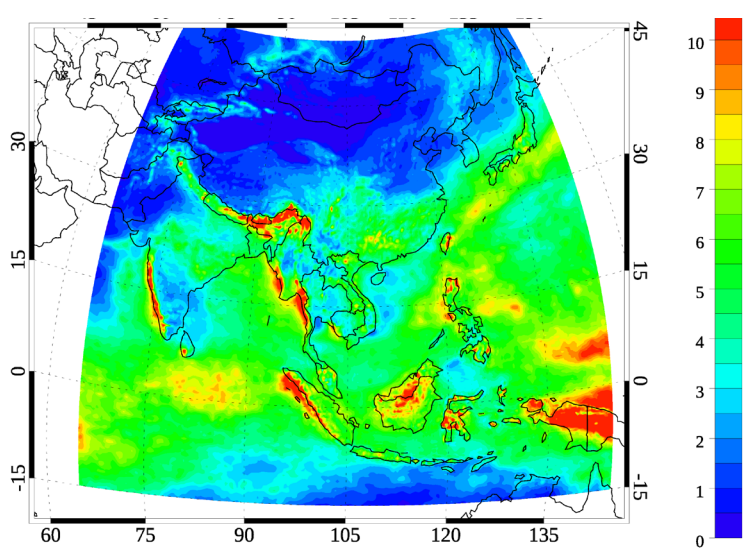
Works in progress

WP1 - Status in September 2021

WP Leader: Amir Sapkota

We have completed compiling weather data from number of sources including Global Historical Climatology Network (GHCN), the Integrated Surface Database (ISD) daily data as well as ERA5 reanalysis products. Using these datasets, we have compiled number of exposure metrics such as extreme weather events, extreme precipitation events, as well as anomaly in temperature and precipitation that are specific to each location and time of year. Most recently, we have incorporated Global Flood Monitoring System (GFMS) dataset that provides surface water storage information (the depth [mm] of the surface water above dry ground) on 1km resolution. We are currently exploring if this dataset will improve our predictive models.

ERA5 Annual Mean Precip in 2019



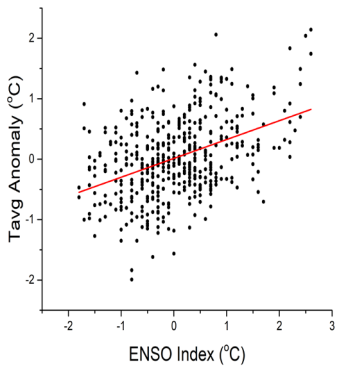
WP2 - Status in September 2021

WP Leader: Chuansi Gao

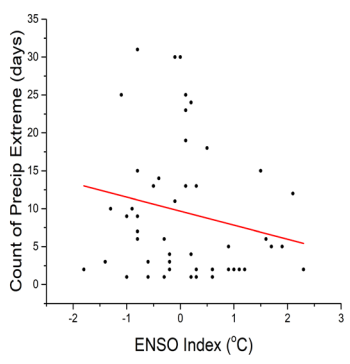
A preliminary analysis using GHCN data at Ho Chi Minh City in Vietnam (VM000048900, 10.82 N, 106.67 E) by Dr. Hao He, showed that monthly average temperature and temperature anomaly are increased with the increase of El Niño Southern Oscillation (ENSO) index*. The number of extreme precipitation days are increased with the decrease of ENSO index. More analysis to find out the relationship between ENSO and extreme weather events is ongoing for different countries and periods.

**ENSO is a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean.*

Relationship between ENSO and temperature anomaly



Relationship between ENSO and number of extreme precipitation days



ENSO drives global weather and can be forecasted with a 6-12 month lead time. Understanding the link between ENSO and extreme weather events provides the opportunity to develop early warning systems with sub-seasonal to seasonal lead times

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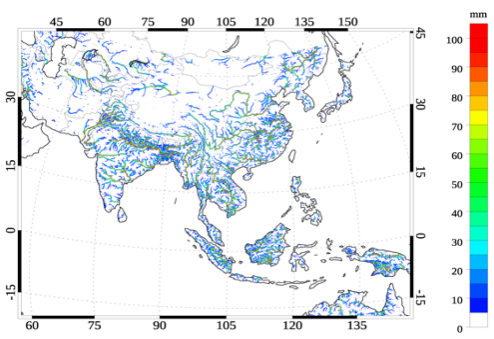
WP3 - Status in September 2021

WP Leader: Yu-Chun Wang

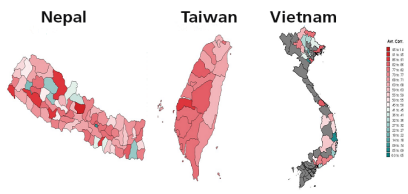
We have been working to update our diarrheal disease dataset by adding additional locations and adding additional years of data for the existing locations. We have linked these diarrheal disease datasets with the climate-based exposure metrics including extreme heat and extreme precipitation events, and anomaly in temperature and precipitation. We have been performing statistical analysis using these linked datasets. We have also incorporated flooding data obtained through the GFMS database in our statistical modeling. Overall, the addition of flooding data seems to improve our statistical model, but this improvement was not consistent across different locations.

Mean GFMS Surface Water Storage 2001 - 2019



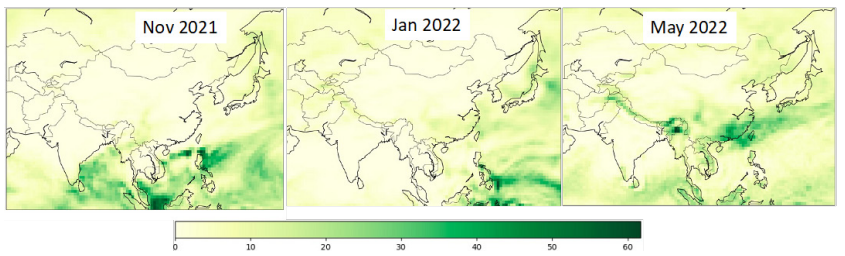
WP4 - Status in September 2021

WP Leader: Amir Sapkota and Yu-Chun Wang



The core team has been working diligently to develop an early warning system using Neural Network approaches. Thus far, we are testing our methods using historical diarrheal datasets from Nepal, Taiwan, and Vietnam.
As expected, the agreement between observed and predicted disease rate varies between country as well as between various administrative units within country. We are also working to incorporate NOAA's S2S forecast for temperature and precipitation into our warning system.

Predicted precipitation rate (avg total in mm)



Other news related to AWARD-APR project

APCS Workshop in October

REGISTER

The third Asia Pacific Climate Service Workshop (APCSW) will be organised by the Taiwan Central Weather Bureau and APEC Climate Center in October 21-22, 2021, as an online workshop.

Theme of the workshop: Climate Service for Resilience and Sustainable Development Towards A Net Zero Emission World.

The goal of APCSW is to enhance the partnerships among governmental sectors, academia, NGO, and related stakeholders on climate service topics in Asia Pacific region.

During the workshop the AWARD-APR project will be presented by Amir Sapkota during the session "Climate Services, products and Applications" on Friday morning, on the 22nd of October 2021. Our project Co-PI, Chuansi Gao will present the project ClimApp, a personalized heat and cold stress warning tool with integrated weather forecast, human thermal models and indices in the afternoon on the same day.

Our project Co-PI, Yu-Chun Wang will be present as one of the organisers from Taiwan Central Weather Bureau.

More information and registration: https://apcsw.cier.edu.tw/
Please register no later than 15 oktober 2021!

New PhD Student

Kha-Ai Tran is a first-year PhD student studying Environmental Health Sciences under Dr. Sapkota at the University of Maryland School of Public Health.

Her background is in geography, information systems, and healthcare and she is currently a full-time professional working in the research engineering industry. Her domain interests includes environmental science and health, supply of food/water/energy, and climate change. She is most interested in interdisciplinary studies of these topics and aim to help address current and emerging issues in population health and environmental security by developing solutions that are not only effective, but sustainable and equitable.

Outside of her research and professional interests, she enjoys writing, reading, painting, and circus aerial arts.

Enbel project

ENBEL project completed and submitted Deliverable report 3.1: Potential synergies between climate change and health projects funded by the Belmont Forum and EU Horizon 2020. More in the newsletter.

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