

STATWEATHER



**StatWeather
Institute**



Innovation in Climate Solutions for the 21st Century

4th Mindanao Policy Research Forum

Speaker: Ria Persad

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Who is StatWeather?

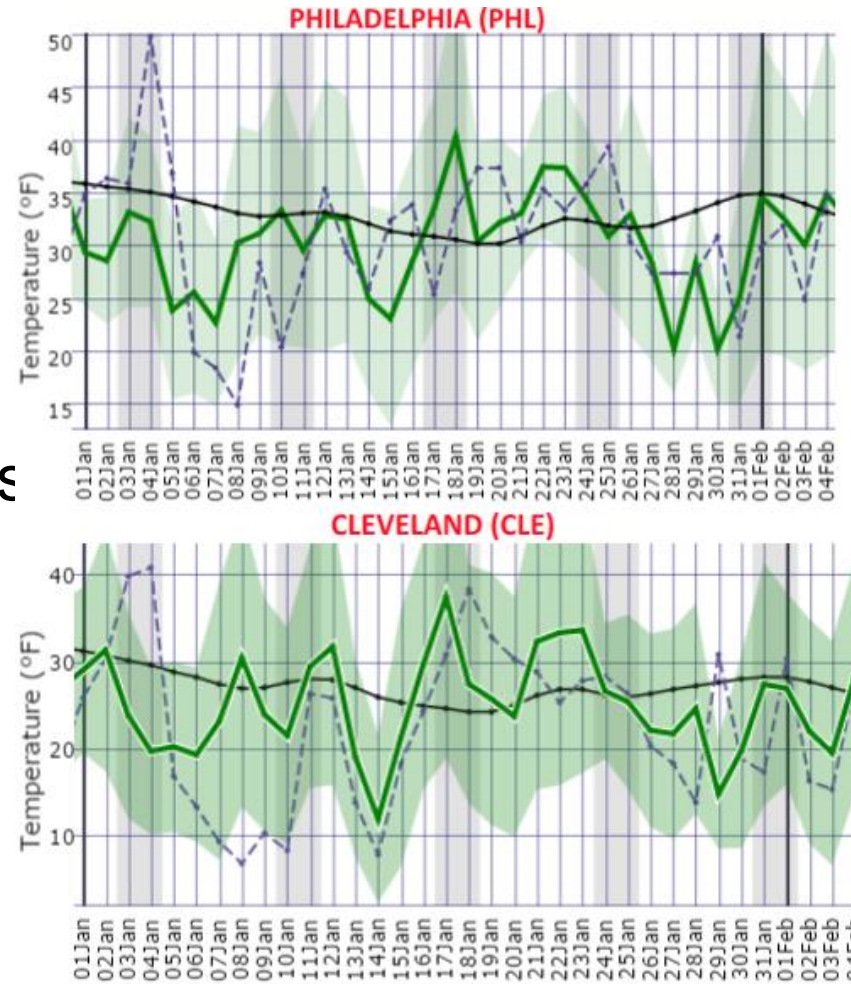
- StatWeather specializes in long-range weather forecasting: post-15 day, intra-seasonal, seasonal, and year-ahead weather outlooks and climate trends.
- StatWeather uses a proprietary model based upon artificial intelligence, data mining, pattern recognition, and statistics, catering to the energy industry.
- StatWeather's humanitarian, non-profit arm is the StatWeather Institute for climate and disaster risk and mitigation for life-threatening climate issues. Focus areas include:
 - CLIMATE CHANGE TRAINING AND EDUCATION IN ADAPTATION ISSUES IN AREAS HARDEST HIT BY CLIMATE DISASTERS
 - ADVOCACY AND AWARENESS ACTIVITIES: NEWSPAPER COLUMNS, SPEAKING TOURS, ENGAGEMENT ACTIVITIES INTERNATIONALLY
 - CONSULTING IN CLIMATE AND DISASTER RISK
 - CLIMATE MODELING AND PREDICTION FOR GLOBAL AREAS
 - CLIMATE CHANGE IMPACT MODELING TO PUBLIC HEALTH, AGRICULTURE, LAND USE, AND INFRASTRUCTURE
 - CLIMATE MITIGATION PROJECTS IN AREAS HARDEST HIT BY TYPHOON, INCLUDING RESEARCH AND DEVELOPMENT

Recognition

- 2018 #1 Climate Technology Globally by Environmental Business International
- 2017 and 2016 Award for #1 Company in Client Services (FL) by AEI
- 2015 Global Data Provider of the Year by Energy Risk
- 2015 Platts Global Energy Awards “Rising Star” Top 10
- 2015 Platts Global Energy Awards “Lifetime Achievement” Top 7
- 2015 Top 4 “Most Innovative” Small Companies by AdvisorTV
- 2014 Google “Top 40 Female Entrepreneurs”
- 2014 International Renewable Energy Award to Founder
- 2013 Newcomer of the Year Award – Energy Risk
- 2012 Energy industry vote as #1 North American Weather Forecaster - Energy Risk
- Prominent media coverage through *Forbes*, *The Wall Street Journal*, *Reuters*, *Renewable Energy World*, and others

Knowledge Domains

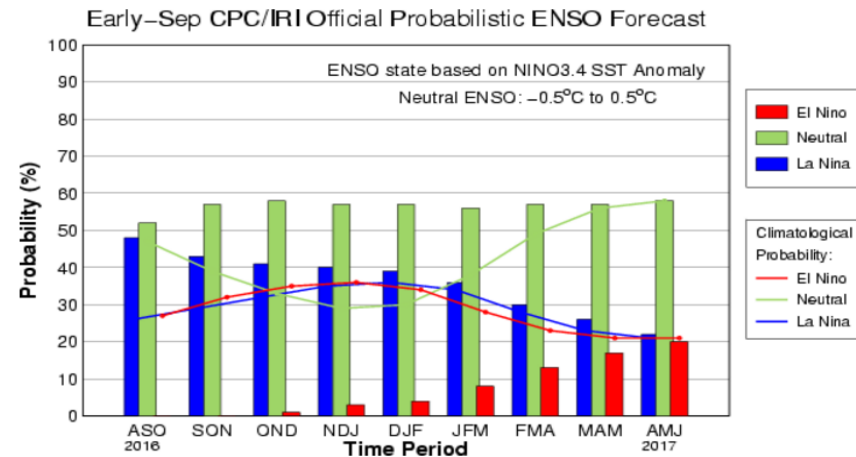
- Machine learning (Artificial Intelligence and pattern recognition) for forecasting
- Bayesian neural networks for risk analytics
- 150 years of historical databases (courtesy NCEI) as the base
- Complex analytic dynamics (theoretical basis)
- Parallel processing-high performance computing
- **The Result: Probabilistic**, high-resolution, daily long-range forecasts



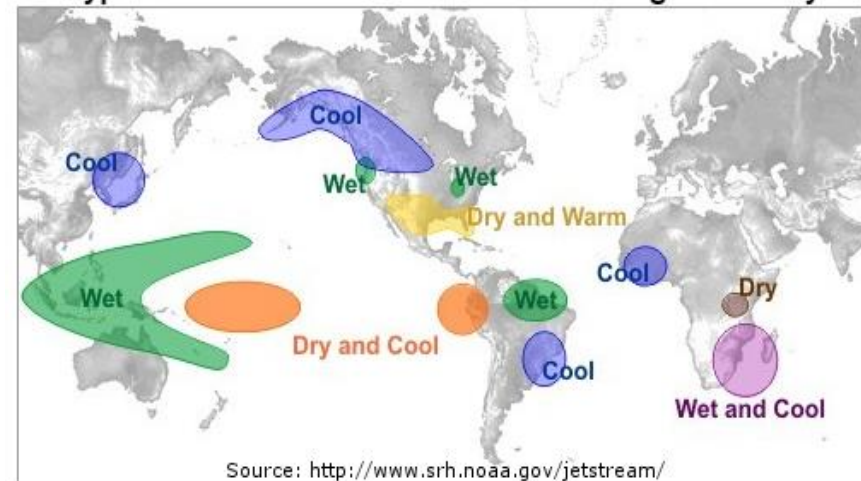
Last Winter, StatWeather forecast 40-75 days in advance (Green is the forecast; blue is the actuals)

Benefits of Data Mining Applied to Weather

- Model is free of human bias
- Out-of-sample backtesting/hindcasting to determine how accurate the model is
- Probabilities and confidence intervals associated with forecast
- Forecast much further than iterative methods (e.g., GFS model where errors are compounded with time)
- Pattern-based, where real past behavior teaches us about future possibilities
- Learn about what causes weather events (discovery)



Typical La Niña Effects: December Through February

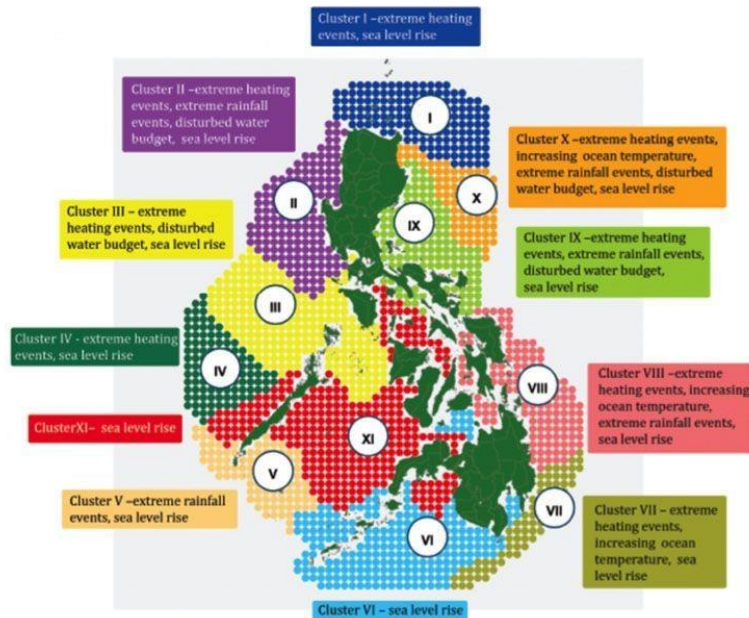


The Increasing Impact of Weather/Climate

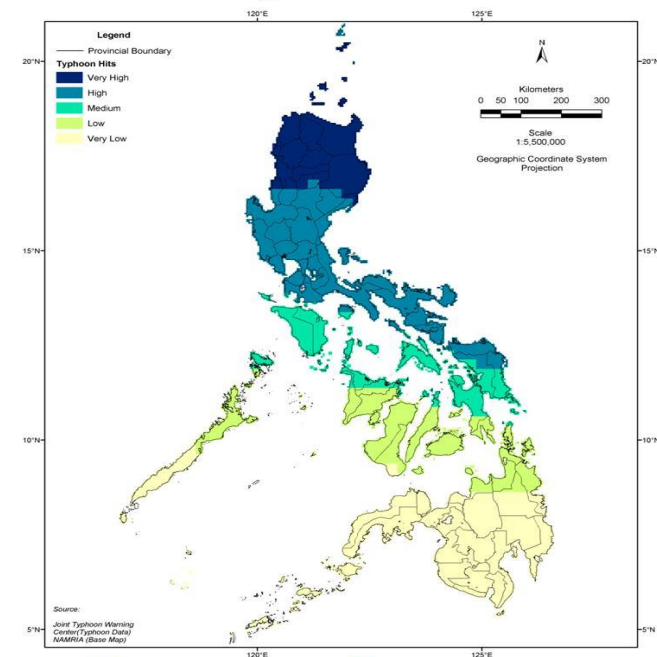
- Why the Philippines? Rated as #1 in climate disasters in 2015 with the highest number of extreme events.
- Frequency of global climate disasters has dramatically increased decade to decade, with 2016/2017 reaching a high point and 2018 shaping up similarly.
- StatWeather forecasts a more intense typhoon season and above average volatility in intra-seasonal patterns—meaning even more extremes in 2018!

Mapping Philippine Vulnerability to Environmental Disasters

PHILIPPINE EXPOSURE MAP ON CLIMATE CHANGE



Typhoon Incidence



MANILA OBSERVATORY



DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Can Extreme Climate Events Be Predicted Season- and Year-Ahead Using Data Mining?

The answer is YES!

- Using a methodology such as StatWeather's, the signatures of upcoming extreme weather events can be discerned from noise in the forecast data.
- There is always an error field due to chaos. We can help to define that field for the end user to indicate the risk.
- The key is verification and transparent statistics for the end user in a probabilistic setting for risk management.

KEYS TO INNOVATION



- **SETTING GOALS:** Have a passionate motivation to solve a problem
 - *Your subconscious mind and creativity will go to work, helping you solve it*
 - *Believe that YOU CAN!!!*
- **OUT-OF-THE-BOX THINKING:** Converge different disciplines
 - *Intuition & creativity does NOT result from analytical thought, but imagination*
- **COLLABORATION:** Seek out those who can help you
 - *Align yourself with others seeking to make a difference, the power of synergy*

THE INNOVATIVE MIND

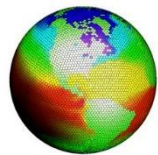


- **Scientist Albert Einstein:** *"When I examine myself and my methods of thought, I come close to the conclusion that the gift of imagination has meant more to me than any talent for absorbing absolute knowledge... All great achievements of science must start from intuitive knowledge. I believe in intuition and inspiration.... At times I feel certain I am right while not knowing the reason."*
- **Mathematician Henri Poincaré:** *"It is through science that we prove, but through intuition that we discover."*

INTERDISCIPLINARY APPROACH AND COLLABORATION

The convergence of various fields is what enables the technology of StatWeather and the rapid advancement of climate prediction solutions.

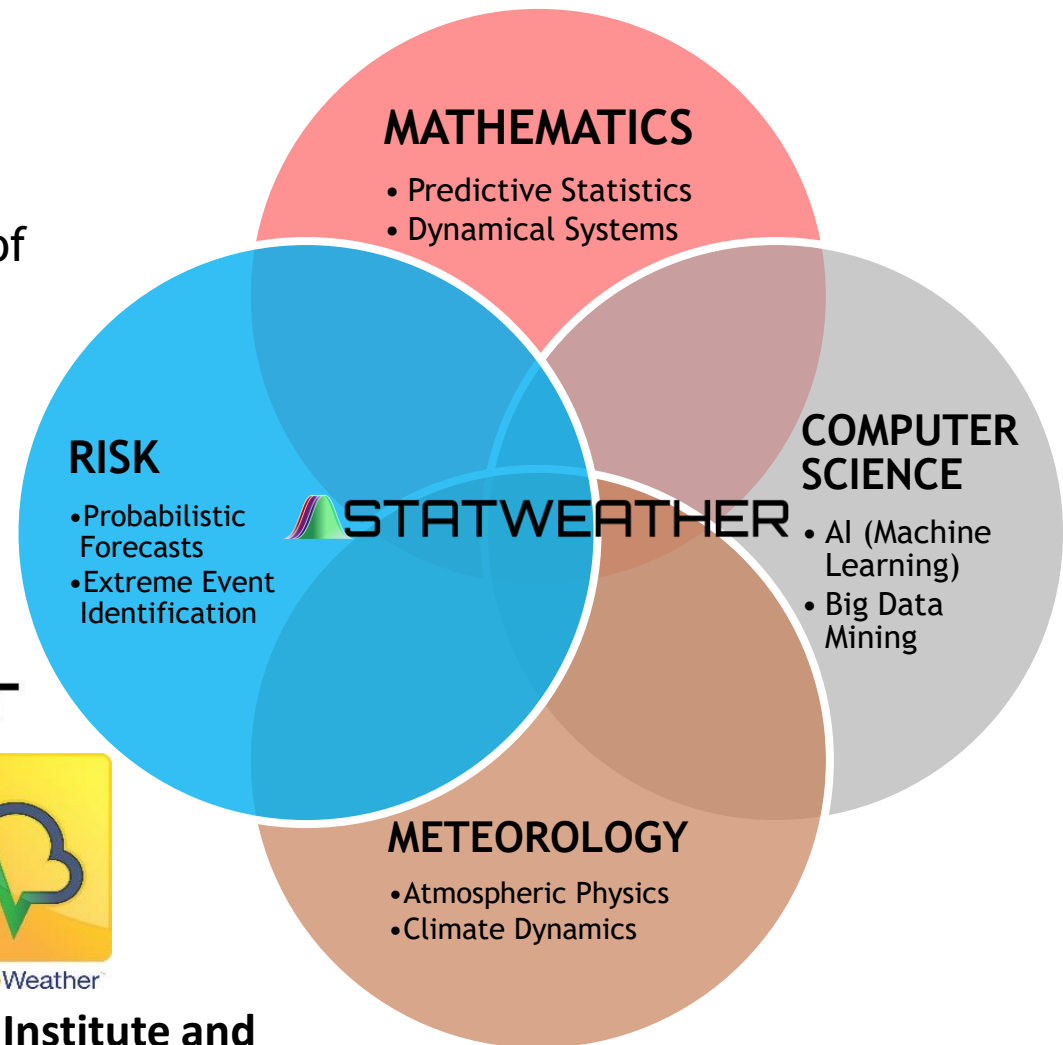
Taking it one step further, these predictions can be combined with public health data to then produce impact risk assessments.



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HEALTHeWeather



**Jan 17th, 2018 - The StatWeather Institute and
HEALTHeWeather released its inaugural 2018
Allergy and Asthma Projection Report**

CLIMATE SOLUTIONS ECOSYSTEM

1. Climate Data

-observatories, research centers, governments, satellites, buoys

2. Climate Risk and Informatics from the Climate Data

-forecasts and models, analytics

3. Climate Impacts from the Climate Risk

-public health, food supply (agriculture, fisheries), infrastructure, land use, poverty, migration, biodiversity, wildlife, energy, transportation...

4. Climate Impact Planning

-what to do about the climate risks and climate impacts

5. Climate Financing of the Plans

-how to fund these plans

6. Climate Plan Implementation

-people on the ground who carry out the plans

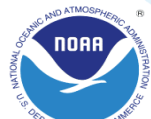
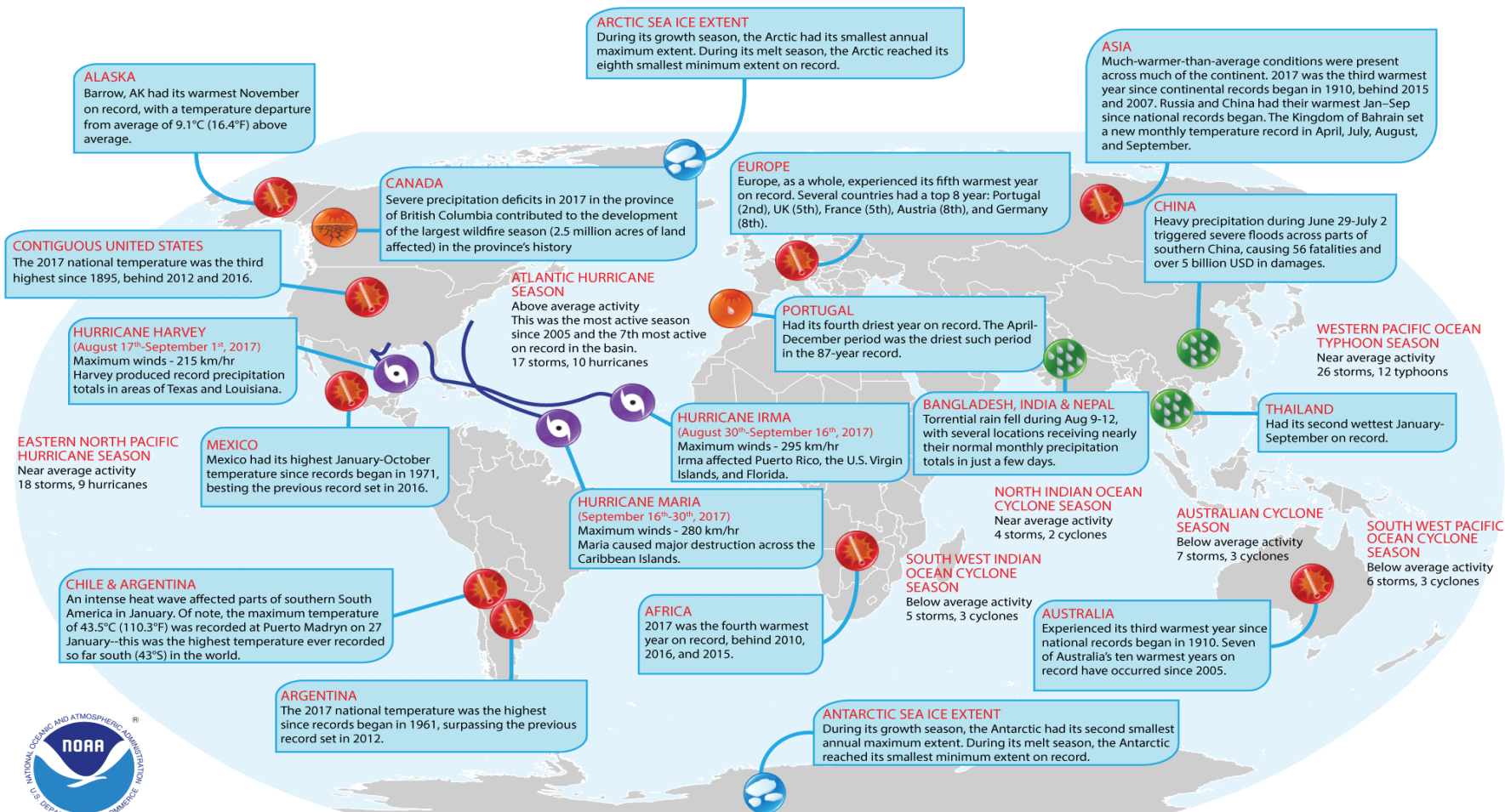
-includes adaptation, mitigation, and sustainability efforts

7. Climate Policy, Communication, Training, and Advocacy

-paradigms, frameworks, and checks-and-balances to ensure the sustainability of a climate-smart future, as well as education of the public and future generations.



Selected Significant Climate Anomalies and Events in 2017



Please Note: Material provided in this map was compiled from NOAA's NCEI State of the Climate Reports and the WMO Provisional Status of the Climate in 2017.
For more information please visit: <http://www.ncdc.noaa.gov/sotc>

Collaboration of all disciplines and efforts around the globe is needed to adapt to climate change.