World's Air Quality

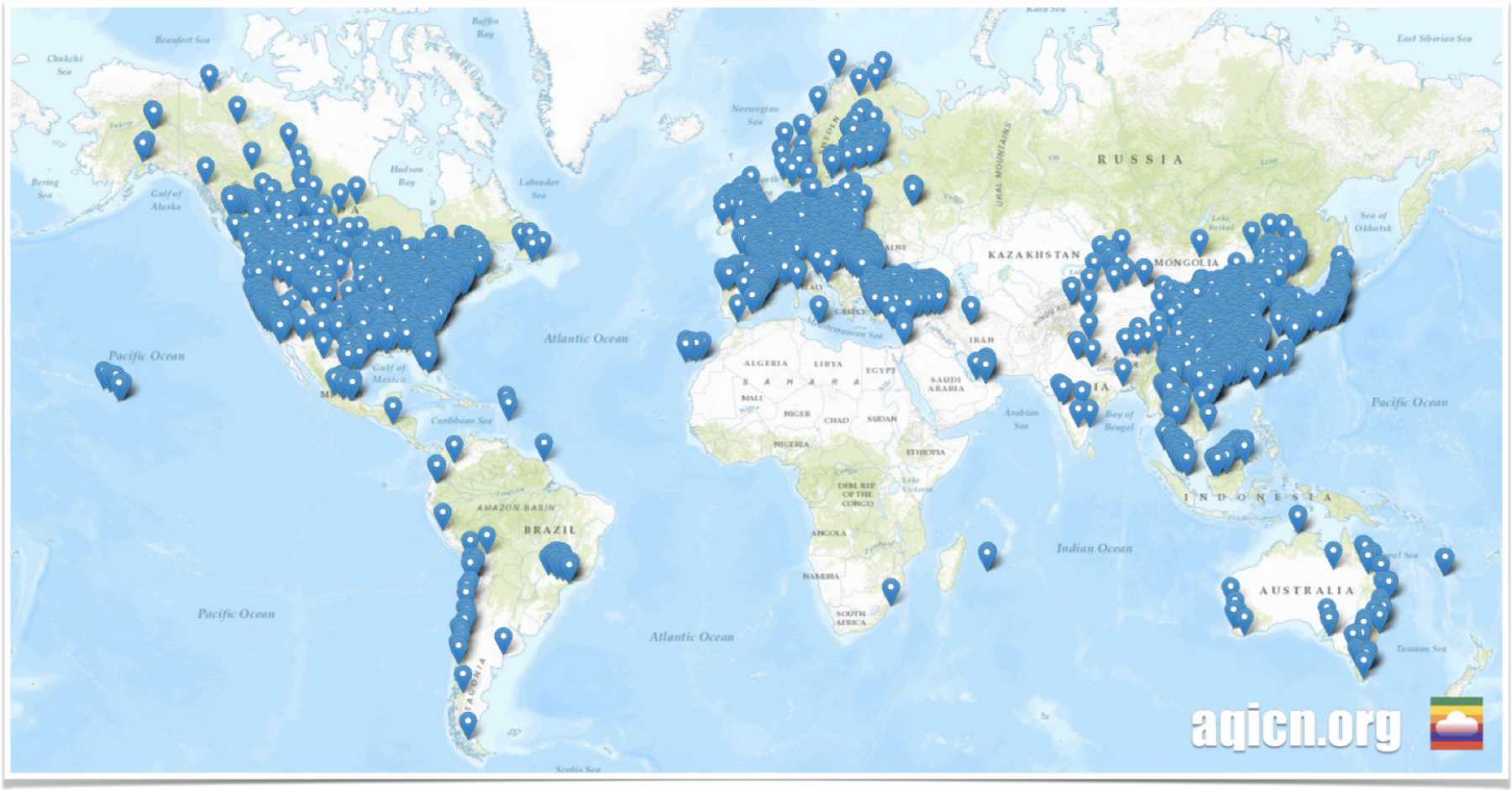
Overview of the aqicn.org project

Version 1.2
prepared for the ARSET-AQ
April 18th 2015

aqicn.org

PM2.5 Ground Monitoring Stations in 2015:

Most of the countries in our world are measuring air quality



Project Philosophy: Why, What & How

1. **Why: Promote** free information about Air Pollution in order to increase Air Quality awareness to the “normal” citizens (non-scientist).

2. **What: Unify** the world Environmental Agencies (EPA) monitoring data, into a global and normalized real-time air quality information.

3. **How: Partner** with local authorities, EPA, and organizations for monitoring new cities and countries, and develop local forecasting models.

There more than 16,000 known monitoring stations, from 60 countries, delivering near real-time hourly readings, out of which almost 8,000 are providing PM2.5/PM10 data.

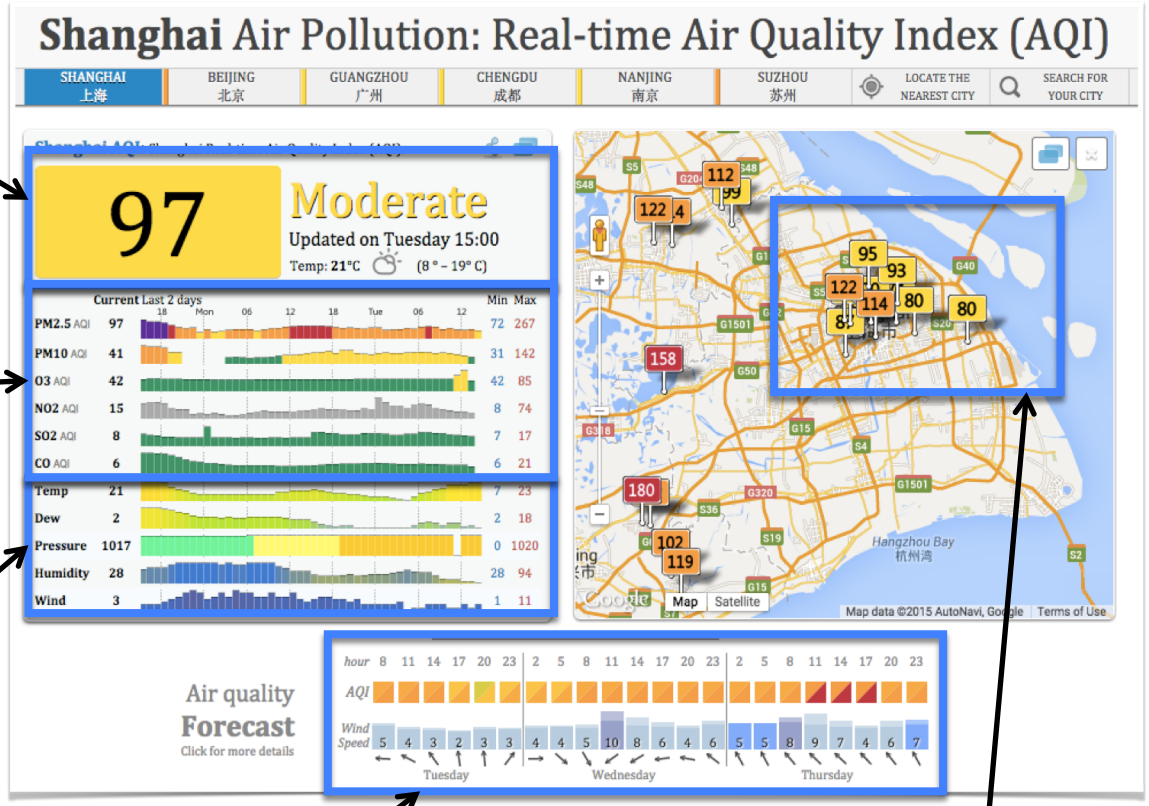
Air Quality Data Visualization

http://aqicn.org/city/shanghai/

Current Air Quality Index
(Using the USEPA Instant-Cast Scale)

Individual AQI for the main Pollutants for the last 2 days
(Pols: PM2.5, PM10, O3, NO2, SO2, CO)

Past 2 days Weather conditions



Forecast: AQI (top) and Wind (bottom)

Nearest Stations

Unifying Global Air Quality Data

Data is gathered, in real-time, from over 60 countries, 300 feeds and 16000 stations. Only official data from EPA/EPBs is used (i.e. no data for DIY/amateur stations is collected).

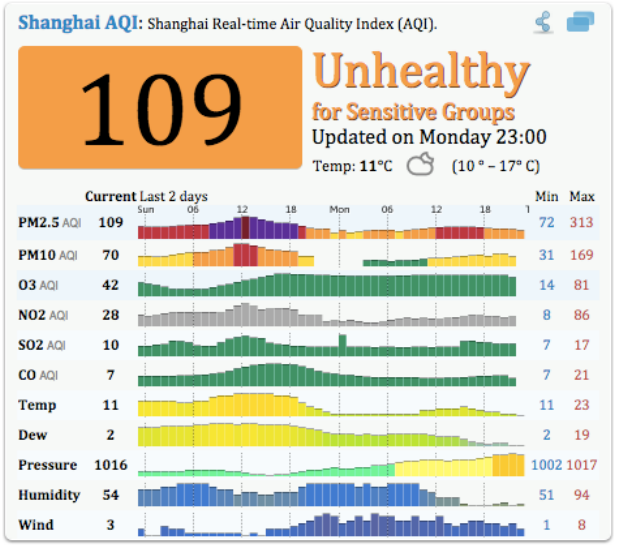
For each station, there can one or several pollutants monitored:

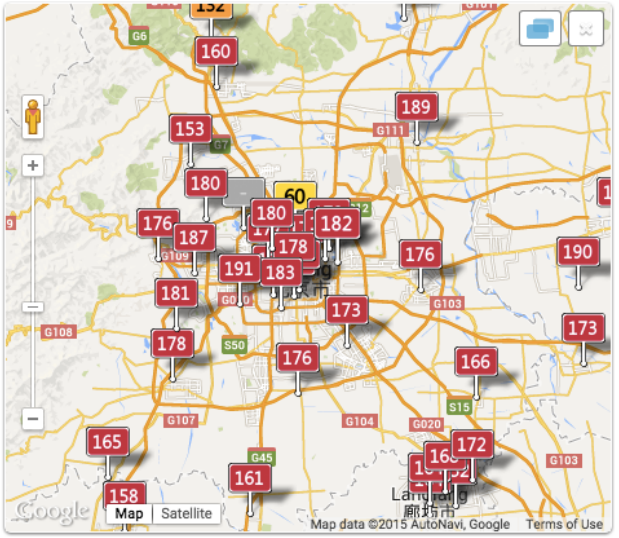
- PM1, PM2.5, PM10
- Ozone, NO2, SO2, CO.
- Benzen, metan, toluen, thc…

Only half of the 16000 stations are published on the map. The reason is that only stations with particulate matter readings (PM2.5/PM10) are published.

For the up-to-data data, check:

- aqicn.org/sources/
- aqicn.org/faq/.





Air Quality Standards

Almost each country or continent has its own Air Quality Index standard, to convert the mass concentrations in mg/m3 into an AQ Index:

- PSI: Pollutant Standards Index (SG)
- API: Air Pollution Index (MY)
- ICA: Índice de la Calidad del Aire (CO)
- IMECA: Índice Metro.. CAi (MX)
- AQHI: Air Quality Health Index (HK,CA)
- CAI: Comprehensive Air Quality (KR)
- CAQI: Common Air Quality Index (EU)

The AQI scale in use on aqicn is the USEPA standard, but we are working on an option allow users to select the scale that best fits their needs.

AQI Category, Pollutants and Health Breakpoints

AQI Category (Range)	PM_{10} 24-hr	$PM_{2.5}$ 24-hr	NO_2 24-hr	O_3 8-hr	CO 8-hr (mg/m^3)	SO_2 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+

Extract of India National Air Quality Index (AQI)

The Air Quality Standard are, for most of them, based on 24-hours exposure at a specific level.

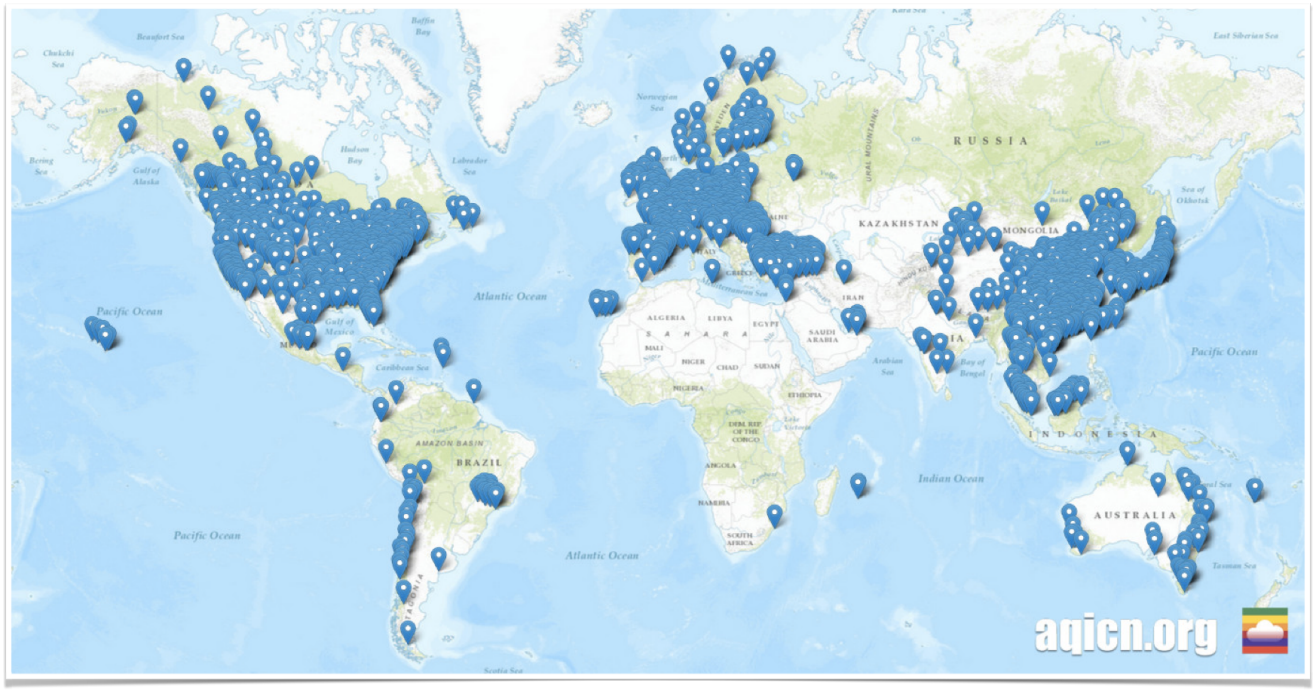
However, due to the highly dynamic nature of Air Pollution, and especially Particulate Matter pollution (PM2.5) in case of strong wind, daily averaging does not give sufficiently good enough information to the citizens. For this reason, the “Instant Cast” reporting is used on aqicn

Real-time World Air Quality PM2.5 Map

http://aqicn.org/map/world/ or http://waqi.info

PM2.5 Air Quality Monitoring

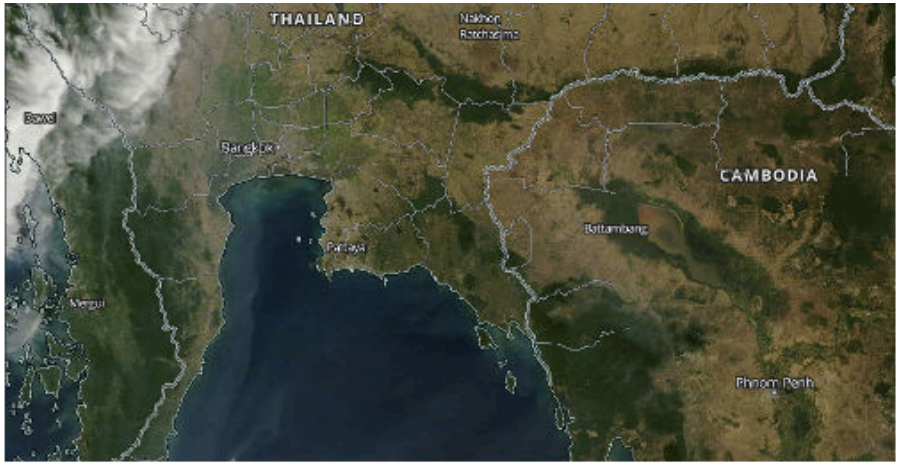
Example of NASAS MODIS data usage



Using remote Satellite AOD data has several advantages:

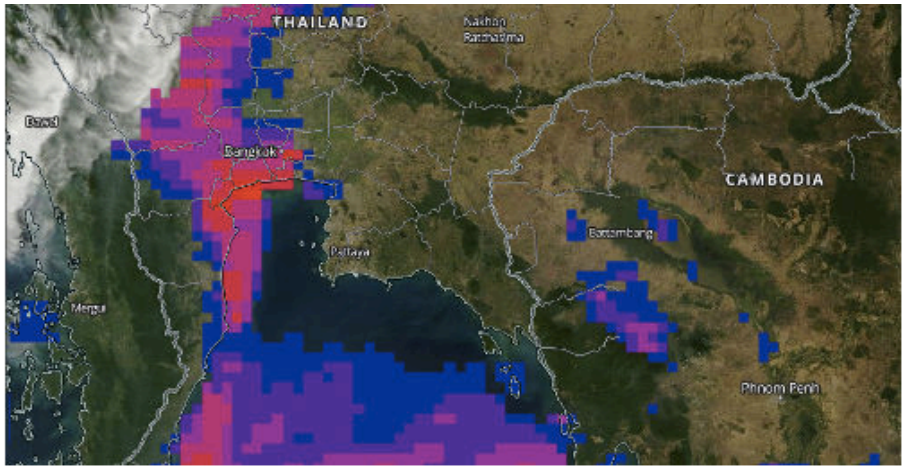
1- Coverage: Monitor AQ over oceans and deserts
2- Verify the viability of ground stations readings
3 – Provide indications for countries without monitoring

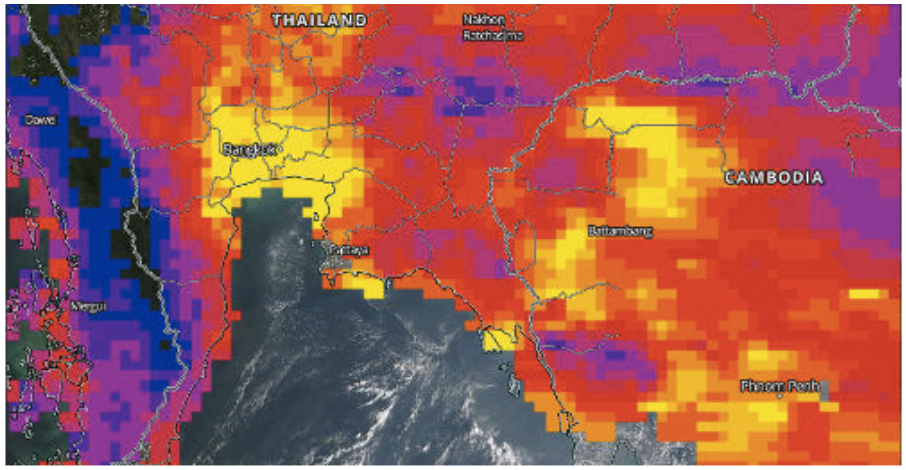
January 16th 2015 - Clear sky over Cambodia



February 11th 2015 - Visible Haze over Cambodia

Same images with the AOD overlay (yellow: thick haze - red: medium haze - blue: light haze)

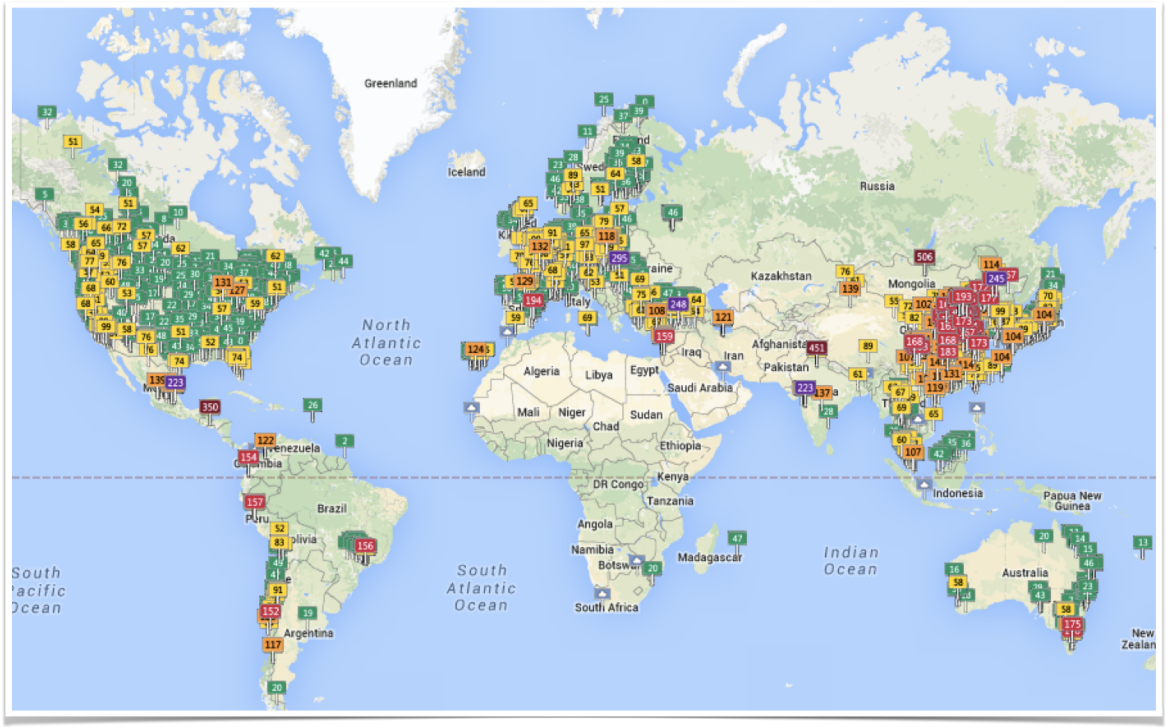




Fire and Thermal Anomalies Hotspots (plotted in red below) in a important input for Air Quality forecasting models.

World Air Quality Monitoring

Global Platform for Research purpose



Air Quality Data Sharing platform for institutions and researchers

The aqicn project is done by a small team, and the information we provide to the users for free. The project is not either receiving any funding from any government or institution. For this reason, we have focused our efforts, until now, on the “citizen” needs for a better air quality information.

We are however now looking at extending our scope to support the institutional needs, by creating an unified data sharing platform, allowing to access historical data set for researchers, and real-time observation for forecasting models.

For this purpose, the aqicn project is now working on establish a joint cooperation with the relevant programs in the United Nations (UNEP, WHO, WMO…). The UNEP team has shown a very strong interest in our work.

Furthermore, in order to further speed-up this activity, the aqicn project is also looking for more partners, institutions and sponsors able to cooperate and support this open data platform project. Interested in joining? Send us an email at partner@aqicn.org

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

Questions?

http://aqicn.org/contact/