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Case Study

Real-Time PM Monitoring Provides China EPA with Key Air Pollution Insights

Tonglu EPA now understands the spatial and temporal distribution of $PM_{2.5}$ across the entire County

Project
Tonglu EPA

Location
China

Date
2015

Services
Dust Sentrys

Measurements
$PM_{2.5}$

Sector
Government

The customer

Tonglu County is a county of Zhejiang Province, three hours' drive south west of Shanghai. The county is picturesque with many mountains and lakes. That has led to the name "Beautiful County Tonglu" (roughly translated) and with it millions of tourist visits every year.

Tonglu Environmental Protection Agency (EPA) is the organisation responsible for keeping Tonglu County's environment pristine. The Tonglu Environmental Monitoring Centre is responsible for monitoring soil, air and water so that the EPA can make good policy and regulatory decisions.

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The problem

Tonglu EPA operates two full reference stations located in Tonglu City. Although the stations are well run and are highly accurate, they can only give particulate measurements for Tonglu City – not for all of Tonglu County. The County's area is 1,852 km^2 and the EPA calculated that 15 monitoring stations would be needed to give an accurate view of $PM_{2.5}$ levels across the county.

In winter and autumn it is common for farmers to burn agricultural residue. These fires add to the $PM_{2.5}$ levels (as well as PM_{10}) and worsen the haze. The 400,000 permanent citizens and millions of tourists are affected by the haze which detracts from their quality of life and impacts on Tonglu's desirability as a tourist destination.

Tonglu EPA realised that installing 15 reference stations would be beyond their budget. So they investigated alternative monitoring methods including Aeroqual's Dust Sentry. They tested a number of instruments from several different manufacturers over a one month period.

> **"Our Dust Sentry network is a powerful environment management tool with minimal maintenance requirements."**
>
> **Mr Yao**
> Head of Environmental Monitoring, Tonglu County EPA

The solution

Tonglu EPA chose the Aeroqual for their $PM_{2.5}$ network. They gave several reasons:

1. The strong correlation of the Dust Sentry $PM_{2.5}$ to their existing Thermo Fisher analyzers.
2. Their ability to afford 15 stations on their available budget.
3. Strong service and support by Aeroqual's partner Shanghai Digital Sensing Technology Ltd.

They also installed real-time video cameras with each $PM_{2.5}$ monitor. The video allows the EPA to verify high PM readings and spot any fires in the vicinity. All the data is fed directly via Ethernet connection into the customer's environmental monitoring software.

Evaluation

Tonglu now has an accurate view of $PM_{2.5}$ levels throughout the county and is actively managing pollution sources which contribute to the problem. The $PM_{2.5}$ network also helps to establish Tonglu's reputation as a county which takes environmental protection seriously.

The performance of the instruments has been extremely stable. Winter temperatures as low as 15°C were recorded and highs in the summer reached almost 40°C. During colocation of the instruments with the customer's EPA-approved monitoring stations, the Dust Sentries show correlation of 0.96.

Tonglu is considering buying Aeroqual's AQM 65 for short term monitoring of gaseous and particle pollutants. Dealing with one manufacturer for all special purpose air monitoring is very appealing.

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