CONAIRE : AIR QUALITY FORECAST IN CHILE, SPECIFIC MODELLING OF WOOD BURNING EMISSIONS

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Context

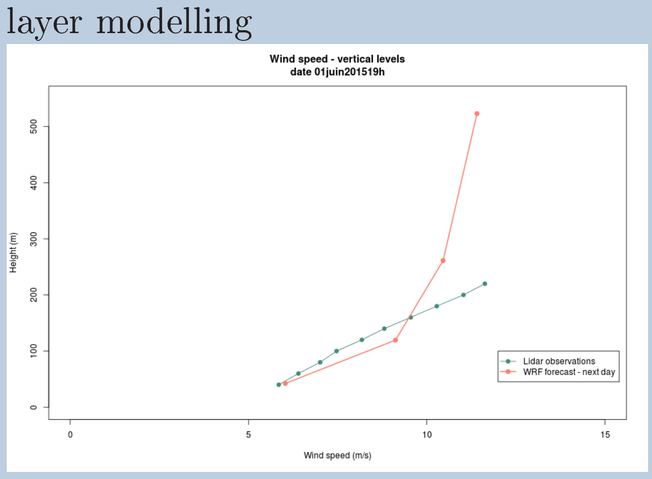
- In Biobio Region, Chile, Air Quality is highly affected by wood burning emissions
- In winter, chilean Ministry of Environment take preventive measures to avoid air pollution episodes
- ARIA Technologies developped a regional air quality 72h-forecast, used as a decision-help system by the authorities

CONAIRE system

- WRF-CHIMERE operational chain
- Regional emission inventory for LPS, Traffic, and residential heating
- Specific modelling of wood burning PM2.5 emission

LIDAR validation campaign

- Comparison between LIDAR observations and WRF Forecast to validate boundary layer modelling

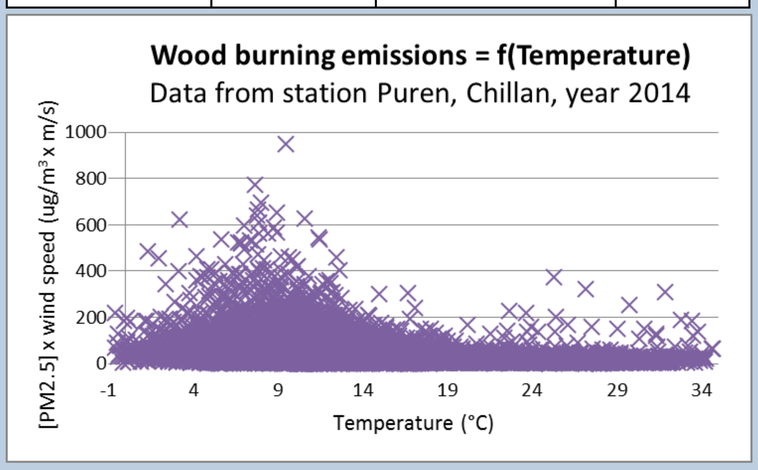


CONAIRE actors

Specific modelling of wood burning emissions

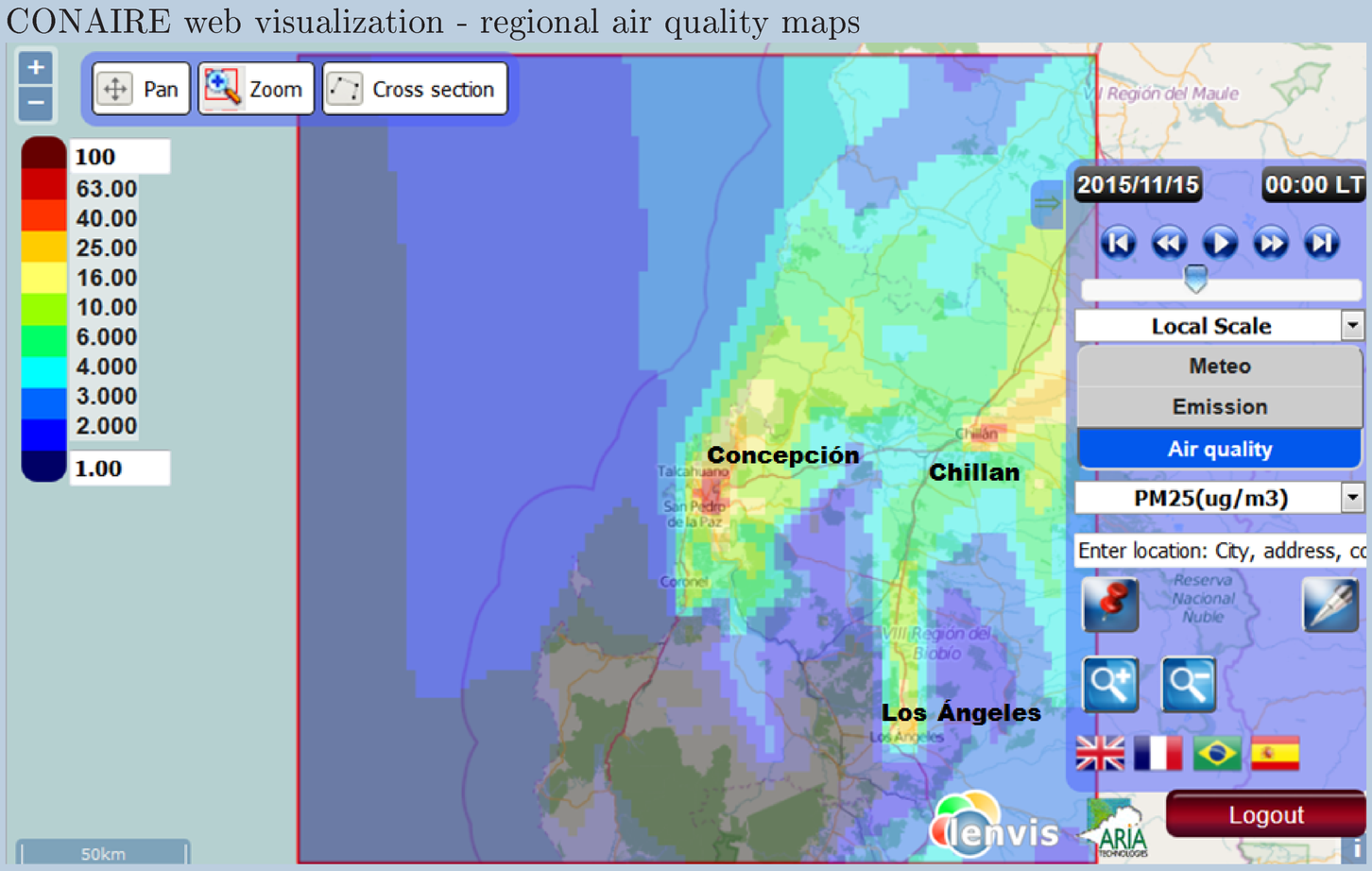
- Emission factors used in Chile are 2 to 5 times higher than the ones used in Europe/USA
- CONAIRE takes into account local habits in stove operation
- It might account for partitioning of semi volatile organic compound (SVOC) during dilution
- INERIS degree-day algorithm adapted to local observations (Temperature, Wind Velocity and PM2.5 concentration)

Equivalent wood burning emission factors			
CONAIRE	CITEPA	EMEP	US-EPA
26.0	5.0	10.4	14.8

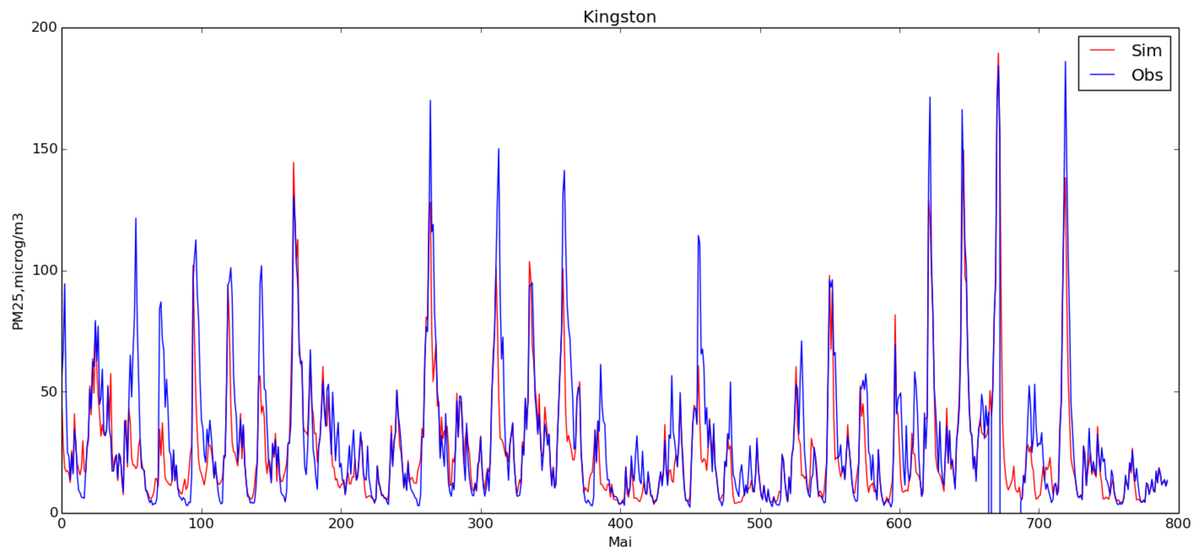


Results

- CONAIRE web visualization - regional air quality maps



- Validation in Kingston College station, May 2015, PM2.5 hourly concentrations



- Excellent Biais and correlation for PM2.5 (3-month validation)

Average results for three stations in the three main cities of Biobio Region	
Average Absolute Bias (ug/m3)	Correlation
6.15	0.91
3-month validation (May, June, July 2015) in Kingston College, LA Oriente and INIA stations	

Acknowledgements

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References

[1] Saide et al.: *Air quality forecasting for winter-time PM2.5 episodes occurring in multiple cities in central and southern Chile*, journal of Geophysical Research Atmospheres, (2016)

[2] Lipsky: *Effects of dilution on fine particle mass and partitioning of semivolatile organics in diesel exhaust and wood smoke*, Environmental Science and Technology, (2006)