



UNIVERSIDAD
DE ALMERÍA

CAPABILITIES FOR AQUIFER MONITORING OF LONG-TERM MHVSR OBSERVATIONS

IN CAMPO DE DALÍAS (ALMERÍA, SE SPAIN)

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MOTIVATION

Assess the Microtremor-HVSR curves stability

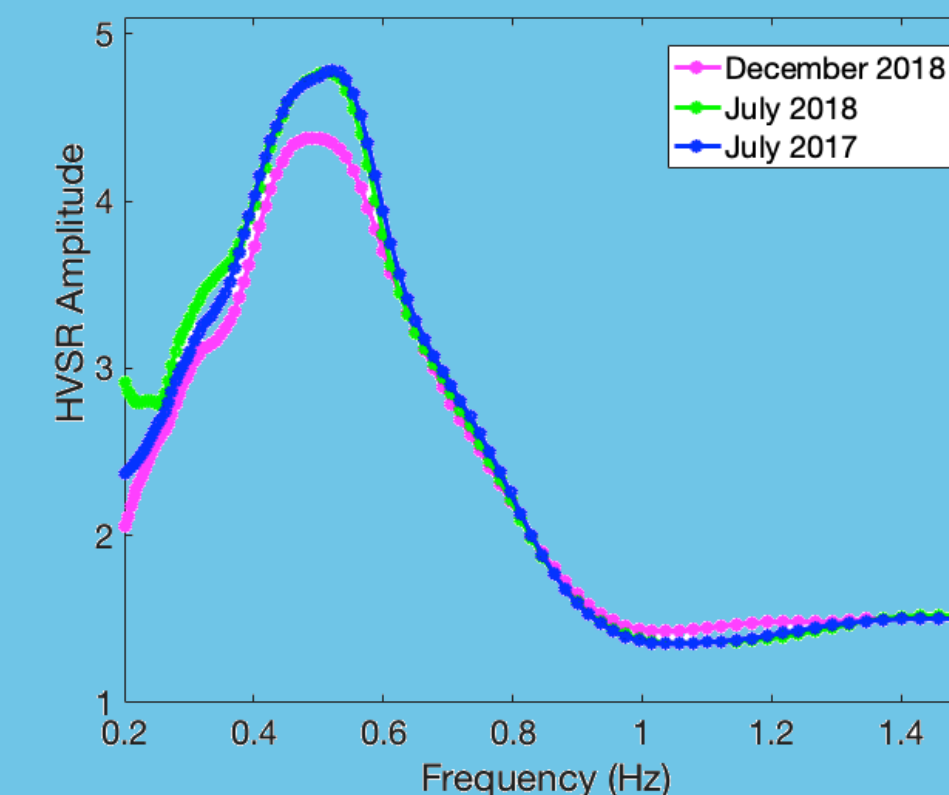
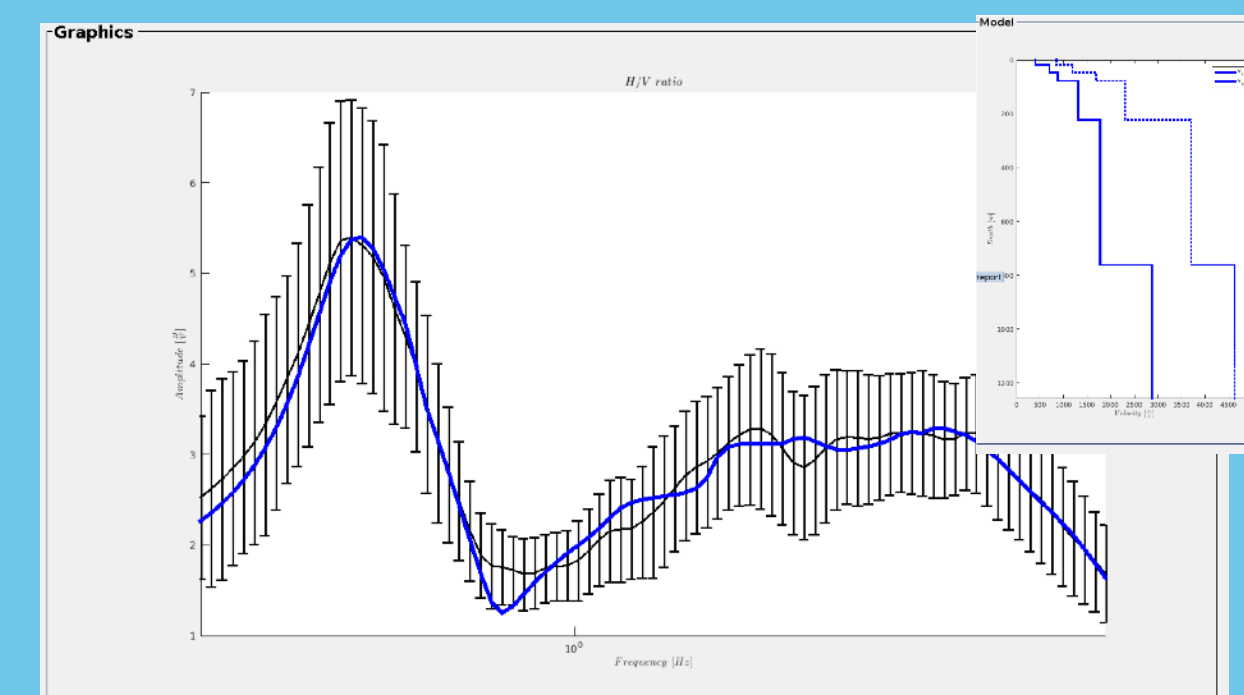
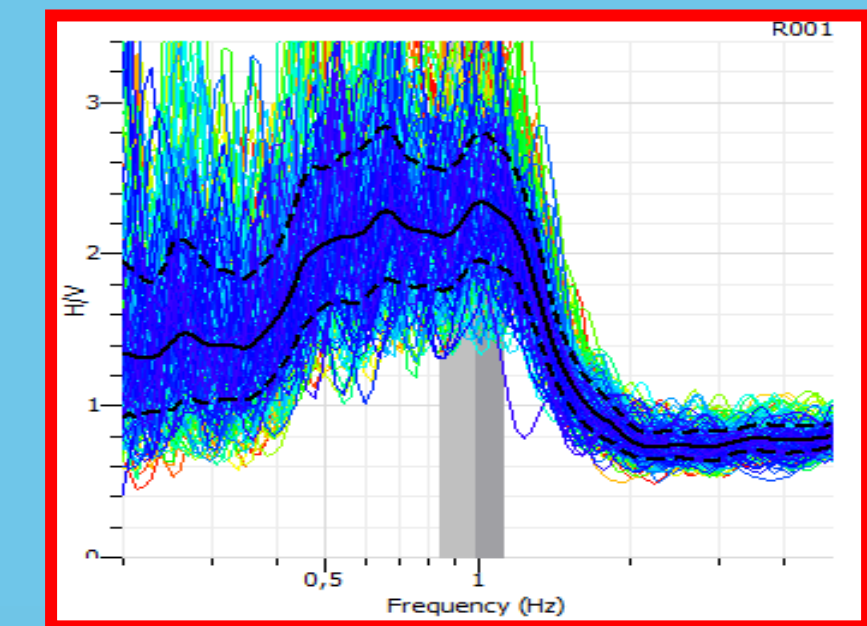
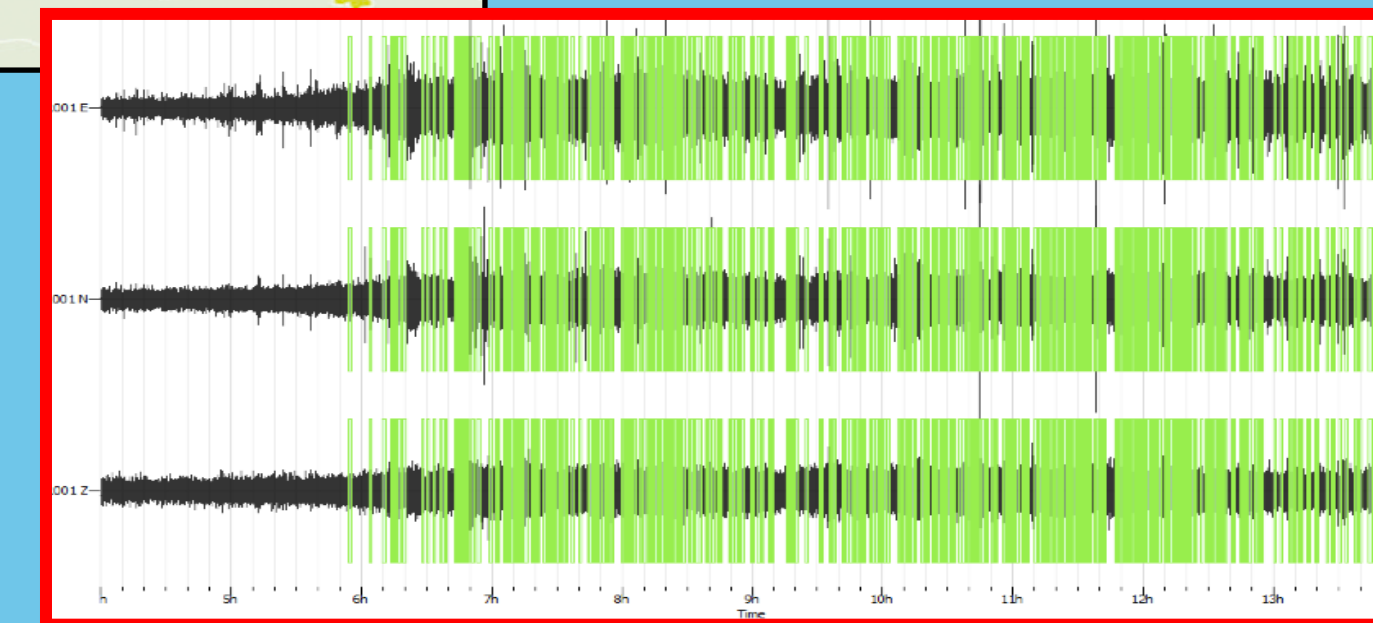
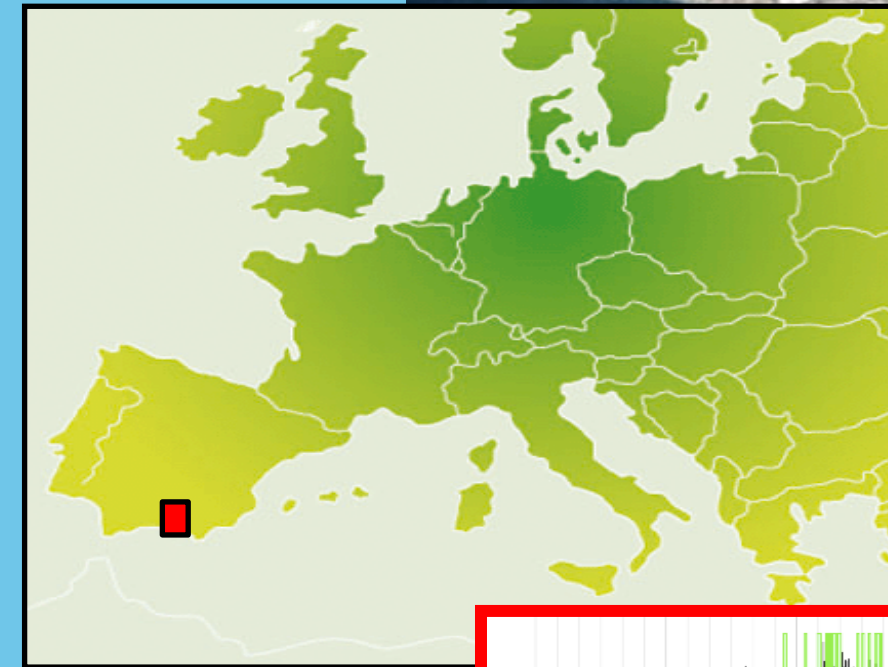
PRECEDENTS

Microzonation of El Ejido town *

Predominance of Broad-peaks

STUDY ENVIRONMENT

- Coastal Plain with sparsed urban areas
- Intensive Agriculture Industry
- Windy-prone area

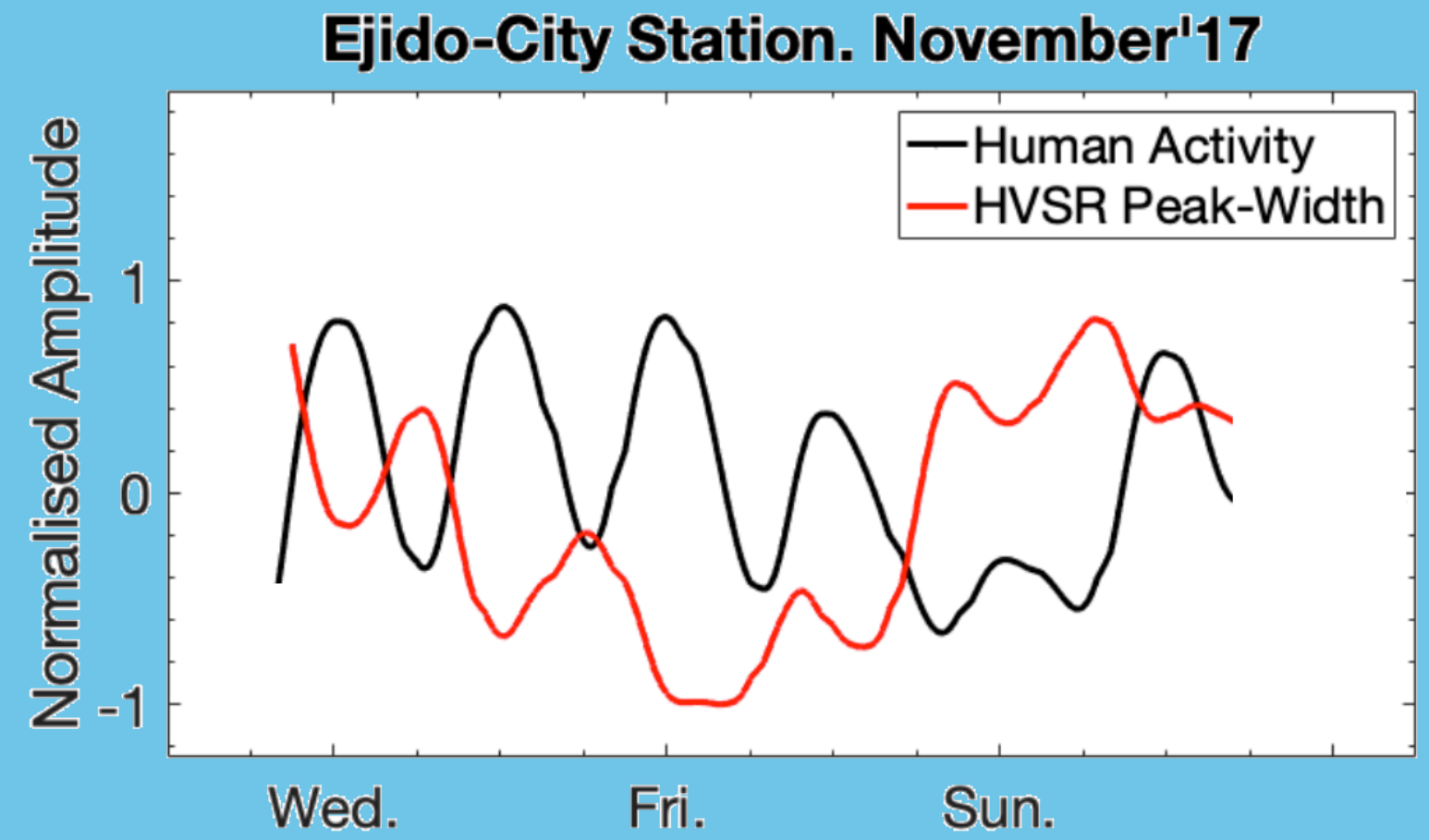
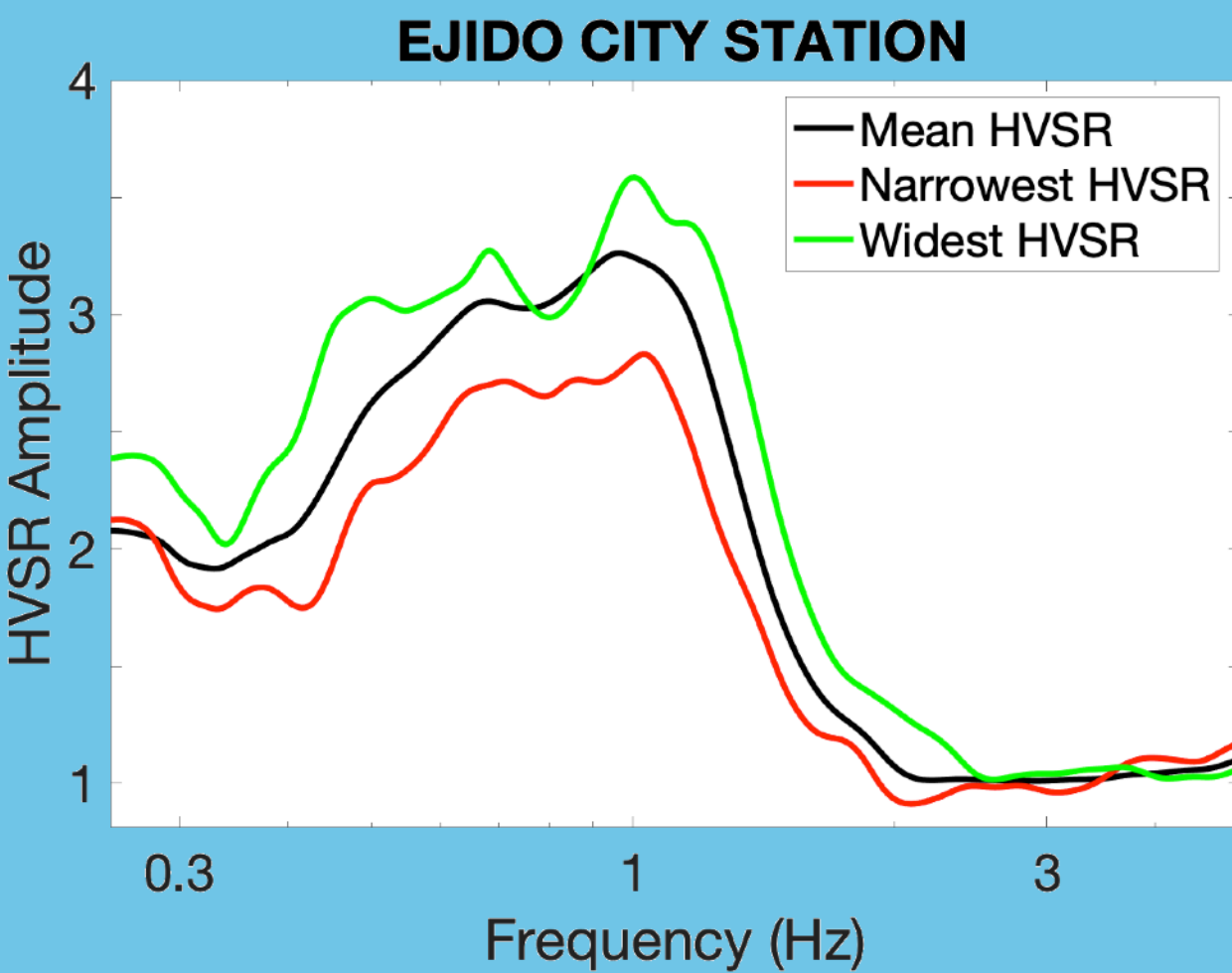
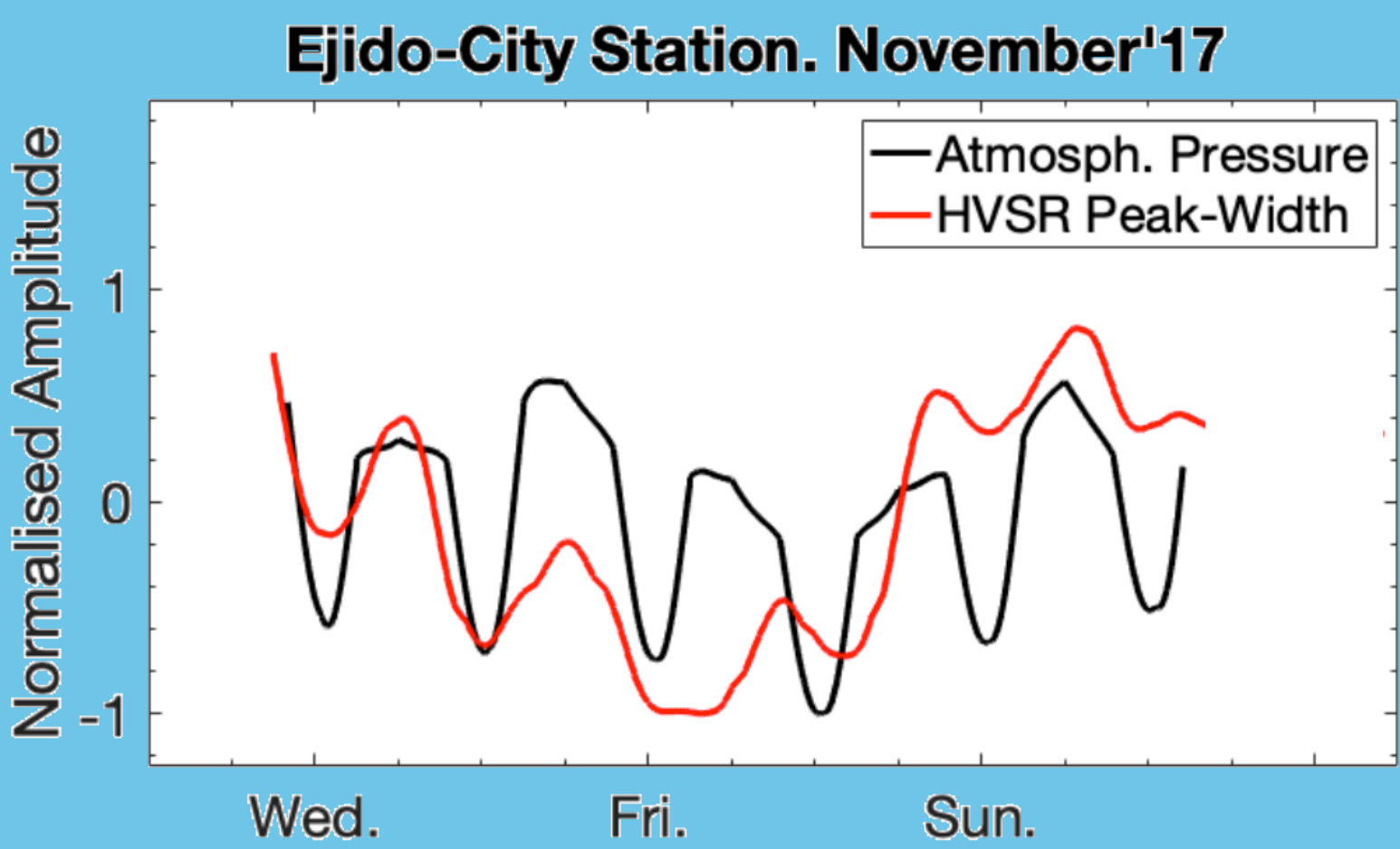


* García-Jerez, A., Seivane, H., Navarro, M., Martínez-Segura, M., & Piña-Flores, J. (2019). Joint analysis of Rayleigh-wave dispersion curves and diffuse-field HVSR for site characterization: The case of El Ejido town (SE Spain). *Soil Dynamics and Earthquake Engineering*, 121, 102-120.

FIRST APPROACH

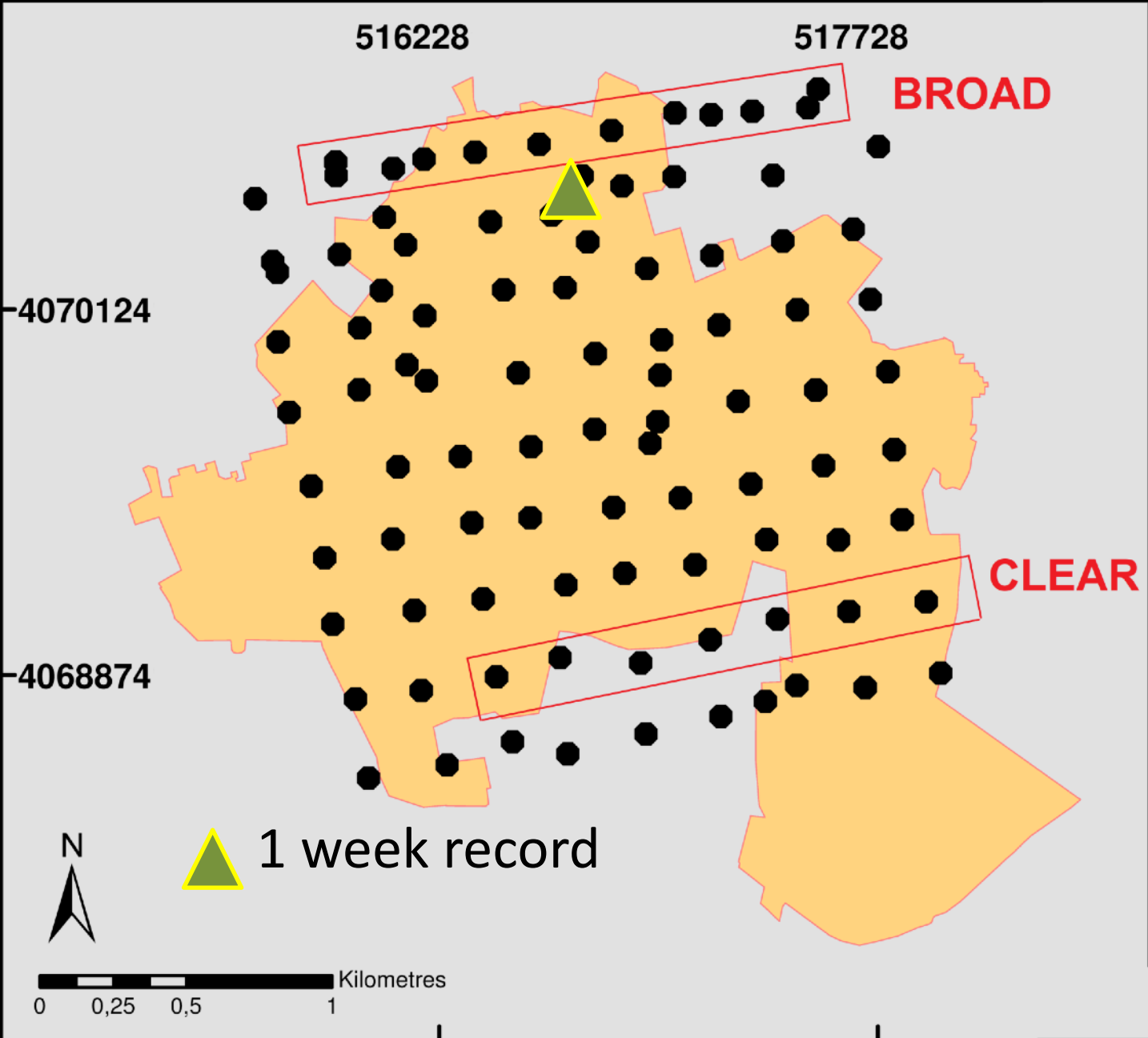
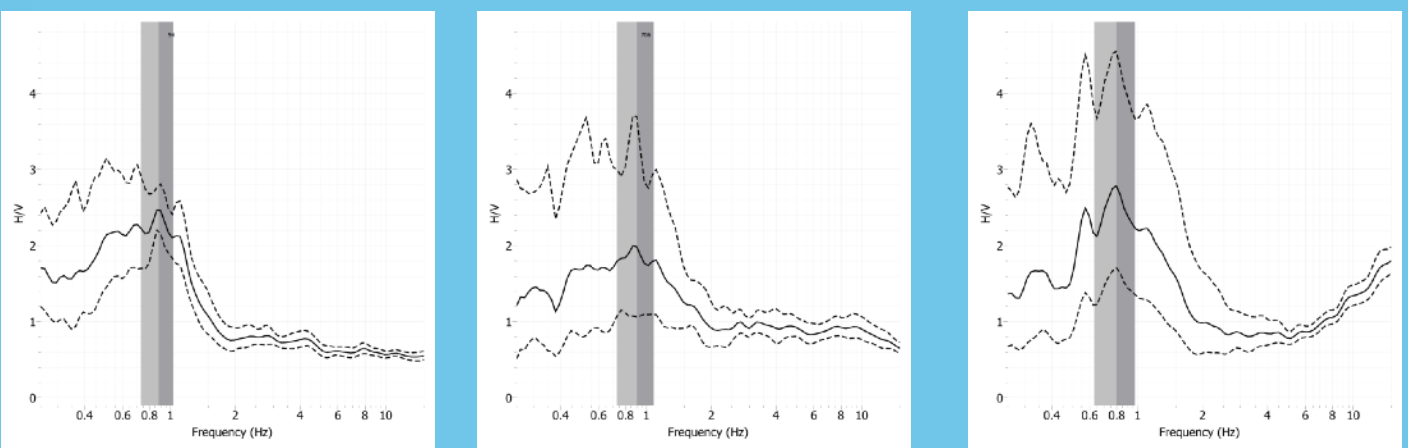
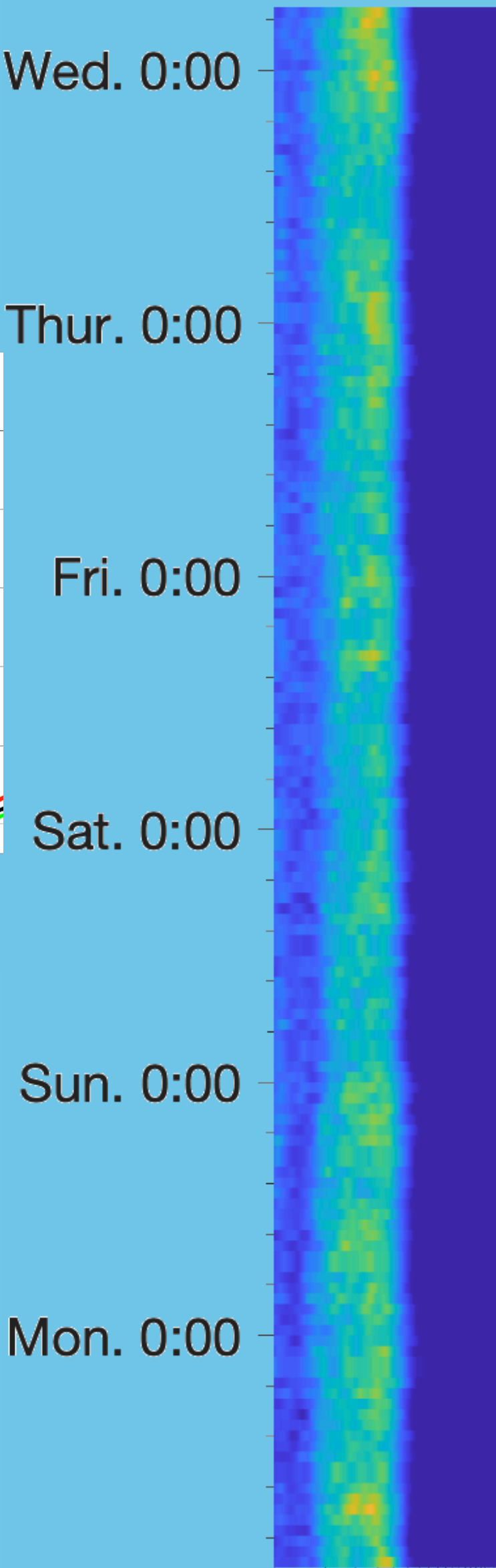
One-week ambient noise recording in El Ejido town

EJIDO CITY



Pearson coefficients

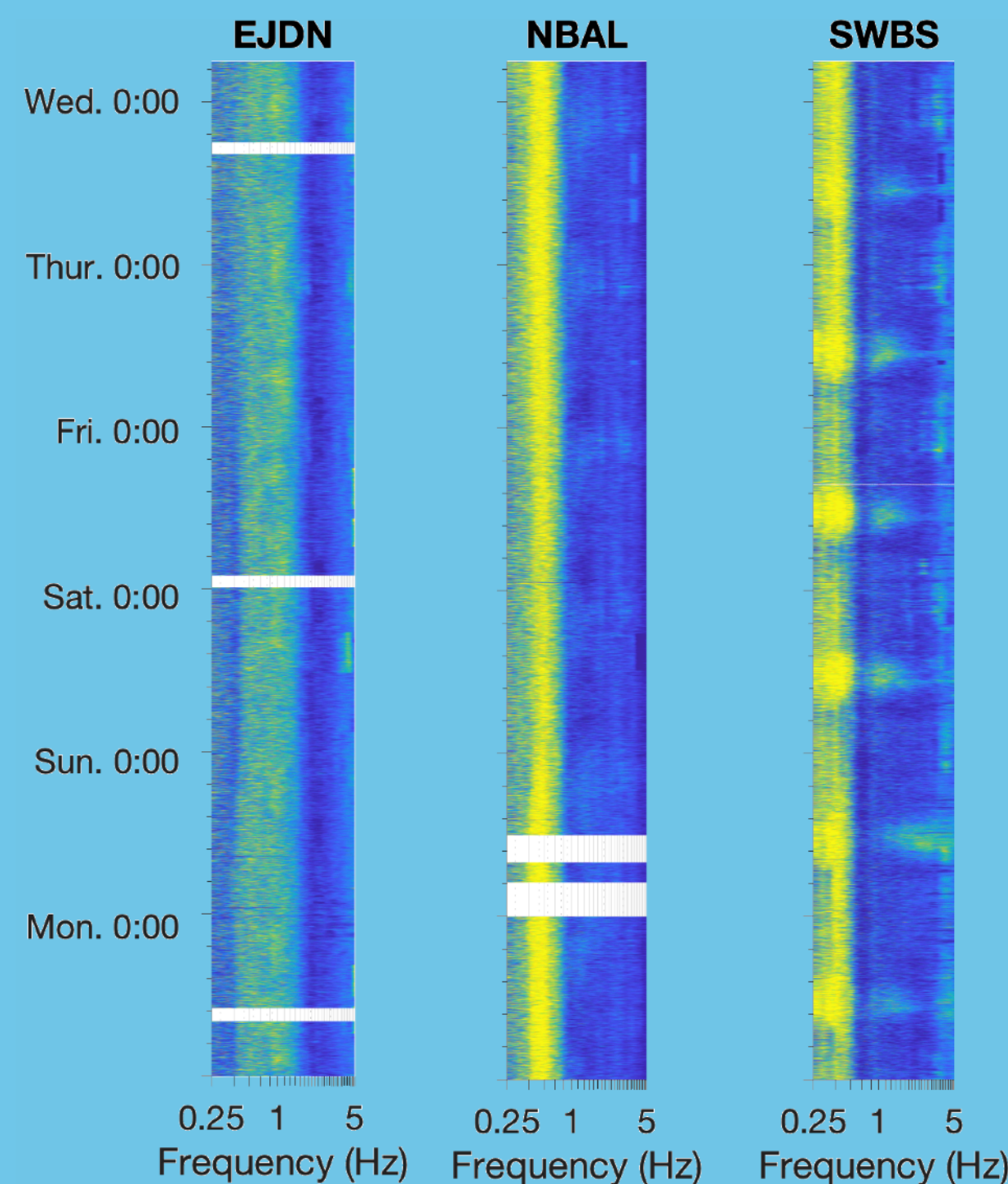
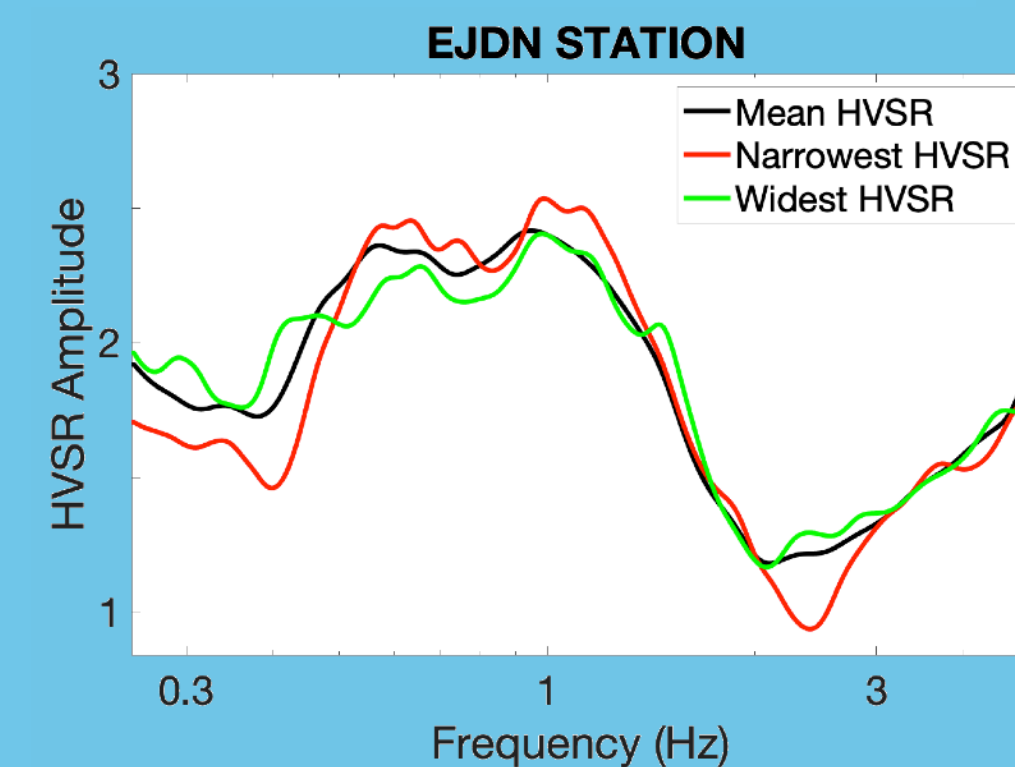
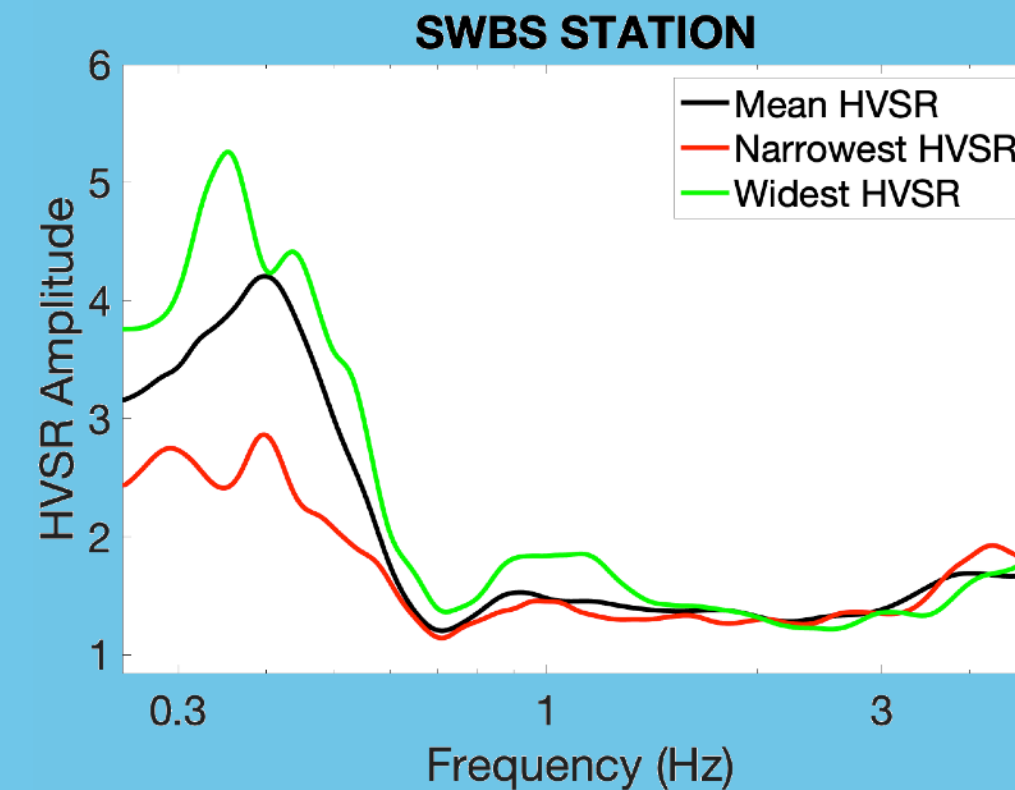
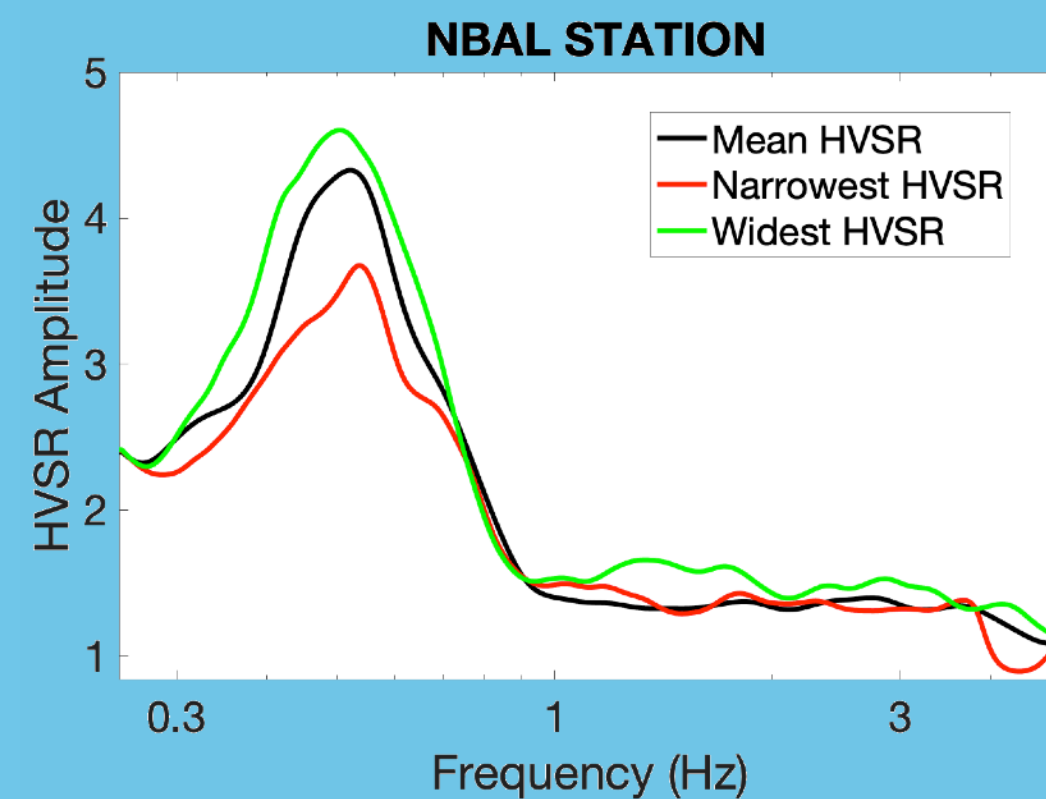
November	
a)	Ejido City
Wind	0.2050*
Water Level	-
Temperature	-0.3438**
Pressure	0.4887**
Human Act.	-0.4048**
Sea Tide	-0.0884



Digital broadband seismometer Guralp CMG-6TD used in long and short time measurements of ambient noise both in El Ejido town and Campo de Dalías basin.

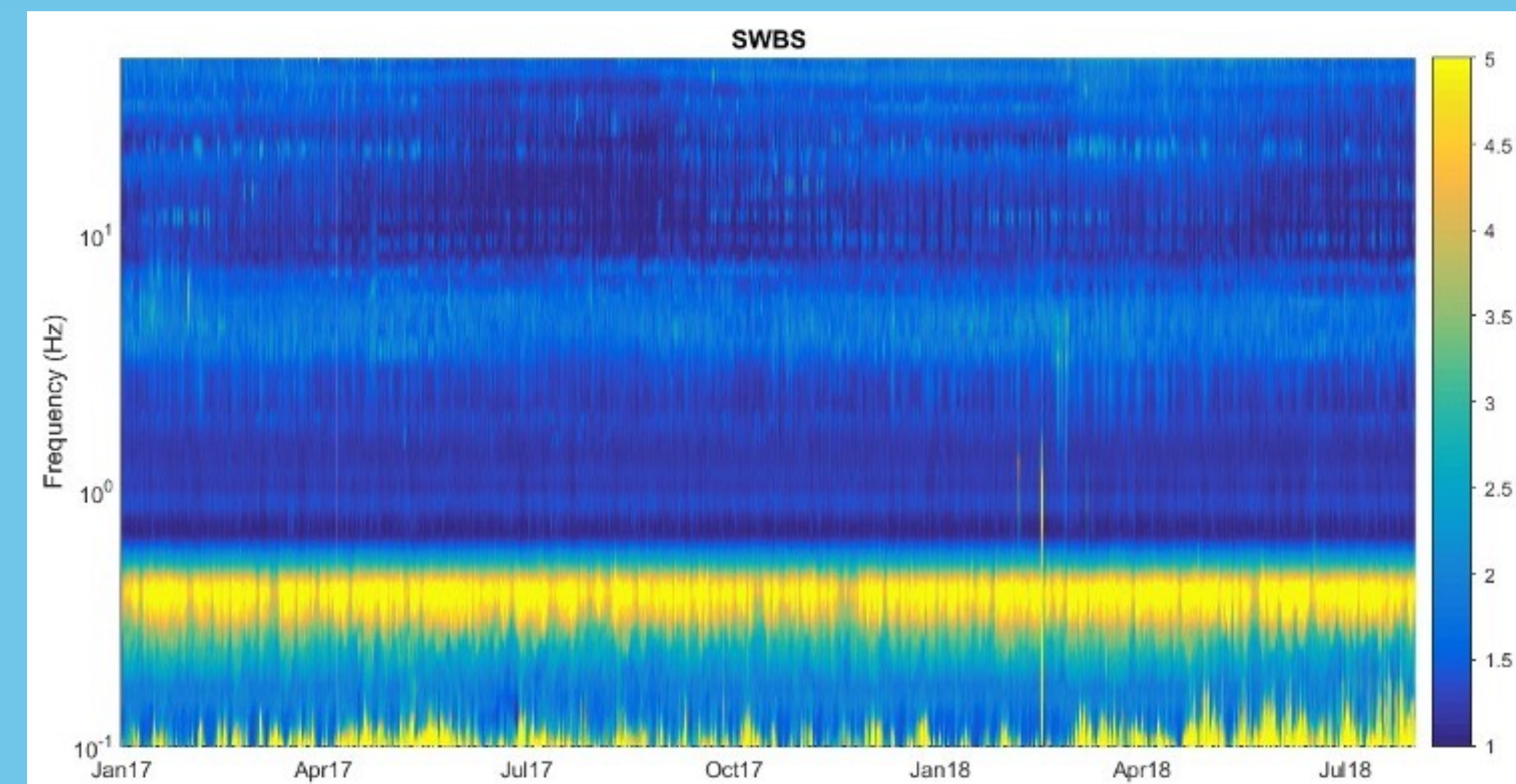
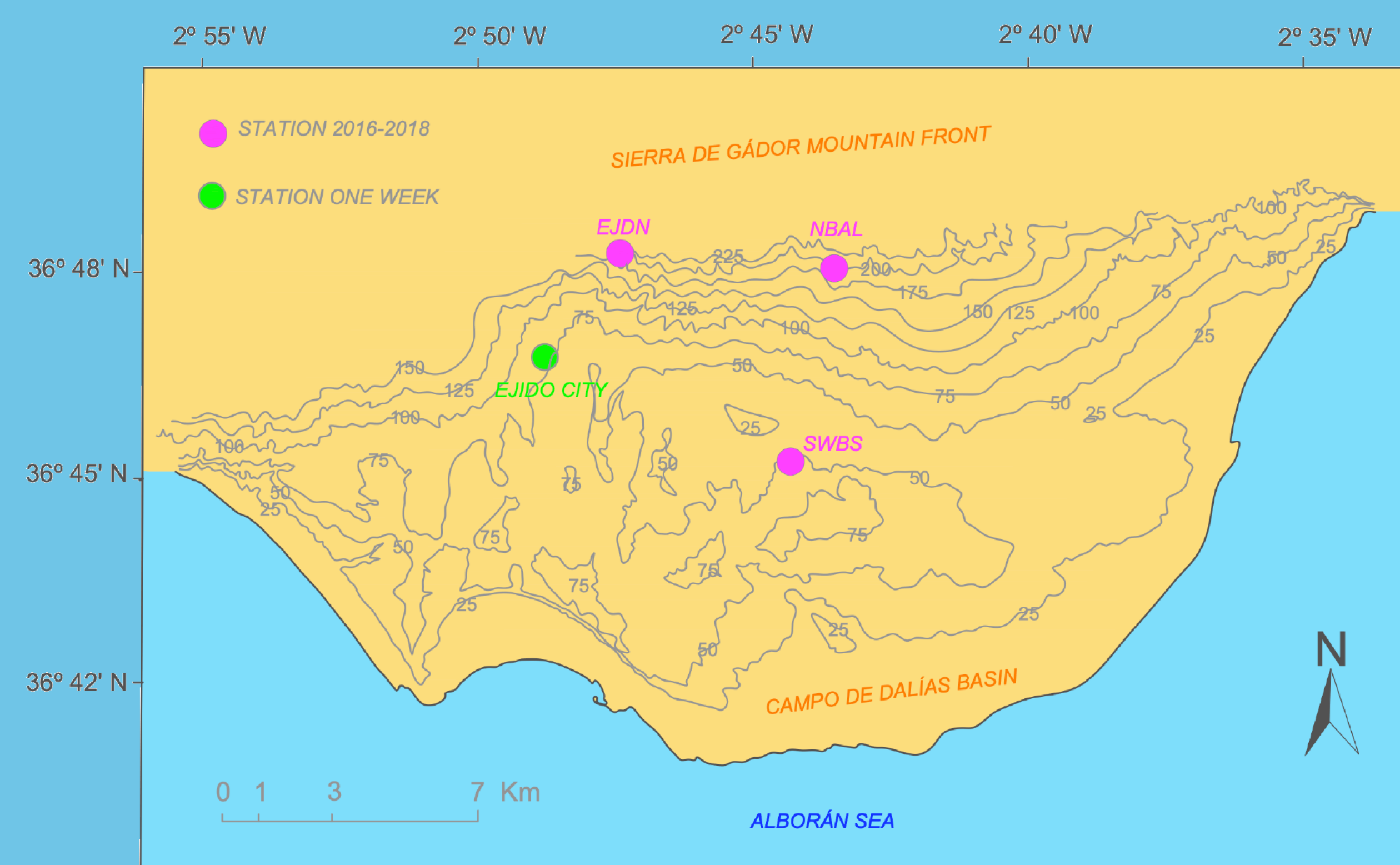
SECOND APPROACH

Yearly ambient noise recordings 2016-2018



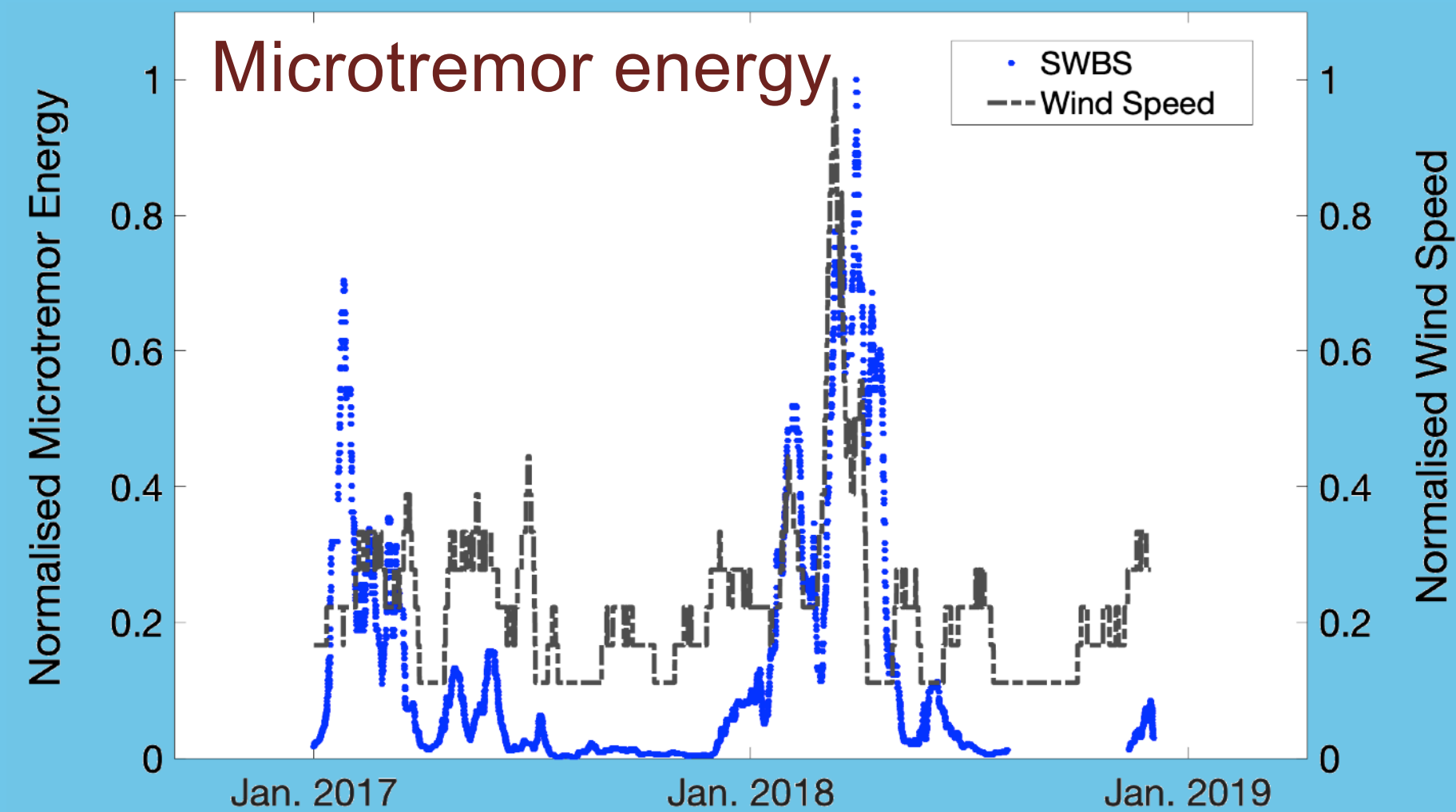
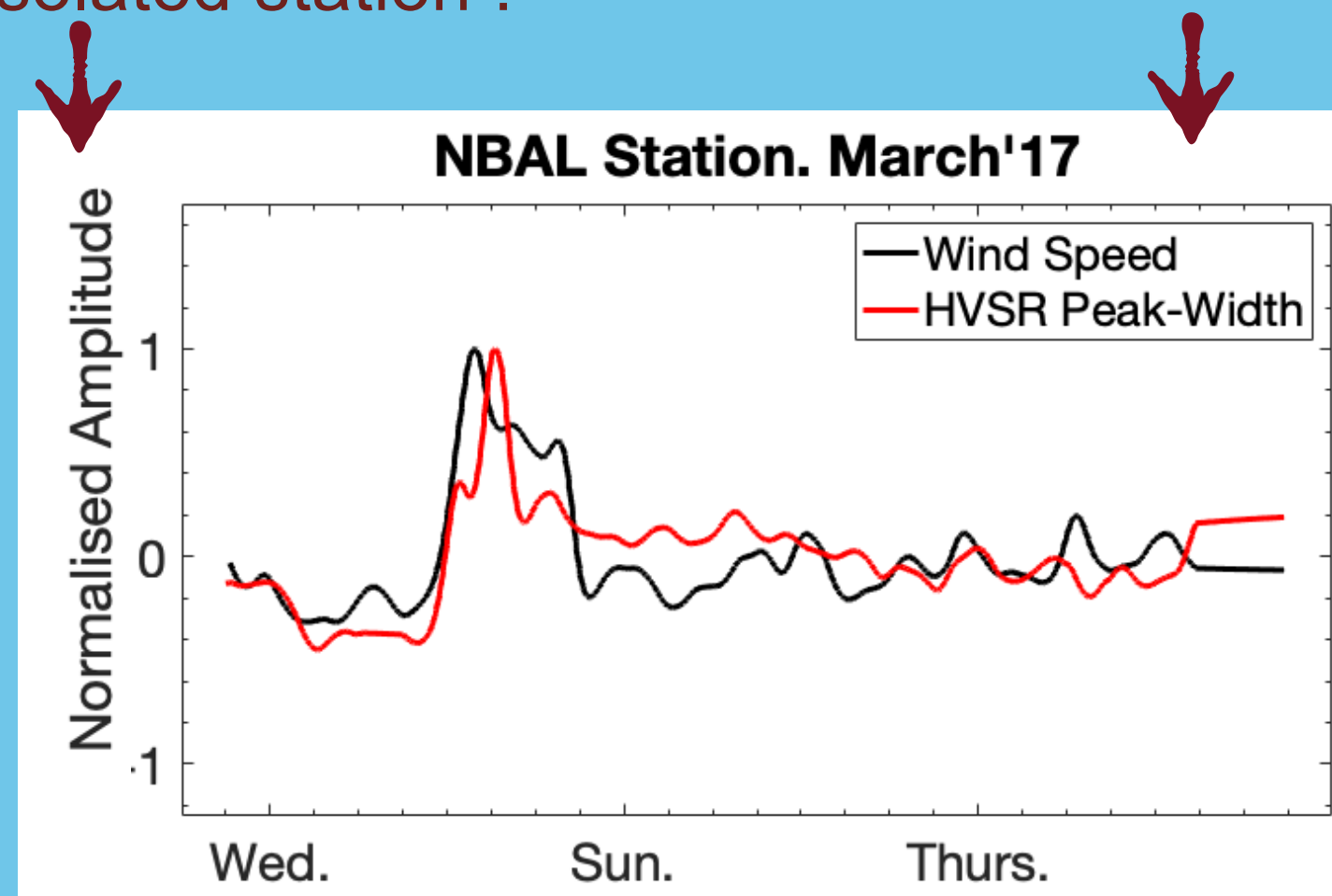
HVSr Parameterization:

- Peak Frequency
- Peak Amplitude
- Peak Width
- Trough Frequency

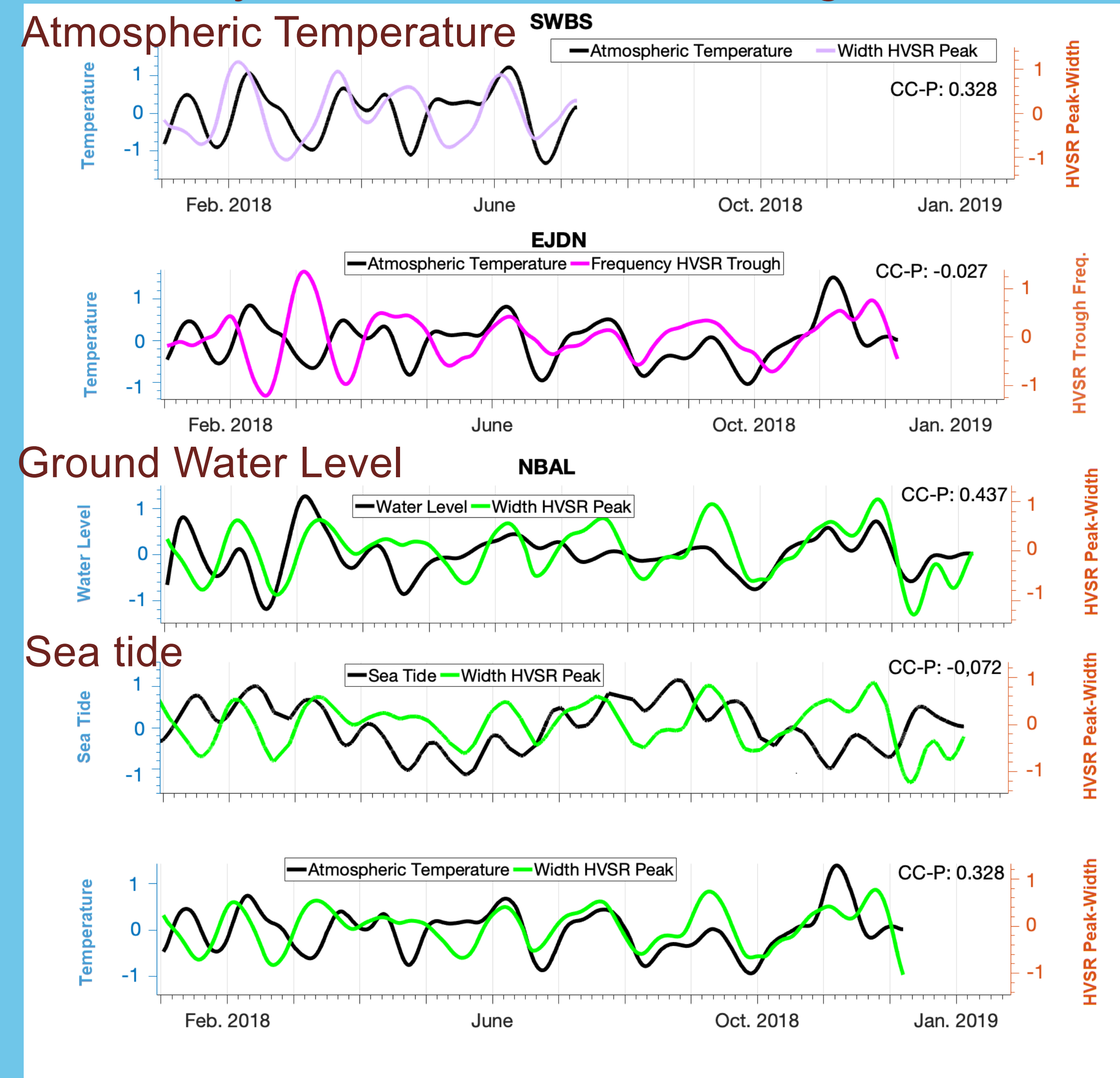


Examples of HVSR variability compared to environmental variables *

- The wind speed shows lowest correlation coefficients with the long-term MHVSR peak parameters.
- However, strong wind-gusts in the less isolated station :



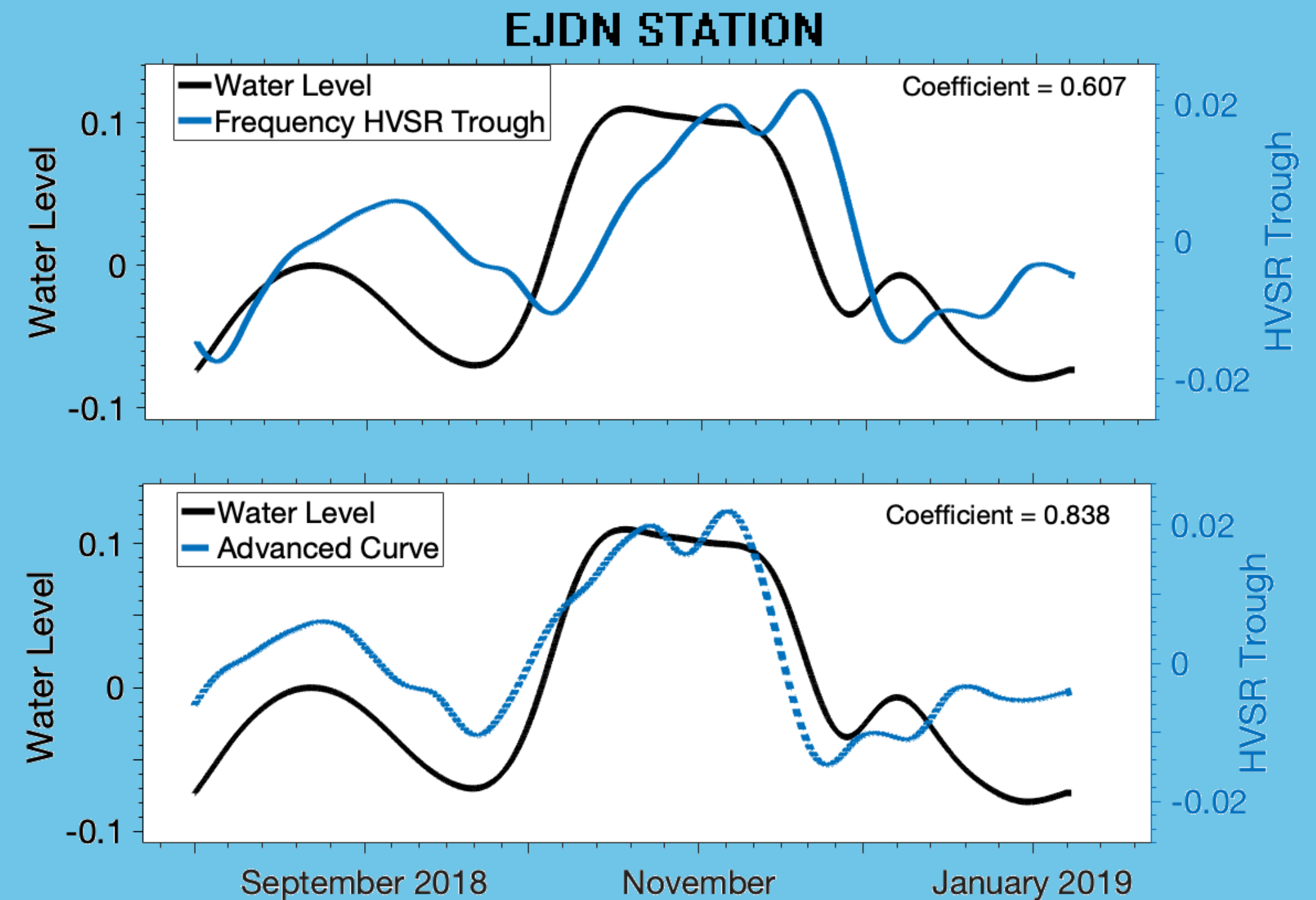
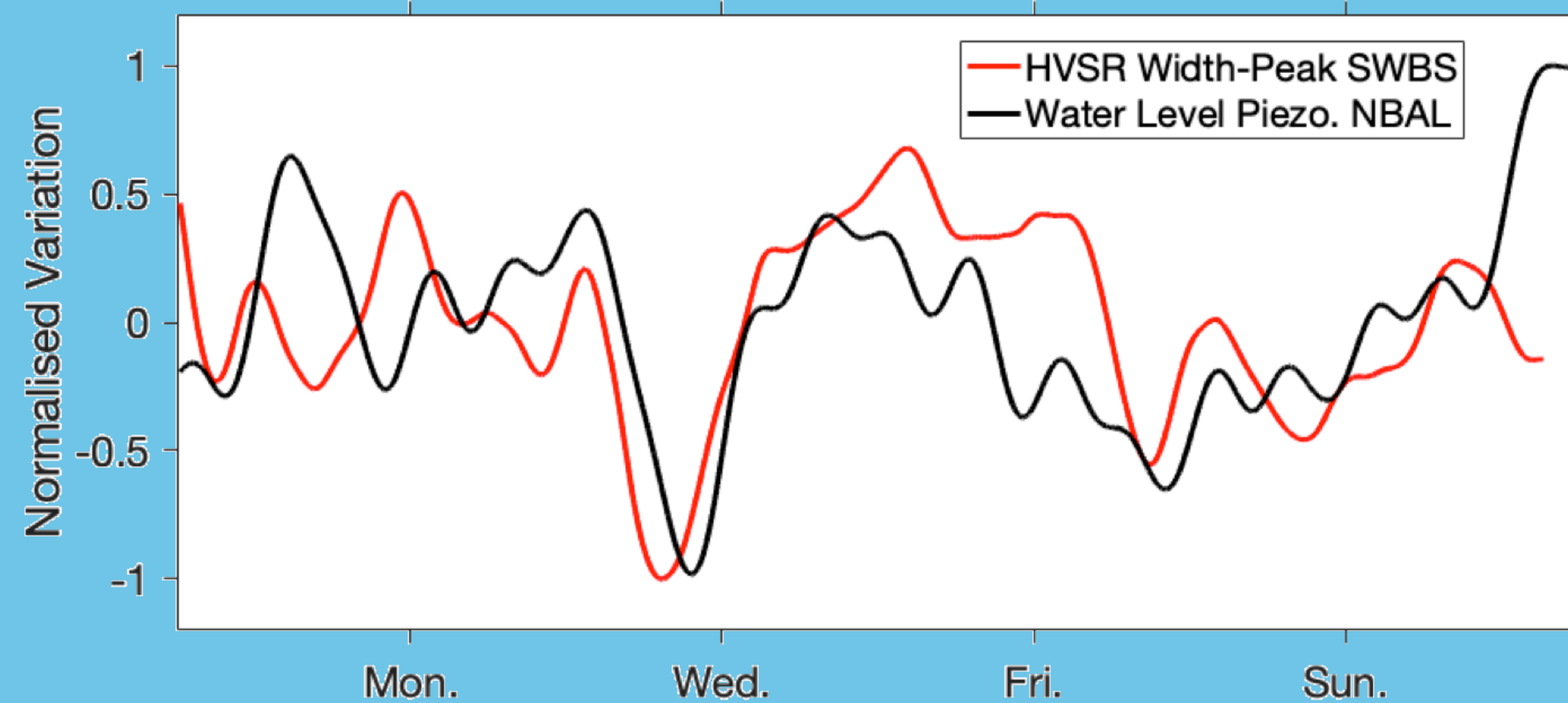
-Yearly ambient noise recordings-



***See** Seivane, H., García-Jerez, A., Navarro, M., Molina, L. & Navarro-Martínez, F. (2022) On the use of the microtremor HVSR for tracking velocity changes: a case study in Campo de Dalías basin (SE Spain). Geophysical Journal International, 230, 542–564. doi:10.1093/gji/ggac064 **For further reading.**

CONCLUSIONS

- The ground water table is the the local variable that keeps a linear-relationship with MHVSR peak-parameters on a long-term scale.
- Seasonalities in the long-term MHVSR variations are found to be in phase (minor delays) with the groundwater cycles. As well, short and high synchronicities are sporadically found.



- The MHVSR capabilities can be proposed as a complementary tool in the geophysical exploration of hydrological environments like karstic aquifers as in the study area of Campo de Dalías (SE Spain).