SnT 2019
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

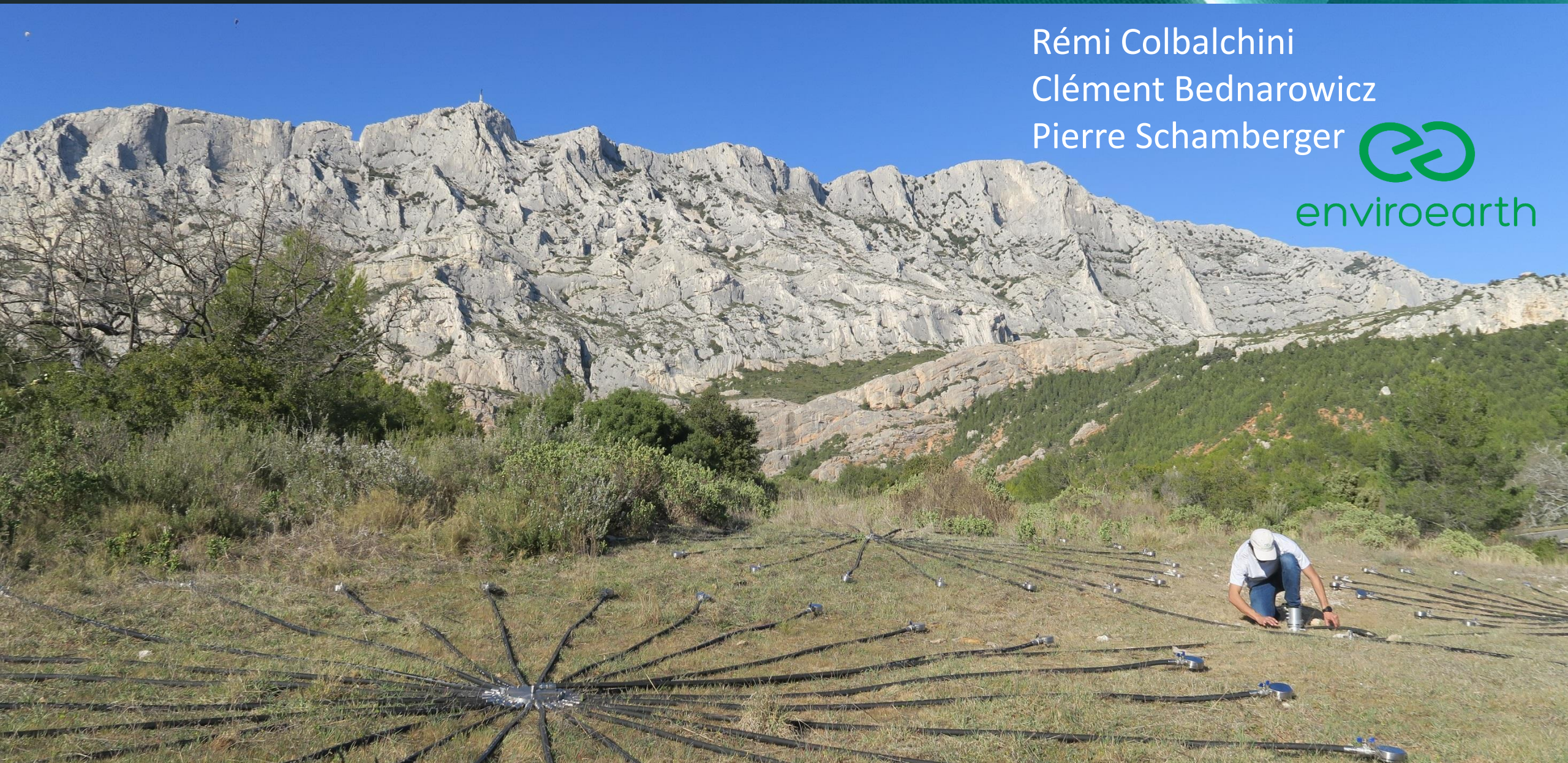
Disclaimer
The views expressed on this poster are those of the author and do not necessarily reflect the view of the CTBTO

T4.1-01 Adaptable Modular Solution for Infrasound station

Oral Presentation

Rémi Colbalchini
Clément Bednarowicz
Pierre Schamberger

enviroearth



Why Enviroearth is so much involved in infrasound ?

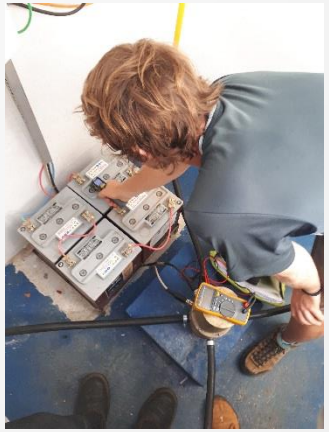
Operation, maintenance and upgrade missions of EE on IMS network

enviroearth

Infrasound knowledge and industrial skills development

Manufacturing and supply of infrasound equipment

Manufacturing and test of power and communication cabinet



Site-survey and trouble shooting

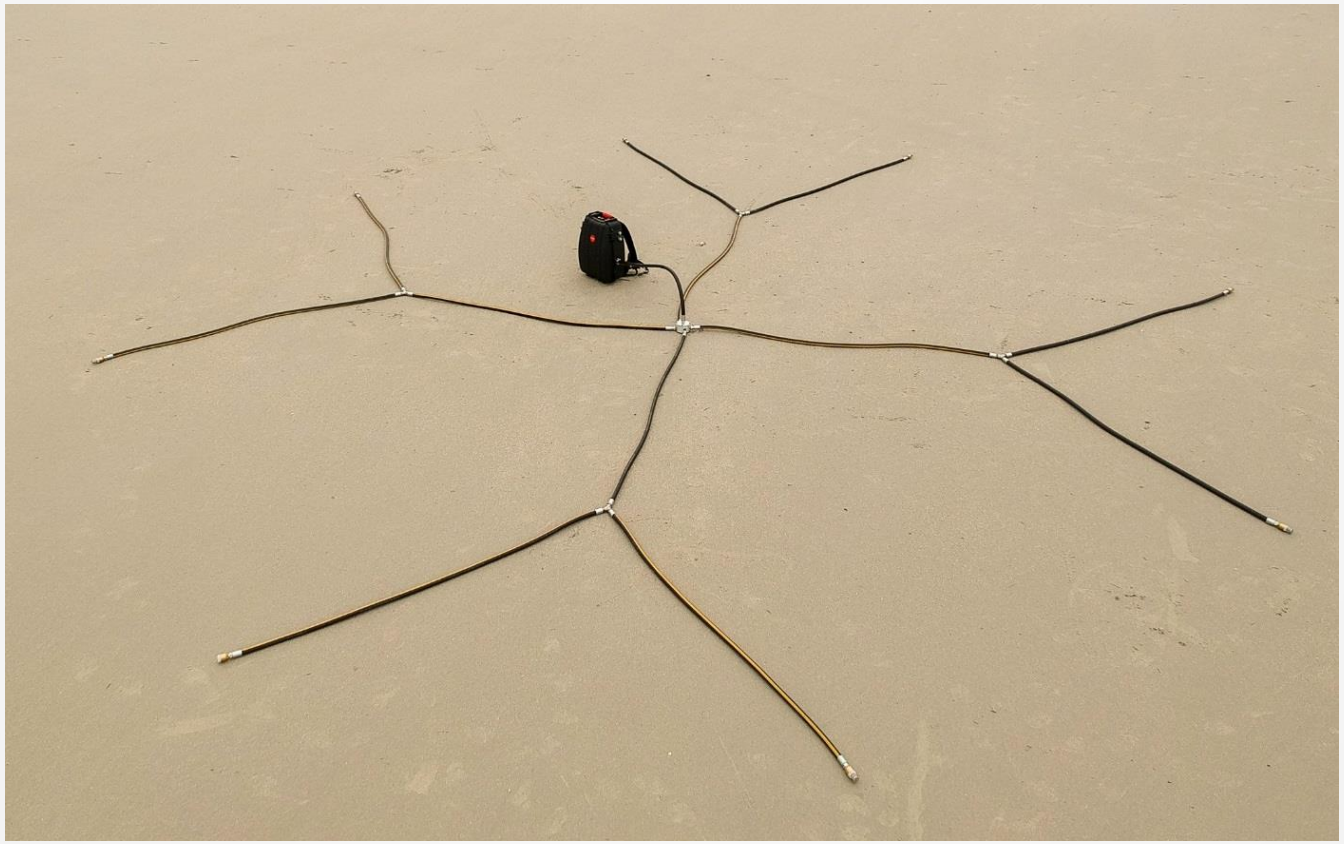
enviroearth

What is an infrasound station ?

enviroearth

Examples of infrasound stations

Portable Infrasound Station TIME developed by Seismo Wave and Enviroearth



enviroearth

Examples of infrasound stations

Acoustics comparison
Hose WNRS and
Stainless steel Vault

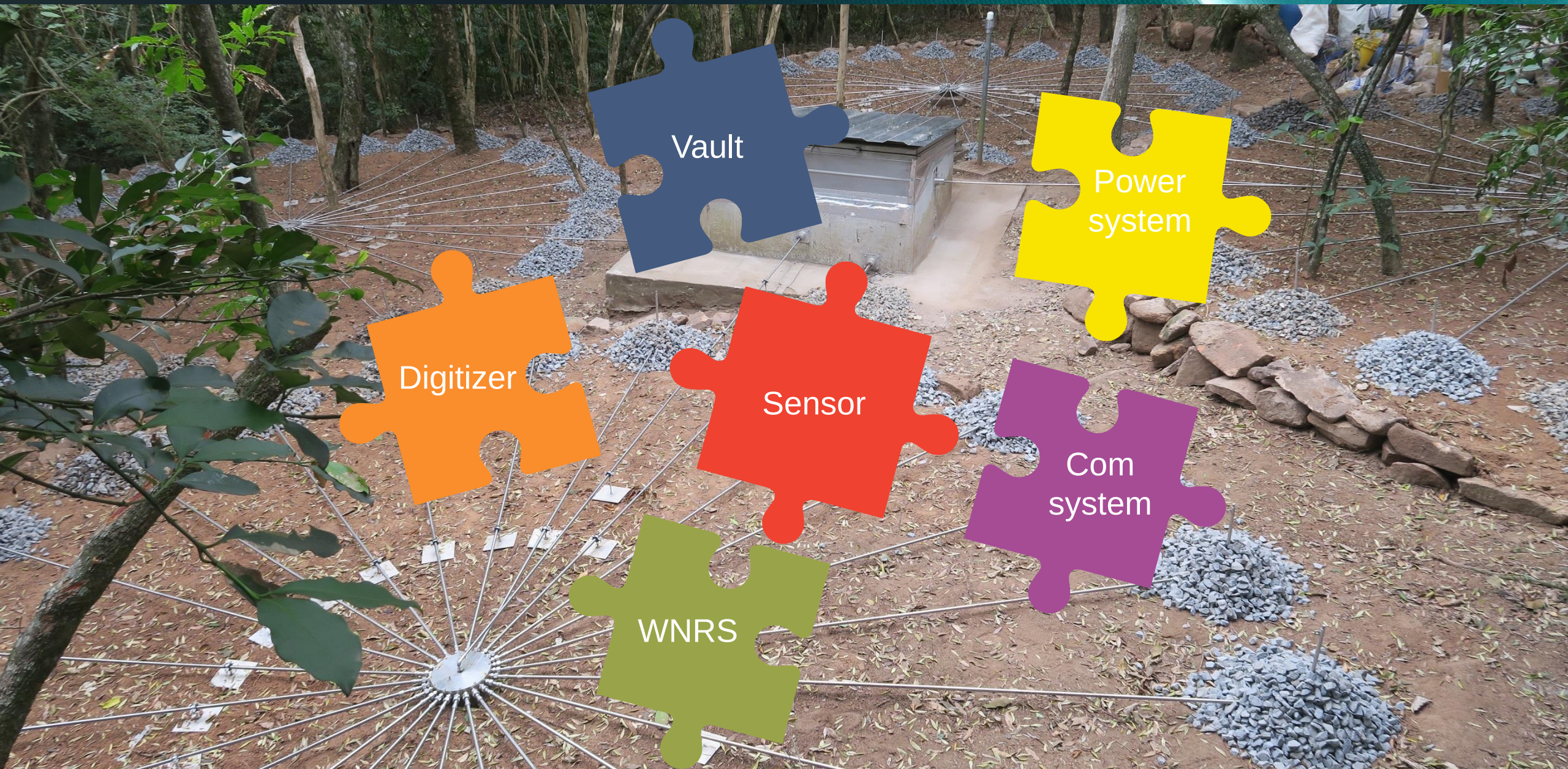
enviroearth

Examples of infrasound stations

IMS station IS41
at Villa Florida,
Paraguay

What compose an infrasound station ?

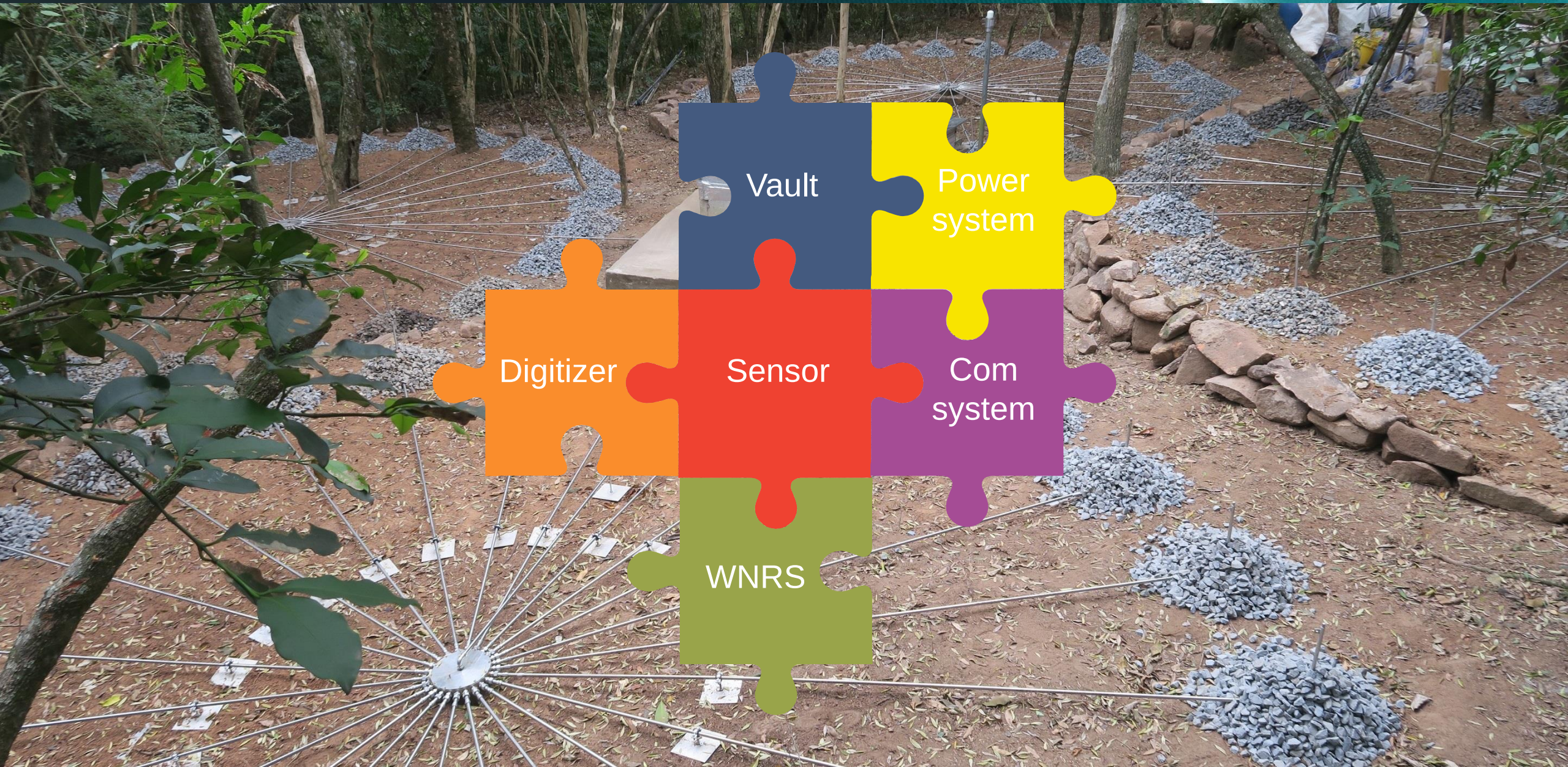
enviroearth



SnT 2019
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

Disclaimer
The views expressed on this poster are those of the author and do not necessarily reflect the view of the CTBTO

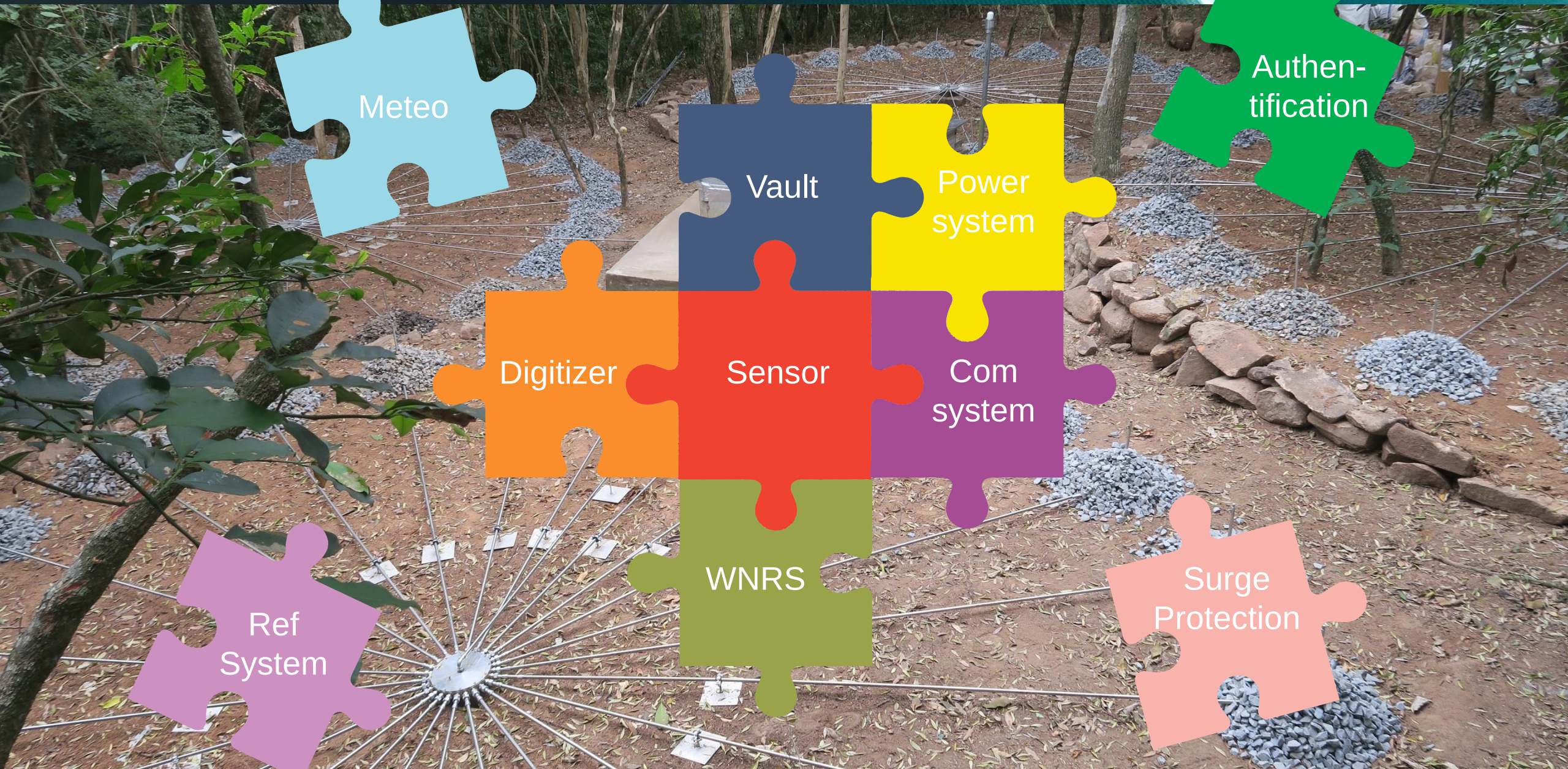
Oral Presentation



SnT 2019
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

Disclaimer
The views expressed on this poster are those of the author and do not necessarily reflect the view of the CTBTO

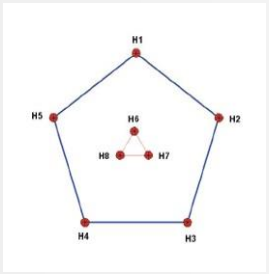
Oral Presentation

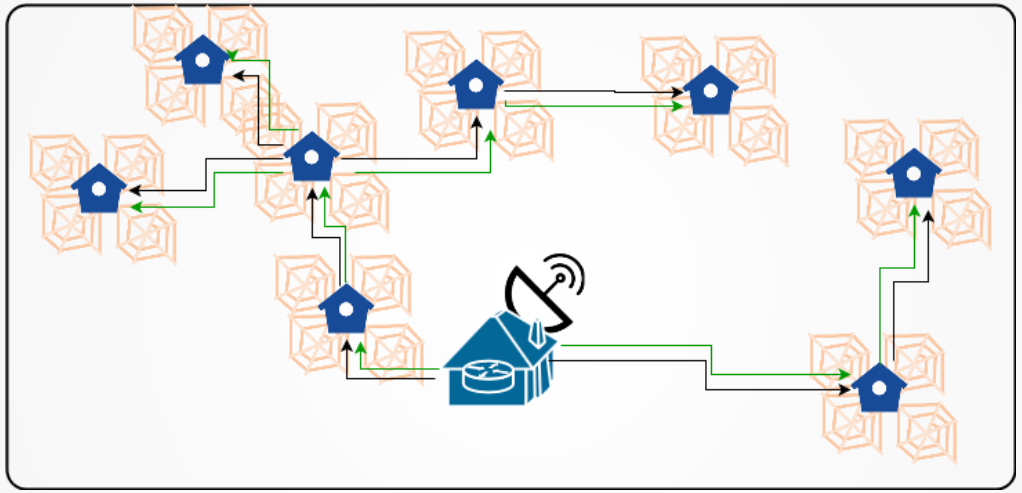


Criteria that define specifications and choices of modules

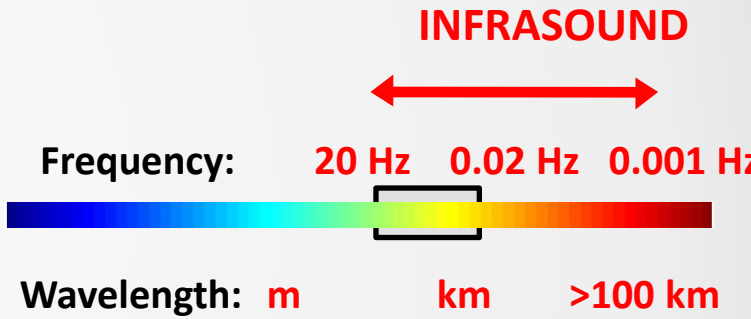
Station environment

Array design





Frequency bands of interest



Use of station

IMS Network
Long-term research station
Government network
Temporary survey

Type of operation & maintenance

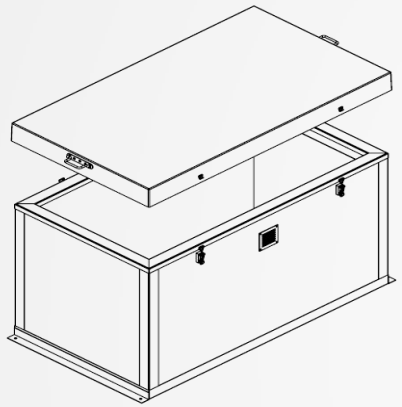
Data analysis criteria

Threshold
Data availability
Data quality

Fields of research

enviroearth

Vault Description



Adapted to environment

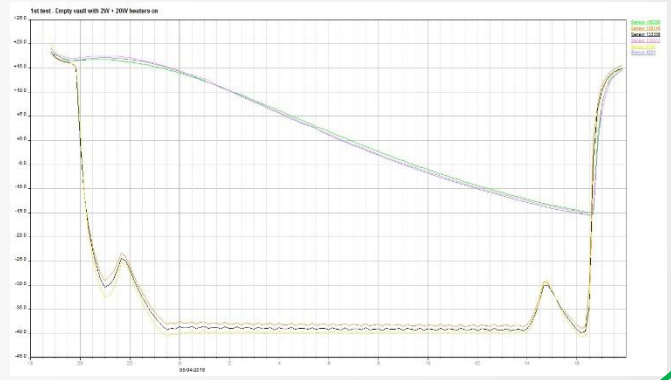
Insulation and/or ventilation
Specific IP

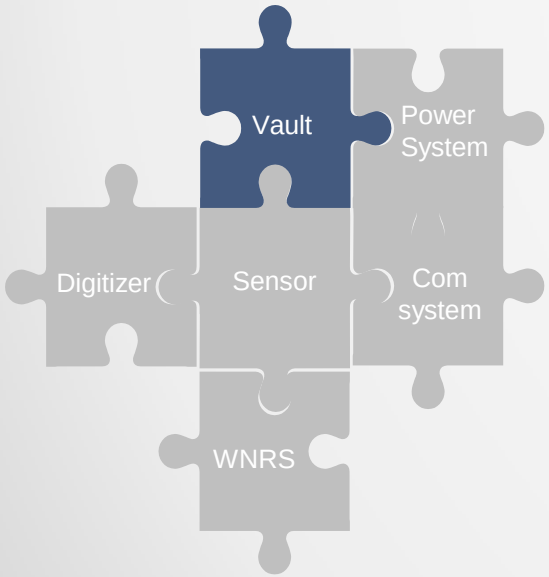
Requirement for installation

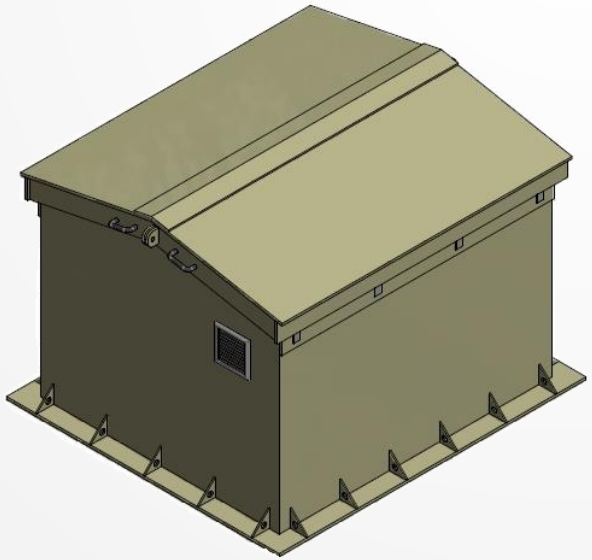
Concrete base
Levelling if needed

Dimensions and physical characteristics

External dimensions
Weight
Possibility of insulation
Type of material – UV resistance cover







Interaction with other modules

Possibility of two vaults
(Sensor vault and equipment vault)
Cable passageway

enviroearth

Vault Description

Light Panel sandwich solution

1300*700*600 – 63kg

UV resistant material

Friendly environment

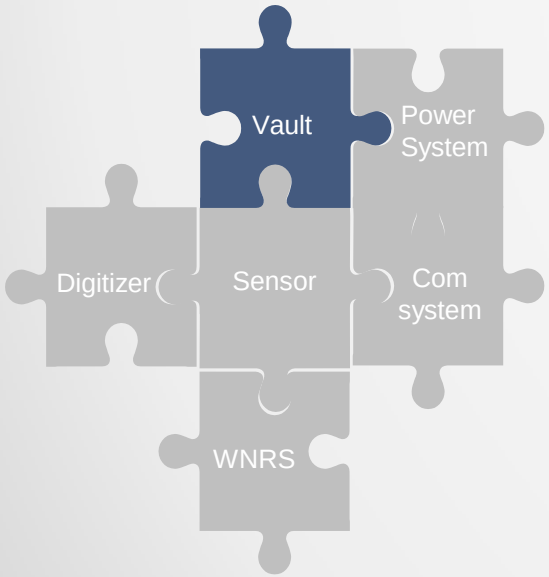
Easy to customize

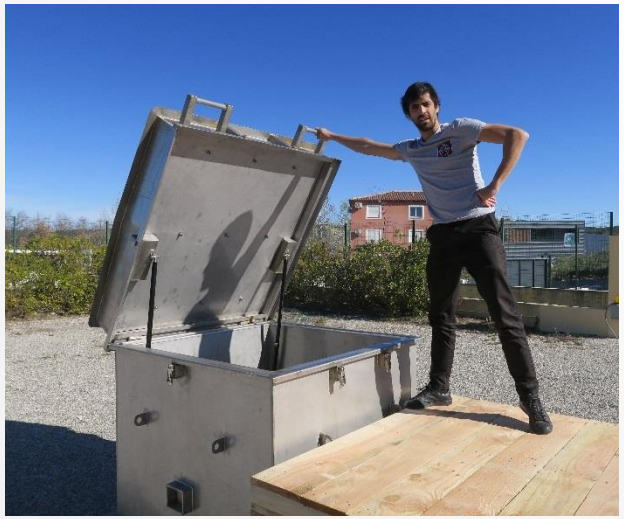
Pelicase solution

570*570*450 – 40kg

UV resistant material

Easy to customize





Stainless steel solution

1400*1400*1200 – 400kg

UV&Corrosion resistant and material

Harsh environment

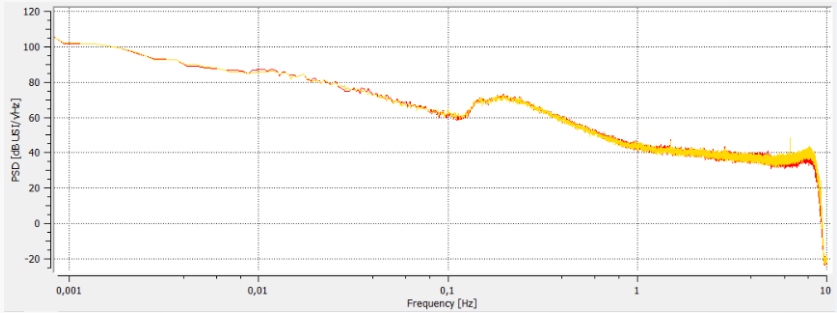
Heavy-duty installation

enviroearth

WNRS Description

Requirement for installation

Clearing
Levelling if needed

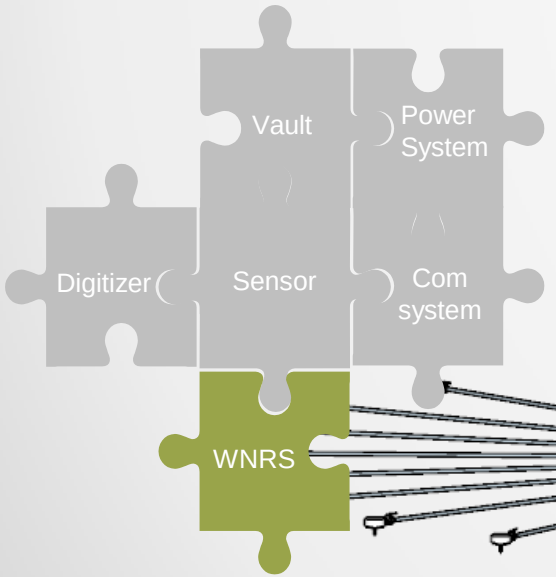


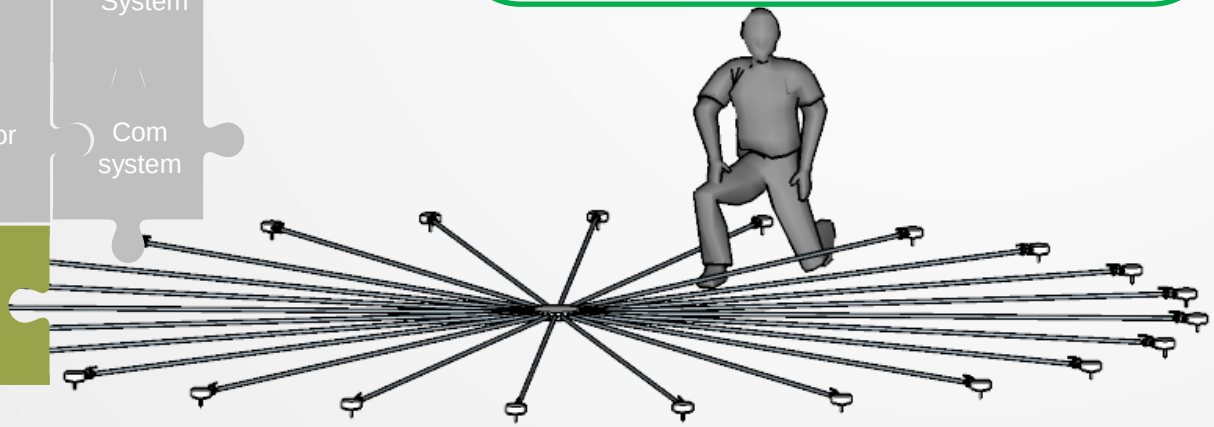
Evaluation and test

UV test
Factory device acceptance test
Acoustic evaluation
Continuous improvement of material

Dimensions and physical characteristics

18m span
96 Inlet ports
Ball-valve for pressure test
2 Material models





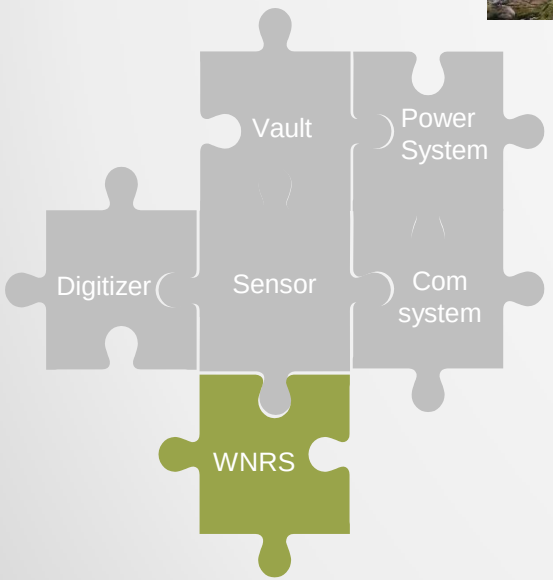
Test at Enviroearth facilities

enviroearth

WNRS Description

IMS station IS52 at Diego Garcia, BIOT

Enviroearth facilities



Stainless steel solution
18m – 96 inlets
Long lasting material
Possibility of pressure test

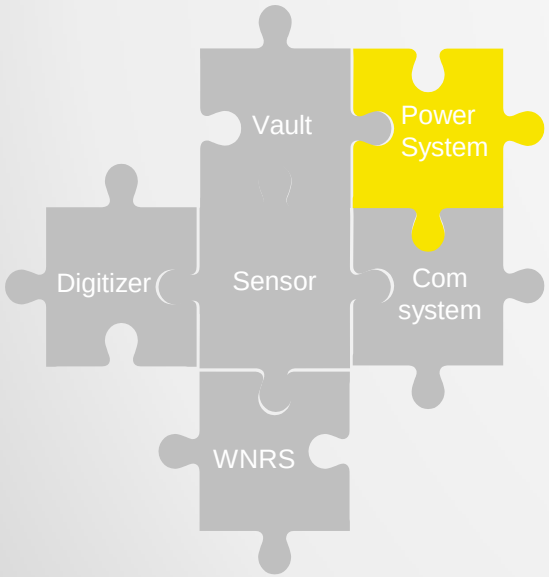
Hose solution
18m – 96 inlets
Heavy-duty hose material – easy to install
Possibility of pressure test

enviroearth

Power System Description for remote station

Installation and environment

Solar resource
Civil works possible (trenches)
Grid quality
Exposure to theft



Design and manufacturing of Simple Power cabinet

Off-Grid
Solar MPPT Cabinet

On-Grid
AC/DC Cabinet

Test and Development

Test on facilities
Power cut-off scenario
Batteries charge monitoring

→ Development of global monitoring solution

Various technologies

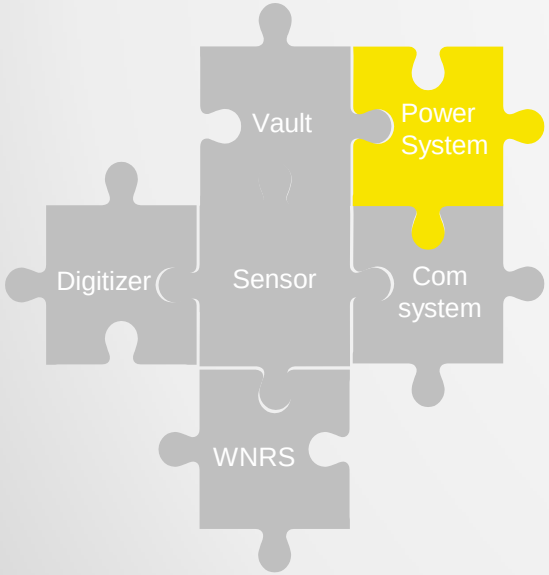
PV panels + MPPT
Grid AC
Diesel Generator
Fuel Cells
Wind generators
Batteries

enviroearth

Power System Description for remote station

IMS station IS40, PNG

IMS station IS41, Paraguay



AC/DC Cabinet
Load Battery rack
Possibility of CALEX DC/DC stabilizer
AC plug option
Integrated LPD

Solar MPPT Cabinet
Load Battery rack
Possibility of CALEX DC/DC stabilizer
Monitoring option
Integrated LPD

enviroearth

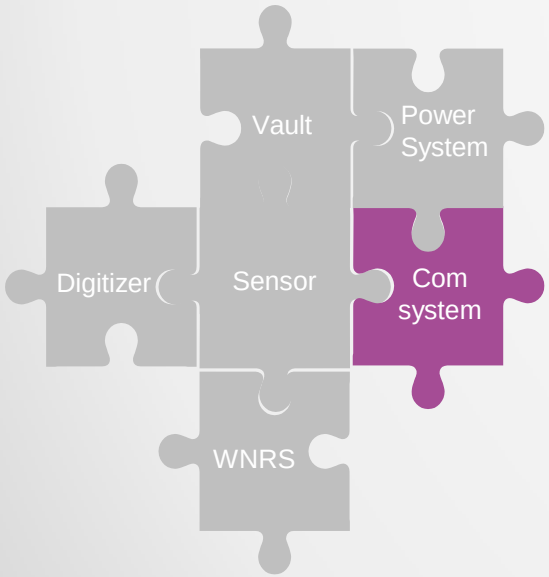
Communication System Description

Installation and environment

Civil works possible (trenches)
Sites typology
Exposure to theft

Various technologies available

Radio Comm
Ethernet
Fiber optic
GSM



Design and manufacturing of Media Converter Cabinet

Ethernet cabinet
FO Patch cabinet

Connected to Splicing box – Radiomodem box

enviroearth

Summary table

Sensor
- MB3a
- MB2005
- Chaparal 50A
- Hyperion 5000
- MB3d
- etc

Digitizer
- EuropaT
- DM24S
- Aubrac
- SMART24
- MB3d
- etc

Vault
- Pelicase
- Light Sandwich solution
- Stainless steel solution
- Cabinets
- Concrete solution
- etc

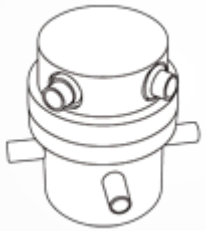
WNRS
- 18m-96inlets – SS
- 18m – 96inlets – Hose
- 36m – hexa
- Dome/ Wind barriers
- etc

Power
- PV MPPT + Battery bank
- AC/DC + Battery bank
- Central PV + Battery + DC/DC
- etc

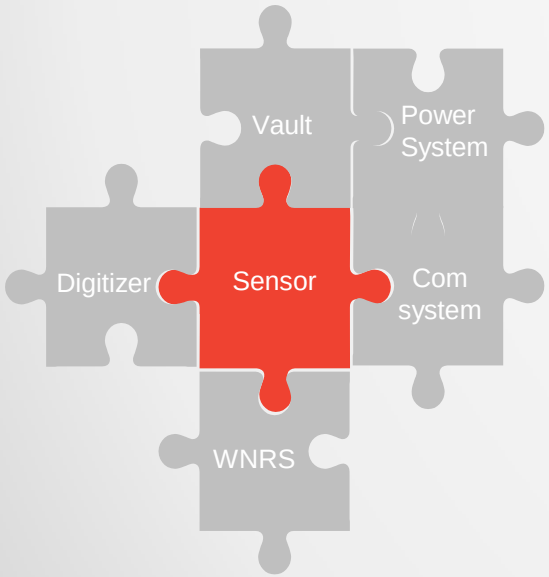
Communication
- Fiber optic
- Ethernet + Radio System
- Ethernet (small scale)
- GSM
- etc

enviroearth

Infrasound station “à la carte”



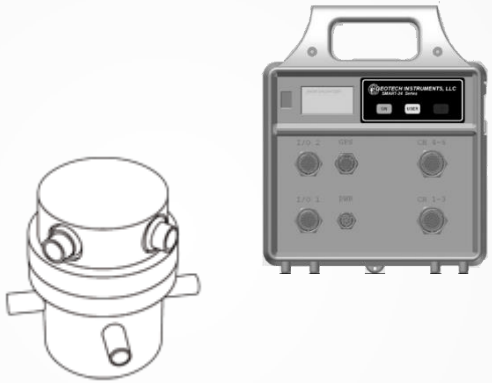
MB3a - SeismoWave

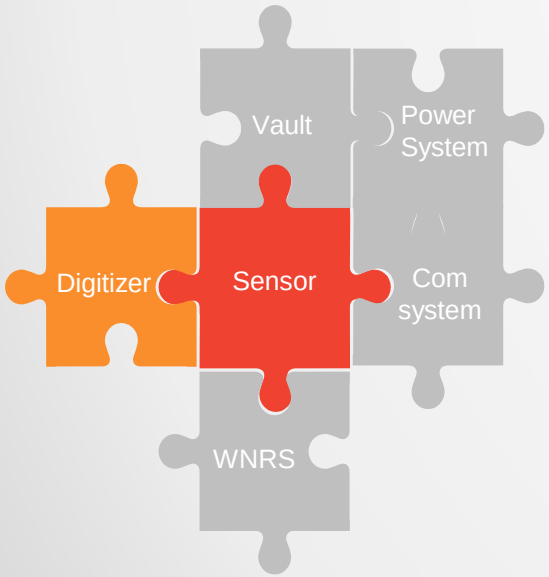


enviroearth

Infrasound station “à la carte”

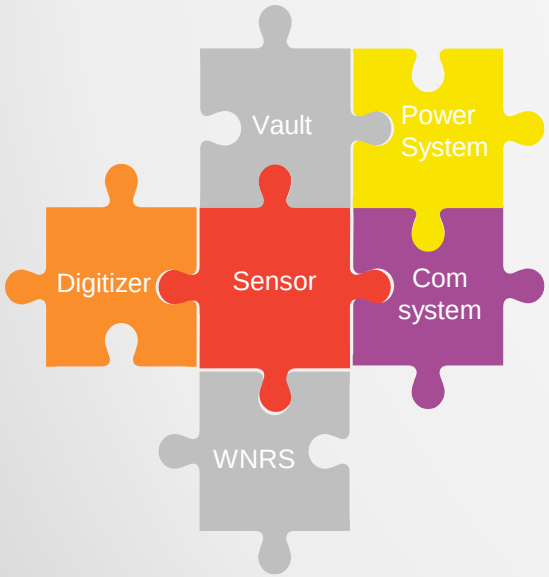
SMART24 - Geotech



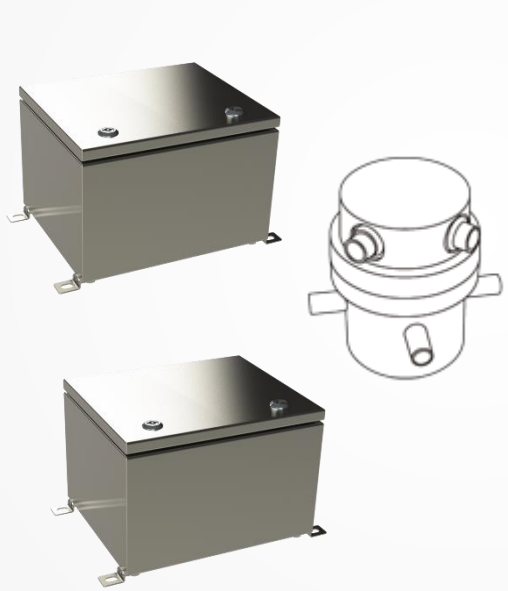


enviroearth

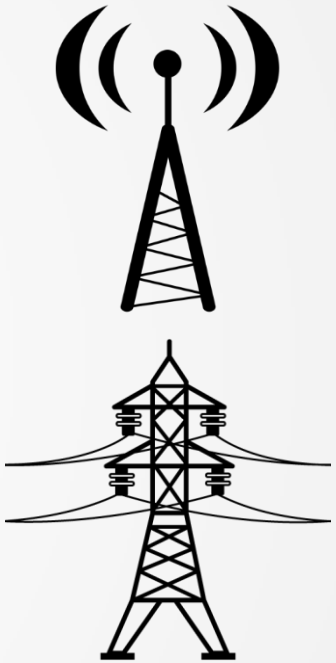
Infrasound station “à la carte”



Media converter box for GSM

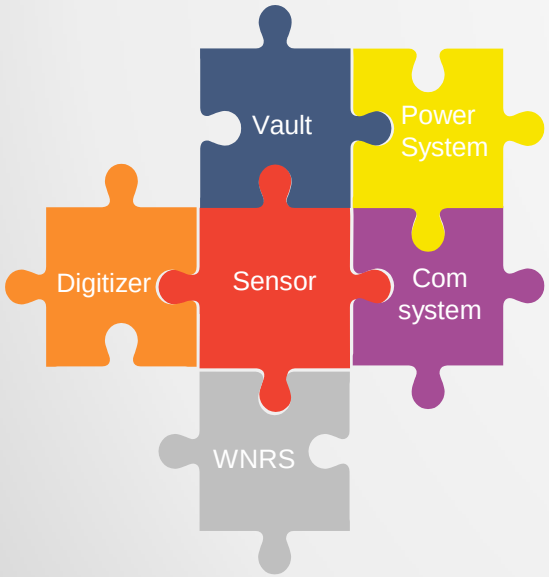


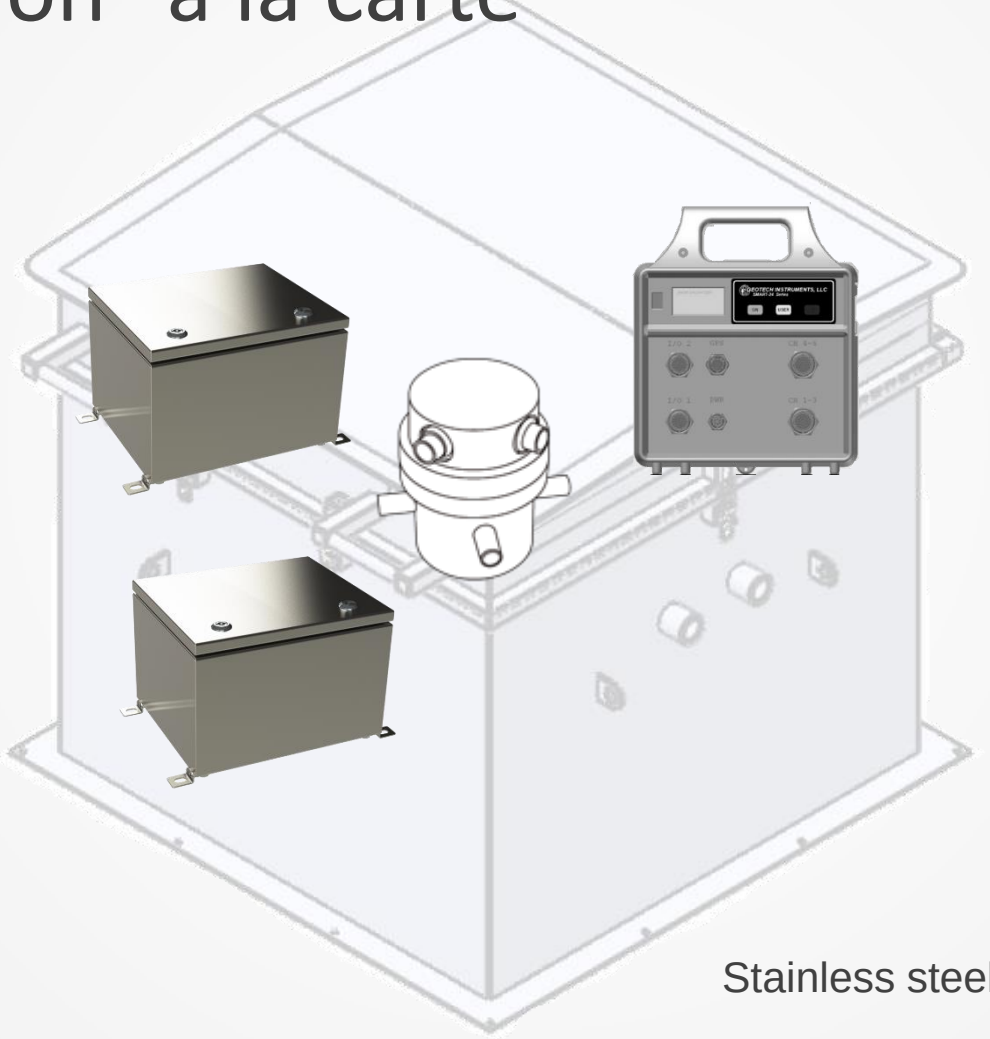
Power cabinet AC/DC grid connected

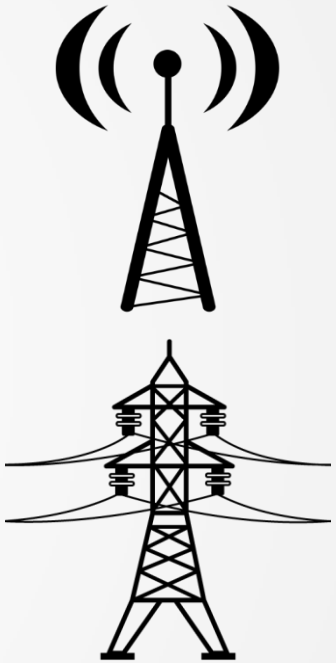


enviroearth

Infrasound station “à la carte”





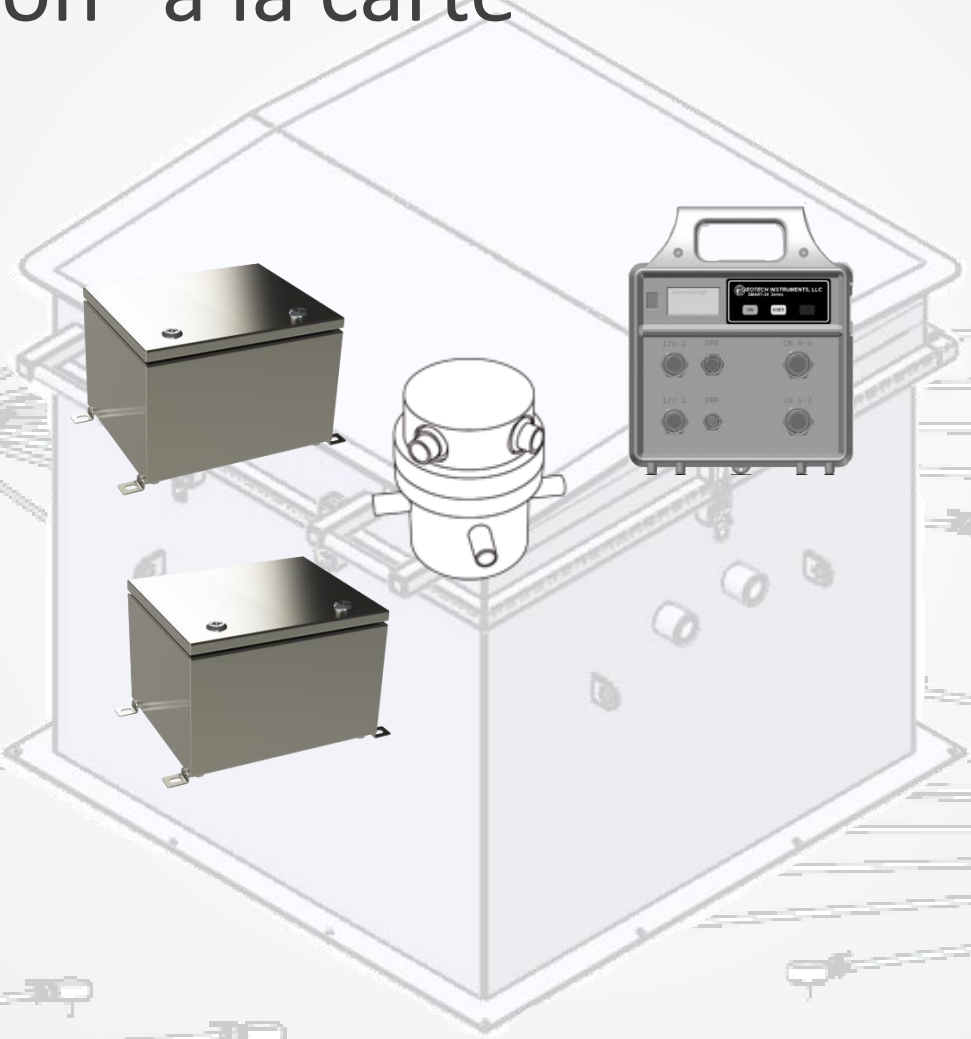


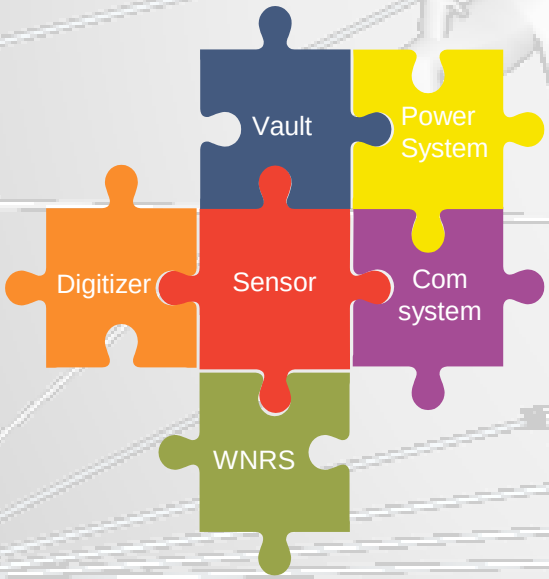
Stainless steel vault

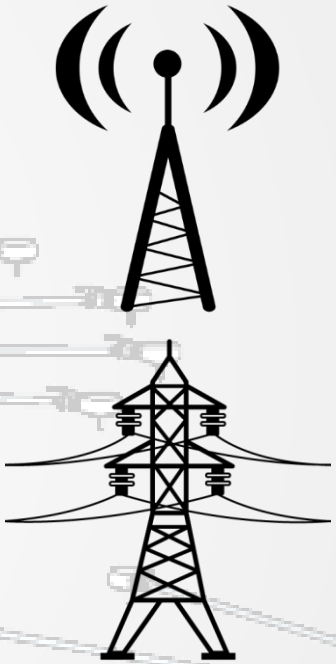
enviroearth

Infrasound station “à la carte”

WNRS & Installation







enviroearth

Thank you for your attention

enviroearth