

The National Climate Observatory

An Open Source Hardware & Software Online Grid of Weather Stations For Sri Lanka

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Chemin, Bandara

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Consultative Group for International Agricultural Research

Ratified on October 2nd, 2013

Full Open Access & Open Source

Research data and publication

- ▶ International Public Goods
- ▶ Public Domain
- ▶ Publications Open Access
- ▶ FOSS models and algorithms



Partners:



2018: all 15 CG centres, already FOSS4G Lab:
gsl.worldagroforestry.org

Introduction

Early Prototyping

Rationale

 δT Tower δT parts δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply
Wind Sensors
Raingauge
Electronics

Software

istSOS
PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply
Wind Sensors
Raingauge
Electronics

Software

istSOS
PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

FOSS4G and Open Hardware

Developed together to address new needs

High spatio-temporal climate investigation

- ▶ Low-cost OSHW weather station
- ▶ National Distributed Monitoring Grid
- ▶ Online Aggregation
- ▶ e-Xecutive Web-Apps

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

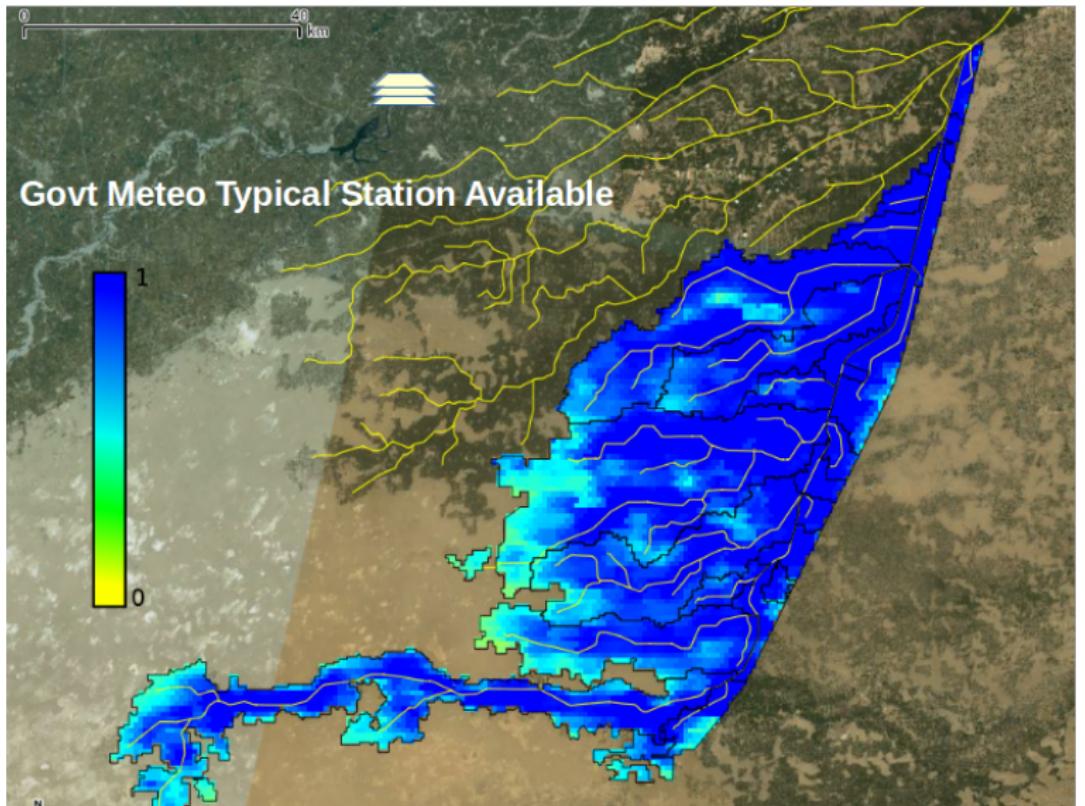
Electronics

Software

istSOS

PyWPS

Conclusions



Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

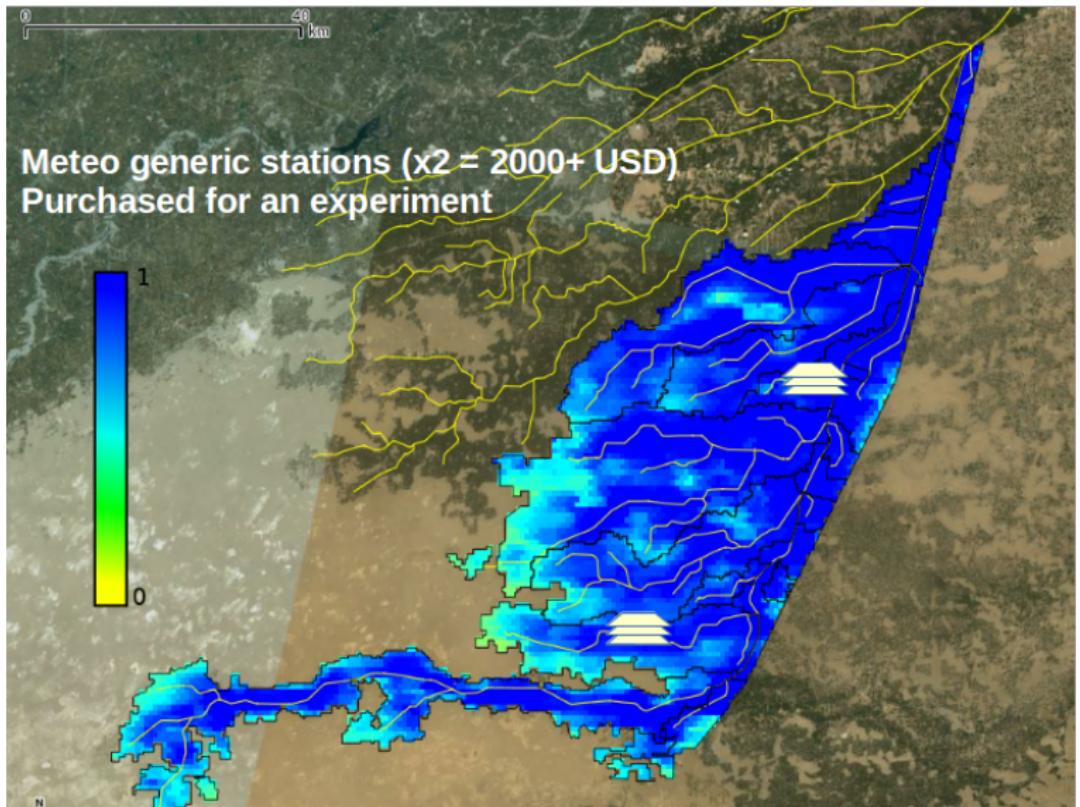
Electronics

Software

istSOS

PyWPS

Conclusions



Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

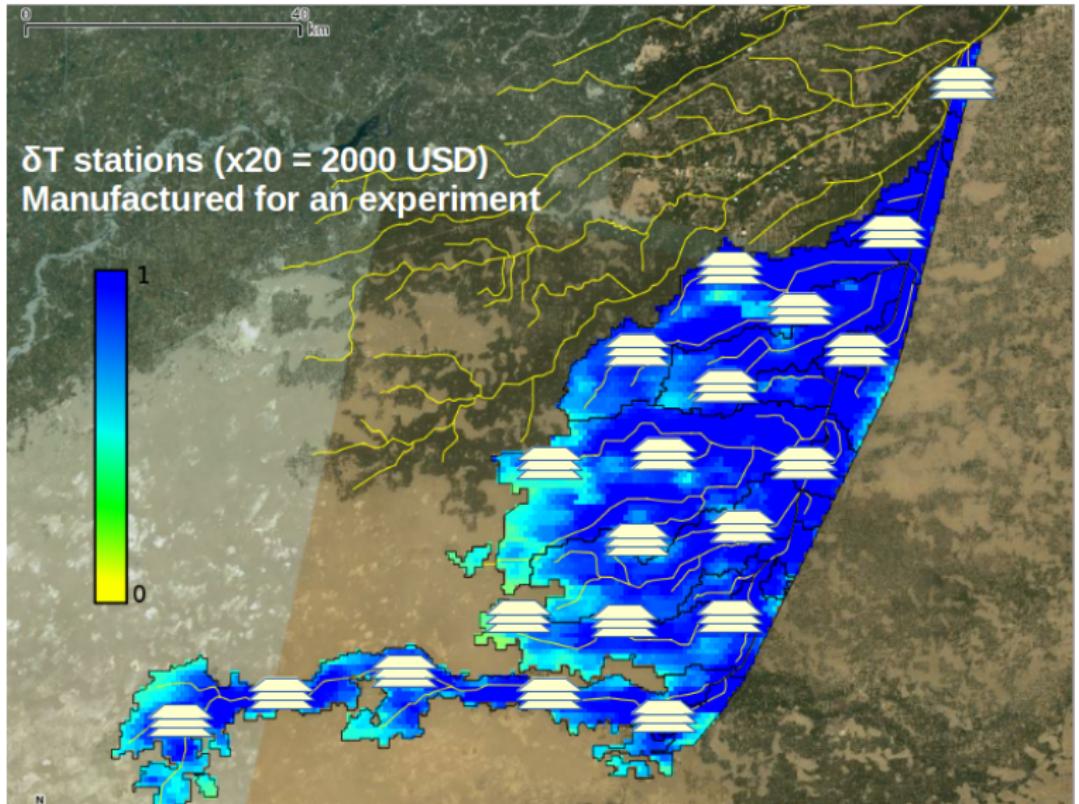
Electronics

Software

istSOS

PyWPS

Conclusions



Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

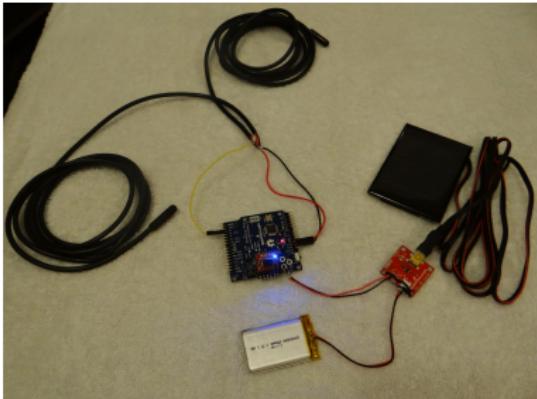
istSOS

PyWPS

Conclusions

Micro Weather Station v1: Temperature Profiler for ET models calibration

- ▶ Arduino Pro 3.3V
- ▶ Water-proof Digital Temperature Sensors
- ▶ Li-ion Battery + Solar Panel
- ▶ OpenLog data logger with SD card
- ▶ Cost < 100 USD



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Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

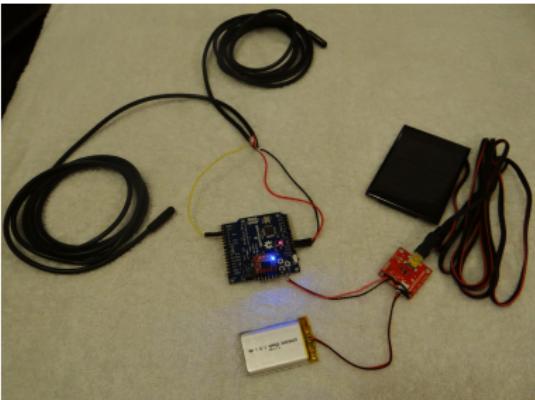
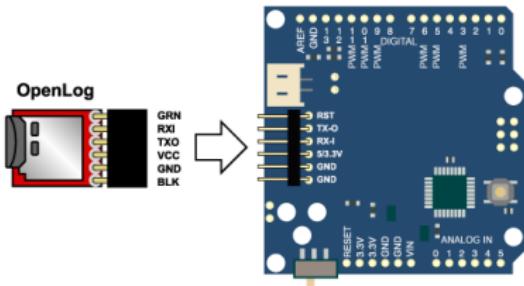
Software

istSOS

PyWPS

Conclusions

OpenLog + Arduino Pro



Rationale

δT Tower

δT parts

δT Setup

Power Supply
Wind Sensors
Raingauge
Electronics

istSOS
PyWPS

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

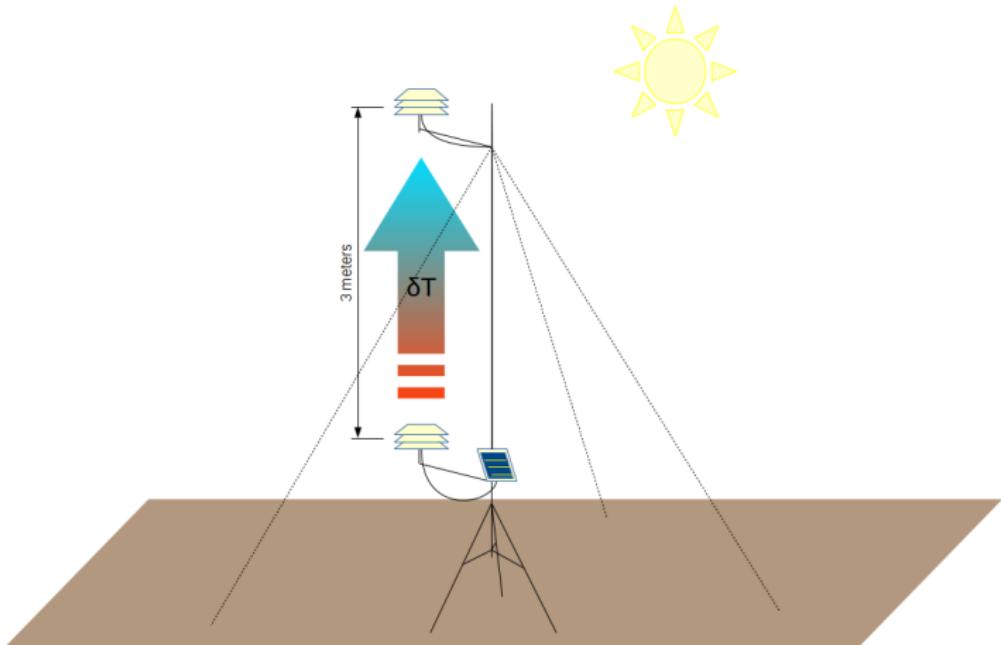
Electronics

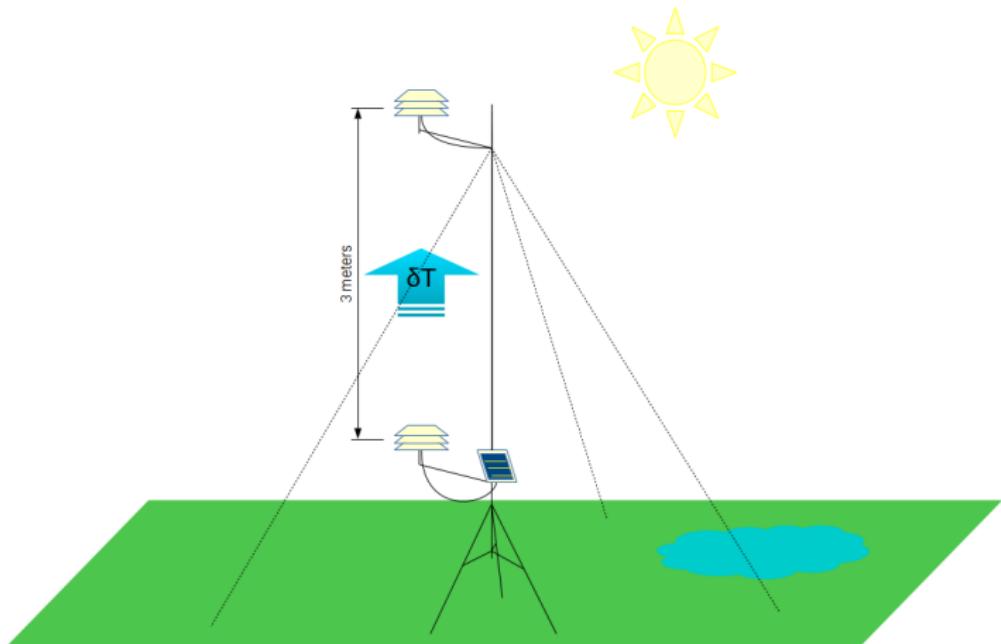
Software

istSOS

PyWPS

Conclusions



[Introduction](#)[Early Prototyping](#)[Rationale](#)[δT Tower](#)[δT parts](#)[δT Setup](#)[MWS Tower](#)[Power Supply](#)[Wind Sensors](#)[Raingauge](#)[Electronics](#)[Software](#)[istSOS](#)[PyWPS](#)[Conclusions](#)

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply
Wind Sensors
Raingauge
Electronics

Software
istSOS
PyWPS
Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

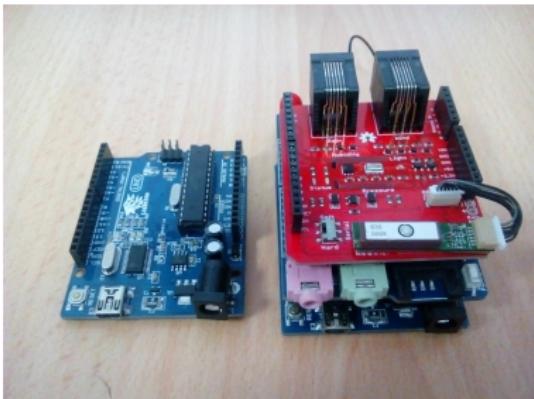
istSOS

PyWPS

Conclusions

Micro Weather Station v1: Meteorological support for Irrigation Department in Sri Lanka

- ▶ Lakduino (www.lakduino.com)
- ▶ Weather Sensor Board
- ▶ GPRS Modem Board
- ▶ Data logger with 8/16Gb micro-SD card
- ▶ Moto battery + Solar Panel



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Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Chemin, Bandara

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions



Chemin, Bandara

Rationale

δT Tower

δT parts

δT Setup

Power Supply

Wind Sensors

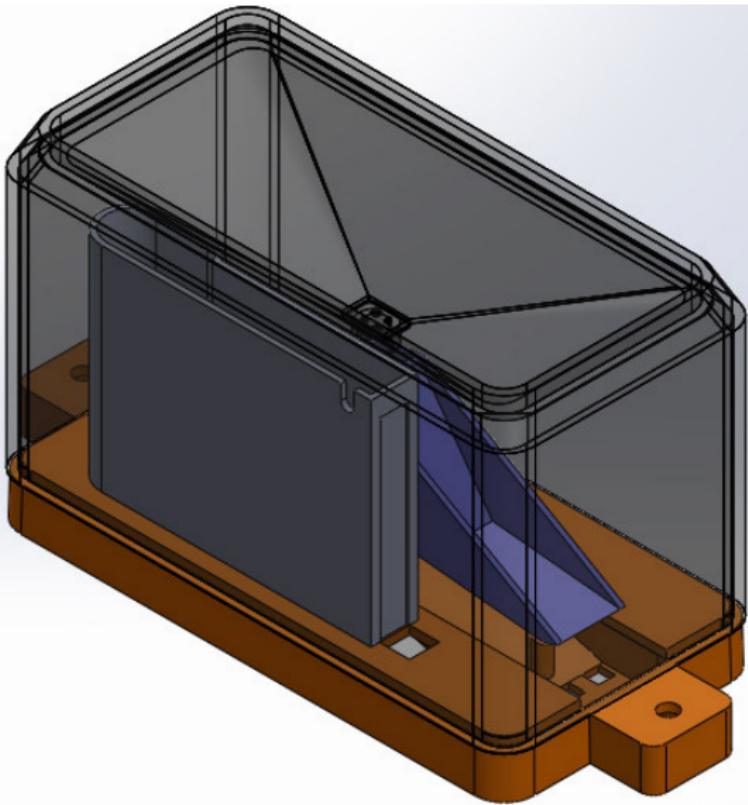
Raingauge Electronics

Electronics

istSOS
B-WRS

PyWPS





Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

[Introduction](#)[Early Prototyping](#)[Rationale](#)[δT Tower](#)[δT parts](#)[δT Setup](#)[MWS Tower](#)[Power Supply](#)[Wind Sensors](#)[Raingauge](#)[Electronics](#)[Software](#)[istSOS](#)[PyWPS](#)[Conclusions](#)

Lakduino



UP: Weather Sensor Shield
MID: GPRS Shield
LOW: Lakduino

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply
Wind Sensors
Raingauge
Electronics

Software
istSOS
PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

- ▶ OGC SOS server implementation written in Python.
- ▶ Sensor Observation Service standard.
- ▶ Manage and dispatch observations from monitoring sensors



Introduction

Early Prototyping

Rationale

 δT Tower δT parts δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

ISCC-G

PyWPS

Conclusions

Developed by Jachym Cepicky (<http://les-ejk.cz/>)

- ▶ OGC WPS standard
- ▶ Server side
- ▶ Written in Python Language
- ▶ Version 4 in the making
- ▶ v4 Low-level API: integration with GRASS GIS
- ▶ v4 Possible pyGRASS support

PyWPS

PyWPS v2 style

WPS_hakra_ef.py (~/wps_processes/evapfr) - gedit

Fichier Édition Affichage Rechercher Outils Documents Aide

Ouvrir Enregistrer Annuler

WPS_hakra_ef.py x

```

# EF processing
if os.system("t.eb.evapfr lst=lst ouput=hakra_ef_%s >&2" % (self.Inputs[0]['value'])):
    return """Could not process Hakra EF map"""

#Mask non Hakra Command Area
if os.system("r.napcalc hakra_ef_%s=%sif(isnull(MASK),null(),hakra_ef_%s)" >&2" % (self.Inputs[0]
['value'])):
    return """Could not clip Hakra Command Area"""

# export
if os.system("r.out.gdal in=hakra_ef_%s out=hakra_ef_%s.tif type=Float32 >&2" % (self.Inputs[0]
['value'],self.Inputs[0]['value'])):
    return """Could not export Hakra EF map"""

#clean the mess 2
os.system("rm -f %s" % tmpfilelist)
del rnd, tmpfilelist, f, lstfiles, wildcard, tmpdir

if __name__ == "__main__":
    p = Process()
    p.Inputs[0]['value'] = "2012-09-01"

```

Python Largeur des tabulations: 8 Lig 67, Col 9 INS

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions

[Introduction](#)[Early Prototyping](#)[Rationale](#)[δT Tower](#)[δT parts](#)[δT Setup](#)[MWS Tower](#)[Power Supply](#)[Wind Sensors](#)[Raingauge](#)[Electronics](#)[Software](#)[istSOS](#)[PyWPS](#)[Conclusions](#)

FOSS4G natural extension is Open Source Hardware

- ▶ **Arduino:** Micro-controller
- ▶ **istSOS:** Sensor Network Aggregator
- ▶ **GDAL/OGR:** Flexible sensor raw data manipulation
- ▶ **GRASS GIS:** Mobile FOSS4G powerhouse
- ▶ **PyWPS:** Online GRASS GIS processing
- ▶ **Together:** Flexible all-in-one sensor-to-map solutions



Introduction

Early Prototyping

Rationale

δT Tower

δT parts

δT Setup

MWS Tower

Power Supply

Wind Sensors

Raingauge

Electronics

Software

istSOS

PyWPS

Conclusions