



Food and Agriculture  
Organization of the  
United Nations



# Training on Digital Soil Organic Carbon Mapping

Tentative Agenda  
20-24 January 2018  
Tehran/Iran

# DAY 1

**DATE: 20/01/2018**

**TIME: 08:30 – 17: 30**

**LOCATION:**

|                      |   |
|----------------------|---|
| <b>Theme</b>         | Welcome, Introduction, Digital Soil Mapping   |
| <b>Instructors:</b>  | Yusuf Yigini (FAO/GSP)  |
| <b>Please read:</b>  | GSP Guidelines for sharing national data/information to compile a Global Soil Organic Carbon (GSOC) map |
| <b>Please bring:</b> | Portable PC, updated software (R, RStudio, QGIS), and own data  |

| Time                  | Title  |
|-----------------------|--|
| <b>08:30 - 09:00</b>  | REGISTRATION   |
| <b>09: 00 - 09:15</b> | OPENING AND WELCOME  |
| <b>09:15 – 10:00</b>  | -Introduction to the GSP Pillar 4 and the Global Soil Information System |
| <b>10:00 - 10:15</b>  | Introduction to the Workshop: Background, Scope and the Extent           |
| <b>10:15 - 10:45</b>  | Soil Organic Carbon, GSOCMap   |
| <b>10:45 - 11:15</b>  | <b>COFFEE BREAK</b>  |
| <b>11:15 - 13:00</b>  | Setting-up Hardware/Software Environment                                 |
| <b>13:00 - 14:00</b>  | <b>LUNCH</b>   |
| <b>14:00 - 14:30</b>  | Introduction to Digital Soil Mapping (DSM) and review of software        |
| <b>14:30- 15:00</b>   | Working with R, R Studio: Basics   |
| <b>15:00 - 15:30</b>  | <b>COFFEE BREAK</b>  |
| <b>15:30- 17:30</b>   | Working with R, R Studio: Basics   |

# DAY 2

DATE: 21/01/2018

TIME: 08:30 – 17: 30

LOCATION:

Theme

QGIS Basics, R- ESSENTIALS

Instructors:

Yusuf Yigini (FAO/GSP)

Please read:

GSOC cookbook

Please bring:

Portable PC, National SOC Datasets, Covariates

| Time          | Title  |
|---------------|--|
| 08:30 - 10:30 | QGIS Basics: GIS Operations and data manipulation<br><b>HANDS ON:</b> R Basics   |
| 10:30 - 11:00 | <b>COFFEE BREAK</b>  |
| 11:00 - 13:00 | R Basics: Objects, Commands, Expressions, packages, Assignments<br><b>HANDS ON:</b> R Basics<br>R- Data Types: Vectors, Data Frames, Lists<br><b>HANDS ON:</b> R data Types, Exercises |
| 13:00-1400    | <b>LUNCH</b>   |
| 14:00 - 15:00 | <b>Getting Spatial in R:</b> Vectors, Rasters, Coordinate Systems, Import, Export  |
| 15:00 - 16:00 | Cont. <b>Getting Spatial in R:</b> Vectors, Rasters, Coordinate Systems, Import, Export<br><b>HANDS ON:</b> Getting Spatial in R   |
| 16:00-16:30   | <b>COFFEE BREAK</b>  |
| 16:30- 17:30  | Data Preparation   |

## Additional Information:

In this introduction to R, participants will learn the basics of this open source language, including factors, lists and data frames. With the knowledge gained in this course, you will be ready to undertake their own non-spatial data analysis

# DAY 3

DATE: 22/01/2018

TIME: 08:30 – 17: 30

LOCATION:

|               |  |
|---------------|--|
| Theme         | Getting Spatial With R                         |
| Instructors:  | Yusuf Yigini (FAO/GSP)                         |
| Please read:  | GSOC cookbook                                  |
| Please bring: | Portable PC, National SOC Datasets, Covariates |

| Time                 | Title   |
|----------------------|---|
| <b>08:30 - 10:30</b> | Data Preparation: Preparing and pre-processing of point and covariate data  |
| <b>10:30 - 11:00</b> | <b>COFFEE BREAK</b>   |
| <b>11:00 - 13:00</b> | <b>HANDS ON:</b> Preparing and pre-processing of point data and covariates. |
| <b>13:00 - 14:00</b> | <b>LUNCH</b>  |
| <b>14:00 - 15:00</b> | GSOC Map Depth Classes, Spline Function                                     |
| <b>15:00 - 15:30</b> | <b>COFFEE BREAK</b>   |
| <b>15:30- 17:30</b>  | <b>HANDS ON:</b> Depth, Spline Function                                     |

# DAY 4

DATE: 23/01/2018

TIME: 08:30 – 17: 00

LOCATION:

Theme: Linear Models, Regression-Kriging, Random Forest

Instructors: Yusuf Yigini (FAO/GSP)

Please read:

Please bring: Portable PC, National SOC Datasets, Covariates

| Time          | Title  |
|---------------|--|
| 08:30 - 10:30 | Linear Models<br><b>HANDS ON:</b> Linear Models                                  |
| 10:30 - 11:00 | <b>COFFEE BREAK</b>  |
| 11:00 - 13:00 | Regression-Kriging (Sample Dataset)  |
| 13:00 - 14:00 | <b>LUNCH</b>   |
| 14:00 - 15:00 | <b>HANDS ON:</b> Regression-Kriging (National Data)                              |
| 15:00 - 15:30 | <b>COFFEE BREAK</b>  |
| 15:30- 17:30  | Random Forest (Sample Dataset)<br><b>HANDS ON:</b> Random Forest (National Data) |

# DAY 5

DATE: 24/01/2018

TIME: 08:30 – 17: 00

LOCATION:

Theme

Conventional Upscaling, Uncertainties, Validation

Instructors:

Yusuf Yigini (FAO/GSP)

Please read:

Please bring:

Portable PC, National SOC Datasets, Covariates

| Time          | Title   |
|---------------|---|
| 08:30 - 10:30 | Conventional Upscaling Methods: Geomatching                               |
| 10:30 - 11:00 | COFFEE BREAK  |
| 11:00 - 13:00 | <b>HANDS ON:</b> Conventional Upscaling Methods: Geomatching              |
| 13:00 - 14:00 | LUNCH   |
| 14:00 - 15:00 | Uncertainty and Validation  |
| 15:00 - 15:30 | COFFEE BREAK  |
| 15:30- 16:30  | <b>HANDS ON:</b> Uncertainty and Validation                               |
| 16:30 - 17:30 | Assessment of the training Certificate Ceremony , Closure of the workshop |