

Ministero delle politiche agricole alimentari e forestali



Corpo Forestale dello Stato

Associated Beneficiary within LIFE+ FutMon Project [Contract n° LIFE07 ENV/D/000218]

In co-operation with its sub-contractor



SpinOff
Spin-off Università di Siena

Meeting of

Action C1-QAC-15(IT)

Coordination of quality assurance and quality control (QA/QC)

February 16th 2010, Tampere, Finland

Organised within the

Combined FutMon/ICP Forests Expert Meeting



Meeting of
Action C1-QAC-15(IT)
Coordination of quality assurance and quality control (QA/QC)
February 16th 2010, Tampere, Finland

Objective of the meeting

summarize the status of Action C1 QAC to C1 leaders, collect suggestions and plan next steps.

Provisional agenda

- | | |
|---------------|---|
| 13.30 – 13.35 | Opening of the meeting (E. Pompei, M. Ferretti) |
| 13.35 – 13.50 | Harmonization of methods and manuals (M. Ferretti) |
| 13.50 -14.00 | List of parameters (R. Fischer) |
| 14.00 - 14.25 | Open discussion and collection of comments. |
| 14.25 - 14.30 | Update of the meeting – to be continued jointly with the ICP Forests QA Committee, Thursday 18 February, h. 13.30-16.30 (M. Ferretti) |



Action C1-QAC-15(IT) LIFE+ FutMon Project
[Contract n°LIFE07 ENV/D/000218]



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accademico
Spin-off Università di Siena

Harmonization of methods and manuals

Recommendations, implementation, next steps

Prepared for:
Meeting of Action C1-QAC-15(IT)
within the combined FutMon/ICP Forests Expert Meeting,
February 15th-19th 2010, Tampere, Finland

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Talk outline

- Motivation, description, expected results
- Concept
- Recommendations and implementation
- Next steps



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Talk outline

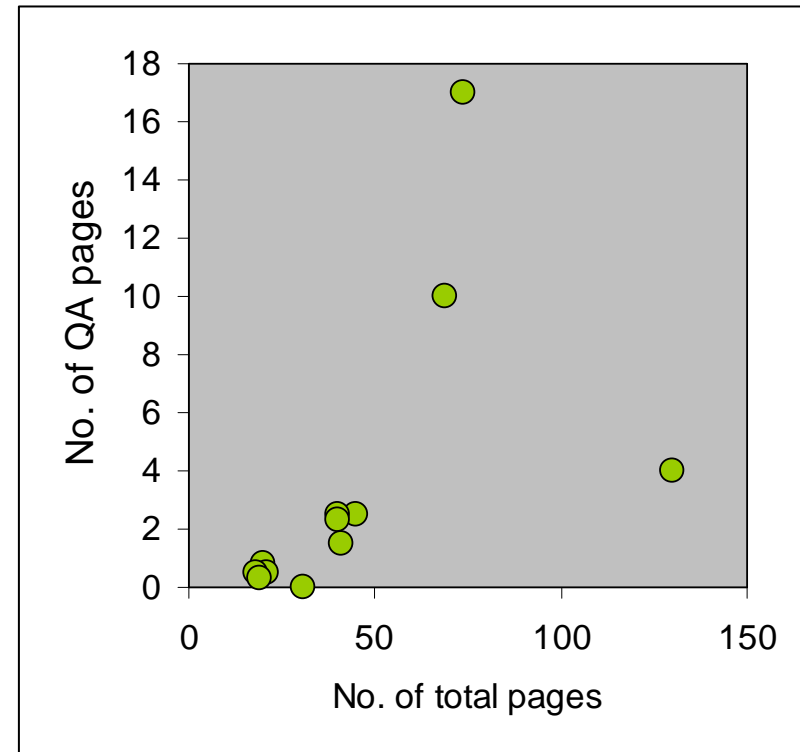
- Motivation, description, expected results
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Motivation

- ICP Forests
 - Set-up of the QA Committee
 - Mandate from TF 2007
- Life+, Futmon project
 - C1–QAC–15 (IT),
Coordination of quality assurance and quality control (QA/QC)



Description

- Coordination of quality assurance and quality control (QA/QC)
 - Ensure that all proper means are adopted to promote, control and report the quality of the data gathered by the project.
 - It includes:
 - (i) continuous harmonization of methods
 - (ii) setting data quality requirements;
 - (iii) monitoring, summarizing and reporting data quality status in the various actions of the project.



Expected results

- Information on the current quality status of monitoring methods
- Related proposals for improvement
- Appraisal of results obtained in terms of quality assurance and control within the new European monitoring system,
- Information on the impact of data quality on the results obtained by the project.



Talk outline

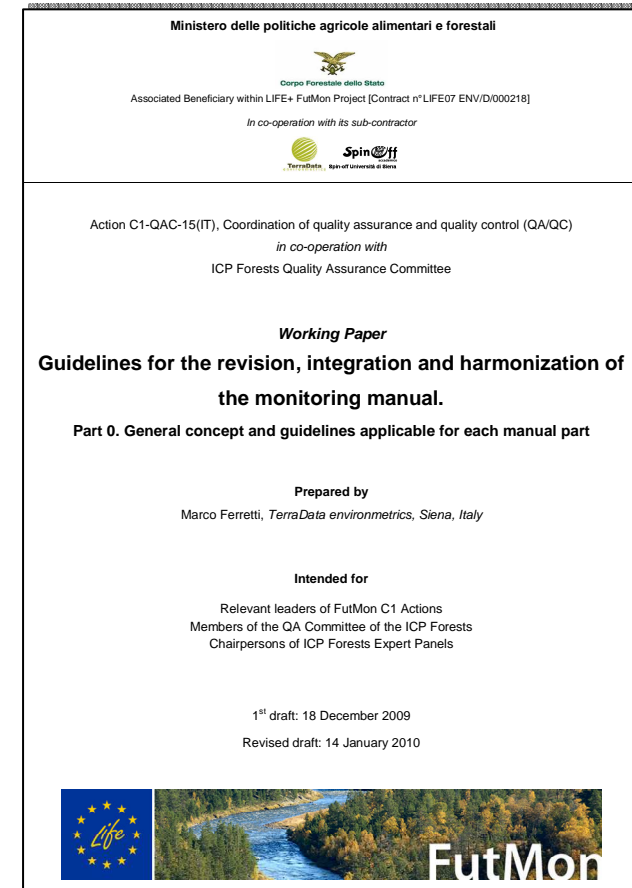
- Motivation, description, expected results
- **Concept**
- Recommendations and implementation
- Next steps



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General concept

- (i) Consider other methods: ForestBiota, BioSoil and the recent FutMon Field Protocols.
- (ii) Use the ICP Forests Manual as the basis for the revision process. Experts should take into account the other sources of methods and integrate relevant parts of them into the revised Manual (when possible).
- (iii) The revised manual will be submitted to the FutMon Status Workshop 2010 and to the Task Force of the ICP Forests in 2010.



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Revision process

- Within the ICP Forests Manual
 - Revision of the overall structure
 - Harmonization of structure and information content among individual parts
 - Editorials
- Between ICP Forests Manual and other SOPs used - for various purposes and at various times - over the FutMon plots



Within the ICP Forests manuals

Current structure

- I. Mandate
- II. Crown
- III. Soil
 - I. A. Soil (solid)
 - II. B. Soil solution
- IV. Needles/Leaves
- V. Growth
- VI. Deposition
- VII. Meteo
- VIII. Ground vegetation
- IX. Phenology
- X. Ambient Air Quality
 - I. A. Air
 - II. B. Visible injury
- XI. Litterfall

Suggested structure

- I. Mandate
- II. The monitoring networks (incl. network/plot design, georef.)**
- III. Quality Assurance (general)**
- IV. Crown
- V. Growth
- VI. Phenology
- VII. Biodiversity
- VIII. Ozone Injury
- IX. Meteo
- X. Soil
- XI. Soil solution
- XII. Needles/Leaves
- XIII. Litterfall
- XIV. Deposition
- XV. Ambient Air Quality
- XVI. QA/QC Labs**
- XVII. Data submission forms**



Within the ICP Forests manuals



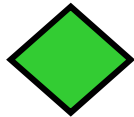
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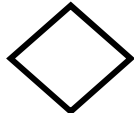
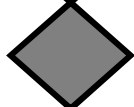
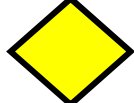
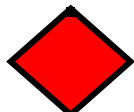


Current Sub-
Manuals and
QA sections



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New design of
Manuals –
consistent QA
sections

1. Introduction, where the nature of the investigation is put in context of the whole monitoring programme.

2. Scope and application of the described methods, with a table for quick reference

3. Objective for the investigation of concern, in an operational format (include statistical details about minimum detectable change, time frame, P-level, ...)

4. Location of measurements and sampling

4.1 Sampling design at plot level, where the allocation of observation within the plot is described

4.2 Sampling equipments, when applicable. However, detailed descriptions must be left in an Annex.

4.3 Sample collection, when applicable. However, detailed descriptions must be left in an Annex.

4.4 Sample storage and transport, when applicable. However, detailed descriptions must be left in an Annex.

5. Measurements (it includes assessment, analysis etc)

5.1 Measurements to be done and reporting units. Give details of methods in Annex.

5.2 Data Quality Requirements – Plausibility limits, Data Completeness, Measurement Quality Objectives, Data Quality Limis. Give details in Annex.

6. Data handling

6.1 Storage, where data storage forms, files etc are described. Give details in Annex.

6.2 Plausibility limits, data completeness

6.3 Transmission to co-ordinating centres, with timeable and rules

6.4 Data processing guidelines

6.5 Reporting guidelines

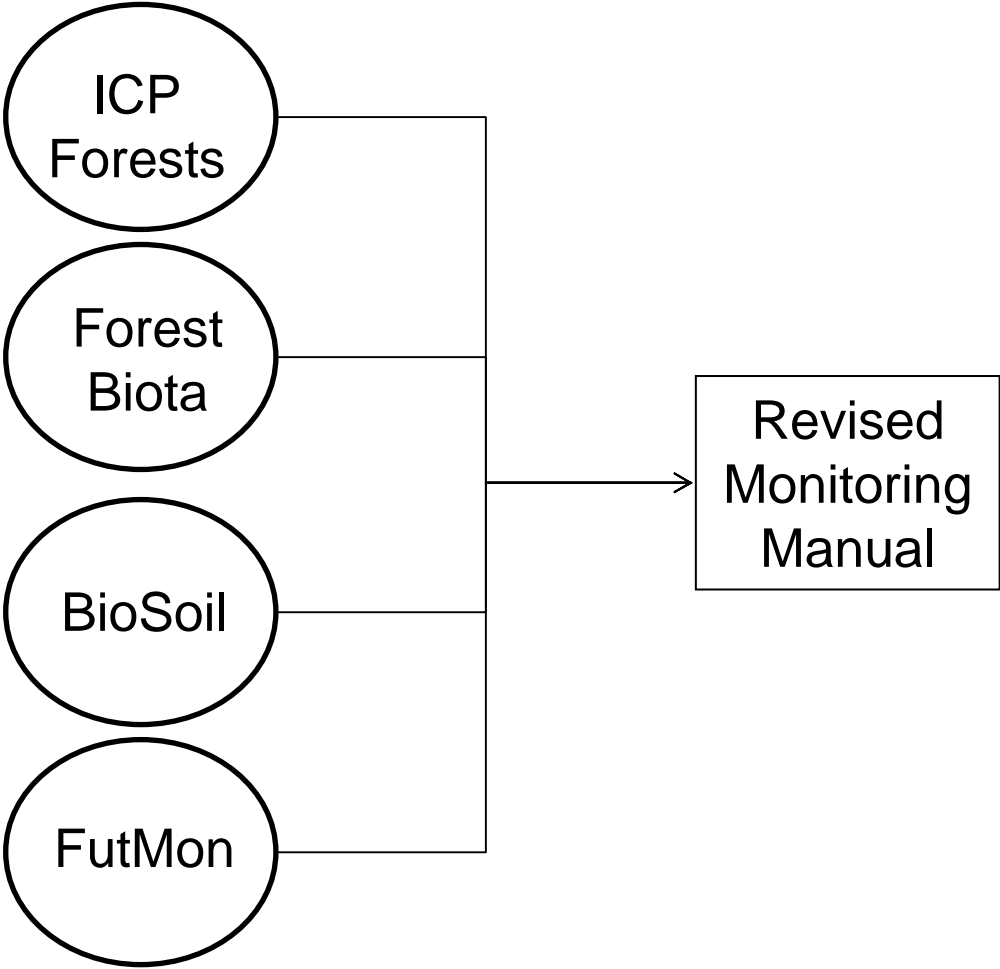
7. References

8. Annexes



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Between ICP Forests Manual and other SOPs



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Between ICP Forests and other SOPs

Current ICP Forests Manual	Other protocols		
	Forest Biota Methodology (Level II)	BioSoil Manual (Level I)	FutMon field protocols
Crown condition	Canopy closure, tree layers species mixture	Canopy closure, tree layers	D1 Tree vitality
Soil	-	BioSoil soil manual Level I and Level II	D3 Soil water retention
Soil solution	-	-	D3 Soil water retention
Leaves and needles	-	-	D2 Foliage: more intensive + D2 ground vegetation nutrient budgets
Growth and yield	Canopy closure, tree layers species mixture, forest management, structural diversity	DBH, top height, canopy closure, tree layers	D1 Growth: selection of trees, girth bands, dendrometers
Deposition	-	-	-
Meteorology	-	-	D3 Soil water retention



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Between ICP Forests and other SOPs

Current ICP Forests Manual	Other protocols		
	Forest Biota Methodology (Level II)	BioSoil Manual (Level I)	FutMon field protocols
Ground vegetation	Species list, diversity indexes	Ground vegetation	D2 Foliar: biomass estimate
Phenology	-	-	D1 Phenology
Air quality	-	-	Air quality
Ozone injury	-	-	Ozone injury
	-	-	D1 D2 LAI
Litterfall	-	-	D1, D2: Litterfall
-	Deadwood	Deadwood	-
-	Lichens	-	-
-	Tree coordinates	-	-
-	Structural group of four assessments	-	-
-	-	Soil fauna	-
-	-	-	C1 QAC, QA harmonisation
-	-	-	C1 QALab, Laboratories
Handling	Handling	Handling	Handling
Forms	Forms	Forms	Forms
Submission	Submission	Submission	Submission



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- Editorial terms

Term	Definition
Manual	The whole ICP Forests Manual as resulting from the total of the various Parts (sub-manuals)
Part	The part of the ICP Forests manual concerned with a specific investigation
Chapter	The main division of individual parts
Sub-chapters	The subsequent divisions of each chapter
Annex	A chapter added to the main Part and where detailed information is provided about specific items.

- Citation

Part	Citation
Manual	ICP Forests, 2010. Manual on methods and criteria for harmonized sampling, assessment, monitoring and analysis of the effects of air pollution on forests. 2010 Edition. Programme Co-ordinating Centre. pp. xxx.
Manual Part	[Editor(s)] and [Expert Panel]. Sampling and Analysis of Soil. Edition 2010. In: UN/ECE ICP Forests, 2010. Manual on methods and criteria for harmonized sampling, assessment, monitoring and analysis of the effects of air pollution on forests. Part xyz. Forest Soil Co-ordinating Centre. Belgium, Geraardsbergen, pp. 110.



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- Motivation, description, expected results
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- **Recommendations and implementation**
- Next steps



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Recommendations and guidelines

- Distributed on 14 January to EP chairs, C1 leaders, selected experts
- Cover
 - General guidelines
 - Guidelines for individual Parts
 - Tentative drafts for individual Parts
 - Suggestions and comments about text and new attributes

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Spin@ff
TERRADATA, SpA di servizi di base

Action C1-QAC-15(IT), Coordination of quality assurance and quality control
in co-operation with
ICP Forests Quality Assurance Committee

Working Paper
Guidelines for the revision, integration and harmonisation of the monitoring manual.
Part II. Visual Assessment of Crown Condition

Prepared by
Marco Ferretti, TerraData environmetrics, Siena, Italy
(incorporate comments by Richard Fischer, vTI, Hamburg)

Intended for
Relevant leaders of FutMon C1 Actions
Members of the QA Committee of the ICP Forests
Chairpersons of ICP Forests Expert Panels

1st draft: 04 January 2010
Revised 14 January 2010

2010 Revision of the ICP Forests Manual

Part of Manual being revised	II
Theme	Crown condition
Title	Visual Assessment of Crown Condition
Elaborated by	Expert Panel on Crown Condition
Update	06/2006

Tentative revised draft structure

prepared by:
Marco Ferretti
QA Committee of the ICP Forests
and FutMon C1 QAC

04 January 2010

ICP Forests			FutMon			ForestData			BioSof		
Ref	Target	Indicator	Ref	Target	Indicator	Ref	Target	Indicator	Ref	Target	Indicator
SubManual Crown	Method	Frequency									
SubManual Crown	Method	Position of crown	D1	Method	Assessable crown						
SubManual Crown	Method	Direction	D1	Method	Field position of assessment						
SubManual Crown	Method	Reference									
Annex 1	Plot	Number									
Annex 1	Plot	Latitude/longitude coordinates									
Annex 1	Plot	Availability of water to principal species									
Annex 1	Plot	Humus type									
Annex 1	Plot	Altitude									
Annex 1	Plot	Orientation									
Annex 1	Plot	Mean age of dominant storey									
Annex 1	Plot	Sample tree number									
Annex 1	Tree	Species	D1	Tree	Species	Stand structure data	Tree	Species	BioSof Manual	Plot	Orientation
Annex 1	Tree	Removals and mortality	D1	Tree	New concept tree removals and mortality						
Annex 1	Tree	Social class									
Annex 1	Tree	Crown shading				Stand structure data	Tree	Canopy closure	BioSof Manual	Tree	Canopy closure
Annex 1	Tree	Visibility									
Annex 1	Tree	Distillation									
Annex 1	Tree	Discoloration									
Annex 1	Tree	Foliage transparency									
Annex 1	Tree	Flowering									
Annex 1	Tree	Fruiting	D1	Tree	Fruiting (visual)						
Annex 1	Tree	Secondary shoots and epicormics									
Annex 1	Tree	Crown form/topology (incl. Root)									
Annex 2	Tree	Symptom description									
Annex 2	Tree	Affected part of the tree and location in crown									
Annex 2	Tree	Symptoms and their specification									
Annex 2	Tree	Age of the damage									
Annex 2	Tree	Causal agents / factors									
Annex 2	Tree	Scientific name of cause									
Annex 2	Tree	Quantification									
			D1	Tree	Age						
			D1	Tree	Crown diameter related distance to neighbours						
			D1	Tree	Apical shoot architecture						
						Stand structure data	Tree	Height	BioSof Manual	Tree	Height
						Stand structure data	Tree	DBH	BioSof Manual	Tree	DBH
						Stand structure data	Tree	Coordinates	BioSof Manual	Tree	DBH

Suggestion: make reference to the growth and yield manual



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Key issues driving revisions

- Ensure consistency between QA-C suggested format and current structure
- Ensure objectives are clearly reported
- Ensure consistency between aims/objectives and methods, with particular emphasis on sampling issues
- Ensure proper QA is considered
- Ensure DQR are formally expressed
- Ensure integration of other methods are considered (=adopted, not adopted, post-poned after proper evaluation of the case in hand)



Substantial issues that have arisen

- Lengthy introductions more suited for reviews than for a Manual. (no question about the value – just not suited in a Manual)
- Generic objectives (exception: Deposition)
- Inconsistency of sampling guidelines: it is often said that data should be representative of the plot, then a procedure is described that will never lead to “representative” data.
- Good (in general) description of measurement methods
- Lack of DQR for field measurements
- Lack of data processing guidelines (with few exceptions)



Implementation

Current structure

- I. Mandate
- II. Crown
- III. Soil
 - I. A. Soil (solid)
 - II. B. Soil solution
- IV. Needles/Leaves
- V. Growth
- VI. Deposition
- VII. Meteo
- VIII. Ground vegetation
- IX. Phenology
- X. Ambient Air Quality
 - I. A. Air
 - II. B. Visible injury
- XI. Litterfall

Suggested structure

- I. Mandate
- II. The monitoring networks (incl. network/plot design, georef.)
- III. Quality Assurance (general)
- IV. Crown
 - ✓ **Growth**
 - ✓ **Phenology**
- I. Biodiversity
 - ✓ **Ozone Injury**
 - ✓ **Meteo**
 - ✓ **Soil**
 - ✓ **Soil solution**
 - ✓ **Needles/Leaves**
- I. Litterfall
 - ✓ **Deposition**
 - ✓ **Ambient Air Quality**
 - ✓ **QA/QC Labs**
- I. Data submission forms



Implementation: next steps

(as agreed at vTI in Hamburg, December 8, 2009)

- 10th Jan 2010: Ferretti to prepare and send the detailed guidelines for revision to EPs.
- 5th (latest 10th) Feb: EP chairs to prepare and send draft manuals (v1 r0) to PCC.
- 5th (latest 10th) Feb: PCC to post drafts on the web.
- 15 Feb: Tampere meeting
- By 27 Feb: EP chairs to collect comments
- By 15th March: EP chairs prepare updated final draft (v1 r1)
- By 15th March: updated version posted on the web
- By 12th April: NFCs to comments to PCC
- By 19th April: PCC and Ferretti to edit comments and send to EP Chairs.
- By 1st May: EP Chairs to prepare updated draft (v1 r2).
- 1st June: Task Force

✓ Done on 14 Jan 2010

✓ 77% EP Parts (59% all)

✓ Done accordingly

Second revision

Third revision



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Other C1-QAC deadlines

- April 2010: data quality requirements
- June 2010: participation and b-t-b meeting in Garmish
- Summer 2010: extra meeting in Italy? (if necessary)
- December 2010: final report



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C1-QAC expected results

Investigation	Variable	Reference	MQO	DQL	Type of exercise	Participants, n	Achievement of DQL,%
<i>Identifies the investigation of concern (e.g. tree condition)</i>	<i>Identifies the variable within the investigation (e.g. defoliation)</i>	<i>Defines the reference for the accuracy</i>	<i>Identifies the expected accuracy for individual measurements/assessment (e.g. +/- 10% of defoliation with respect to a control)</i>	<i>Identifies the expected frequency of achievements of MQOs</i>	<i>Identifies the type of exercise (lab ringtest, field intercalibration course, photo exercise, field checks)</i>	<i>Total number of participating teams/labs</i>	<i>Actual achievements of DQLs</i>
Ozone effects	Foliar injury	Expert judgement	at least 90% of the scores should agree with the control	At least of 90% of team should achieve MQOs	photo	x	y
Tree condition	Defoliation	Expert judgement	±10% of the control	At least of 90% of team should achieve MQOs	field	x	y
Deposition	Ca	Reference water solution	±10% of the control	At least of 90% of team should achieve MQOs	Lab	x	y
....



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Acknowledgements

- All the EP chairs, C1 leaders, involved experts for their contribution and patience
- FutMon AB 15(IT), Corpo Forestale dello Stato for support and assistance
- The team at vTI for support and assistance
- Giorgio Brunialti (TerraData) for his help



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