

HRZZ IP-06-2016\_Assessment of Atmospheric  
**D**eposition and **O**zone levels in **M**editerranean **F**orest  
ecosystems

Principal Investigator: Tamara Jakovljević, PhD  
Kick-off meeting

Croatian Forest Research Institute

# Information about project

- **Project title:** Assessment of Atmospheric Deposition and Ozone levels in Mediterranean Forest ecosystems
- **Acronym:** DepOMedFor
- **Project duration:** 01.03.2017. - 28.02.2020.
- Project founded by **Croatian Science Foundation**
- **Grant requested (in HRK):** 591.000,00
  - I year – 232.400,00
  - II year – 196.800,00
  - III year – 161.800,00

# List of team members

Team member	Institution
Tamara Jakovljević, PhD	Croatian Forests Research Institute (CFRI)
Nenad Potočić, PhD	Croatian Forests Research Institute (CFRI)
Ivan Seletković, PhD	Croatian Forests Research Institute (CFRI)
Krunoslav Indir, PhD	Croatian Forests Research Institute (CFRI)
Željko Zgrablić, PhD	CFRI - Centre for forest ecosystem goods and services, Pazin, Istra
Lukrecija Butorac, PhD	Institute for Adriatic Crops and Krast Reclamation, Split
Goran Jelić, PhD	Institute for Adriatic Crops and Krast Reclamation, Split
Renato Buljan, PhD / Tamara Marković, PhD	Croatian Geological Survey
Aldo Marchetto, PhD	Consiglio Nazionale delle Ricerche Istituto per lo Studio degli Ecosistemi CNR-ISE
Alessandra De Marco, PhD	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile - ENEA
Guillaume Simioni, PhD	Institut National de la Recherche Agronomique (URFM)
Student, PhD	Faculty of food technology and biotechnology

# Objectives

- **O1 Establishment of forest environmental monitoring in Mediterranean forest ecosystems**
- A1.1 Defining study sites and equipping monitoring plots (**T. Jakovljević**)
- **O2 Estimation of atmospheric inputs to forest ecosystems and Identification of the possible impact of acid deposition and ozone (O<sub>3</sub>) on crown condition, tree nutrition, growth, soil and water availability, estimation of the present deposition loads and calculation of the critical load (CL) for nutrient N and acidity**
- A2.1 Measurement of atmospheric deposition, estimation of present loads and calculation of the critical load for nutrient N and acidity (**T. Jakovljević**)
- A2.2 Evaluation of ozone (O<sub>3</sub>) impact (**T. Jakovljević**)
- A2.3 Soil condition (**R. Buljan / T. Marković**)
- A2.4 Tree nutrition (**N. Potočić**)
- A2.5 Tree growth and crown condition (**I. Seletković**)

- **O3 Identification of the cause-effect relationships between physiological and biochemical parameters of trees, forest condition, meteorological parameters and atmospheric inputs by using different statistical tools**
- A3.1 Analyses and processing the collected data by using different statistical tools (**T. Jakovljević**)
- A3.2 Comparison of field measured and modelled data and future predictions on input of atmospheric pollutants and climate change (**T. Jakovljević**)

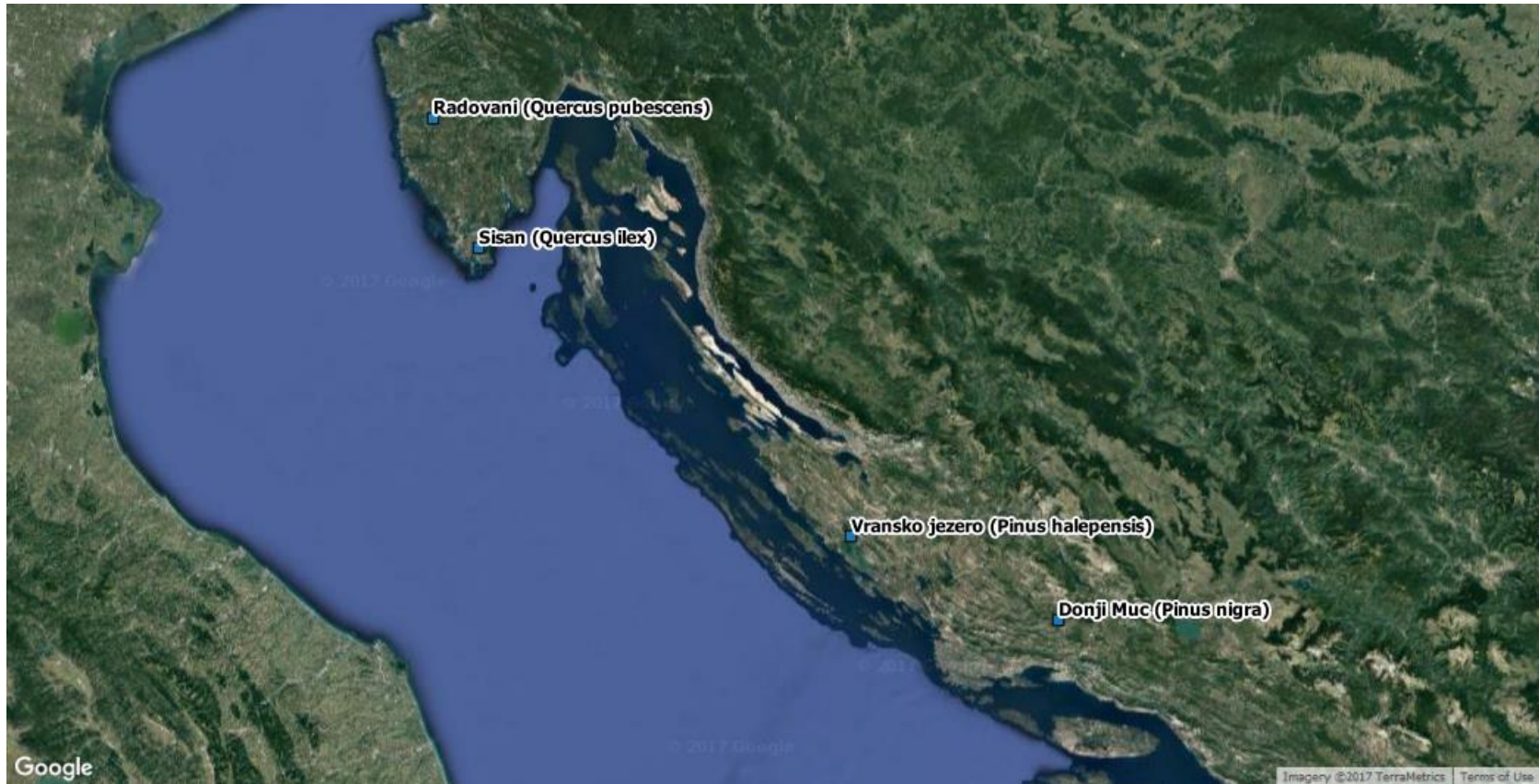
## DESSEMINATION

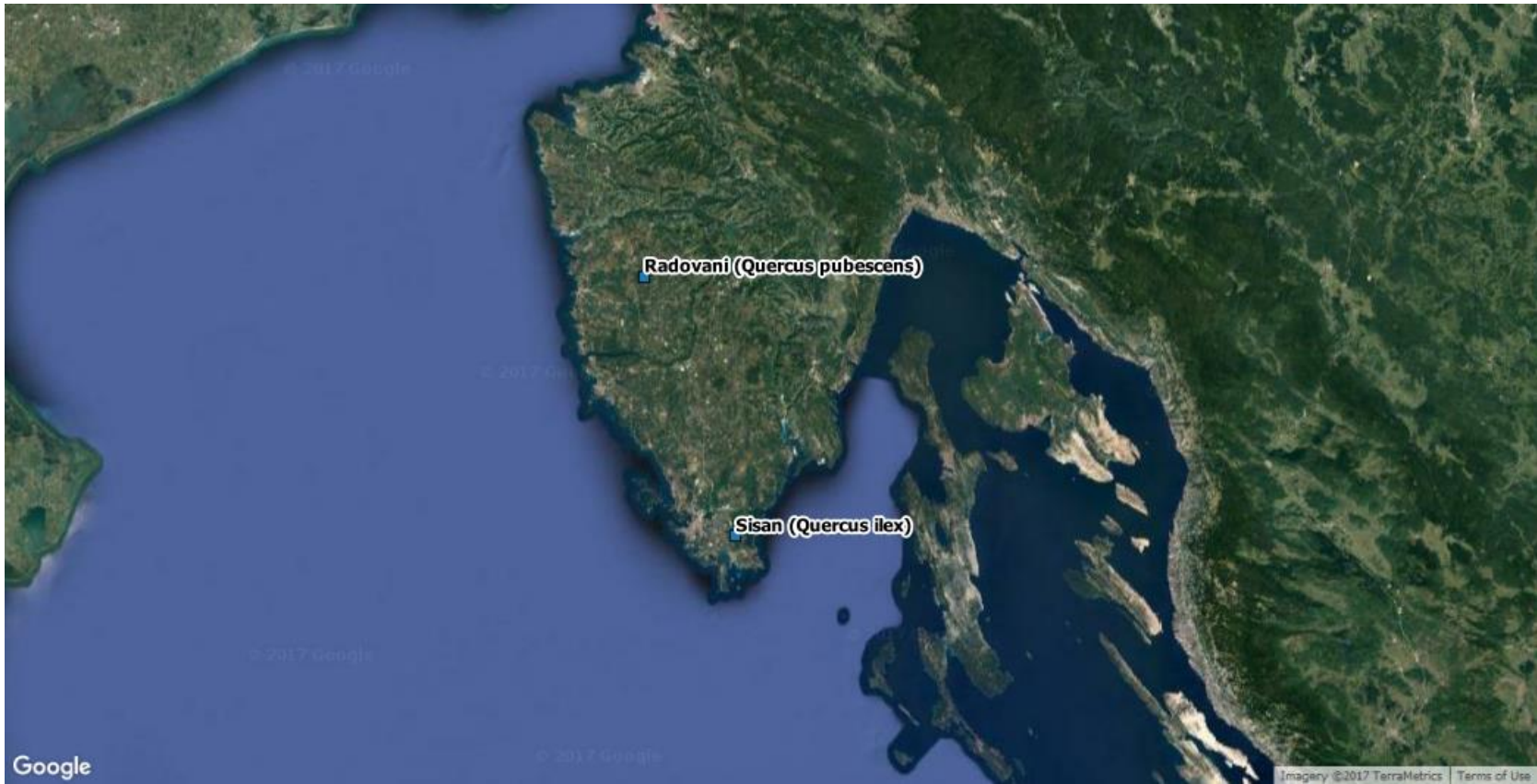
- **O4 Translation of the acquired knowledge of Mediterranean forests ecosystems to forest management and scientific communities**
- A4.1 Meetings and workshops (**L. Butorac**)
- A4.2 web page (**K. Indir**)
- A4.3 scientific and popular papers (**N. Potočić**)

# Location of plots

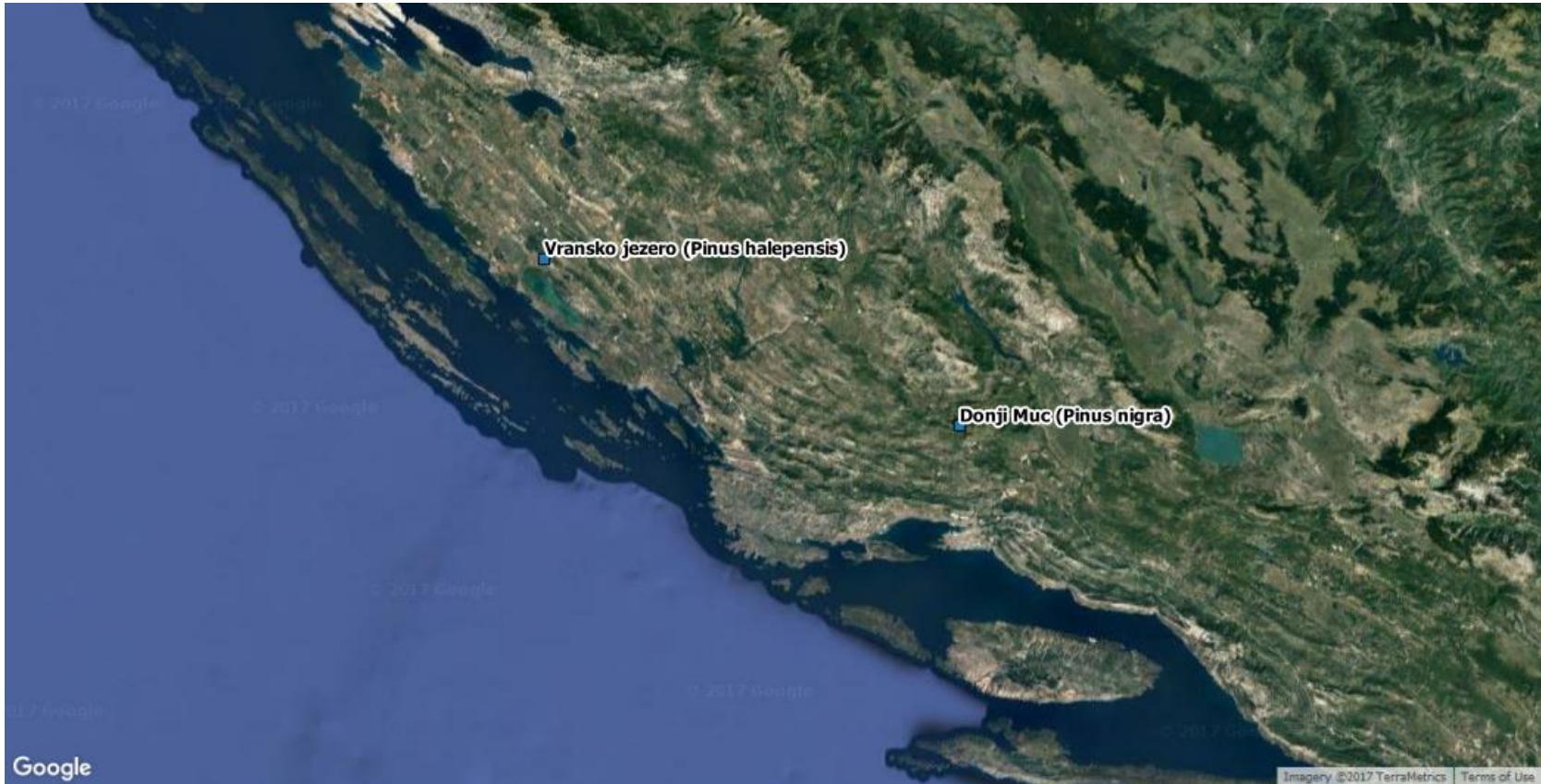












# Work plan

Objectives (O)	Activities (A)	Milestones (M)	Deliverables (D)	Team members Activitie Leader (AL)	Duration of activity (from- to, in months)
<b>O1 Establishment of forest environmental monitoring in Mediterranean forest ecosystems</b>	A1.1. Defining Study sites and equipping monitoring plots (m 1-m 3)	M1.1.1. Monitoring plots defined (month 1)	D1.2. Report with described plots for ecological monitoring (month 3)	<b>T. Jakovljević</b> L. Butorac K.Indir Z. Zgrablić I. Seletković N. Potočić	<b>1-3</b>
		M1.1.2. Monitoring plots equipped and protocols defined (month 3)			
	A.1.2. purchase and installation of laboratory refrigerator and laboratory equipment for ultrapure water (m 1 - m 6)		D.1.3. Purchased and installed laboratory equipment		<b>1-6</b>

Objectives (O)	Activities (A)	Milestones (M)	Deliverables (D)	Team members Activitie Leader (AL)	Duration of activity (from- to, in months)
<b>O2 Estimation of atmospheric inputs to forest ecosystems and identification of the possible impact of acid deposition and ozone (O3) on crown condition, tree nutrition, growth, soil and water availability, estimation of the present deposition loads and calculation of the critical load (CL) for nutrient N and acidity</b>	A2.1 Measurement of deposition, and ozone estimation of present deposition load and calculation of critical load (CL) for N compounds and acidic compounds (m 3-m 36)	M2.1.1. Samples collected (IC anions and cations, conductivity, pH, TOC), analysed, data processed and ready for further use for 2017 - 2019 (12 m,24 m, 34 m)	D2.1.1. Report on the estimated load deposition for 2017 - 2019 (12 m,24 m, 34 m)	<b>T. Jakovljević</b> L. Butorac G. Jelić Z. Zgrablić A. Marchetto Doktorand	<b>3-12</b>
		M 2.1.2. Calculated critical loads (CL) of N compounds and acidic compounds for all plots (m 36)			
	A2.2. Sample Collection of passive ozone and visual assessment of damage ozone and calculate ozone levels (m 3-m 12; m 15-m 24; m 27-m 34)	M2.2.1. Samples collected, analyzed (IC), and visual assessment was performed for 2017-2019 (m 12, m 24, m 34)	D2.2.1. A report on the estimated annual level ozone and visual injuries (m 12, m 24, m 36)		<b>T. Jakovljević</b> N. Potočić I. Seletković L. Butorac G. Jelić Z. Zgrablić A. De Marc

<b>O2 Estimation of atmospheric inputs to forest ecosystems and identification of the possible impact of acid deposition and ozone (O3) on crown condition, tree nutrition, growth, soil and water availability, estimation of the present deposition loads and calculation of the critical load (CL) for nutrient N and acidity</b>	A2.3. Soil condition (m3-m12, m15-m24, m31-m36)	M2.3.1. Samples collected, analyzed nutrients (AAS, CNS, pH) for 2017-2019 (m12, m22, m34)	D.2.3.1 Report on certain properties of the soil in 2017-2019 (m 12, m24, m36)	<b>R. Buljan</b> Ž. Zgrablić L. Butorac G. Jelić T. Jakovljević I. Seletković N. Potočić Doktorand	<b>3-12</b> , 15-24, 31-36
	A2.4. Sampling and analysis of nutrients in the leaves and needles (m7-m12, m18-m24, m30-m36)	M2.4.1. Samples collected, analyzed nutrients (AAS, CNS) for 2017 - 2019 (m 12, m 24, m 36)	D.2.4.1 Report on certain properties of leaves and needles for 2017 - 2019 (m 12, m 24, m 36)	<b>N. Potočić</b> I. Seletković T. Jakovljević Doktorand	<b>7-12</b> , 18-24, 30-36
	A2.5. Tree growth and crown condition	M2.5.1. Samples collected, analyzed, for 2017-2019 and ready for further use (m 12, m 24, m 36)	D.2.5.1 A report on the increment and the crown condition in 2017-2019 (m 12, m 24, m 36)	<b>I. Seletković</b> K. Indir N. Potočić	<b>3-12</b> , 13-24, 25-36



Objectives (O)	Activities (A)	Milestones (M)	Deliverables (D)	Team members Activitie Leader (AL)	Duration of activity (from- to, in months)
<b>O3 Identification of the cause-effect relationships between physiological parametars of trees, forest condition, meteorological parameters and atmospheric in puts by using different statistical tools</b>	A3.1 Implementation of procurement and introduction of laboratory management system (m15-m24)	M 3.1. Laboratory management system has been introduced and tested (m24)	D3.1. Implemented Laboratory Management System (m24)	<b>T. Jakovljević</b> N. Potočić I. Seletković L. Butorac K. Indir Z. Zgrablić G. Jelić R. Buljan G. Simioni A. Marchetto A. De Marco Doktorand	15-24, 30-36, 33-36
	A3.2 Analyses and processing the collected data by using different statistical tools		D3.2 Physiological parameters of trees, forest condition, meteorological parameters and atmospheric input data validated and use din models (Individual tree growth model, RFA) (m 36)		
	A3.3. Comparison of field measured and modeled data and future predictions on input of atmospheric pollutants and climate change (m33-m36)		D3.3. Models validated with field measurement Projections of consequences of climate change and atmospheric inputs on forest condition (m36)		

Objectives (O)	Activities (A)	Milestones (M)	Deliverables (D)	Team members Activitie Leader (AL)	Duration of activity (from- to, in months)
<b>O4 Translation of the acquired knowledge on forest ecosystems of Mediterranean forest ecosystems to management and scientific communities</b>	A4.1 Meetings and workshops (m1-m3)	M4.1. Kick-off meeting organized (m 2)	D4.1. Report from the kick-off meeting (m 3)	<b>L. Butorac</b> T. Jakovljević N. Potočić I.Seletković K.Indir G. Jelić Ž. Zgrablić A.Marchetto R. Buljan A. De Marco Doktorand	<b>1-3</b>
	A4.2 Web-page (m3-m6)	M4.2. Training workshop organized (m 5)	D4.2 Project web-page available for public (m 6)		<b>4-6</b>
	A 4.3. Participation in the international conference (m3-m12; m13-m24; m25-m36)		D 4.3.1. The conference report for 2017-2019 (m 12, m 24, m 36)		<b>3-12</b> , 13-24, 25-36
	A 4.4 Perfecting for project manager and doctoral student in the institutes CNR ISE, ENEA i INRA (m9-m12; m21-m24; m31-m34)		D 4.4.1. Report from training for 2017 - 2019 (m12, m 24, m 34)		<b>9-12</b> , 21-24, 31-34
	A4.5. The organization of workshops (m15-m18; m33-m36)	M4.5.1. Organized workshop on environmental models for scientists (m 18)	D 4.5.1. A report from the workshop training for the application of ecological models (m 18)		15-18
		M4.5. 2. Organized workshop on the results of the project in the field of forest management (m 36)	D 4.5.2. A report from the workshop on project results (m 36)		33-36

<b>O4 Translation of the acquired knowledge on forest ecosystems of Mediterranean forest ecosystems to management and scientific communities</b>	A4.6. Preparation popular brochure (m 8-m 11)		D4.6. Popular brochure on forest monitoring submitted (m 11)	N. Potočić, Ž. Zgrablić All team members	<b>8-11</b>
	A 4.7. Scientific and popular papers (m 20-m 24; m30-36)		D4.7.1. First Scientific paper with achievements in multidisciplinary research submitted (m 24)		20-24
			D4.7.2 Second Scientific paper with achievements in multidisciplinary research written (m 36)		33-36

**THANK YOU FOR  
YOUR  
ATTENTION!**