



Food and Agriculture  
Organization of the  
United Nations

GLOBAL  
SYMPOSIUM on  
**SOILS** and **WATER**

02-05 October, 2023

Soil and water:  
a source of life

**arauco**



**Sustainable Soil and Water Management:  
Empowering Forest Productivity and  
Community Water Access**

Guillermo Federico Olmedo

Investigaciones Forestales Bioforest S.A. / Arauco



BY USE (IN HECTARES OF  
DECEMBER 2020)

PINE

EUCALYPTUS

OTHER  
SPECIES

TO BE  
PLANTED

NATIVE

OTHER  
USES

TOTAL

CHILE

429,121

183,028

1,823

60,602

280,273

54,133

1,008,979

ARGENTINA

91,335

19,390

19,675

9,291

119,428

5,215

264,334

BRAZIL

52,556

61,280

198

11,689

77,979

7,672

211,375

URUGUAY

151

85,863

325

3,907

4,930

40,968

136,144

TOTAL

573,162

349,561

22,021

85,489

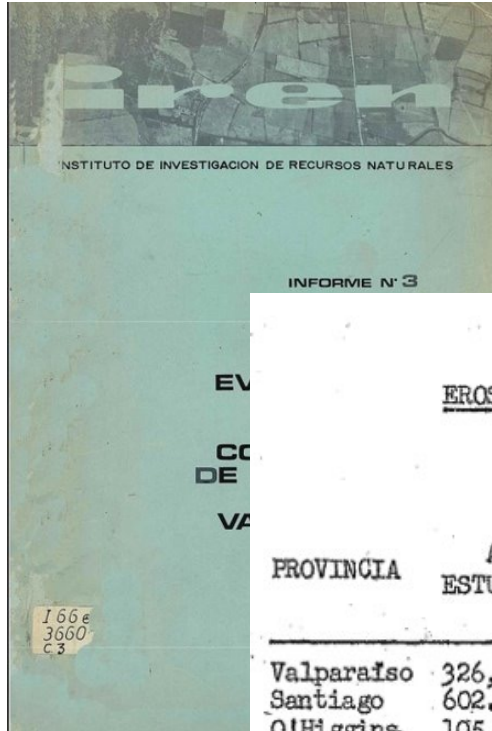
482,611

107,989

1,620,833



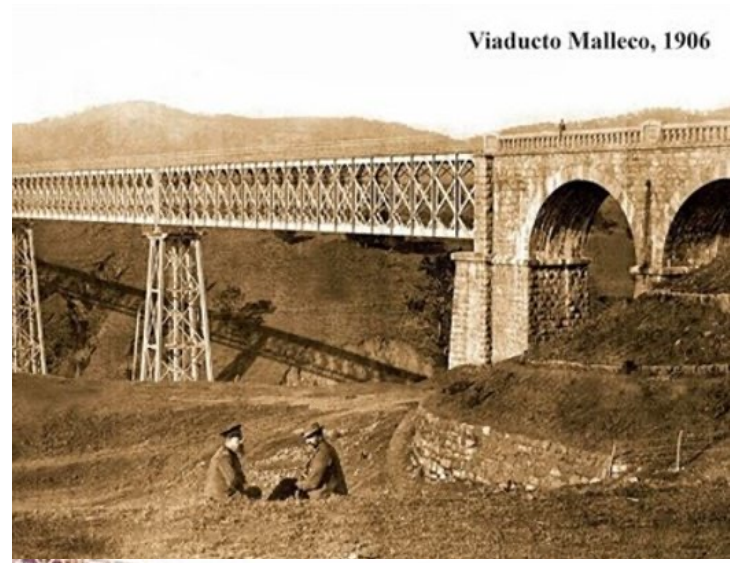
# Historical context



CUADRO N° 1

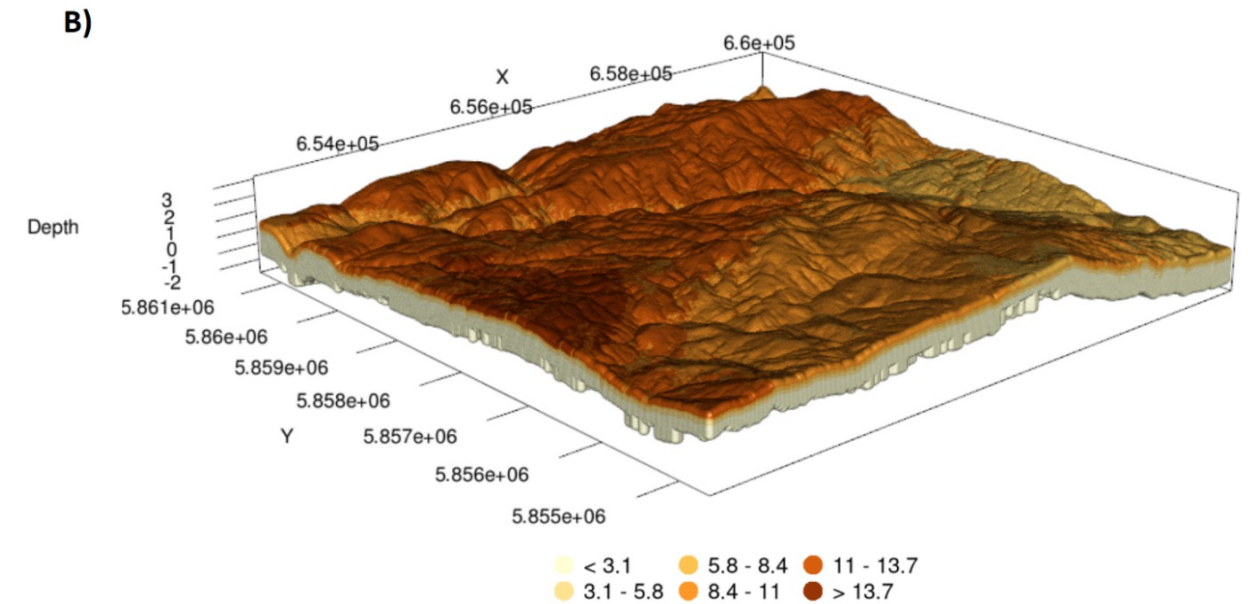
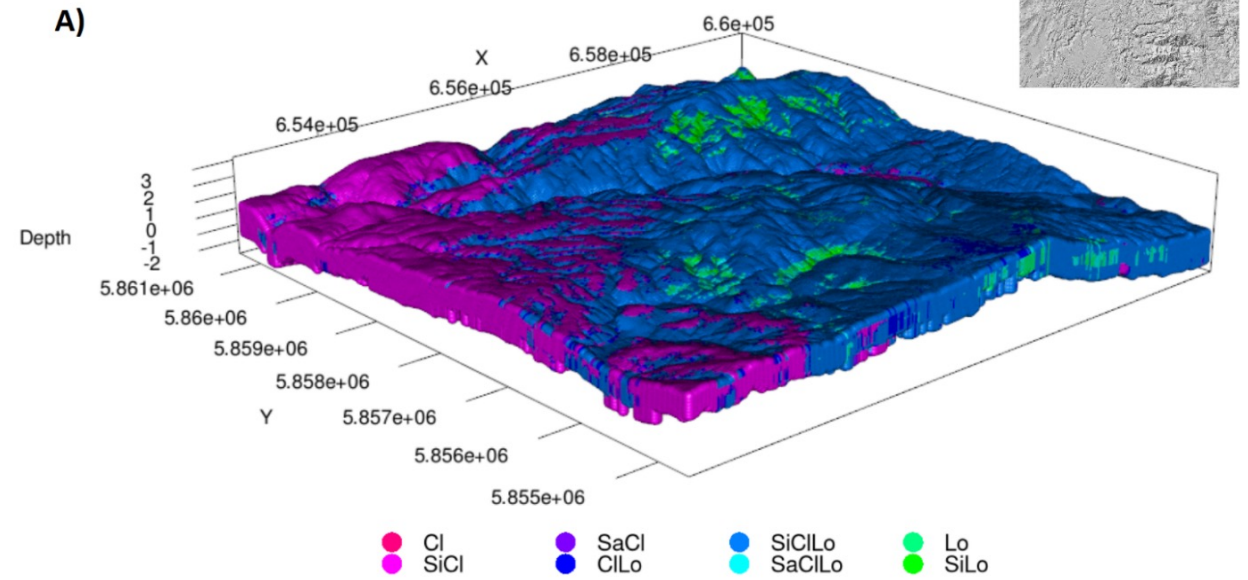
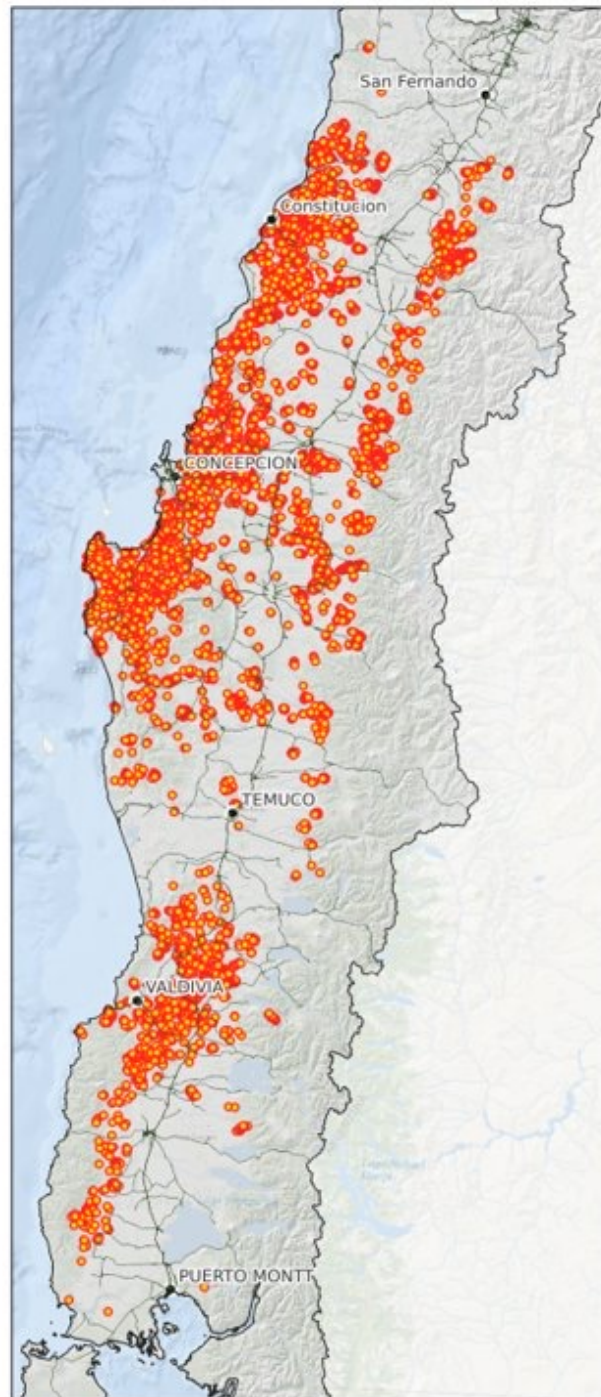
EROSION POR PROVINCIAS, EN EL AREA ESTUDIADA

PROVINCIA	AREA ESTUDIADA	% SUPERFICIE TERRITORIAL	EROSION MODERADA A MUY SEVERA CON ZANJAS DE DISTINTOS TIPOS (HAS).	% DEL AREA EROSIONADA
Valparaíso	326.639,3	62,55	207.396,3	63,5
Santiago	602.130,9	34,04	381.944,2	63,4
O'Higgins	105.615,0	14,86	56.142,0	53,2
Colchagua	489.921,4	58,83	259.086,2	52,9
Curicó	143.744,8	27,29	125.954,2	87,6
Talca	113.957,9	11,23	101.426,6	89,0
Maule	558.103,0	100,00	382.802,5	68,6
Ñuble	339.110,6	24,30	227.600,4	40,8
Bío-Bío	161.810,6	14,53	93.062,3	57,5
Concepción	464.145,6	81,69	318.393,9	68,6
Arauco	509.264,4	100,00	275.383,4	54,0
Malleco	563.672,7	39,99	324.228,9	57,5
Cautín	462.532,7	25,16	101.877,6	22,0
<b>TOTALES</b>	<b>4.840.648,9</b>		<b>2.855.298,5</b>	<b>59,0</b>

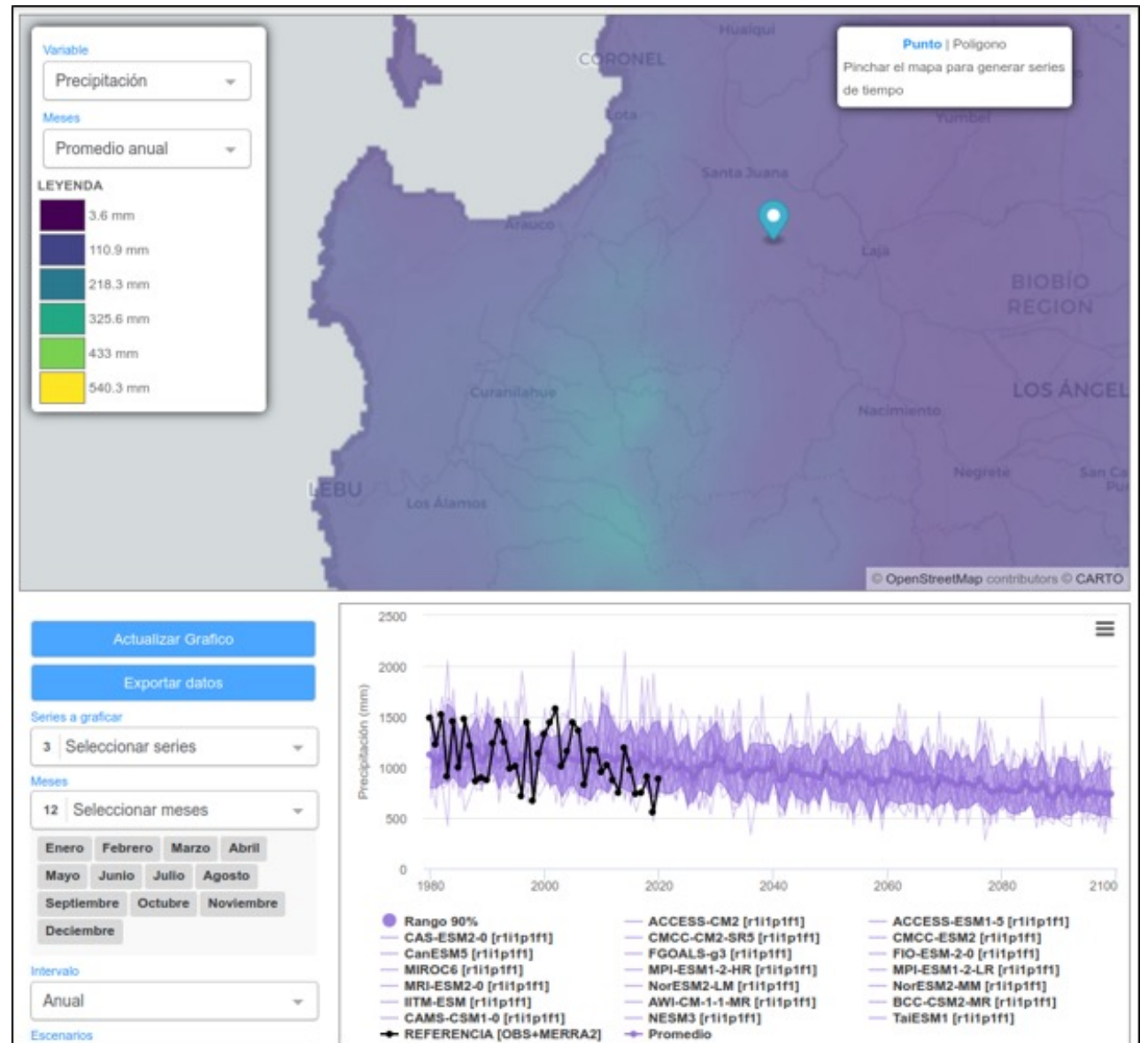
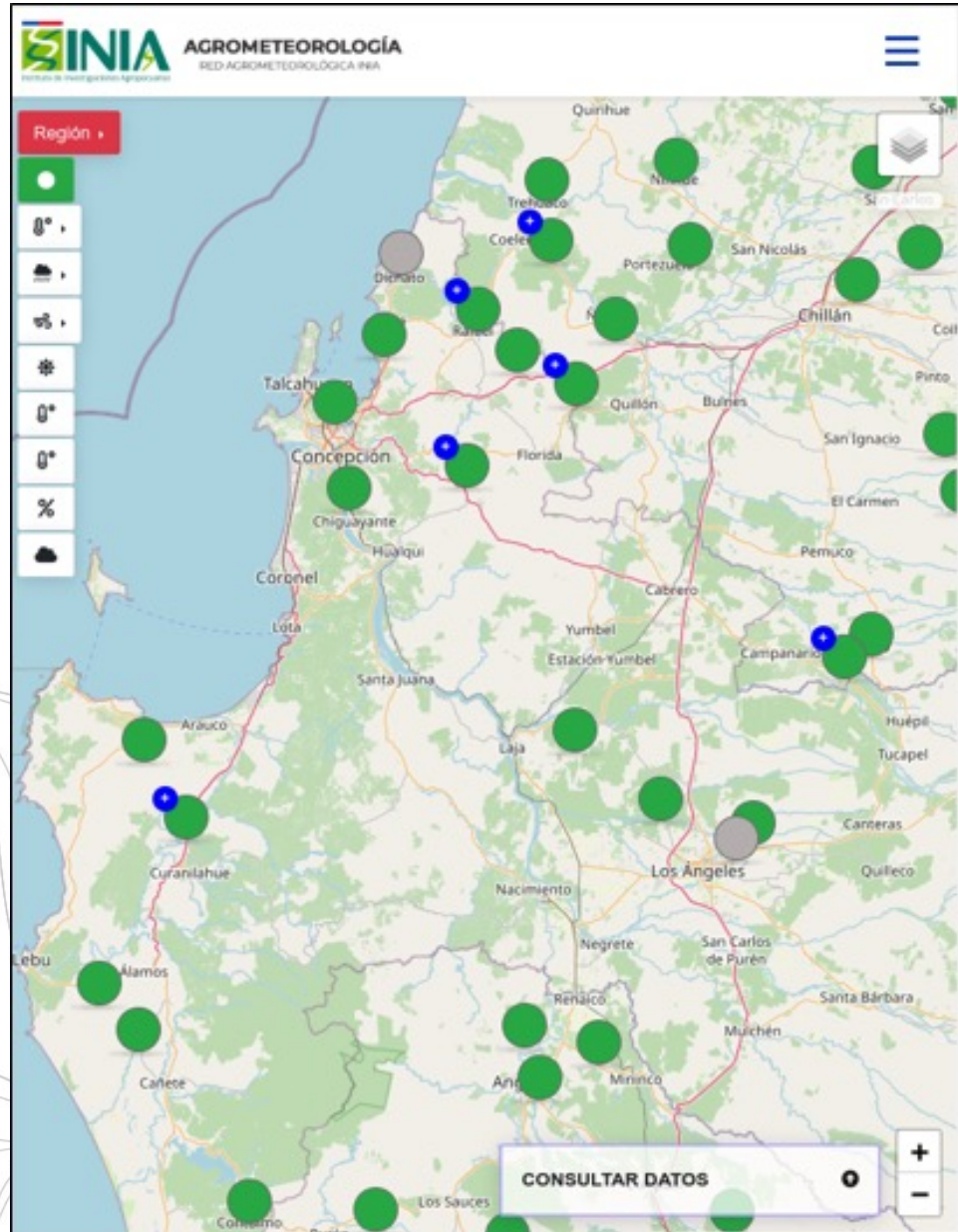


# Soil data

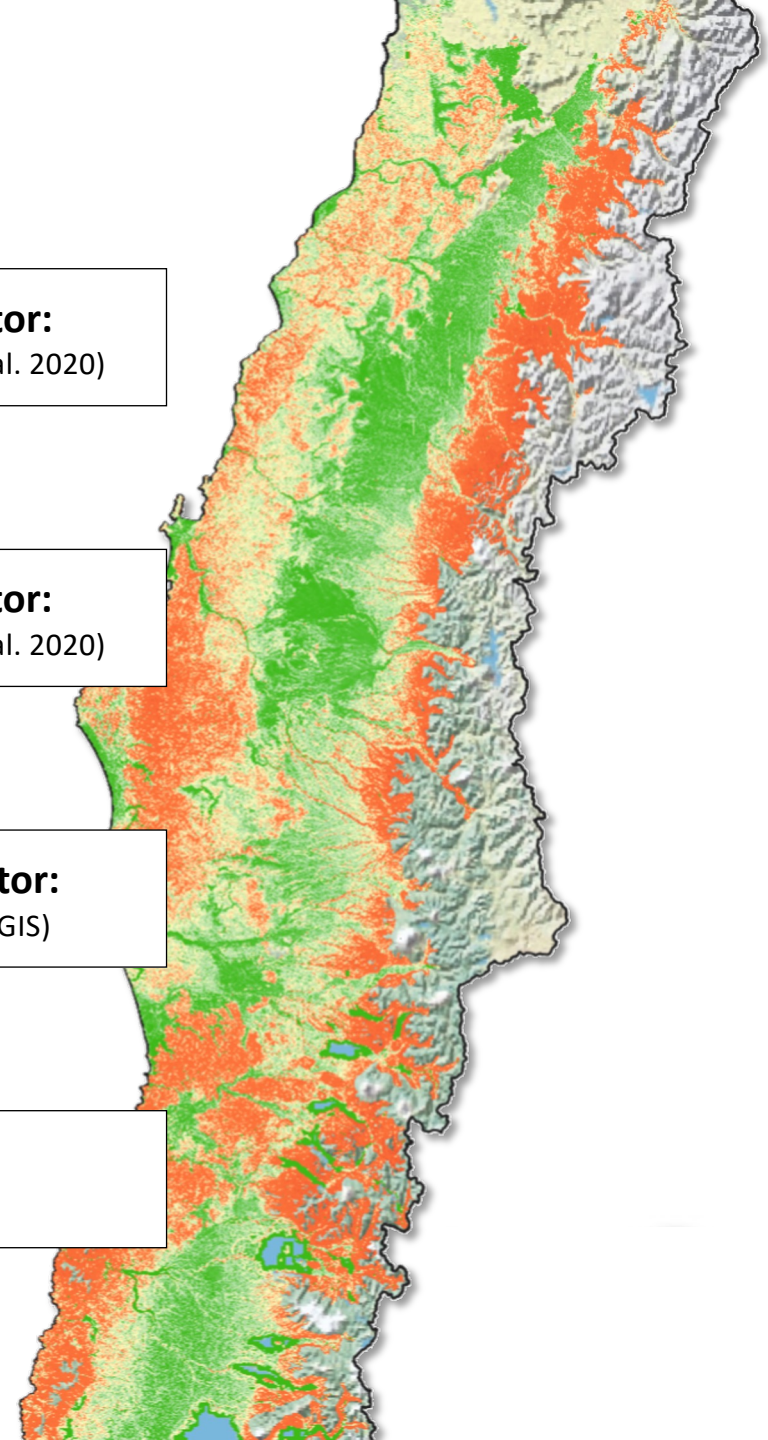
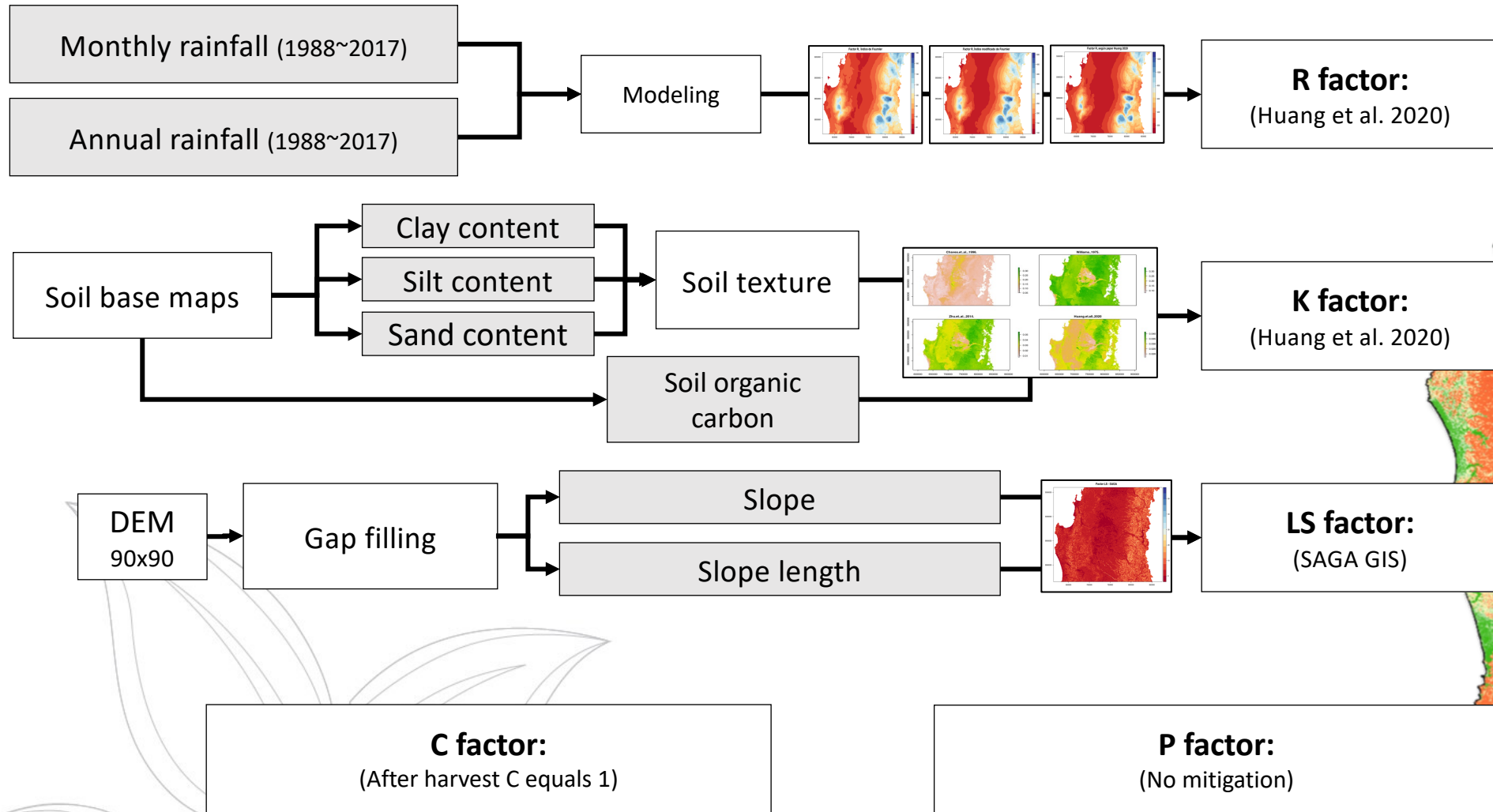
9920 Soil profiles  
[1991~2018]

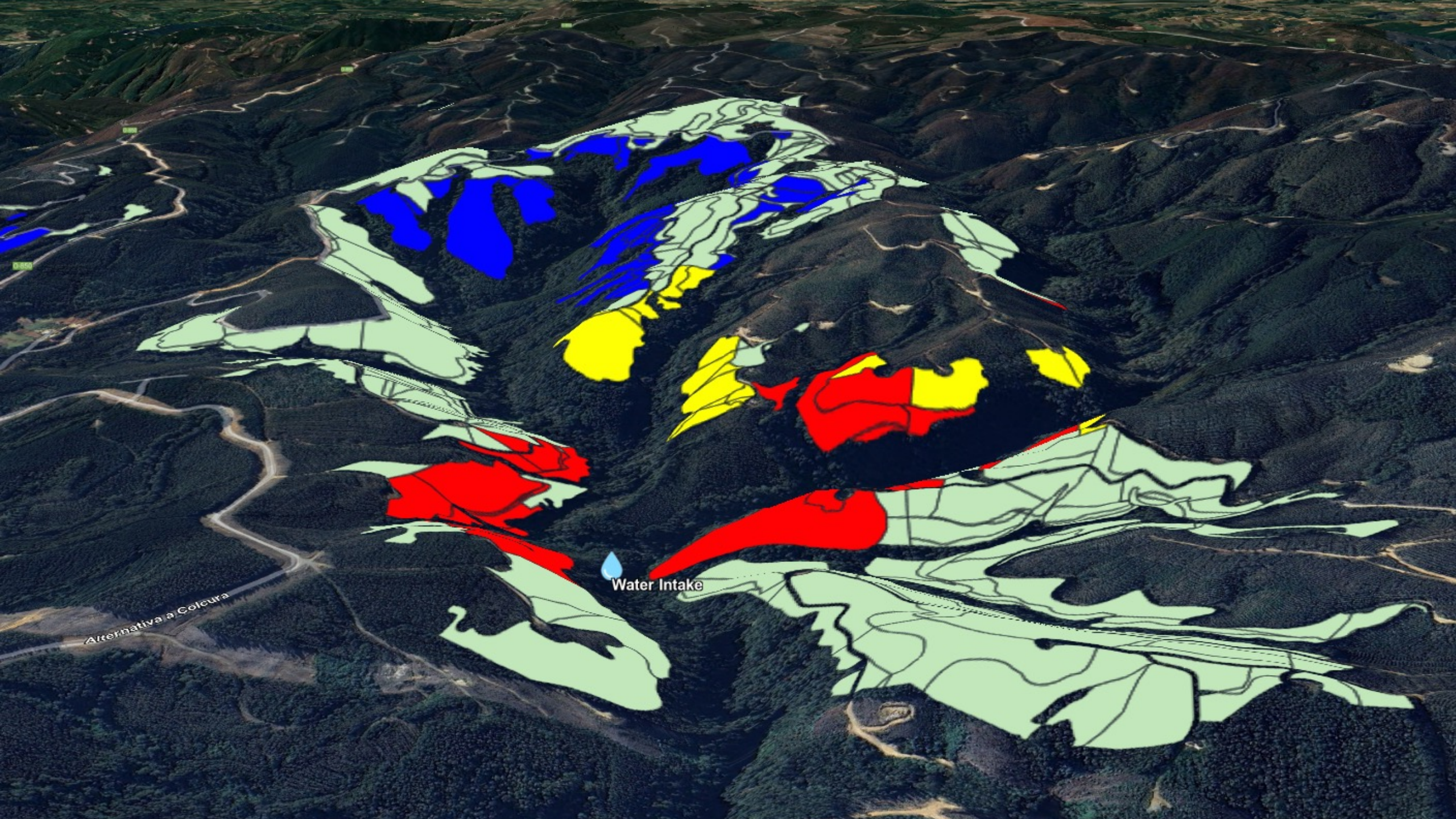


# Climate data



# Revised Universal Soil Loss Equation (RUSLE)



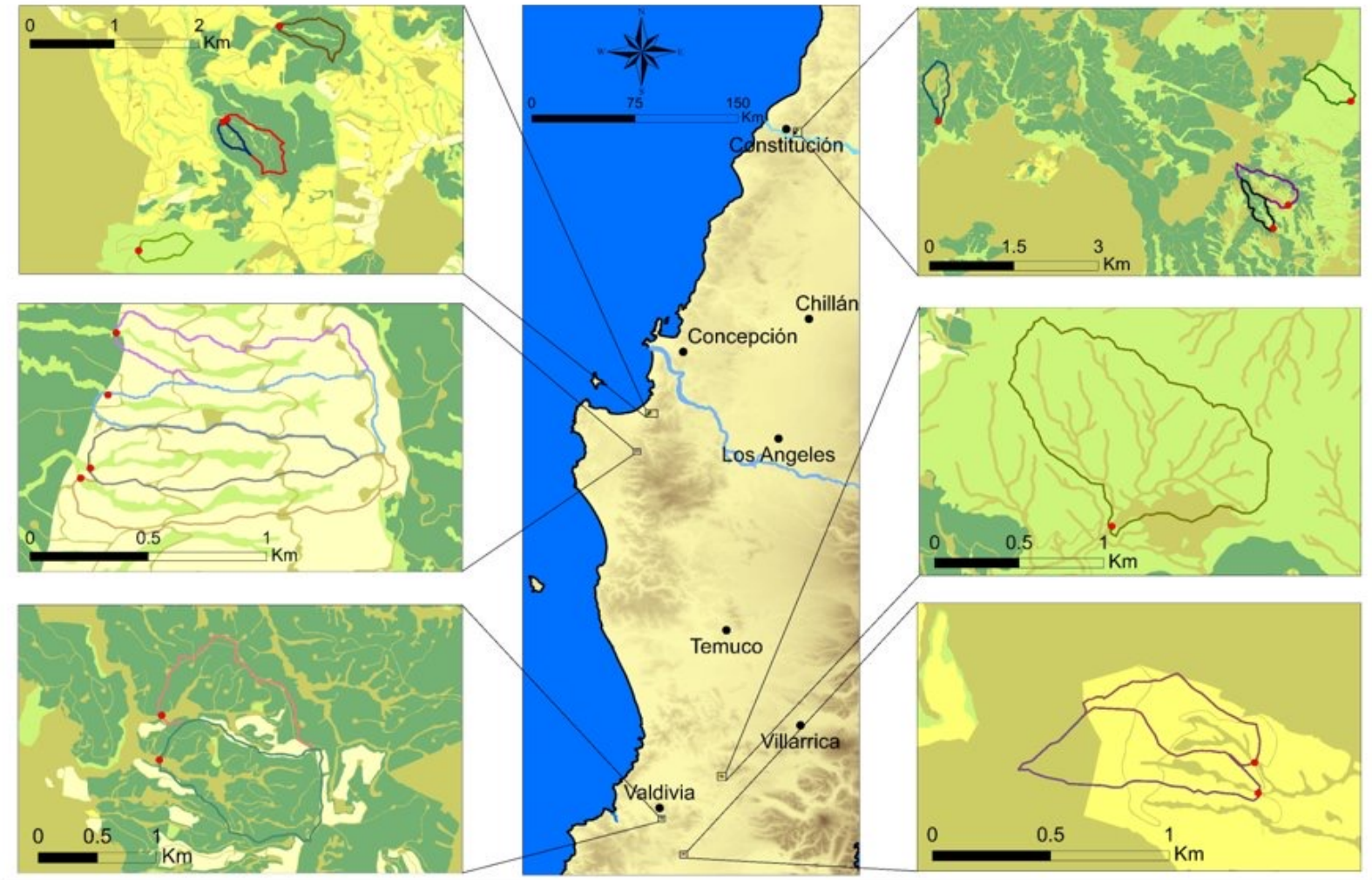
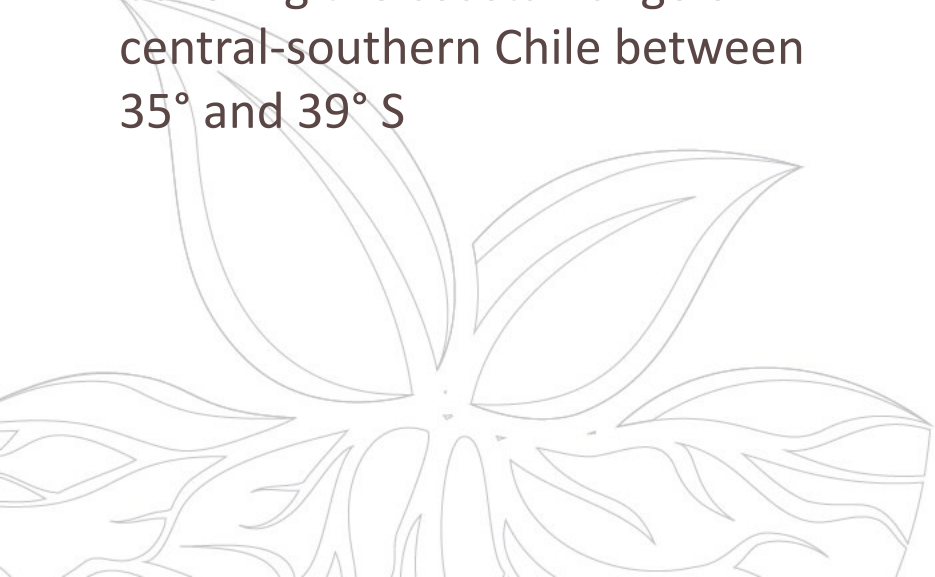


Water Intake

Alternativa a Colcura

# Forest Hydrology: Long Term Ecological Research (LTER)

- Improve our understanding about the role of forest plantations on water balance at a stand and catchment level
- LTER includes 17 catchments from 2008 - today
- Covering the coastal range of central-southern Chile between 35° and 39° S





# Forest Hidrology: Long Term Ecological Research (LTER)



RESEARCH AND OBSERVATORY CATCHMENTS: THE LEGACY AND THE FUTURE

WILEY

## Forestal Arauco experimental research catchments; daily rainfall-runoff for 10 catchments with different forest types in Central-Southern Chile

Francisco Balocchi<sup>1,2</sup> | Don A. White<sup>3,4</sup> | Richard P. Silberstein<sup>4,5,6</sup> | Pablo Ramírez de Arellano<sup>1</sup>

<sup>1</sup>Bioforest S.A. Camino a Coronel s/n km 15, Coronel, Chile  
<sup>2</sup>Water Resources and Energy for Agriculture PhD Program, Water Resources Department, Universidad de Concepción, Chillán, Chile

**Abstract**  
 Forestal Arauco (FA), a global manufacturer of forest products, manages more than 1 million ha of forest plantations and oversees the conservation of more than half a



Contents lists available at ScienceDirect

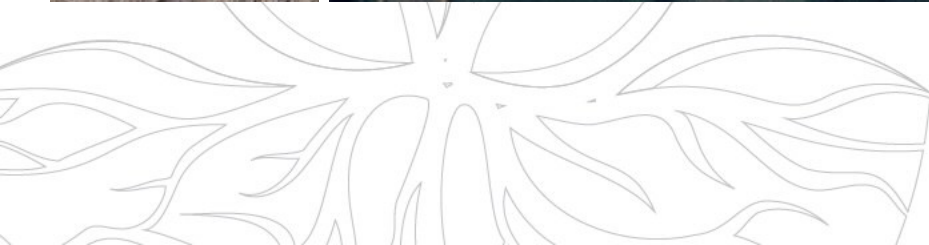
Forest Ecology and Management

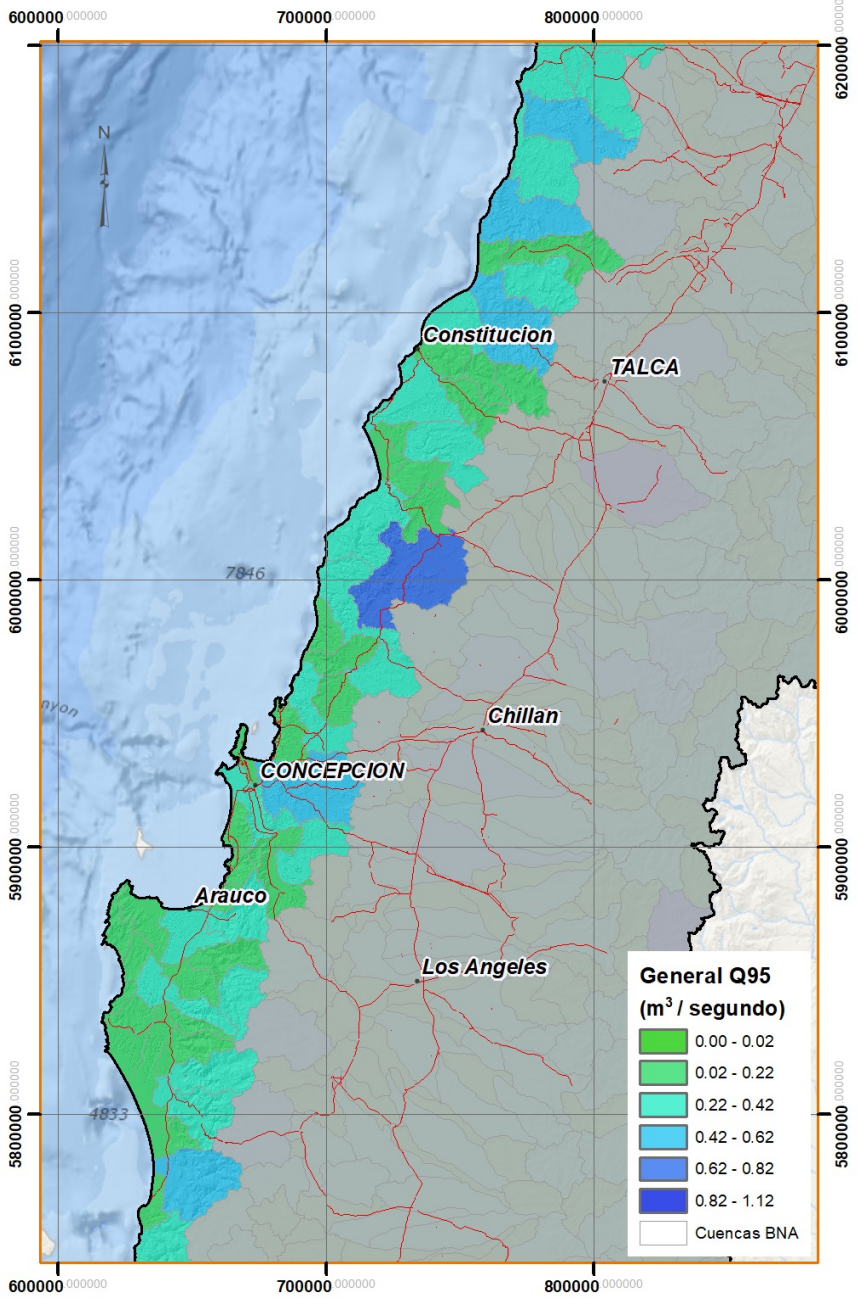
journal homepage: [www.elsevier.com/locate/foreco](http://www.elsevier.com/locate/foreco)



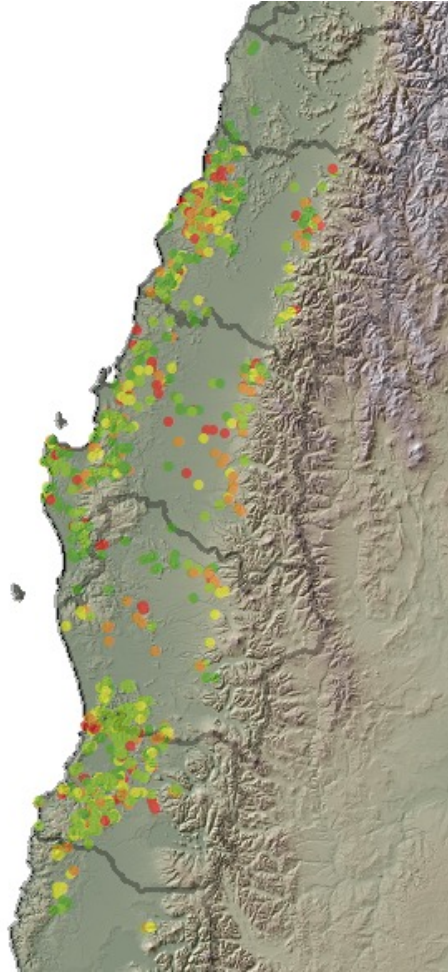
## Growth, water use, and water use efficiency of *Eucalyptus globulus* and *Pinus radiata* plantations compared with natural stands of Roble-Hualo forest in the coastal mountains of central Chile

Don A. White<sup>a,b,c</sup>, Richard P. Silberstein<sup>a,c,d</sup>, Francisco Balocchi-Contreras<sup>e,f</sup>, Juan Jose Quiroga<sup>g</sup>, Dean F. Meason<sup>h</sup>, João H.N. Palma<sup>h,i</sup>, Pablo Ramírez de Arellano<sup>f</sup>

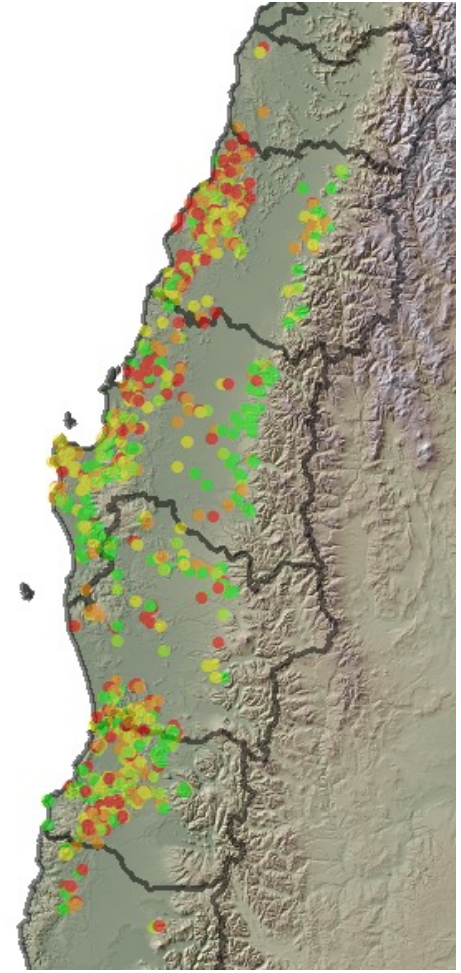




Inhabitants (n°)

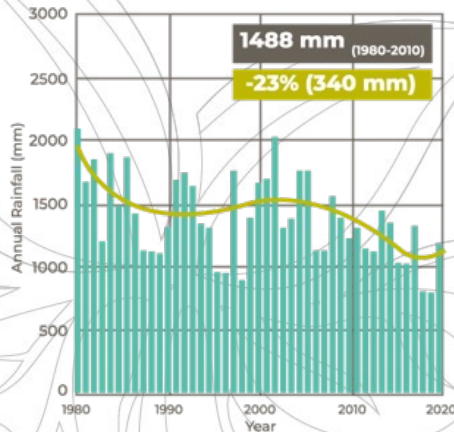
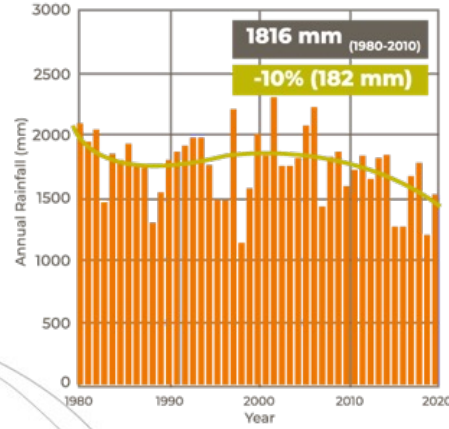
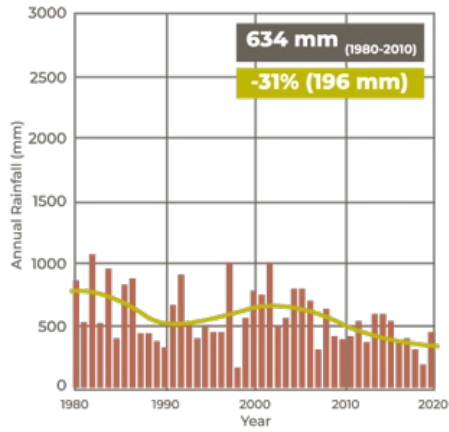


Demand (l/d)



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**17.574.003**

total population

**514.011**

O'HIGGINS-MAULE

**75,8%**

Rural drinking water (APR)

**603.399**

ÑUBLE-BIOBIO-  
LA ARAUCANÍA

**34,4%**

Rural drinking water (APR)

**327.726**

LOS RÍOS-LOS LAGOS

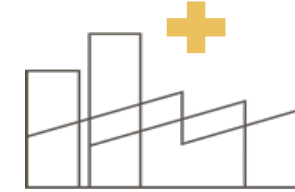
**36,3%**

Rural drinking water (APR)



**2.149.740**

rural population



**15.424.263**

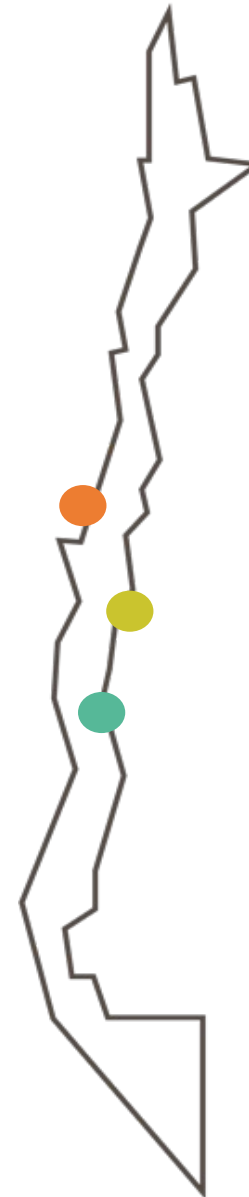
Urban population

**1.445.136**

rural population

**49,6 %**

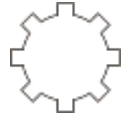
Rural drinking water (APR)



# Developing water supply solutions for neighboring communities



Baseline studies



Engineering projects



Water rights



Lease land easements



Building



Self-management training



# the results so far...

**100**  projects | **40**  Beneficiary communities | **42,500**  People benefited

**MM\$ 1,250**  ARAUCO investment | **MM\$ 22,500**  leveraged



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