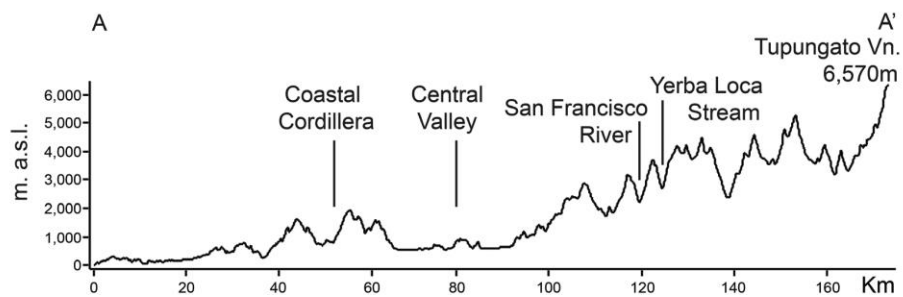
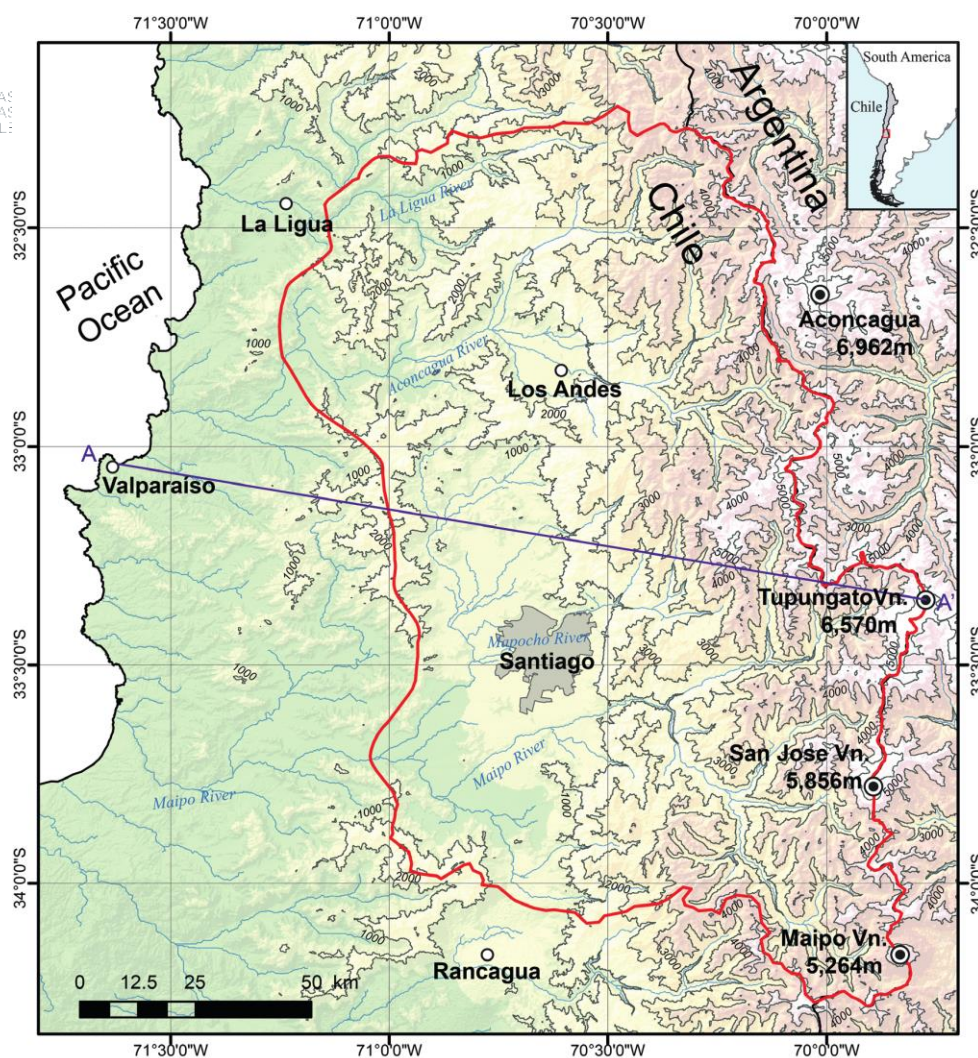




# La cuenca alta del Río Mapocho

James McPhee – Universidad de  
Chile  
Santiago,



**Fig 1.** Contour map showing the highest altitudes on the Chile-Argentina border, Maipo, San José and Tupungato volcanoes and the Aconcagua peak. The profile 'AA' highlights the relief of the region. The principal peaks, rivers and valleys are indicated. The study area is outlined in red.

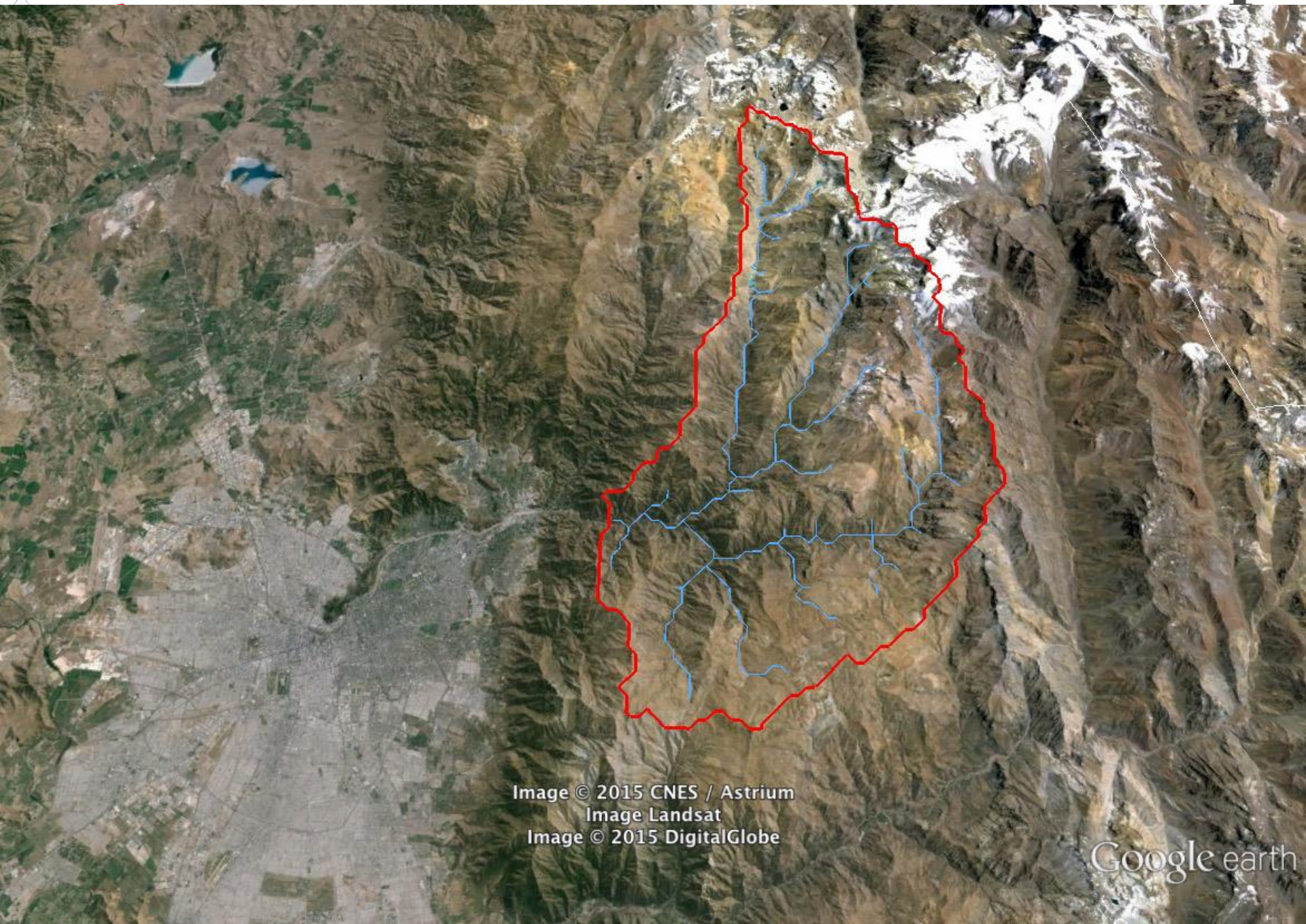


Image © 2015 CNES / Astrium  
Image Landsat  
Image © 2015 DigitalGlobe

Google earth

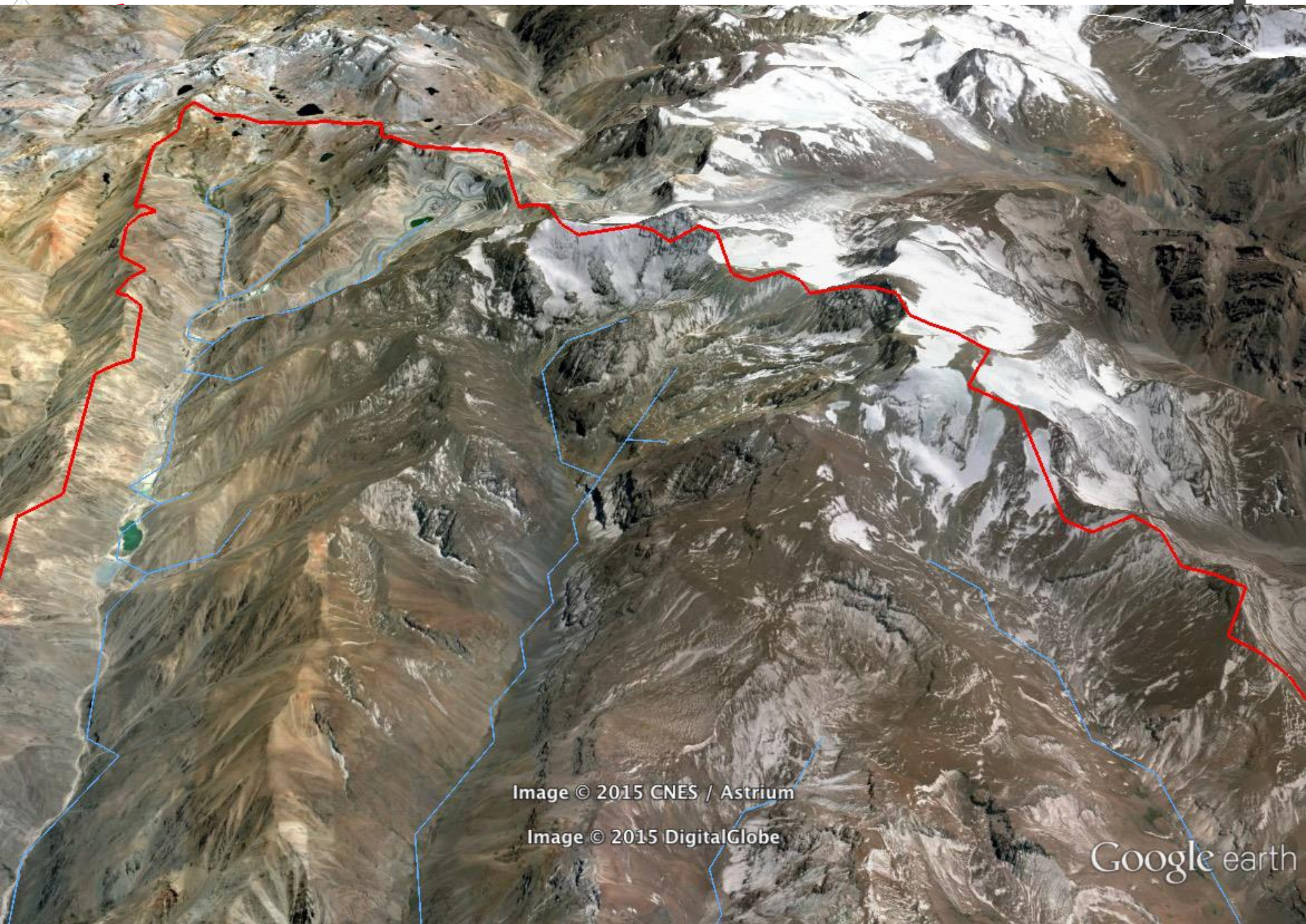


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Google earth



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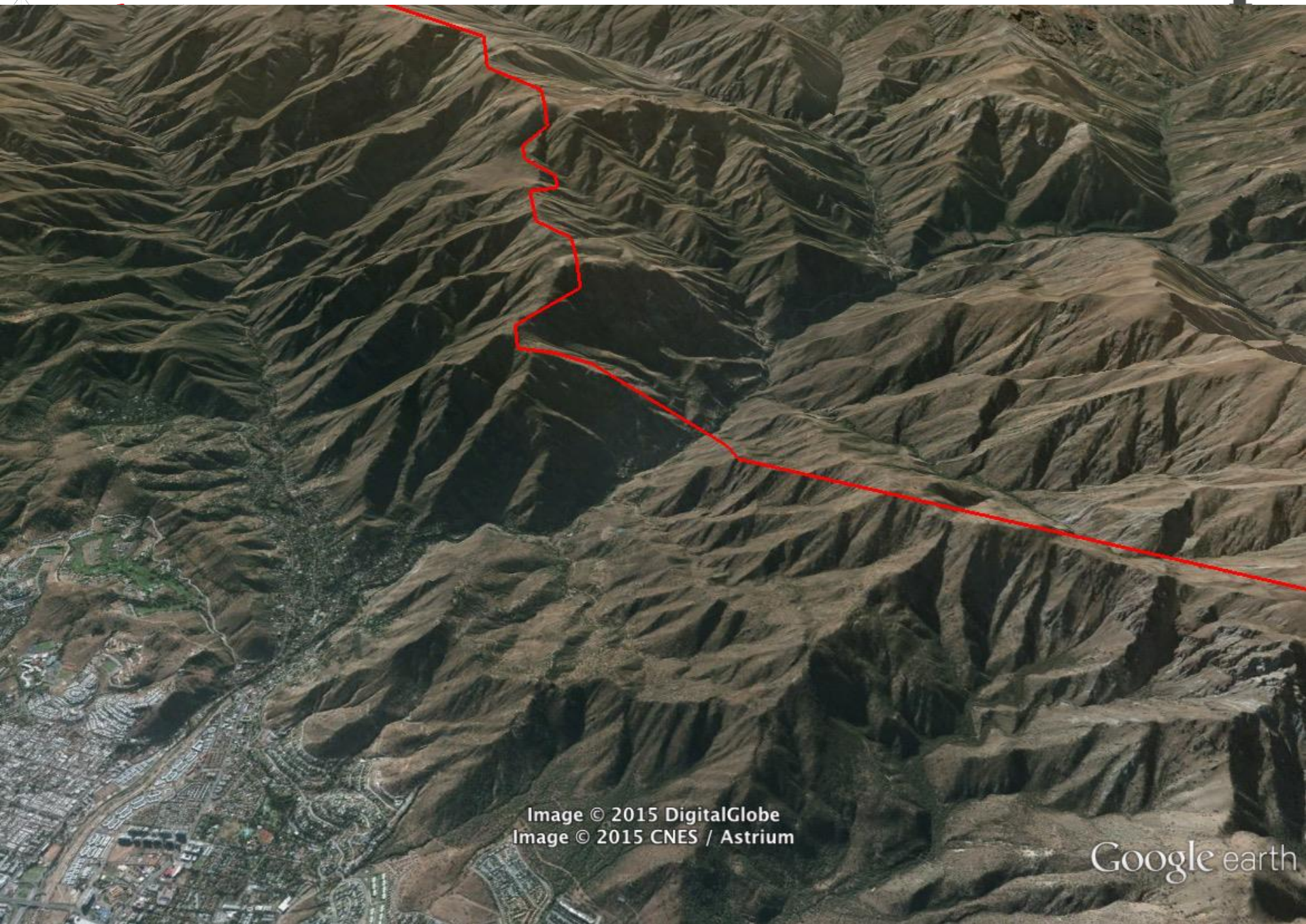


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Image © 2015 CNES / Astrium

Google earth



# Vegetación



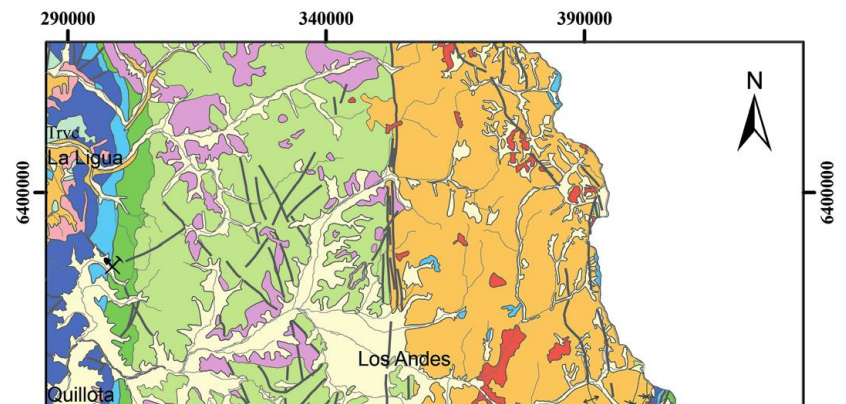
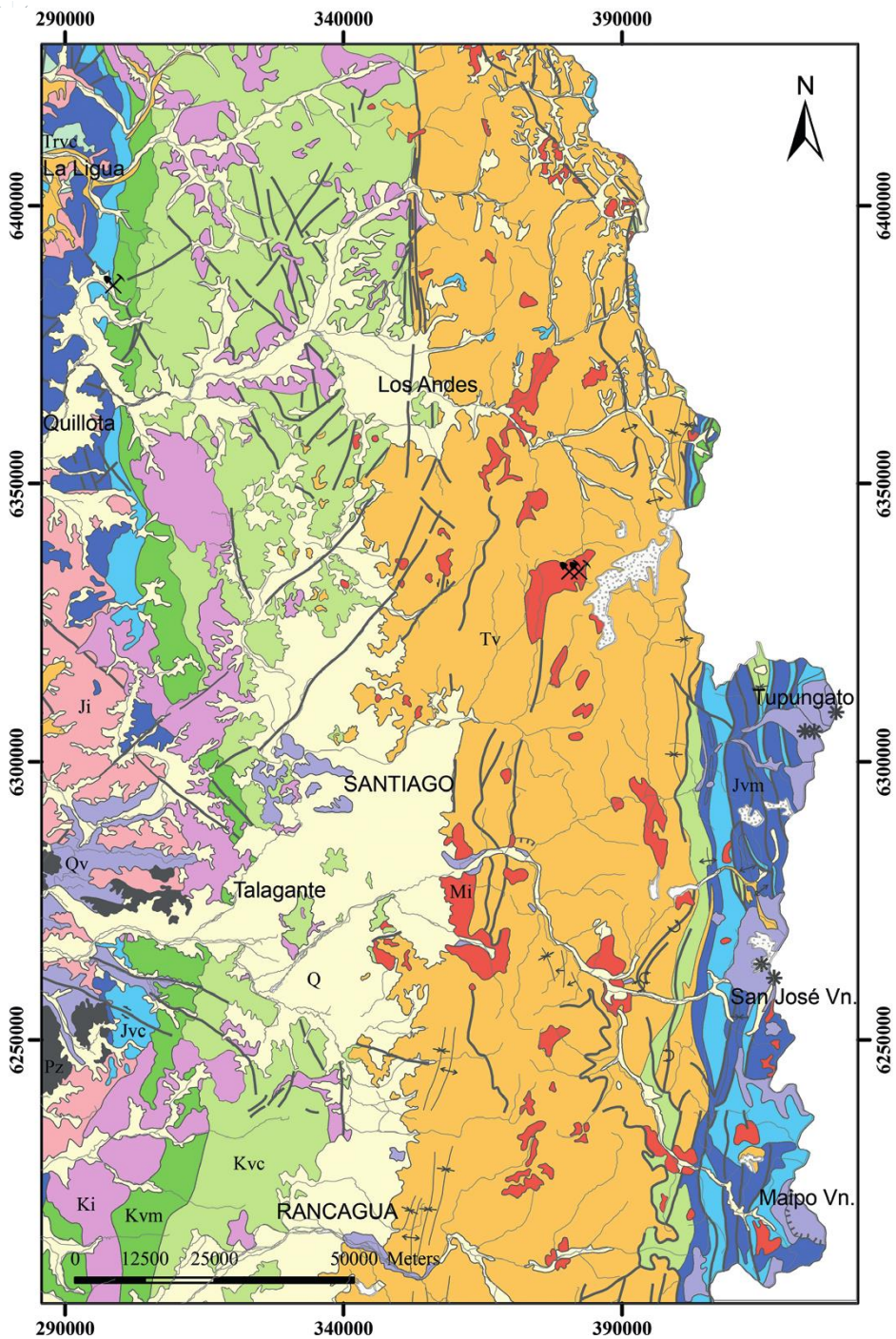
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[http://2.bp.blogspot.com/\\_yB9W0hsRxN8/SD28624nemI/AAAAAAAAAAk/s9Yshnv eoEk/s1600-h/P4200069.JPG](http://2.bp.blogspot.com/_yB9W0hsRxN8/SD28624nemI/AAAAAAAAAAk/s9Yshnv eoEk/s1600-h/P4200069.JPG)







**fcfm**

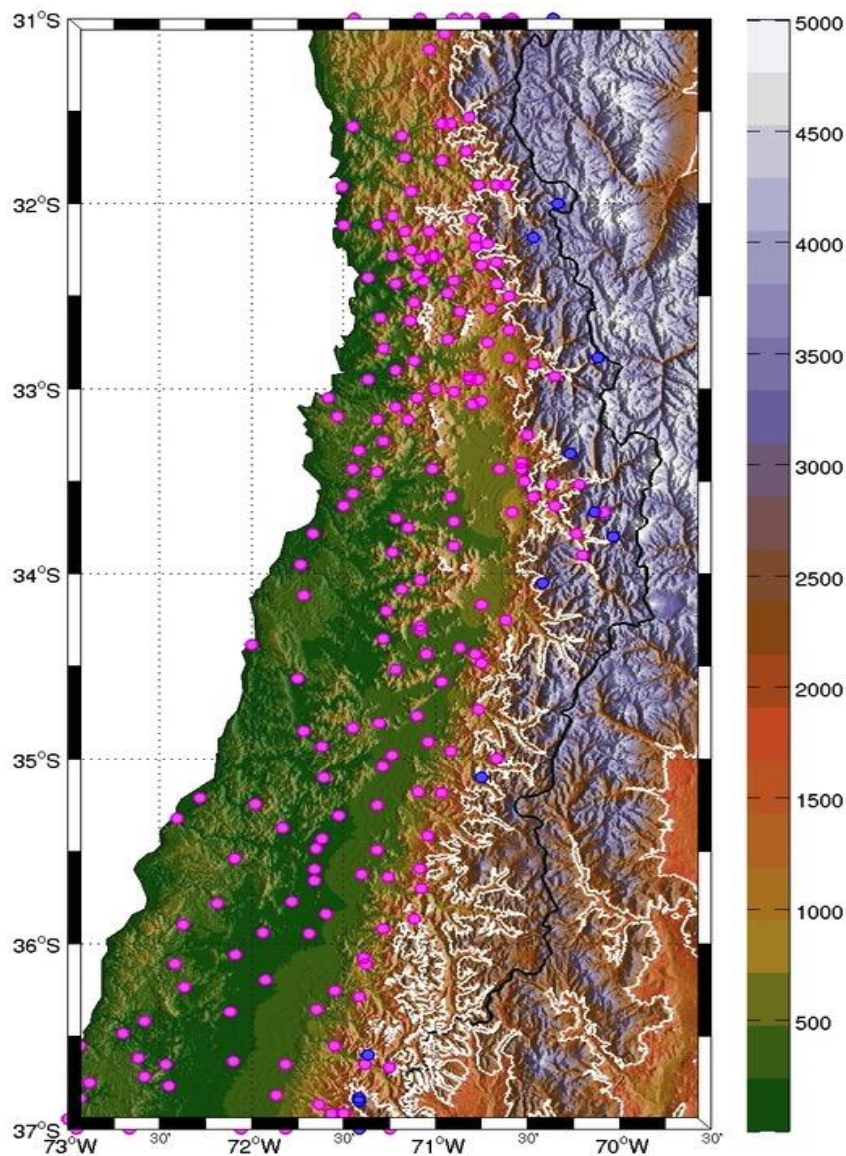
FACULTAD DE CIENCIAS  
FÍSICAS Y MATEMÁTICAS  
UNIVERSIDAD DE CHILE

**amtc**  
ADVANCED MINING TECHNOLOGY CENTER

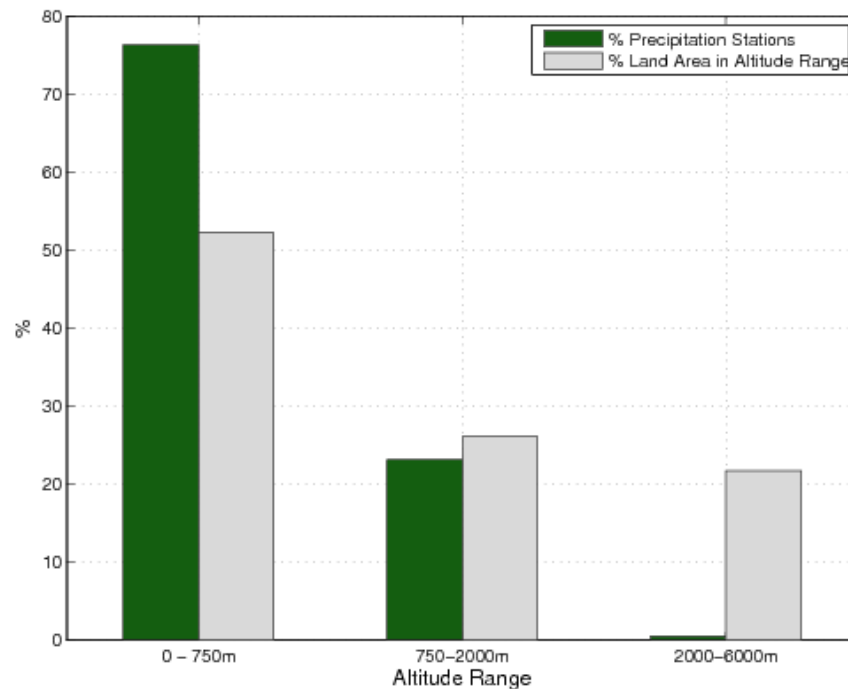
# Suelos

¿?

# Hydro/met observing system in the high Andes



Current coverage (DGA+DMC, pink circles) is reasonable in the “central valley” but dramatically low at higher elevations, where most of the water accumulation takes place





# Mountain observations in Chile

## Government-run

- Operational
  - Point-scale SWE
  - Meteorology
  - Streamflow
- Research
  - Glacier mass-balance

## Research institutions

- Point-scale SWE
- Snow depth surveys
- Meteorology
- Glacier mass-balance

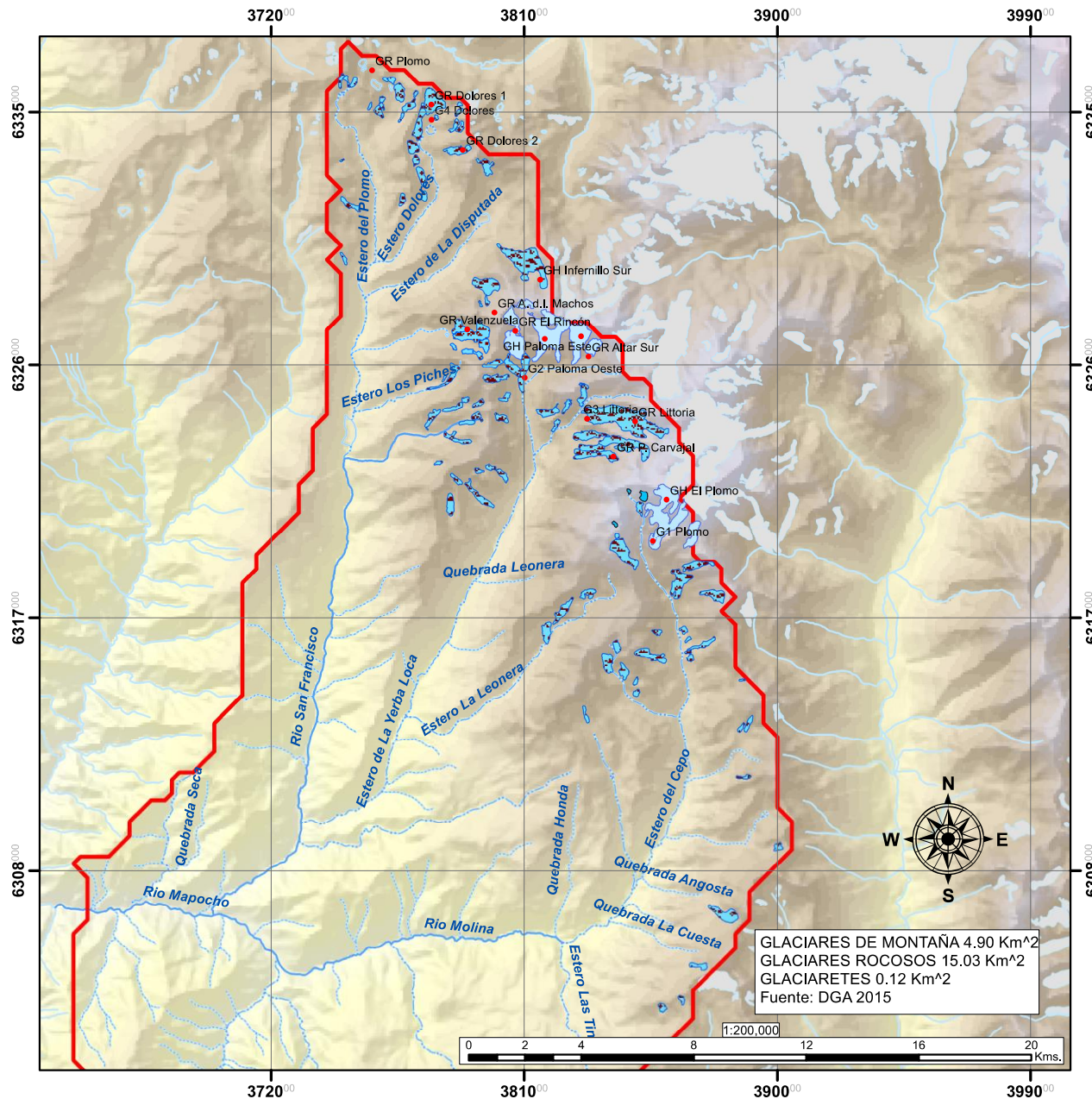
## Private (hydropower, mining)

- Meteorology
- Streamflow
- Glacier mass-balance



# Mapa de Glaciares

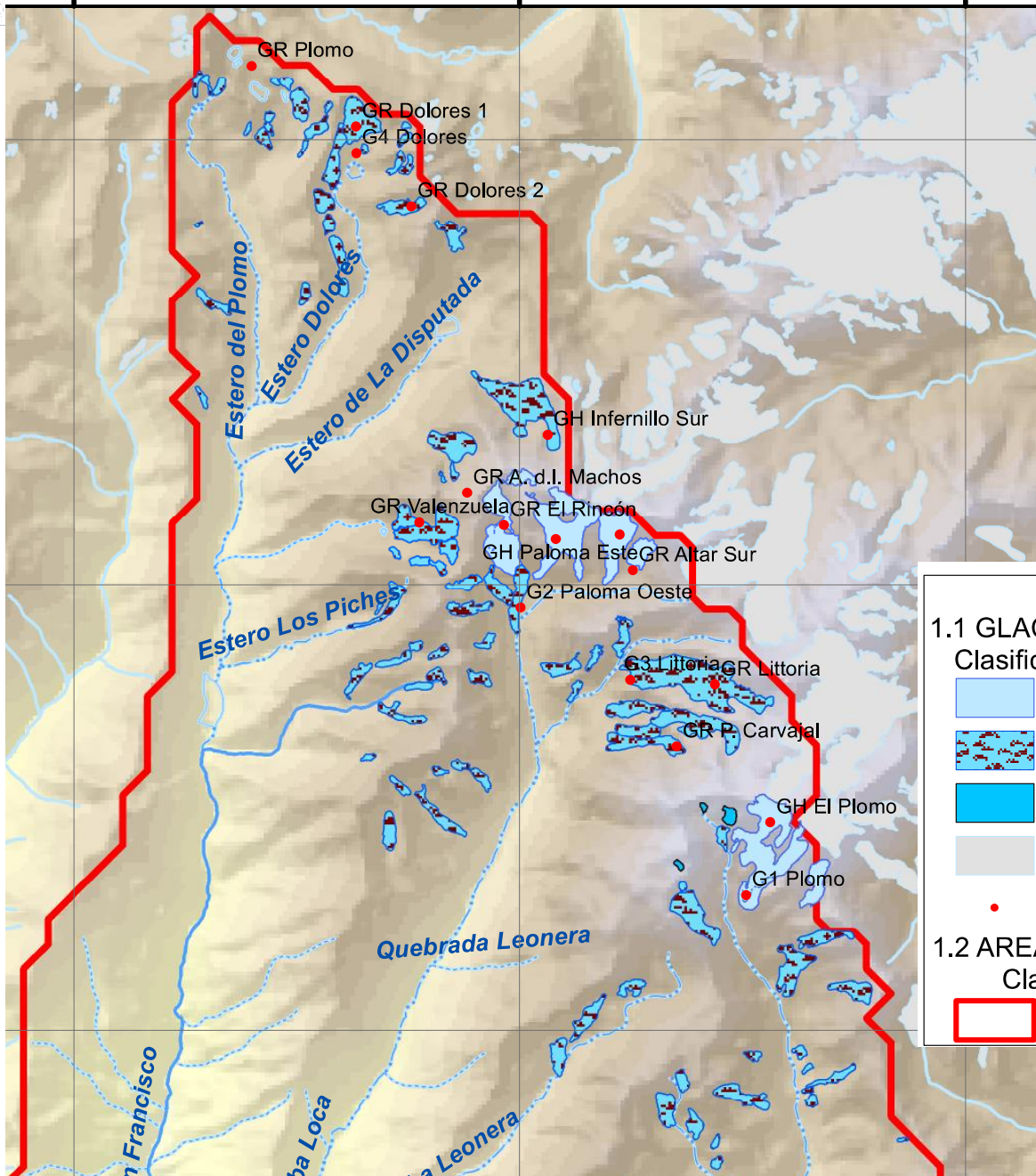
## Cuenca Alta del Río Mapocho - Región Metropolitana de Santiago - Chile



3720<sup>00</sup>

3810<sup>00</sup>

3900<sup>00</sup>



### LEYENDA

#### 1.1 GLACIARES


Clasificación

 Glaciar de montaña

 Glaciar rocoso


 Glaciarete

 Glaciares fuera de area de Estudio

 Nombre de glaciares

#### 1.2 AREA DE ESTUDIO

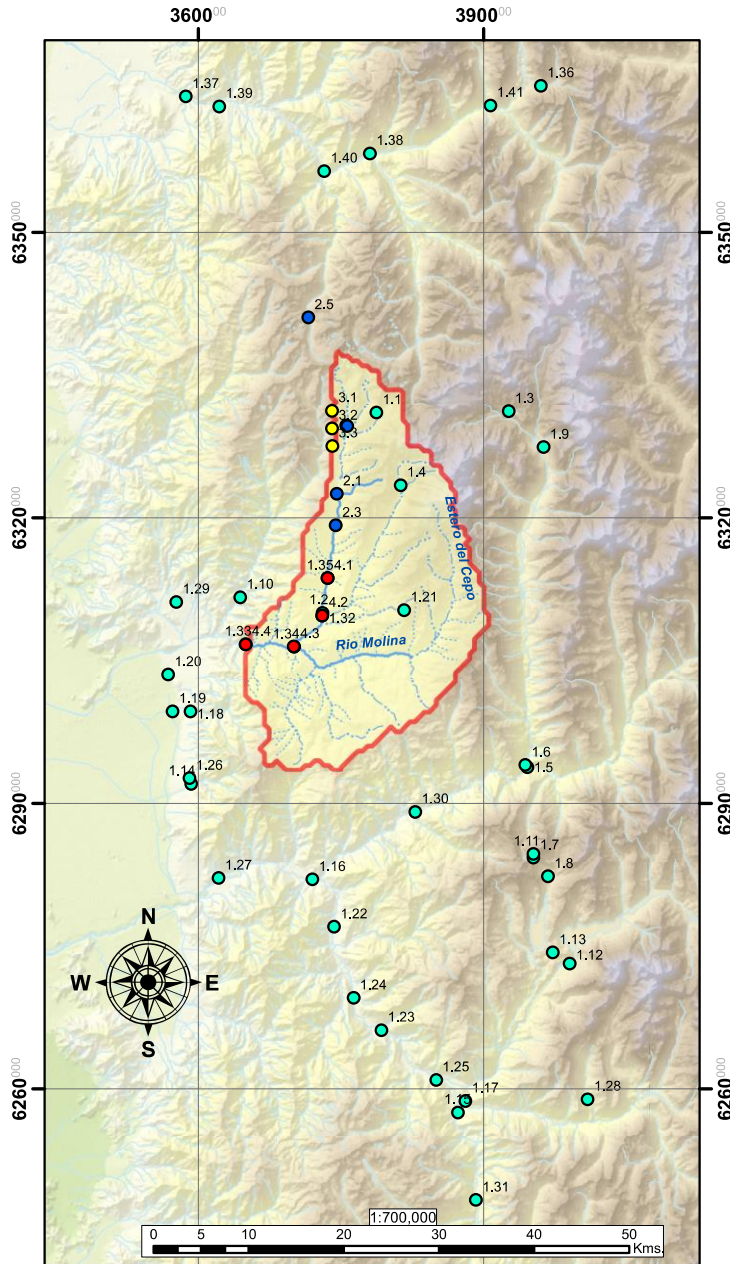
Clasificación

 Cuenca del Río Mapocho



# Estaciones de Medición - Dirección General de Aguas

## Cuenca Alta del Río Mapocho - Región Metropolitana de Santiago - Chile



TIPOLOGÍA	NOMBRE ESTACIÓN	
1- METEOROLÓGICAS	1.1 Los Bronces - AAS	
	1.2 La Ermita CB - DGA	
	1.3 G. Olivares Gamma - DGA	
	1.4 Yerba Loca en Piedra Carvajal - DGA	
	1.5 Colorado a.j. Olivares - DGA	
	1.6 Olivares a.j. Colorado - DGA	
	1.7 Echaurren Alto - DGA	
	1.8 Echaurren Bajo - DGA	
	1.9 Valle Olivares - DGA	
	1.10 Arrayan en La Montosa - DGA	
	1.11 G Echaurren - DGA	
	1.12 El Yeso Embalse - DGA	
	1.13 Laguna Negra DCP - DGA	
	1.14 Quebrada Macul - DGA	
	1.15 Queltehues - DGA	
	1.16 Maipo en El Manzano - DGA	
	1.17 Volcan en Queltehues - DGA	
	1.18 Quebrada Ramon (EMOS) - DGA	
	1.19 Quebrada Ramon - DGA	
	1.20 Cerro Calan - DGA	
	1.21 Barros Negros (Farellones) - DGA	
	1.22 Sn. Jose Reten - DGA	
	1.23 Maipo Sn. Alfonso - DGA	
	1.24 San Alfonso - DGA	
	1.25 Sn. Gabriel - DGA	
	1.26 Antupirun - DGA	
	1.27 La Obra R EMOS - DGA	
	1.28 G. Sn. Francisco Aguas Panimavida	
	1.29 La Dehesa - DGA	
	1.30 Maitenes Bocatoma - DGA	
	1.31 Las Melosas - DGA	
	1.32 Yerba Loca a.j. Sn. Francisco - DGA	
	1.33 Mapocho Almendros - DGA	
	1.34 Molina a. Sn. Francisco - DGA	
	1.35 Sn. Francisco a.j. Yerba Loca - DGA	
	1.36 Portillo DCP - DGA	
	1.37 Aconcagua Chacabuquito - DGA	
	1.38 Aconcagua Blanco - DGA	
	1.39 Vilcuya - DGA	
	1.40 Riecillos - DGA	
	1.41 Juncal en Juncal - DGA	
	2- FLUVIOMÉTRICAS	2.1 Sn. Francisco cota 2900 - AA
		2.2 Dolores en Vertedero - AA
		2.3 Sn. Francisco p. Marchant - AA
2.4 Plomo en Vertedero - AA		
2.5 Riecillos cota 3000 - AA		
3- QUÍMICA SUPERFICIAL	3.1 Plomo LG a. y b. - DGA	
	3.2 Sn. Francisco b. Plomo - DGA	
	3.3 Sn. Francisco a. y b. Tranque Relaves - DGA	
4- FLUVIOMETRICA. QUÍMICA. METEOROLÓGICAS	4.1 Sn. Francisco a. Yerba Loca - DGA	
	4.2 Yerba Loca a. Sn. Francisco - DGA	
	4.3 Molina a. Sn. Francisco - DGA	
	4.4 Mapocho Almendros - DGA	

### LEYENDA

**1.1 ESTACIONES DIRECCIÓN GENERAL DE AGUAS**

**Tipología**

- 1- Meteorológicas
- 2- Fluviométricas
- 3- Química superficial
- 4- Fluviométrica - Química - Mete

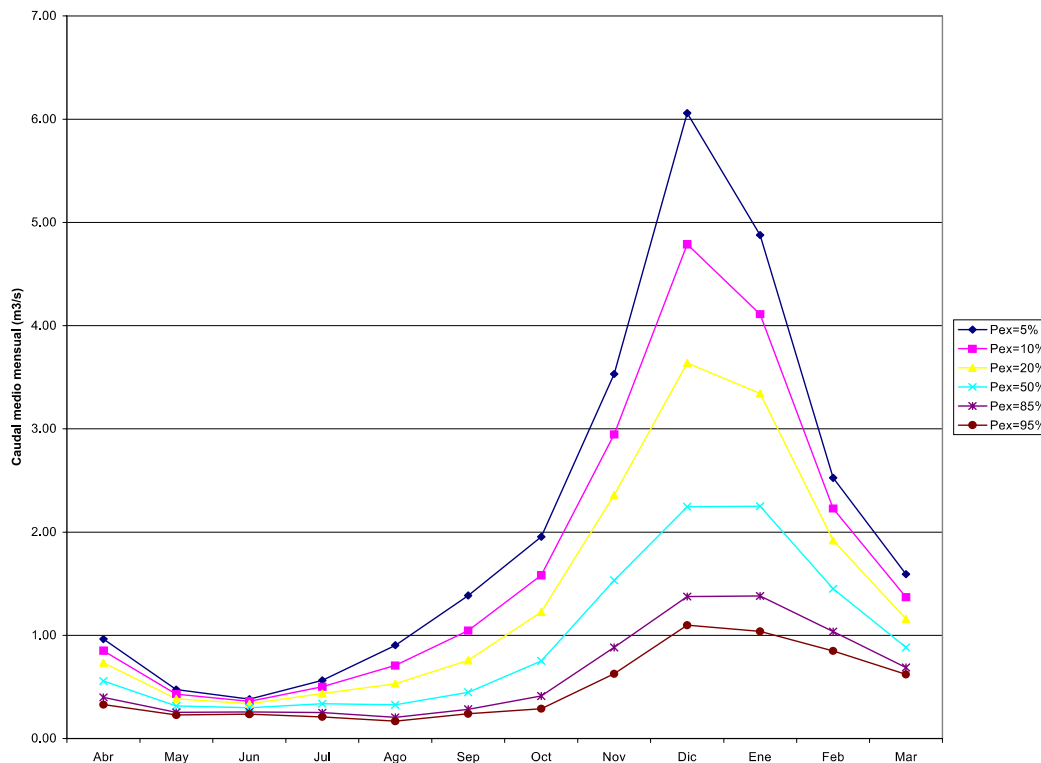
**1.2 HIDROGRAFÍA**

- 1- Río
- - - 2- Arroyo; Estero
- ⋯ 3- Quebrada
- 4- Cauces fuera de area de estudio



**Tabla 4.10: Estación Yerba Loca antes de junta con San Francisco**

Pex (%)	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	Ene	Feb	Mar
5	0.97	0.48	0.38	0.57	0.90	1.39	1.96	3.53	6.06	4.88	2.53	1.59
10	0.85	0.43	0.36	0.50	0.71	1.05	1.58	2.95	4.79	4.11	2.23	1.37
20	0.74	0.39	0.34	0.44	0.53	0.76	1.23	2.36	3.64	3.34	1.92	1.16
50	0.56	0.32	0.30	0.34	0.33	0.45	0.75	1.53	2.25	2.25	1.45	0.88
85	0.40	0.26	0.26	0.25	0.21	0.28	0.41	0.88	1.38	1.38	1.04	0.69
95	0.33	0.23	0.24	0.21	0.17	0.24	0.29	0.63	1.10	1.04	0.85	0.62
Dist	G	G	L2	G	L3	L3	L2	L3	L3	L2	G	L3

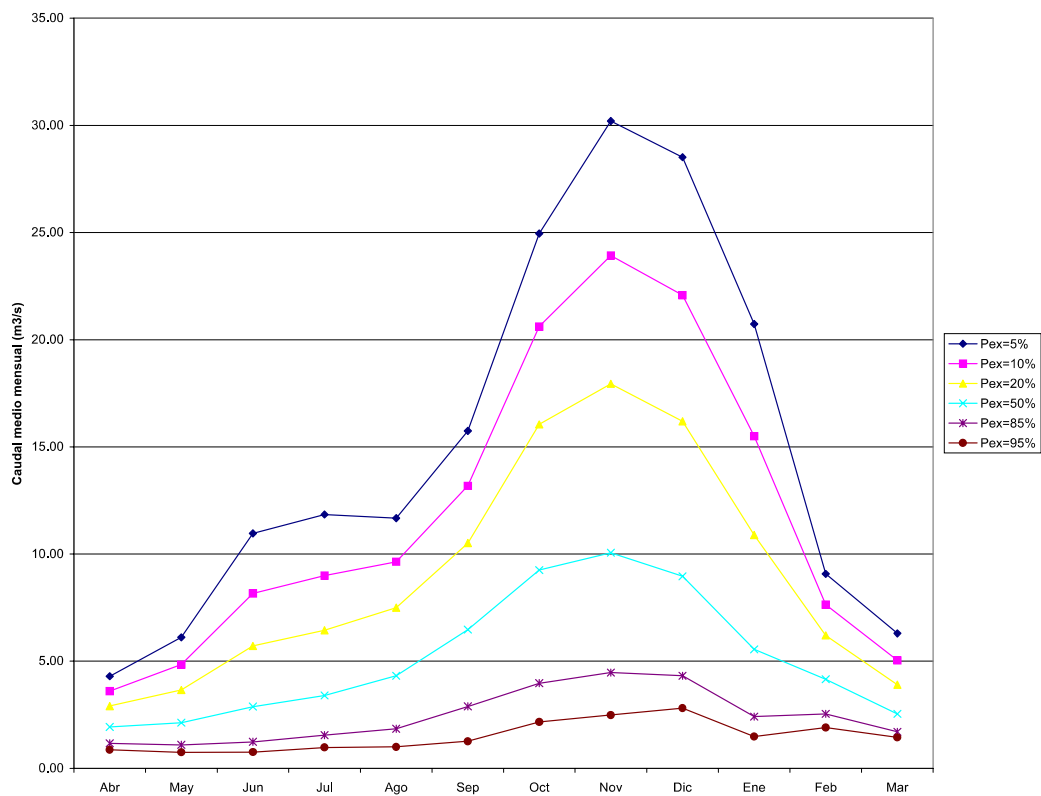


**Figura 4.10: Curva de Variación Estacional en Yerba Loca antes junta San Francisco**



**Tabla 4.11: Estación Mapocho en los Almendros**

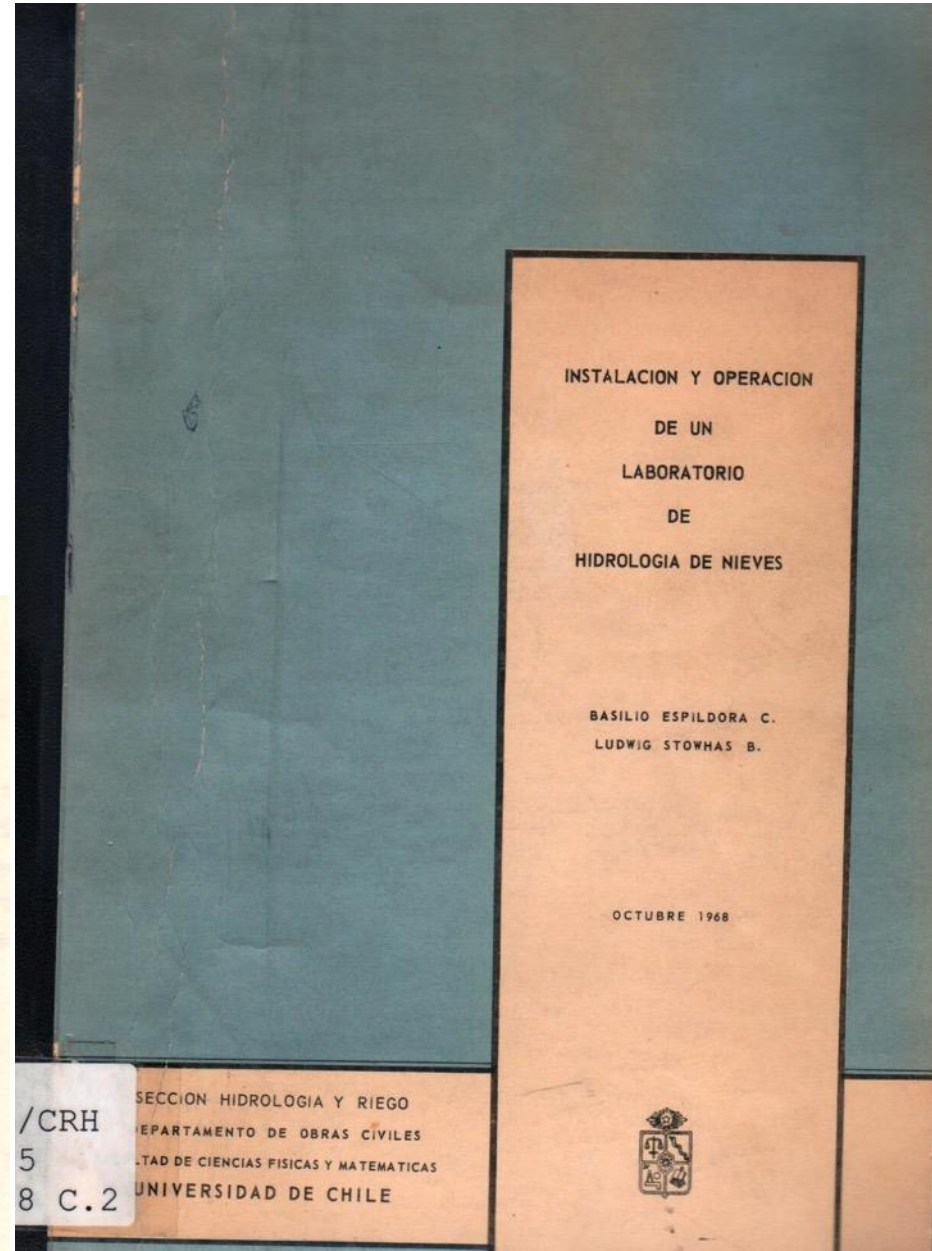
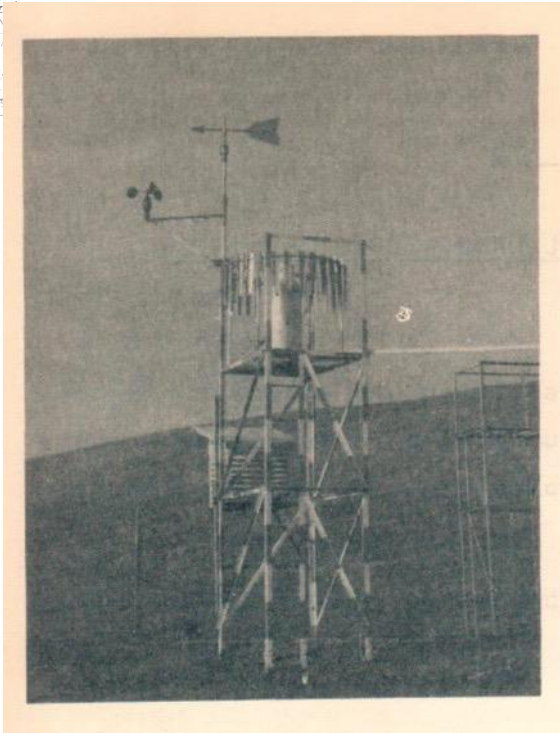
Pex (%)	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	Ene	Feb	Mar
5	4.30	6.11	10.97	11.85	11.67	15.74	24.95	30.20	28.51	20.74	9.08	6.30
10	3.61	4.85	8.17	9.00	9.64	13.18	20.62	23.93	22.08	15.50	7.64	5.04
20	2.91	3.66	5.71	6.44	7.50	10.51	16.05	17.94	16.20	10.89	6.20	3.91
50	1.93	2.14	2.89	3.40	4.32	6.48	9.26	10.06	8.96	5.55	4.16	2.55
85	1.17	1.10	1.24	1.55	1.85	2.89	3.98	4.48	4.32	2.42	2.55	1.71
95	0.87	0.75	0.76	0.98	1.01	1.26	2.17	2.49	2.82	1.49	1.91	1.45
Dist	L2	L2	L2	L2	G2	G	G2	L3	L2	L2	L2	L3



**Figura 4.11: Curva de Variación Estacional en Mapocho en los Almendros**



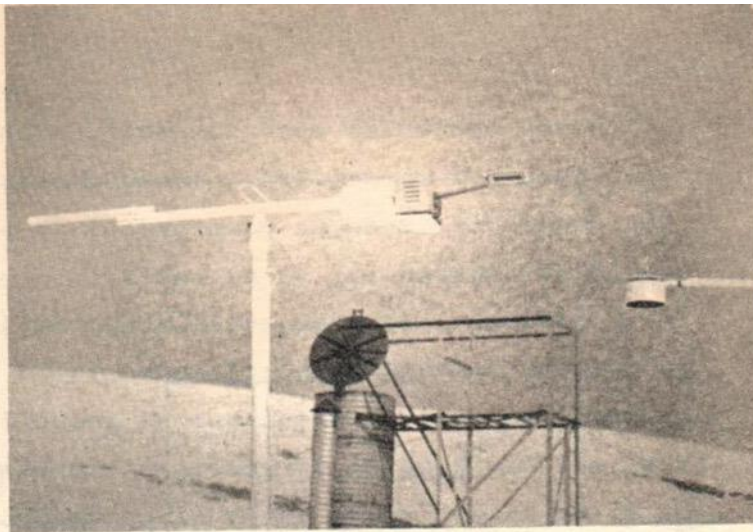
# A Little History





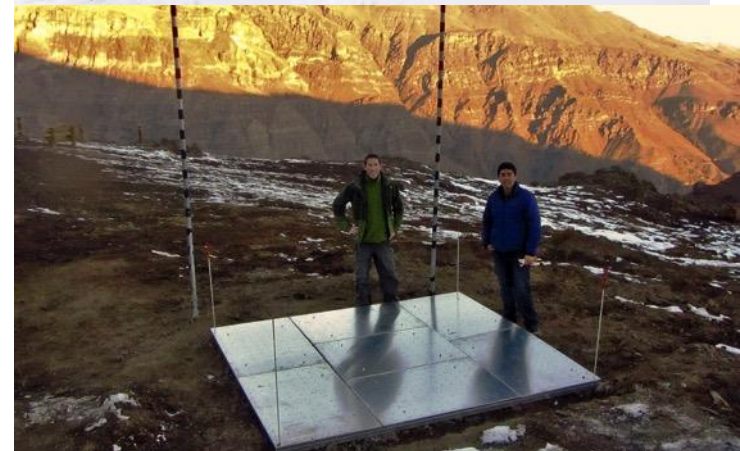
# A Little History... paused in 1970

FOTO Nº 5. - Radiómetro neto Beckman y Whiteley. A la derecha, piranómetros Eppley. Al fondo, chimenea y Torre de acceso.





# Estación Nivométrica Valle Nevado



## Global Cryosphere Watch

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### CryoNet

The GCW surface observation network is comprised of a core component, called **CryoNet**, and contributing stations that are not part of CryoNet. The GCW network builds on existing cryosphere observing programmes and promotes the addition of standardized cryospheric observations to existing facilities in order to create more robust environmental observatories.

*Contributing stations* are those that provide useful measurements of the cryosphere, but whose data records may be shorter or with large gaps, do not completely follow CryoNet measurement practices, or in some other way do not provide the quality and consistency of data required of CryoNet stations. These stations may be in remote, hard to access regions where cryospheric observations are scarce or in regions where they complement other cryospheric measurements. See the pages in the CryoNet menu for more information.

