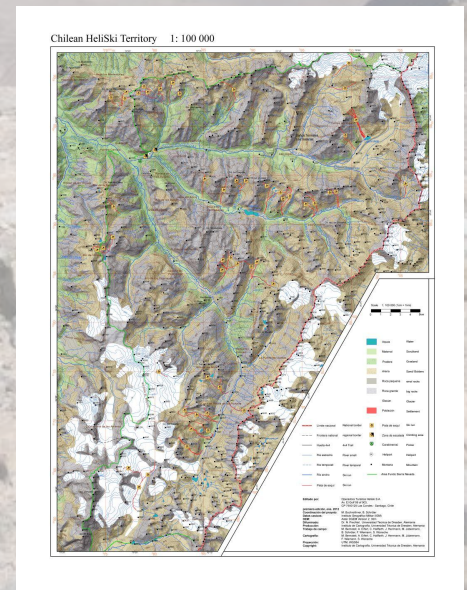


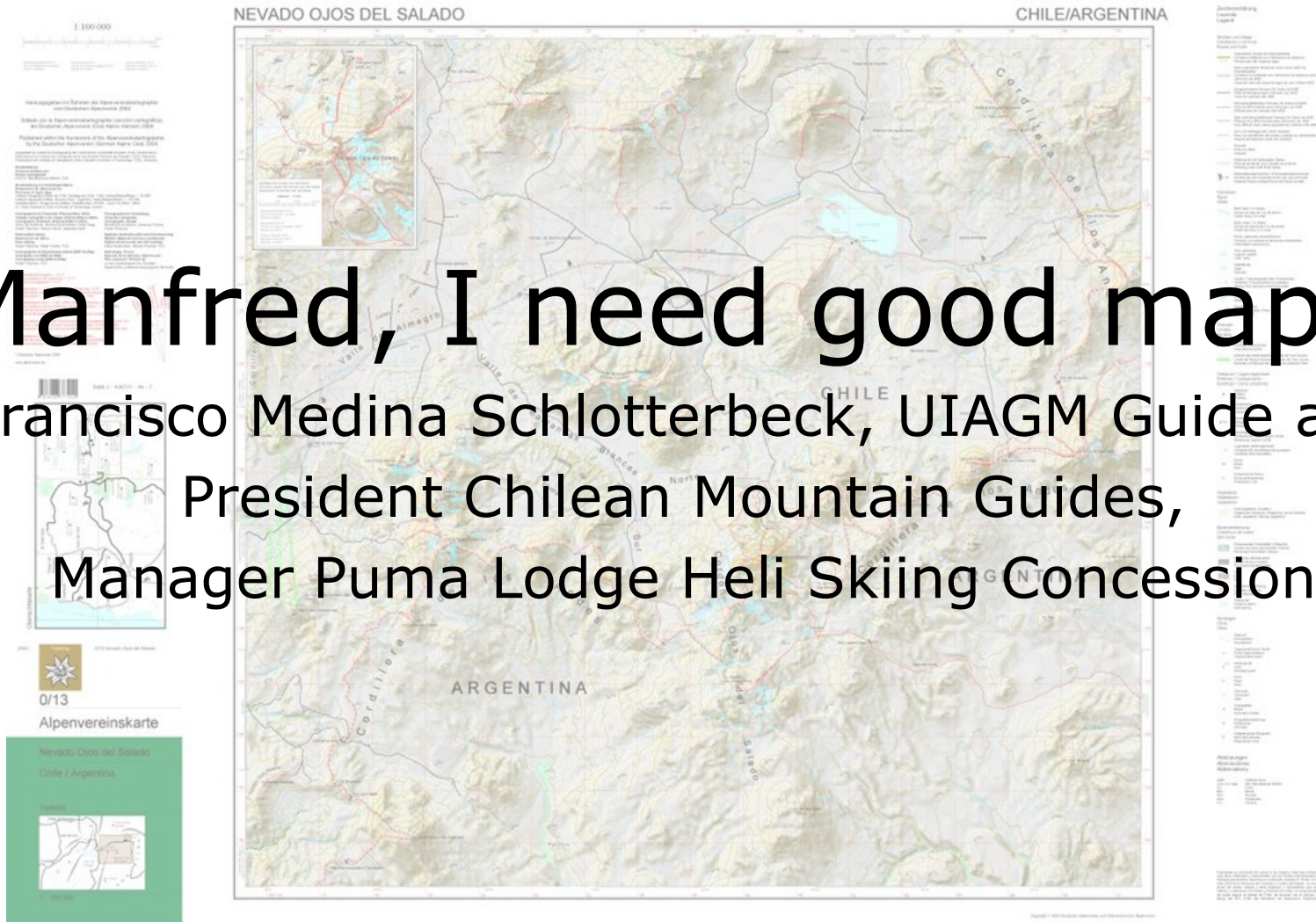
Mapas Andinos – Generation of Cartographic Products for an Andean Helicopter Skiing Region

Benjamin Schröter &
Manfred F. Buchroithner
Institut für Kartographie – TU Dresden



„Manfred, I need good maps!“

Francisco Medina Schlotterbeck, UIAGM Guide and
President Chilean Mountain Guides,
Manager Puma Lodge Heli Skiing Concession





Puma Lodge and Chilean Heli Ski







Timeline

March 2010: „We need good maps!“

April 2011: Students informed about projekt possibilities

November 2011: M. Buchroithner inspects mapping region

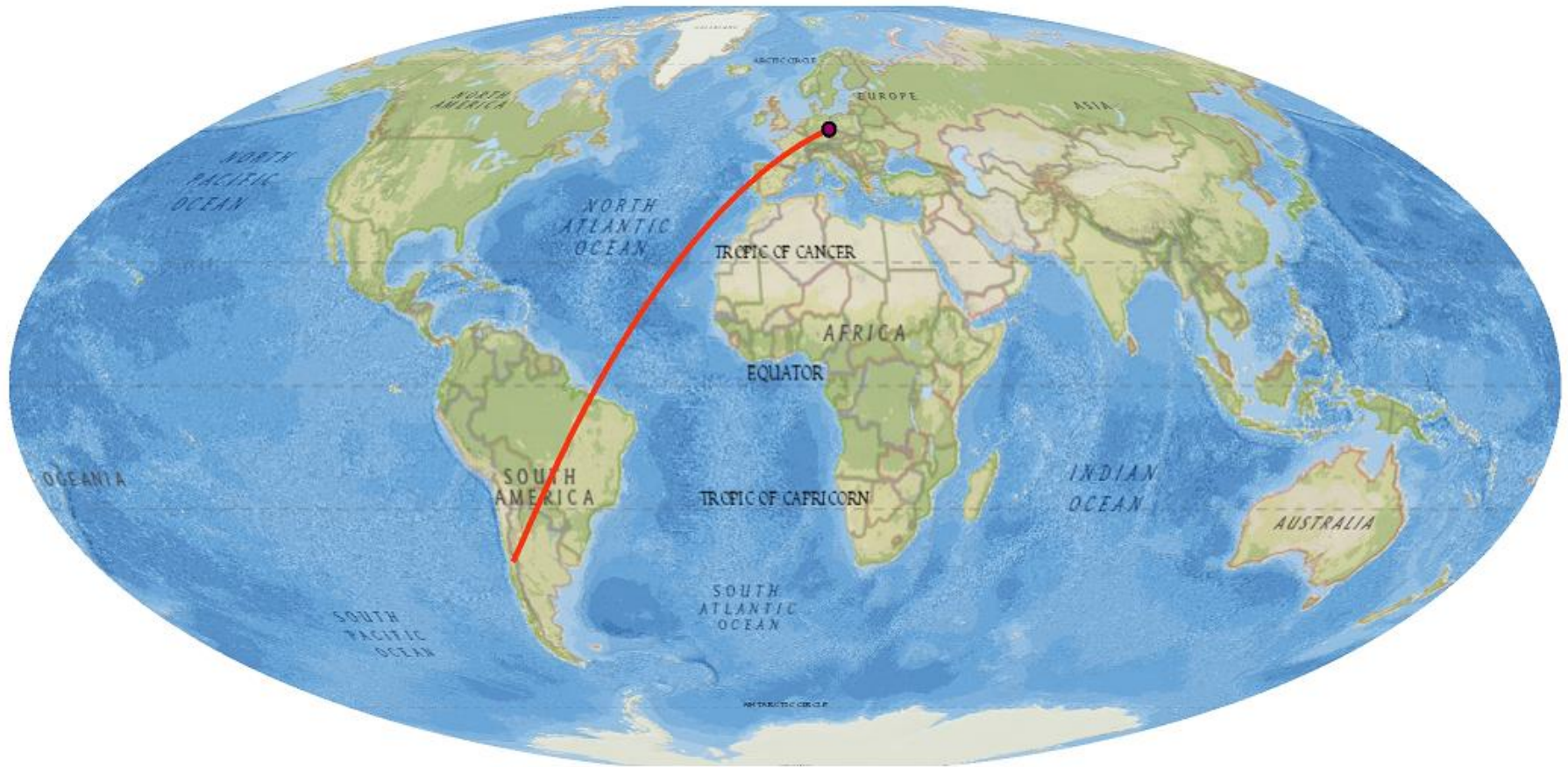
01.03.2012: Flight of mapping team to Chile

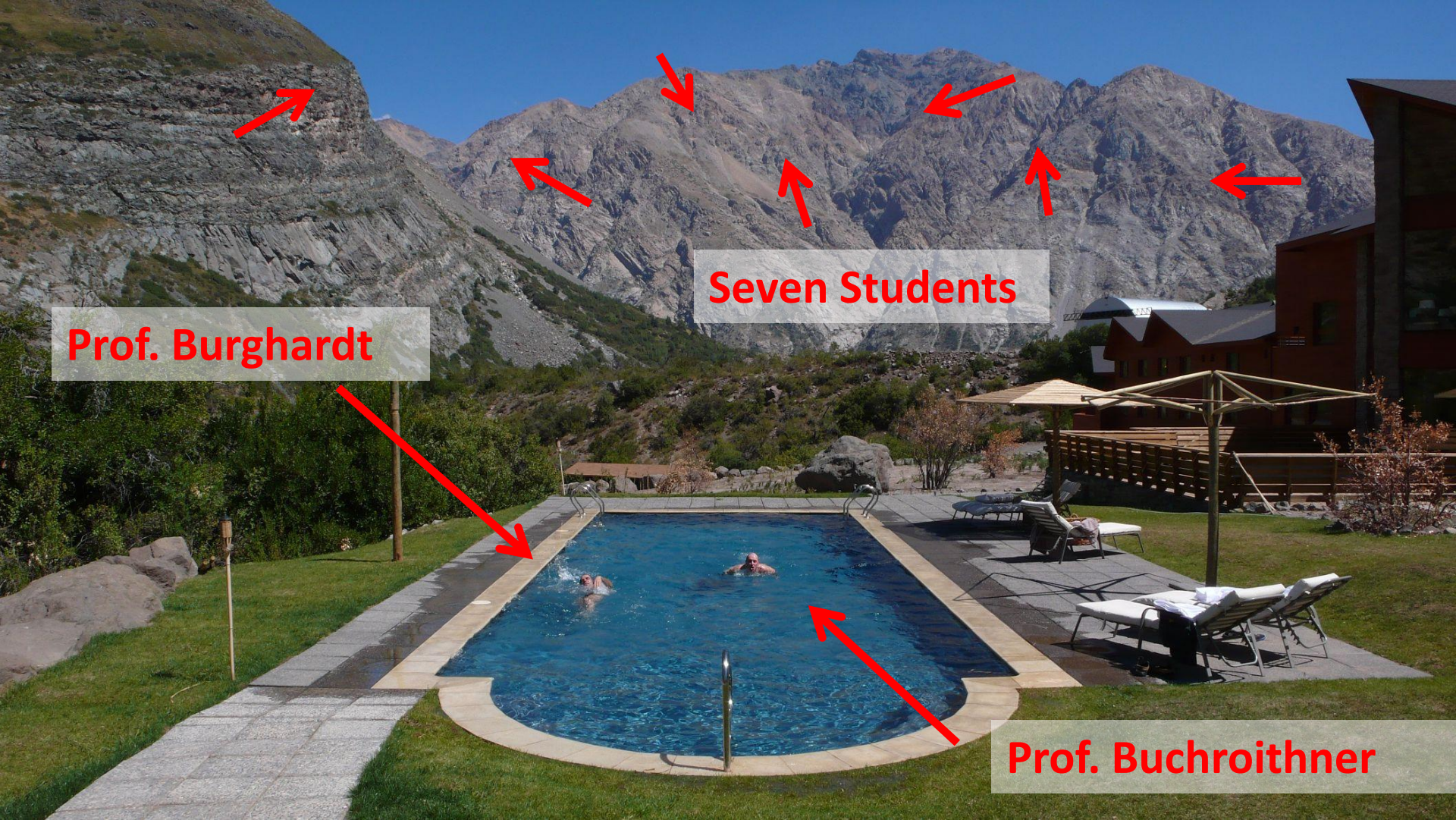
07.04.2012: Finalisation of field-mapping activities

As from June 2012: Delivery of final map products

Generation of a comprehensive map package

- Topographic overview maps (1:50,000; 1:100,000) with all off-pist ski runs
- Topographic detailed maps 1:20,000
- Hiking sketch map of Puma Lodge surroundings
- Access map Santiago/Chile Airport – Puma Lodge
- Risk maps of the individual off-pist ski runs
- 360° outlook panorama





Prof. Burghardt

Seven Students

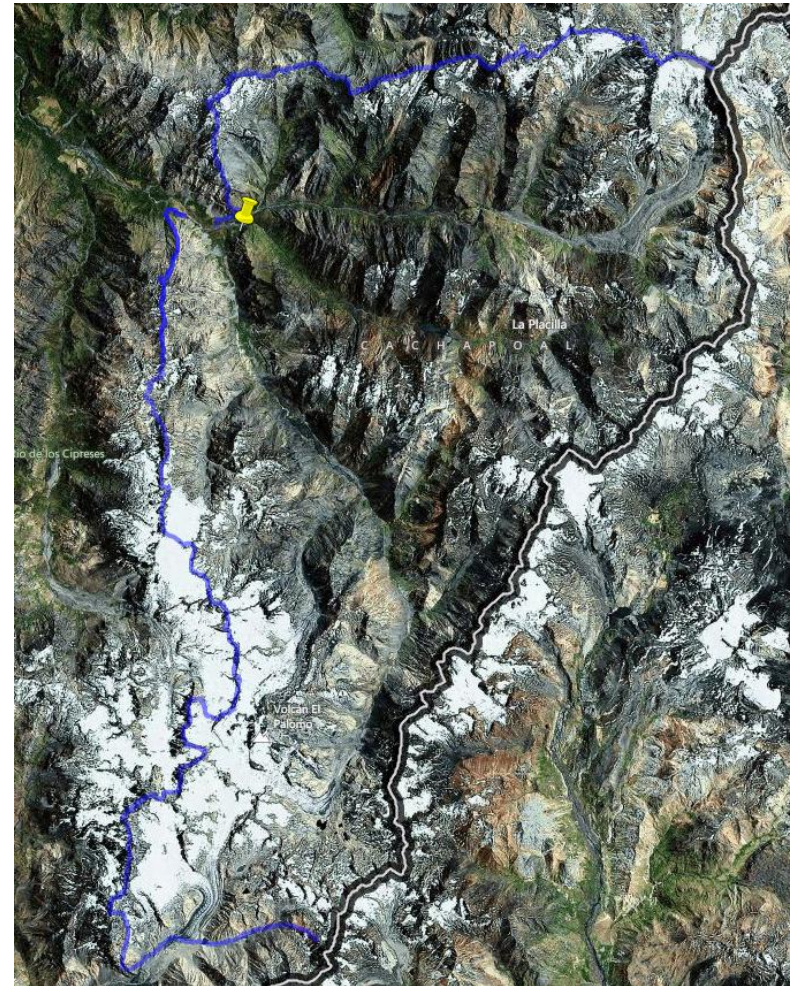
Prof. Buchroithner

1 univ. assistant (also immediately in pool)



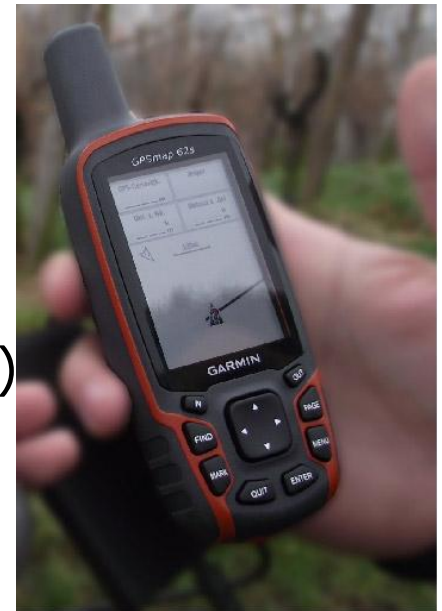
- Mapping region located in central part of the Chilean Andes (size approx. 5,000 km²)
- Deeply incised valleys and peaks (1,300 – more than 5,000 m)

→ Ideal region for deep-snow skiing

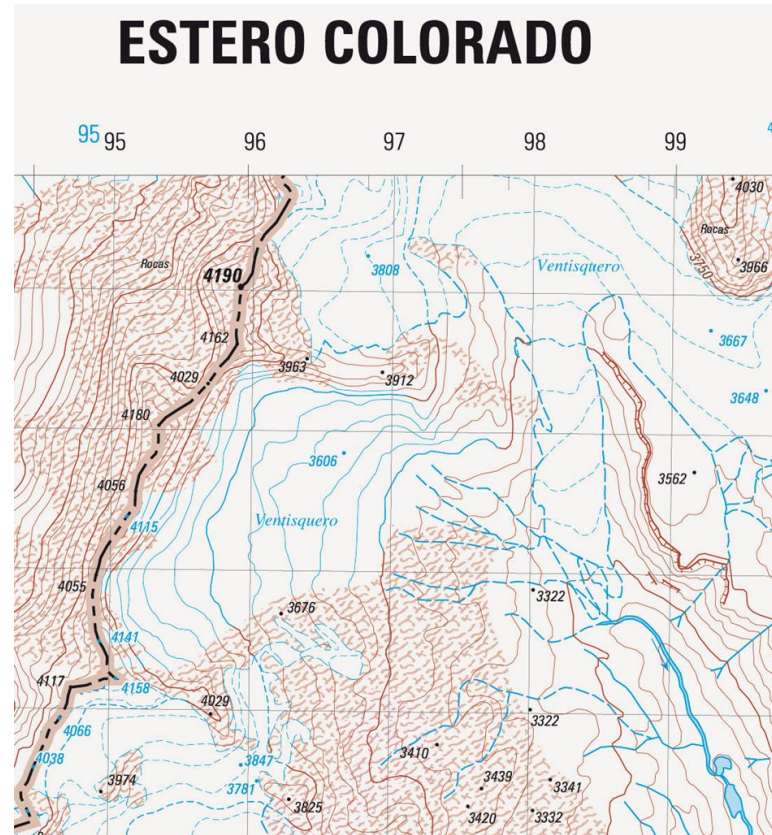
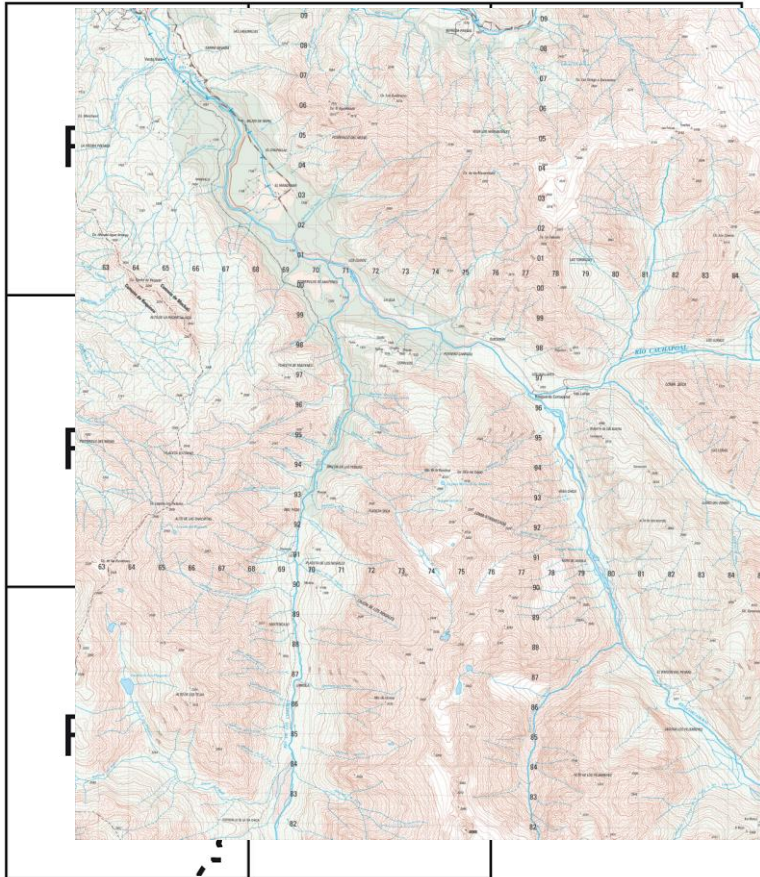


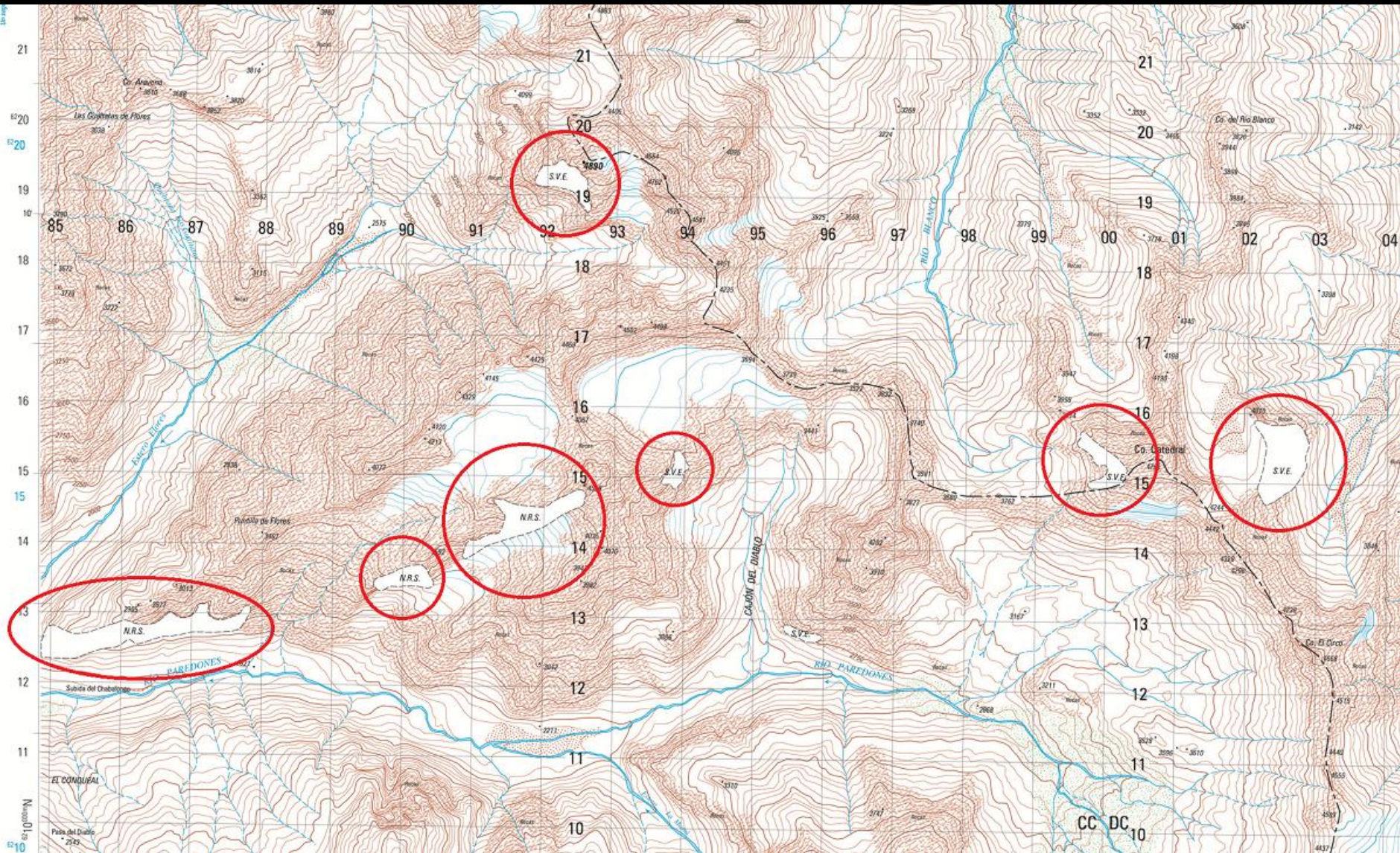
Input data and preparatory work at TU Dresden

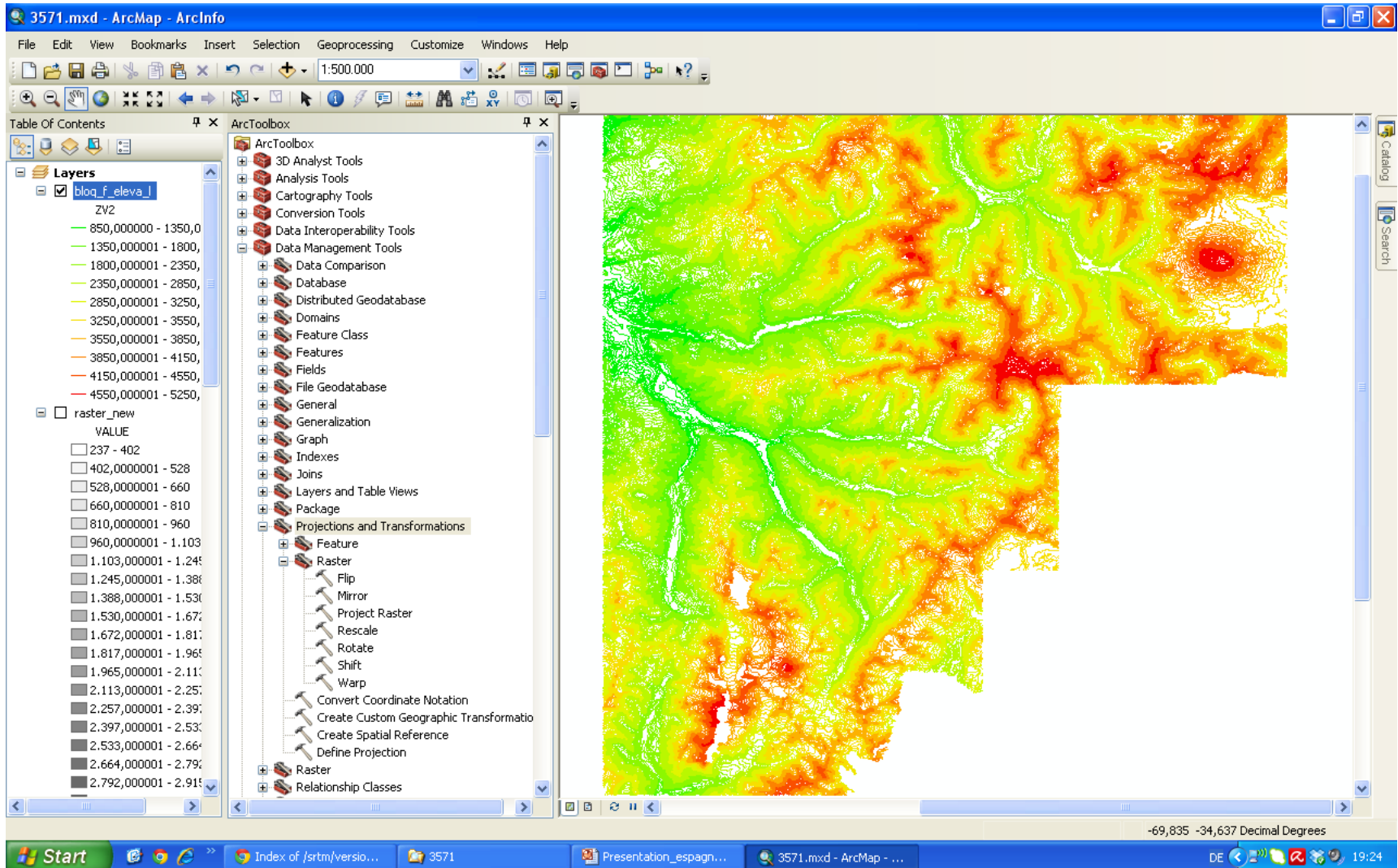
- Topographic maps of IGM
- Digital geodata of IGM
- Satellite imagery (Landsat, BING, GoogleEarth)
- Digital terrain models (Aster, SRTM)
- GPS data / fieldbook

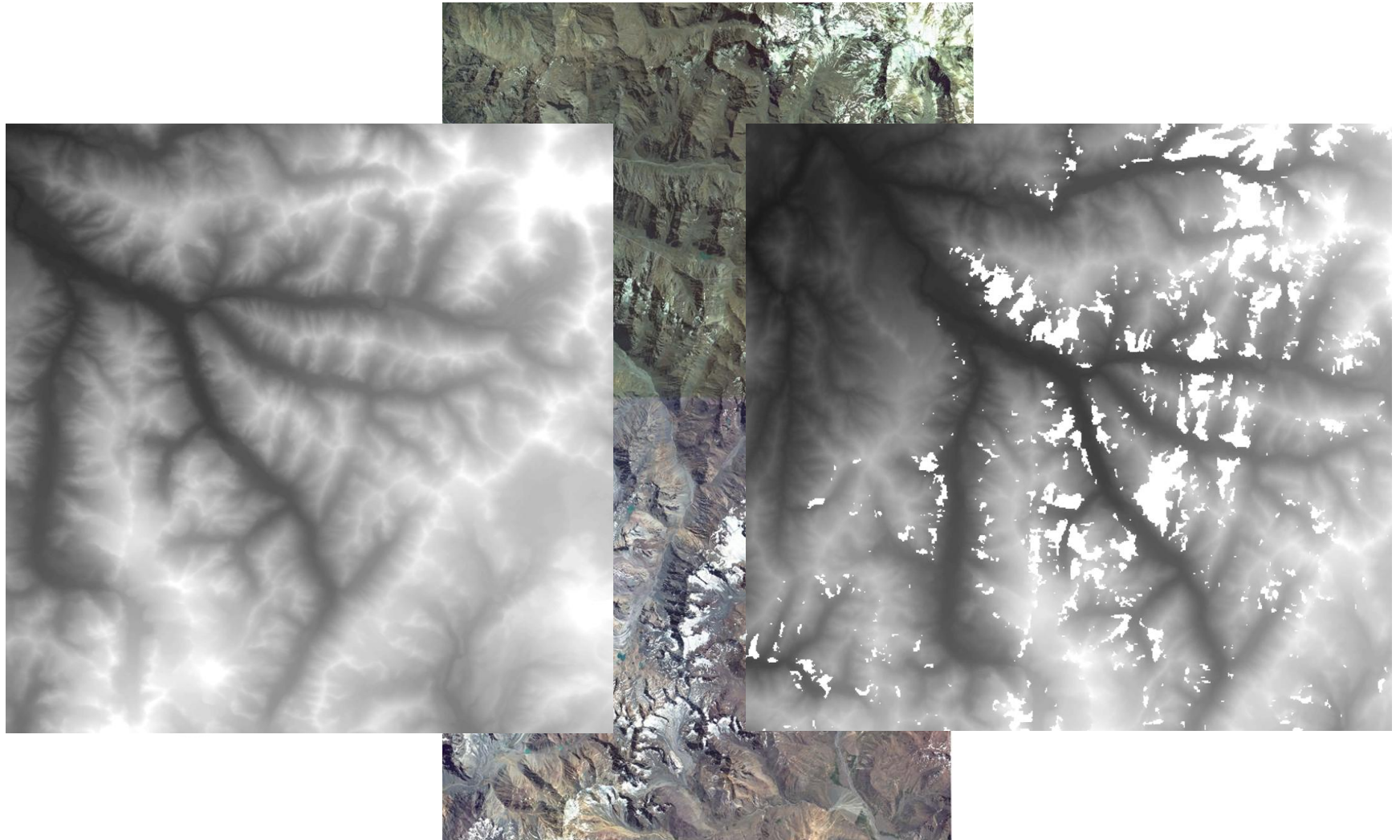


→ **FIELDWORK**







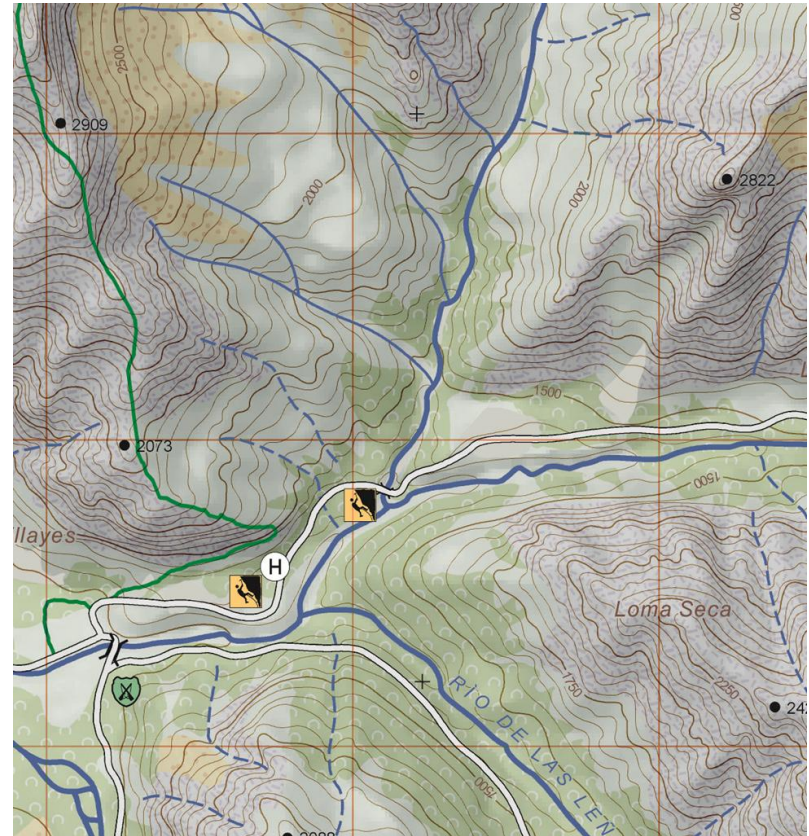




Generation of topographic maps

Synthesis of the individual information layers like

- Trail network (GPS, satellite imagery)
- Hydro network (permanent / perennial)
- Various boundaries
- Surface cover (fieldwork, satellite imagery)
- Tourism information
- etc.



Airport / Aeropuerto

↓
Interstate / Ruta
Amando Corlinez



↓ km 2,0

Interstate / Ruta
Vespucio North Express



↓ km 15
Exit 30 / Salida 30

Interstate / Ruta



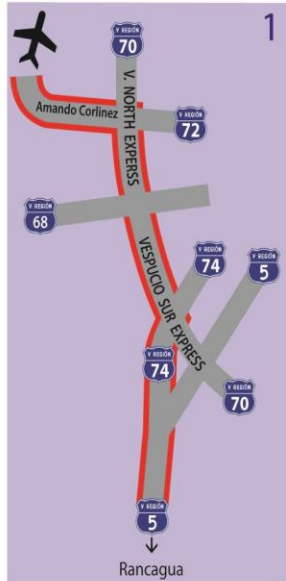
↓ km 18
Direction / Direccion „Al Sur“

Interstate / Ruta



↓ km 64
Tollgate / Peaje

Rancagua → [map 2](#)



Santiago



↓ km 76

First exit / Primera salida
„Rancagua, Graneros, Codegua“

Autopista Panamericana



↓ km 78

Tollgate / Peaje

↓ km 86

Exit / Salida
„Termas de Cauquenes“



U-turn / Retorno
„Av. Capitan Ramon Freire“

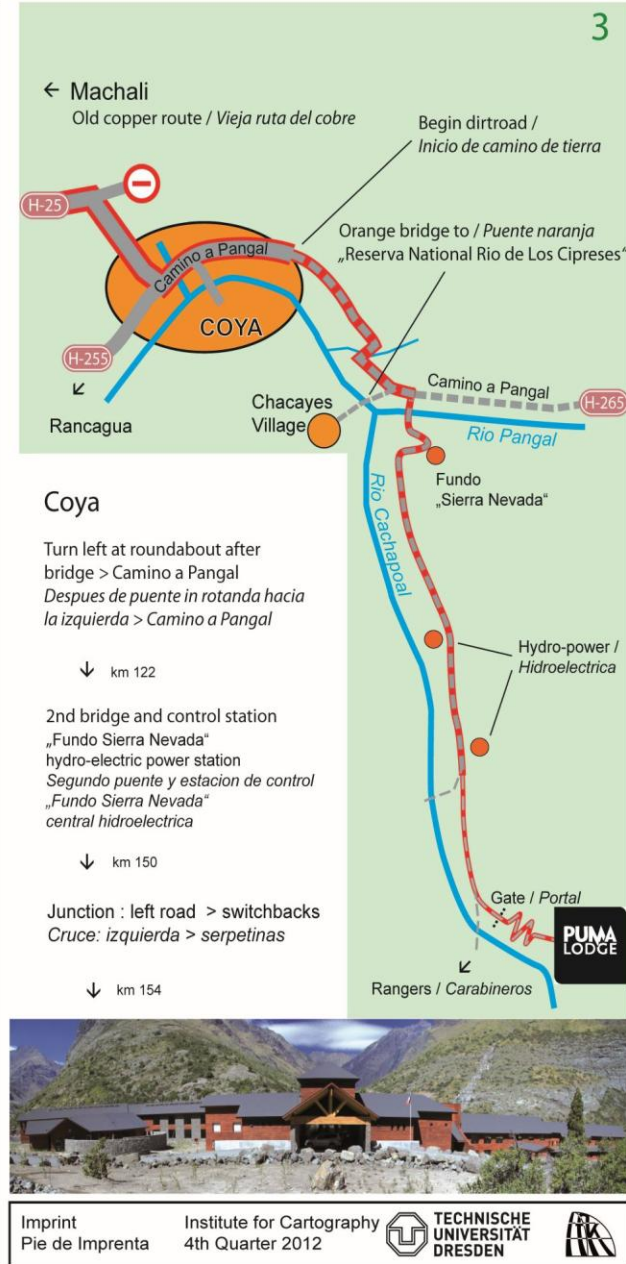
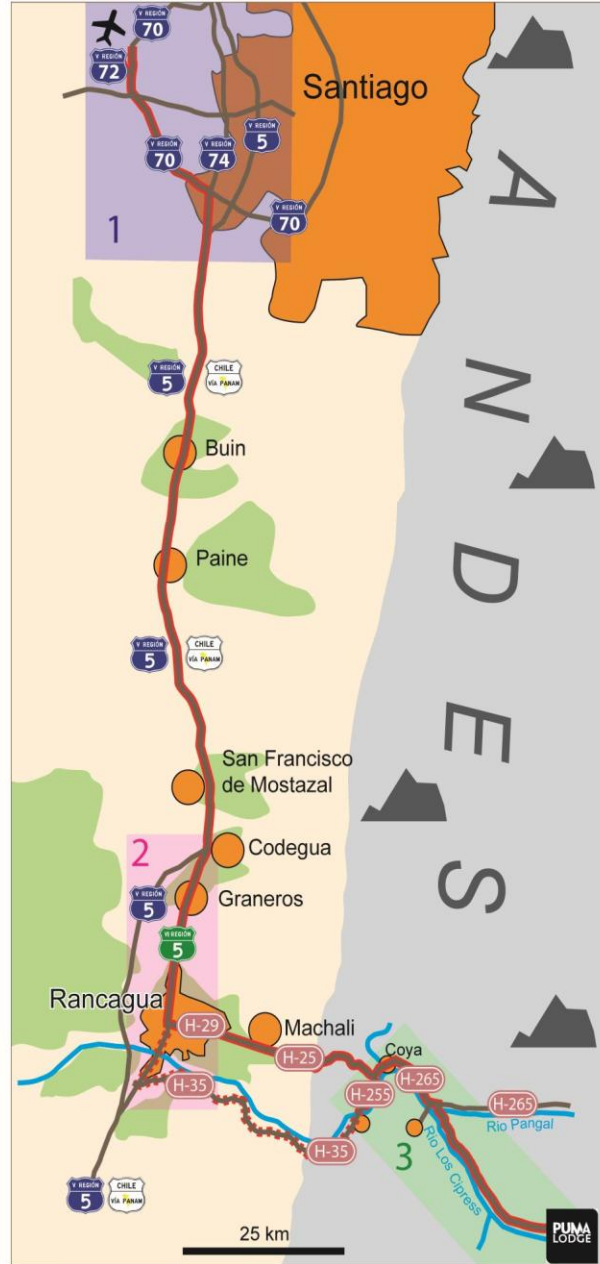
Direction / Direccion
„C. El Cobre“

↓ km 116

Machali, Coya → [map 3](#)



Ruta alternativa
C. de Term. de Cauquenes → Coya

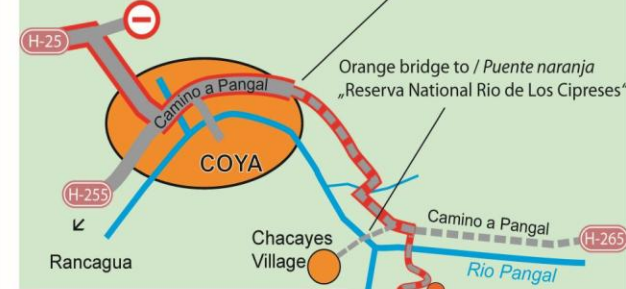


← Machali

Old copper route / *Vieja ruta del cobre*

Begin dirtroad / *Inicio de camino de tierra*

Orange bridge to / *Puente naranja*
„Reserva National Rio de Los Cipreses“



Coya

Turn left at roundabout after bridge > Camino a Pangal
Despues de puente in rotanda hacia la izquierda > Camino a Pangal

↓ km 122

2nd bridge and control station
„Fundo Sierra Nevada“
hydro-electric power station
Segundo puente y estacion de control „Fundo Sierra Nevada“ central hidroelectrica

↓ km 150

Junction : left road > switchbacks
Cruce: izquierda > serpetinas

↓ km 154



70°18'30"W

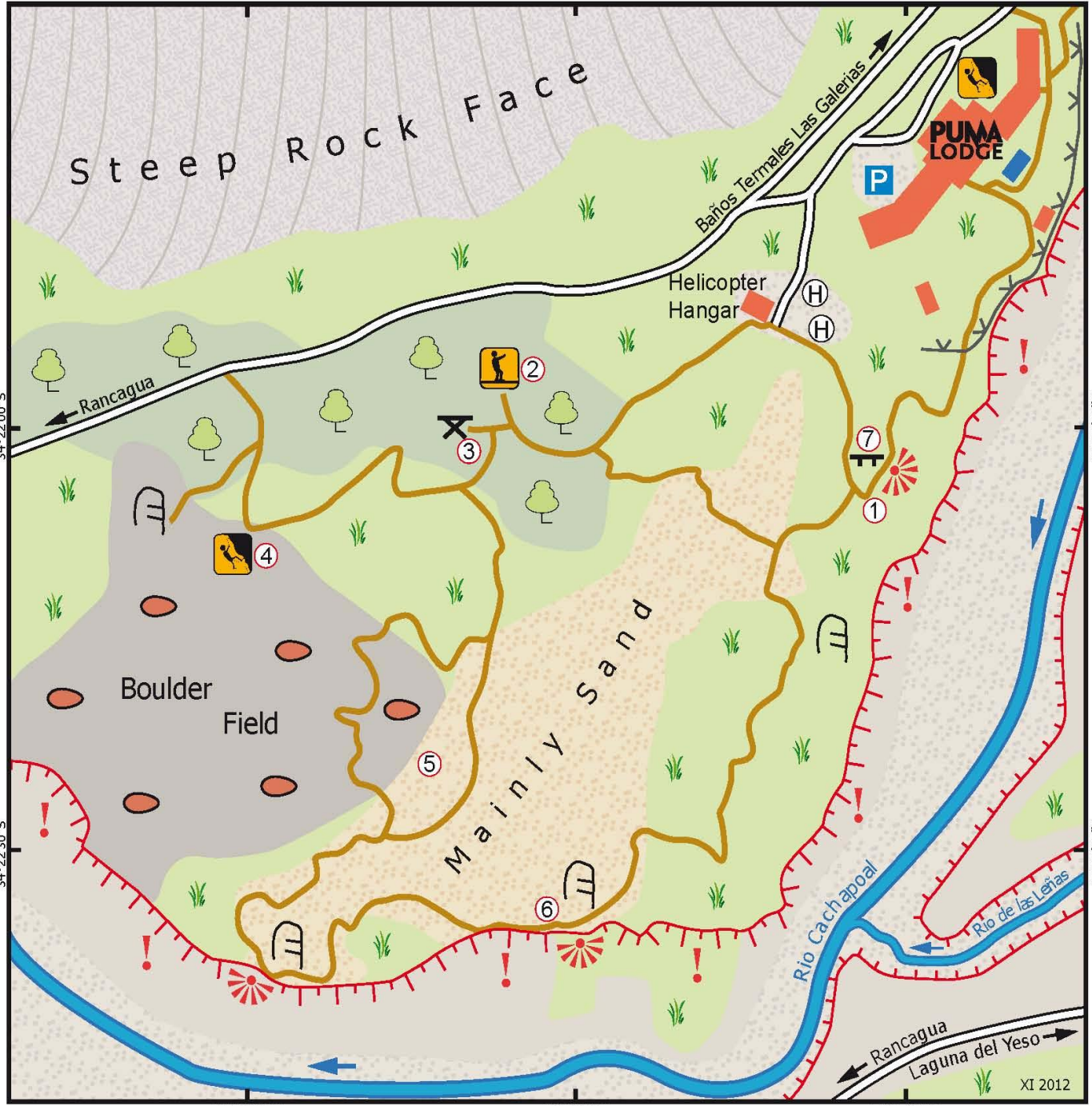
70°18'00"W

70°17'30"W

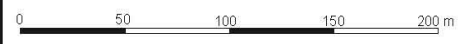
Campo de los Condores

PUMA LODGE

by Noi hotels



- Unpaved Road
- Path
- Fence
- Escarpment Edge
- Danger - Steep Slope
- Scenic Outlook
- Climbing Area
- Slackline
- Prominent Single Boulder
- Helipad
- Picnic Table
- Rest Bench
- Parking Area



TECHNISCHE UNIVERSITÄT DRESDEN



XI 2012

70°18'30"W

70°18'00"W

70°17'30"W

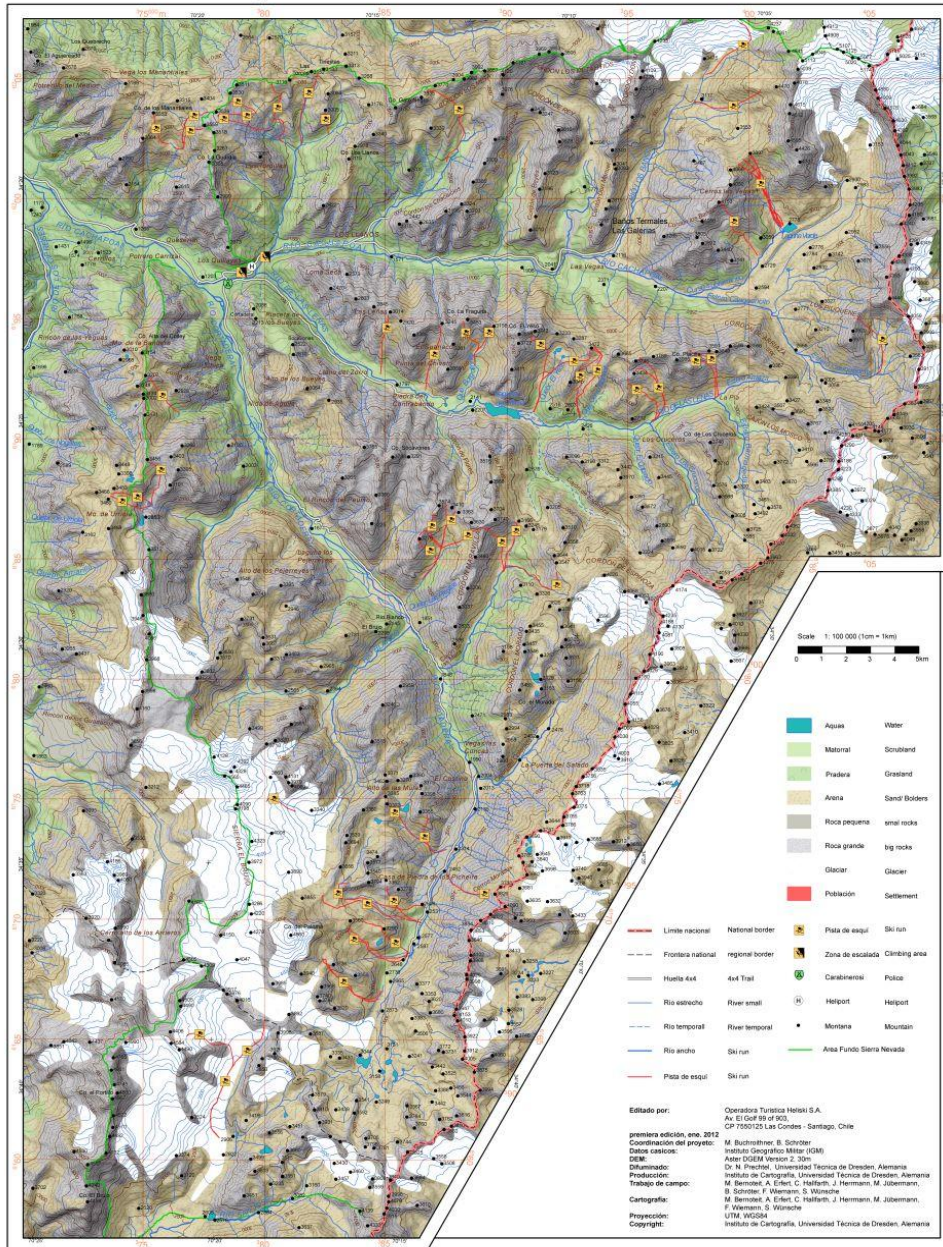
34°22'00"S

34°22'00"S

34°22'30"S

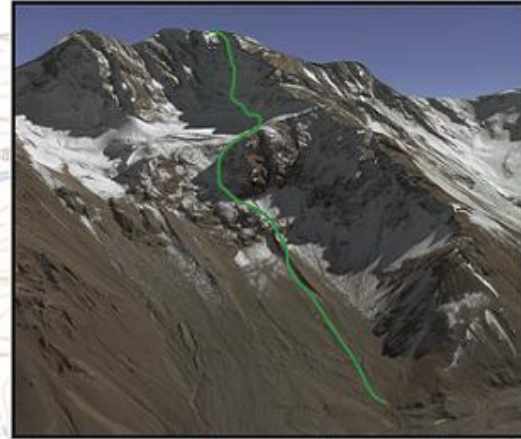
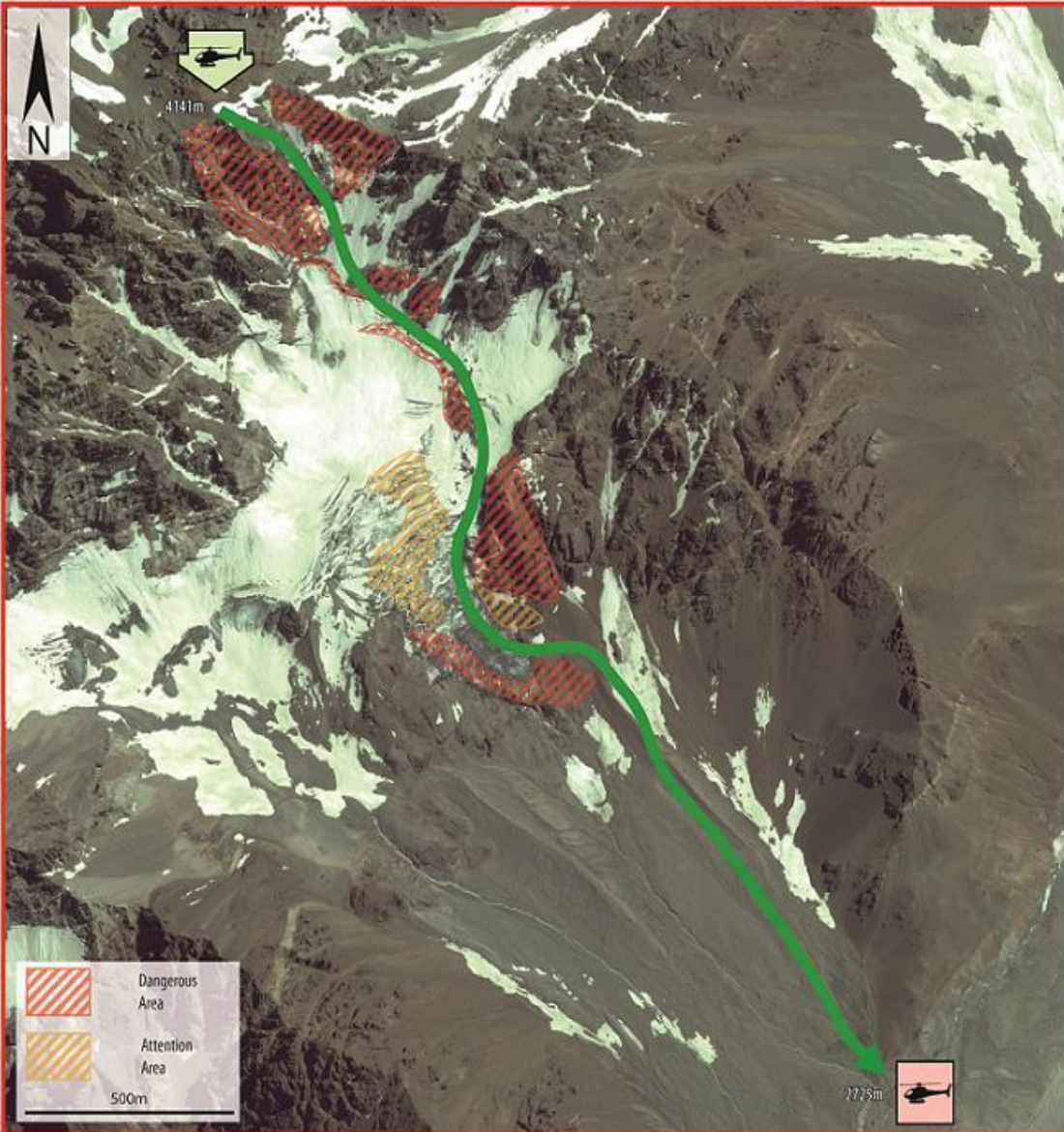
34°22'30"S

Chilean HeliSki Territory 1: 100 000





Skirun Magic Mushrooms

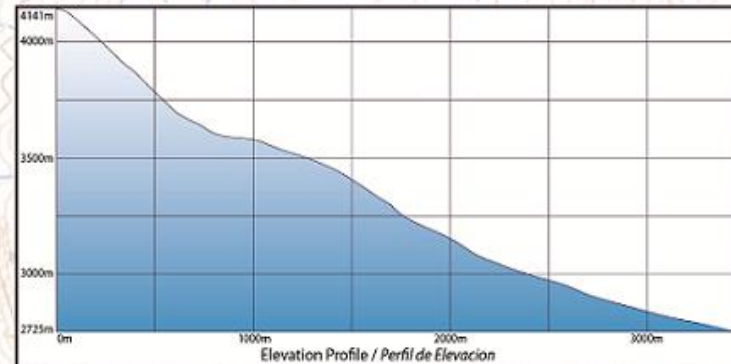


Start: 4141m
S 34°20'16.21"
W 70°06'03.78"

Finish: 2725m
S 34°21'28.94"
W 70°05'00.51"

Technical Data / Los Datos Tecnicos:

Range of Run / Distancia:	3,42 km
Elevation / Elevacion:	1416 m
Max. Slope / Inclinacion max.:	81 %
Avg. Slope / Inclinacion prom.:	42 %







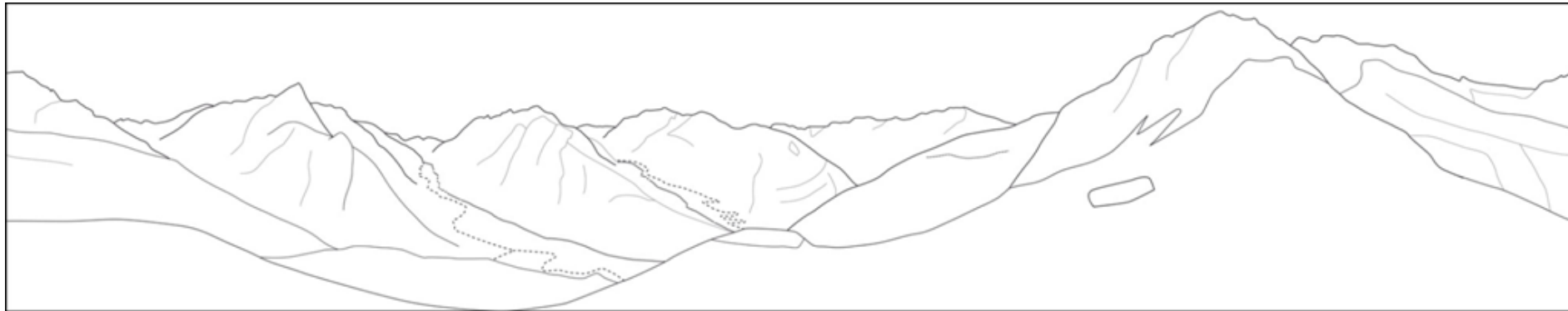
360° panorama for the Mirador Las Orchidias

- Generation of annular panorama



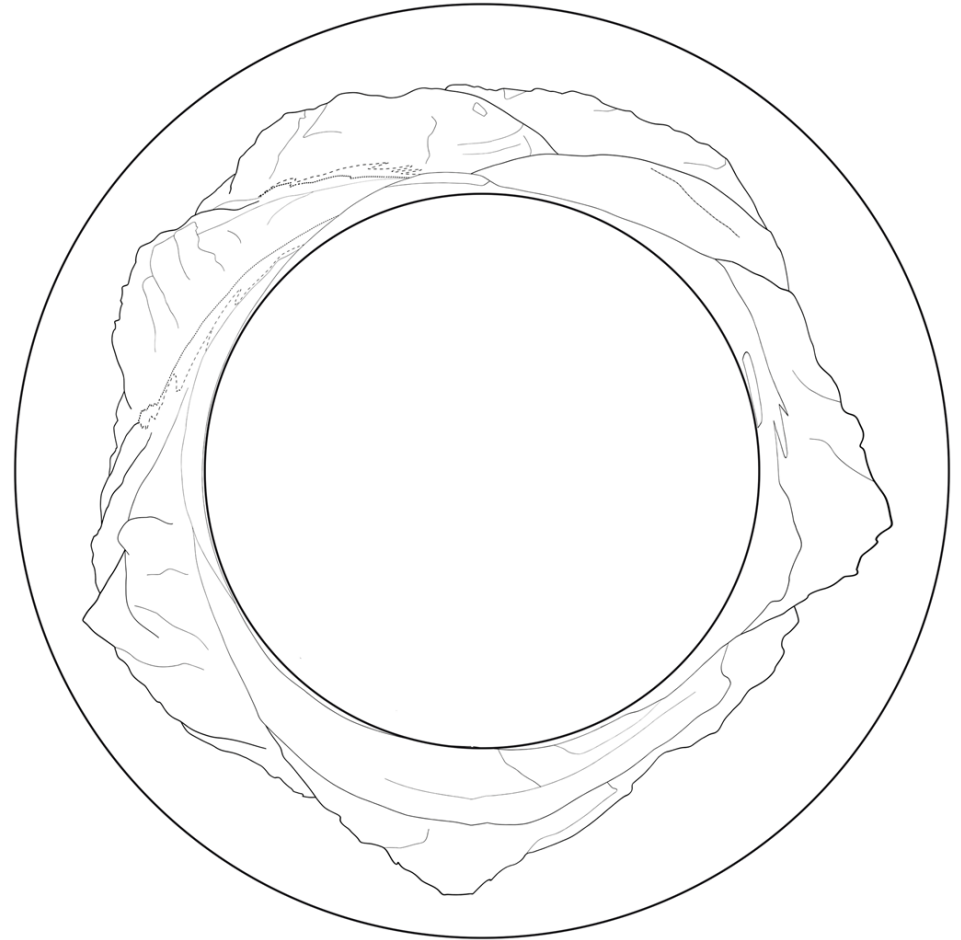
360° panorama for the Mirador Las Orchidias

- Generation of contour lines



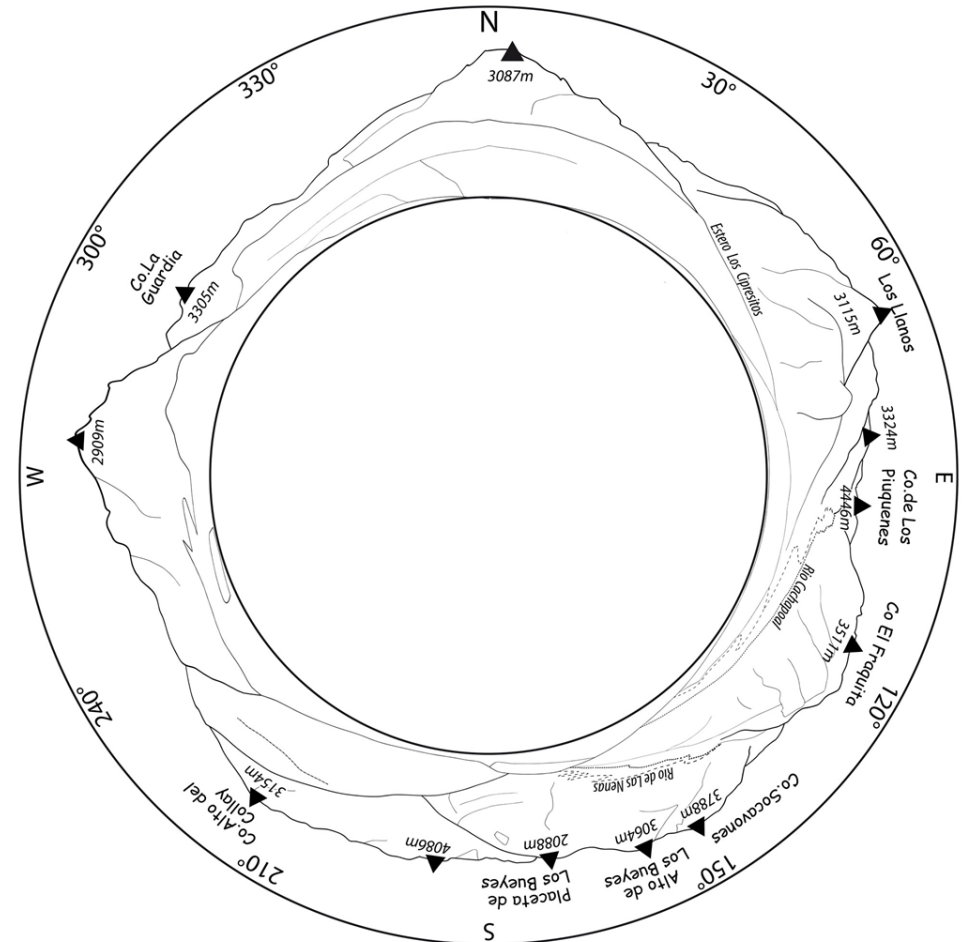
360° panorama for the Mirador Las Orchidias

- Generation of annular panorama



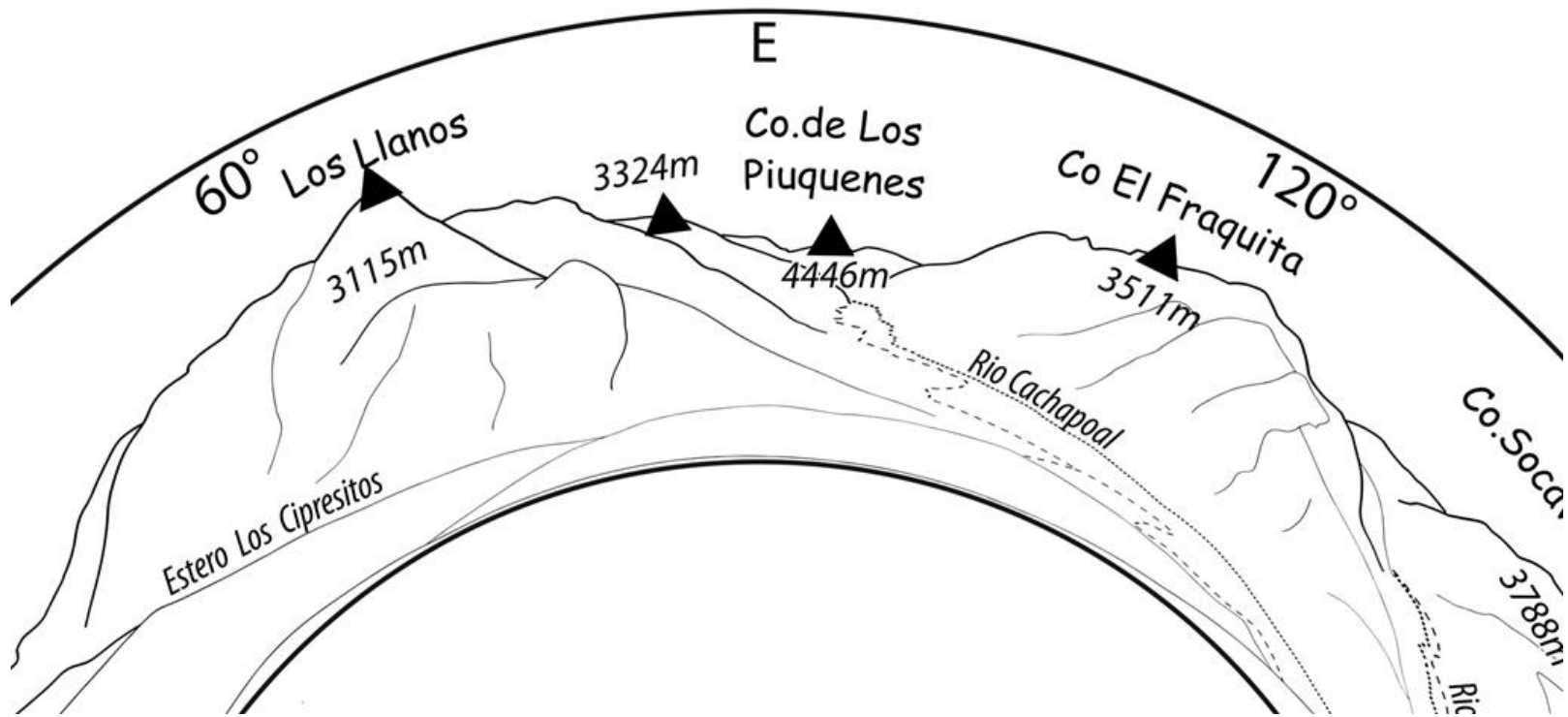
360° panorama for the Mirador Las Orchidias

- Labelling and collateral infos



360° panorama for the Mirador Las Orchidias

- Labelling and collateral infos















Cereal: 4 kg chocolate cereal
4 kg fruit cereal

Milk powder: 4kg
Milo powder: 4kg

Cereal bars: 200 bars with different!!! flavours
Fruit bars: 200 bars with different!!! flavours
Bars: 50 Snickers, Kit Kat, Mars

Cookies: 5 kg different!!! flavours
Waffers: 3 kg different!!! flavours
Nuts: 2 kg salted peanuts
1 kg walnuts

Crackers: 3 kg potato chips, salt sticks
Dried fruits: 3 kg of different kinds

Fruits: 10 kg apples, 3 kg bananas:
Noodles, rice: 70 portions of different flavours
Couscous: 4 kg
Mashed potatoes instant powder: 4 kg

Onions: 1kg
Garlic: 1 clove of garlic



























































Thank you very much for your attention!