

Metamorphic structure of the Alps

Scale 1:1.000.000

Commission for the Geological Map of the World/Commission de la Carte Géologique Mondial

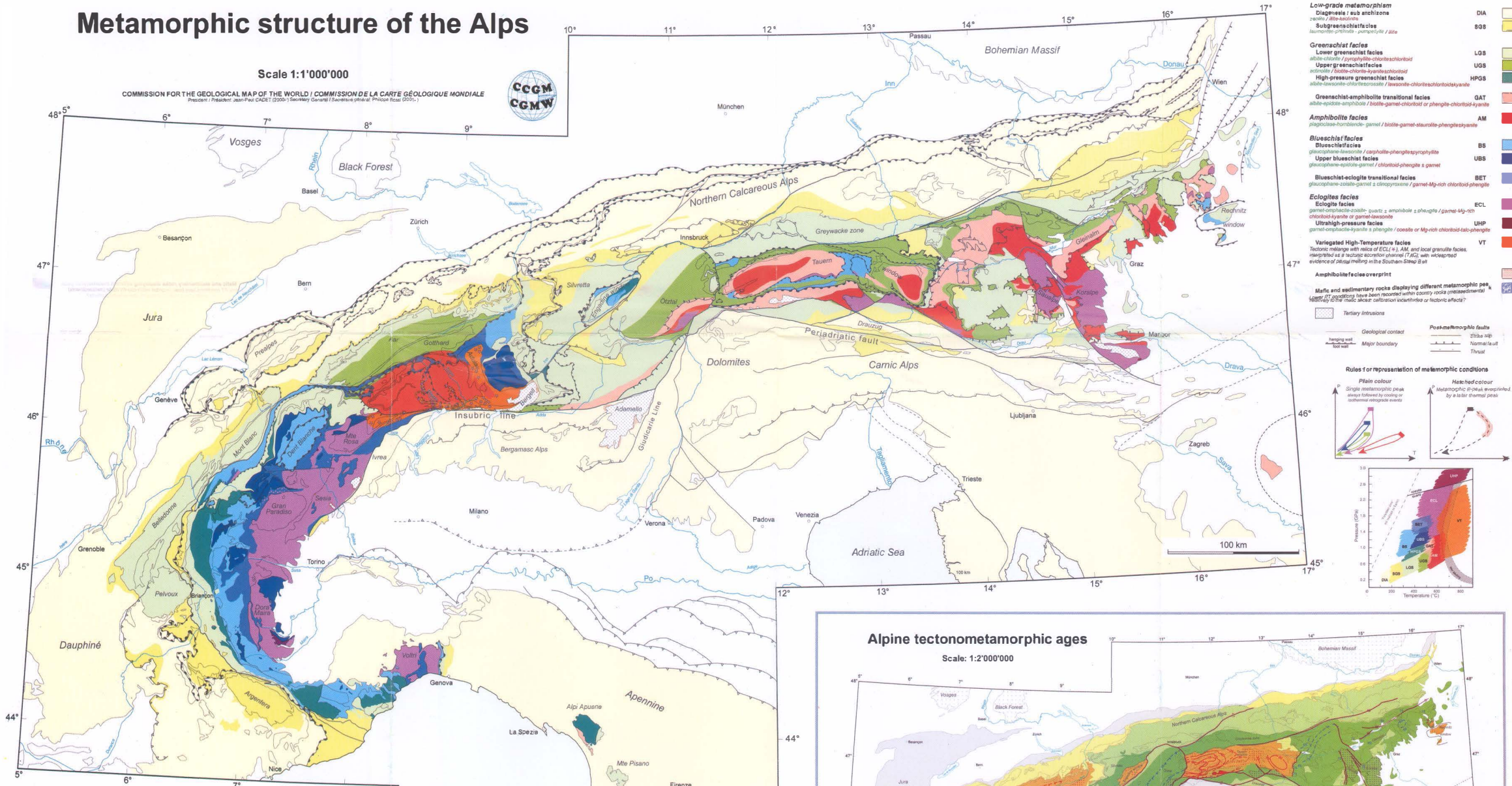
Edited by Roland Oberhänsli (Coordinator, Universität Potsdam), Romain Bousquet (Universität Basel), Martin Engi (Universität Bern), Bruno Goffé (ENS Paris-CNRS), Guido Gosso (Università di Milano), Mark Handy (Freie Universität Berlin), Volker Höck (Universität Salzburg), Friedrich Koller (Universität Wien), Jean-Marc Lardeaux (Université de Nice), Riccardo Polino (IGG-CNR Torino), Philippe Rossi (BRGM, Paris), Ralf Schuster (Geologische Bundesanstalt Wien), Stéphane Schwartz (Université de Grenoble), Iole Spalla (Università di Milano)

Advisory board R. Caby (Université de Montpellier), Ch. Chopin (ENS Paris-CNRS), R. Compagnoni (Università di Torino), G. V. Dal Piaz (Università di Padova), R. Ferreira Mählmann (Technische Universität Darmstadt), Ch. Miller (Universität Innsbruck), St. Schmid (Universität Basel)

with contributions from Ph. Agard (Université Paris VI), J. Babist (Freie Universität Berlin), A. Berger (Universität Bern), R.J. Bertle (Universität Vienna), St. Bucher (Universität Basel), T. Burri (Universität Bern), P. Heitzmann (BWG Bern), G. Hoinkes (Universität Graz), L. Jolivet (Université Paris VI), L. Keller (Universität Basel), M. Linner (Geologische Bundesanstalt Wien), B. Lombardo (IGG-CNR Torino), G. Martinotti (Università di Torino), A. Michard (ENS Paris), G. Pestal (Geologische Bundesanstalt Wien), A. Proyer (Universität Graz), G. Rantisch (Universität Leoben), C. Rosenberg (Freie Universität Berlin), J.M. Schramm (Universität Salzburg), H. Soelva (Universität Wien), M. Thoeni (Universität Wien), M. Zucali (Università di Milano)

Computer graphics: R. Bousquet, J. Tensi, M. Grundmann

Metamorphic structure of the Alps



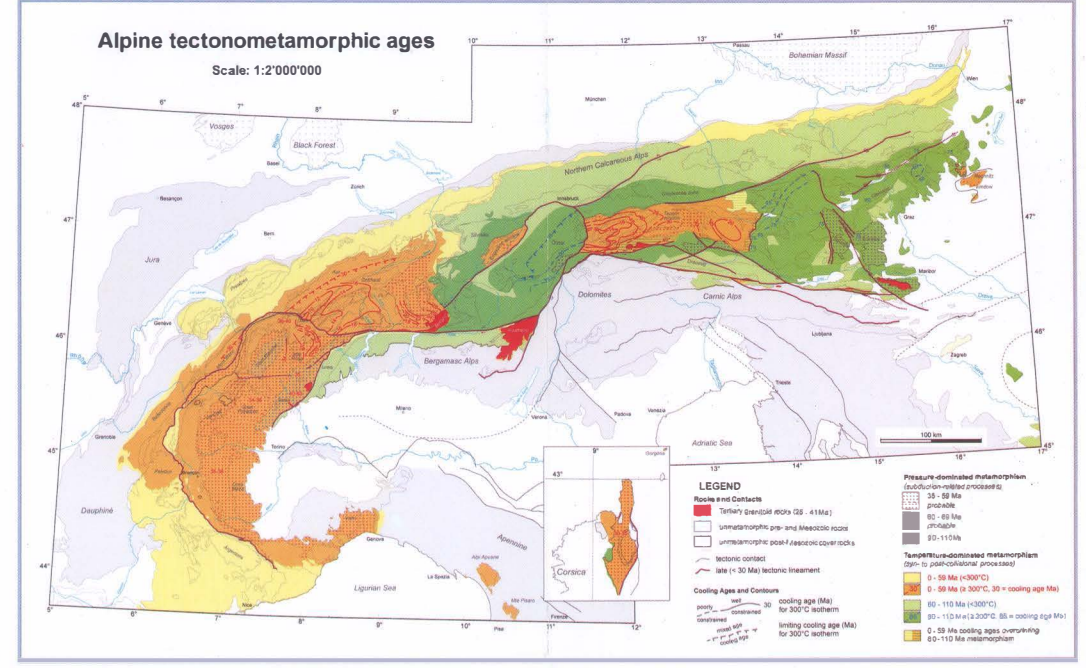
- Low-grade metamorphism**
Diagenesis / sub anchizone
Diagenese / Subanchizone
Subgenschichtfacies
Kontaktmetamorphose / Subanchizone / Zeolith
- Greenschist facies**
Lower greenschist facies
albite-chlorite / pyrophyllite-chlorite-schistoid
Upper greenschist facies
actinolite / biotite-chlorite-glaucophane-schistoid
High-pressure greenschist facies
albite-nauseonite-chlorite-calcite / fessendenite-chlorite-schistoid-actinolite
- Greenschist-amphibolite transitional facies**
albite-glaucophane-amphibolite / biotite-garnet-chlorite or phengite-chlorite-kyanite
- Amphibolite facies**
diopside-hornblende-garnet / biotite-garnet-staurolite-phengite-kyanite
- Blueschist facies**
Lower blueschist facies
glaucofanite-lawsonite / carpholite-phengite-psyrophyllite
Upper blueschist facies
glaucofanite-eclogite-garnet / chloritoid-phengite + garnet
- Blueschist-eclogite transitional facies**
glaucofanite-zoisite-garnet + clinopyroxene / garnet-Mg-rich chloritoid-phengite
- Eclogite facies**
Eclogite facies
garnet-cordierite-zoisite-quartz + amphibole + phengite / garnet-Mg-rich chloritoid-kyanite or garnet-lawsonite
- Ultrahigh-pressure facies**
garnet-cordierite-sillimanite / coesite or Mg-rich chloritoid-feldspar
- Variegated High-Temperature facies**
Facies mélange with relics of ECU + AM, and local granulite facies.
Interpreted as a tectonic accretion channel (TAC) with widespread evidence of partial melting in the Southern Alps Belt
- Amphibolite facies overprint**
Mafic and sedimentary rocks displaying different metamorphic peak history. **PT conditions** have been recorded within country rocks (pre-metamorphic). **Legend** for mafic dykes: collection uncertainties or tectonic effects?
- Geological contact**
Stippled
Major boundary
Normal fault
Thrust
- Post-metamorphic faults**
Stippled
Major boundary
Normal fault
Thrust
- Rules for representation of metamorphic conditions**
Plain colour: Single metamorphic peak (never followed by cooling or isothermal retrograde events)
Hatched colour: Metamorphic peak overprinted by a later thermal event

Edited by Roland Oberhänsli (Coordinator, *Universität Potsdam*), Romain Bousquet (*Universität Basel*), Martin Engi (*Universität Bern*), Bruno Goffé (*ENS Paris-CNRS*), Guido Gosso (*Università di Milano*), Mark Handy (*Freie Universität Berlin*), Volker Höck (*Universität Salzburg*), Friedrich Koller (*Universität Wien*), Jean-Marc Lardeaux (*Université de Nice*), Riccardo Polino (*IGG-CNR Torino*), Philippe Rossi (*BRGM, Paris*), Ralf Schuster (*Geologische Bundesanstalt Wien*), Stéphane Schwartz (*Université de Grenoble*), Iole Spalla (*Università di Milano*)

Advisory board R. Caby (*Université de Montpellier*), Ch. Chopin (*ENS Paris-CNRS*), R. Compagnoni (*Università di Torino*), G. V. Dal Piaz (*Università di Padova*), R. Ferreira Mählmann (*Technische Universität Darmstadt*), Ch. Miller (*Universität Innsbruck*), St. Schmid (*Universität Basel*)

with contributions from Ph. Agard (*Université Paris VI*), J. Babat (*Freie Universität Berlin*), A. Berger (*Universität Bern*), R.J. Bertle (*Universität Vienna*), St. Bucher (*Universität Basel*), T. Burri (*Universität Bern*), P. Heitzmann (*BIWG Bern*), G. Hoinkes (*Universität Graz*), L. Jolivet (*Université Paris VI*), L. Keller (*Universität Basel*), M. Linner (*Geologische Bundesanstalt Wien*), B. Lombardo (*IGG-CNR Torino*), G. Mattioli (*Università di Torino*), A. Michard (*ENS Paris*), G. Pesta (*Geologische Bundesanstalt Wien*), A. Proyer (*Universität Graz*), G. Rantsch (*Universität Leoben*), C. Rosenberg (*Freie Universität Berlin*), J.M. Schramm (*Universität Salzburg*), H. Soelva (*Universität Wien*), M. Thoeni (*Universität Wien*), M. Zucali (*Università di Milano*)

Computer graphics: R. Bousquet, J. Tenal, M. Grundmann



- LEGEND**
- Rock and Contacts**
Tertiary dykes (30 Ma - 4 Ma)
Ultramylonitic pre- and Mesozoic rocks
Ultramylonitic post-tectonic cover rocks
Tectonic contact
Late (> 30 Ma) tectonic truncation
- Pressure-dominated metamorphism**
Ductile-to-brittle transition
35 - 50 Ma (probable)
60 - 65 Ma (probable)
90 - 110 Ma
- Temperature-dominated metamorphism**
30 - 35 Ma (cooling age Ma)
50 - 55 Ma (cooling age Ma)
80 - 110 Ma (cooling age Ma)
90 - 110 Ma (cooling age Ma)
0 - 50 Ma cooling ages overprinting 60-110 Ma metamorphism
- Cooling Ages and Contours**
30 Ma cooling age (Ma) for 300°C isotherm
50 Ma cooling age (Ma) for 300°C isotherm
limiting cooling age (Ma) for 300°C isotherm