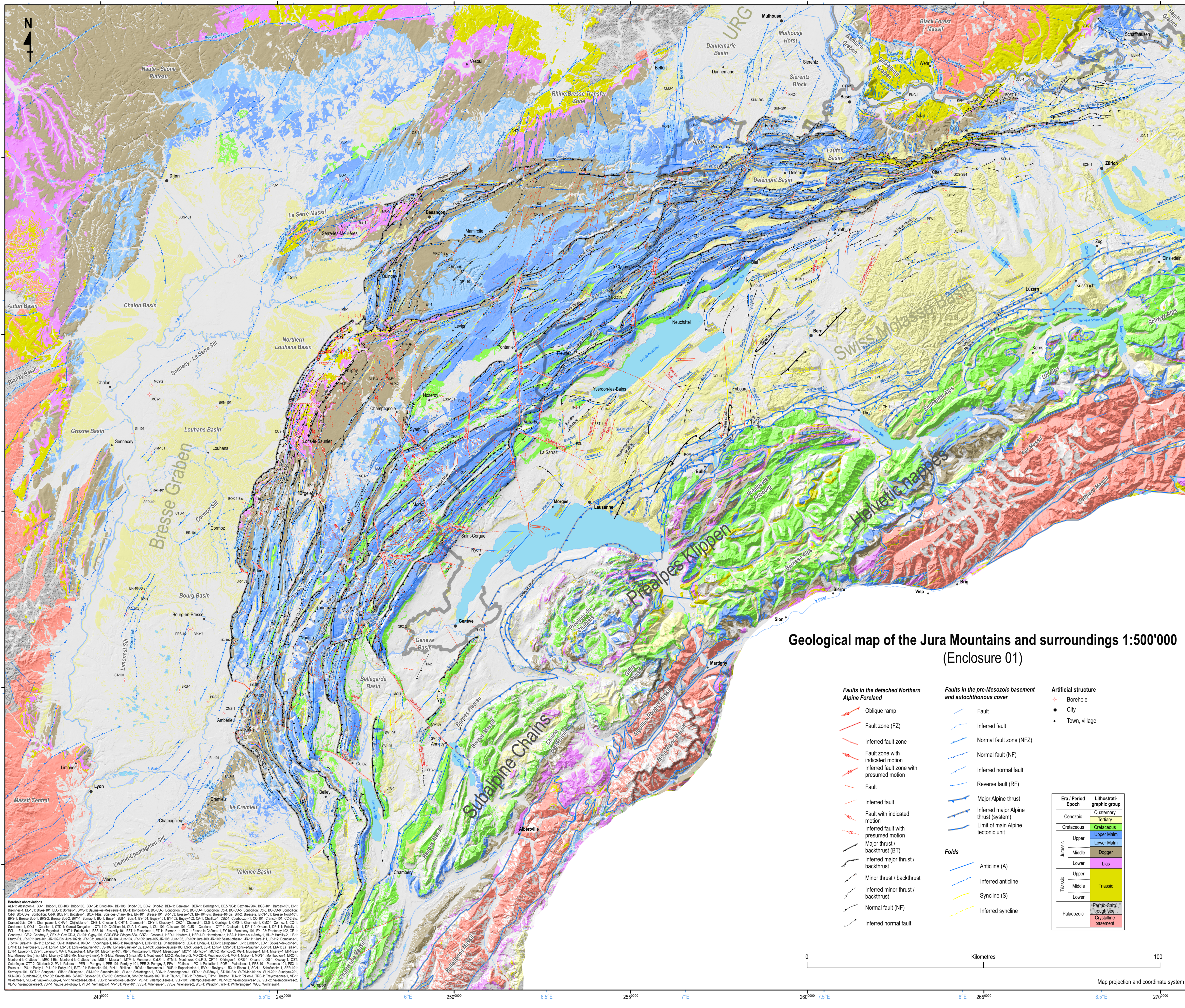

Geological map of the Jura Mountains and surroundings 1:500'000

(Enclosure 01)

Faults in the detached Northern Alpine Foreland

- Oblique ramp
- Fault zone (FZ)
- Inferred fault zone
- Fault zone with indicated motion
- Inferred fault zone with presumed motion
- Fault
- Inferred fault
- Fault with indicated motion
- Inferred fault with presumed motion
- Major thrust / backthrust (BT)
- Inferred major thrust / backthrust
- Minor thrust / backthrust
- Inferred minor thrust / backthrust
- Normal fault (NF)
- Inferred normal fault

Faults in the pre-Mesozoic basement and autochthonous cover

- Fault
- Inferred fault
- Normal fault zone (NFZ)
- Normal fault (NF)
- Inferred normal fault
- Reverse fault (RF)
- Major Alpine thrust
- Inferred major Alpine thrust (system)
- Limit of main Alpine tectonic unit

Folds

- Anticline (A)
- Inferred anticline
- Syncline (S)
- Inferred syncline

Artificial structure

- ⌖ Borehole
- ● City
- • Town, village

Era / Period Epoch		Lithostratigraphic group
Cenozoic		Quaternary
		Tertiary
Cretaceous		Cretaceous
Jurassic	Upper	Upper Malm
		Lower Malm
	Middle	Dogger
	Lower	Lias
Triassic	Upper	Triassic
	Middle	
	Lower	
Palaeozoic		Permo-Carb. trough sed.
		Crystalline basement

0 Kilometres 100

Map projection and coordinate system CH1903+ LV95

Borehole abbreviations

ALT-1: Altishofen-1, BD-1: Briod-1, BD-103: Briod-103, BD-104: Briod-104, BD-105: Briod-105, BD-2: Briod-2, BEN-1: Benken-1, BER-1: Berlingen-1, BEZ-7904: Beznau-7904, BGS-101: Barges-101, BI-1: Bizonnes-1, BL-101: Blyes-101, BLU-1: Bonlieu-1, BMS-1: Baume-les-Messieurs-1, BO-1: Bonboillon-1, BO-CD-3: Bonboillon: Cd-3, BO-CD-4: Bonboillon: Cd-4, BO-CD-5: Bonboillon: Cd-5, BO-CD-8: Bonboillon: Cd-8, BO-CD-9: Bonboillon: Cd-9, BOET-1: Böttstein-1, BOX-1-Bis: Bois-des-Chaux-1bis, BR-101: Bresse-101, BR-103: Bresse-103, BR-104-Bis: Bresse-104bis, BR-2: Bresse-2, BRN-101: Bresse Nord-101, BRS-1: Bresse Sud-1, BRS-2: Bresse Sud-2, BRY-1: Bornay-1, BU-1: Buez-1, BUI-1: Buix-1, BY-101: Bugey-101, BY-102: Bugey-102, CA-1: Chailluz-1, CBZ-1: Courbouzon-1, CC-101: Crancot-101, CC-2-Bis: Crancot-2bis, CH-1: Champvans-1, CHA-1: Chƒtelblanc-1, CHE-1: Chessel-1, CHT-1: Charmont-1, CHY-1: Chapery-1, CHZ-1: Chazelot-1, CLG-1: Conliège-1, CMS-1: Charmois-1, CMZ-1: Cormoz-1, CO-1: Cordonnet-1, COU-1: Courtion-1, CTD-1: Curciat-Dongalon-1, CTL-1-D: Châtillon-1d, CUA-1: Cuarny-1, CUI-101: Cuiseaux-101, CUS-1: Courlans-1, CYT-1: Chaleyriat-1, DP-110: Ornans-1, DP-111: Présilly-1, ECL-1: Ecl,pens-1, ENG-1: Engerfeld-1, ENT-1: Entlebuch-1, ESS-101: Essavilly-101, EST-1: Essertines-1, ET-1: Éternoz-1d, FLC-1: Frasne-le-Château-1, FY-101: Frontenay-101, FY-102: Frontenay-102, GE-1: Gendrey-1, GE-2: Gendrey-2, GEX-3: Gex CD-3, GI-101: Gigny-101, GOS-SB4: Gösgen-SB4, GRZ-1: Grozon-1, HED-1: Herdern-1, HER-1-D: Hermrigen-1d, HSA-1: Hières-sur-Amby-1, HU-2: Humilly-2, ILF-1: Illfurth-R1, JR-101: Jura-101, JR-102-Bis: Jura-102bis, JR-103: Jura-103, JR-104: Jura-104, JR-105: Jura-105, JR-106: Jura-106, JR-109: Jura-109, JR-110: Saint-Lothain-1, JR-111: Jura-111, JR-112: Domblans-1, JR-114: Jura-114, JR-115: Lons-2, KAI-1: Kaisten-1, KNO-1: Knoeringue-1, KRE-1: Kreuzlingen-1, LCD-1D: La: Chandelière-1d, LDA-1: Lindau-1, LEU-1: Leuggern-1, LI-1: Linden-1, LO-1: St-Jean-de-Losne-1, LPY-1: La: Peyrouse-1, LS-1: Lons-1, LS-101: Lons-le-Saunier-101, LS-102: Lons-le-Saunier-102, LS-103: Lons-le-Saunier-103, LS-3: Lons-3, LS-4: Lons-4, LSS-101: Lons-le-Saunier Sud-101, LTA-1: La Tailla-1, LVN-1: Laveron-1, LVY-1: Lavigny-1, MA-1: Mazerolles-1, MAY-101: Macornay-101, MB-1: Montbarrey-1, MBG-1: Meersburg-1, MCY-1: Montcoy-1, MCY-2: Montcoy-2, MG-1: Musiège-1, MI-1: Miserey-1, MI-1-Bis-Mix: Miserey-1bis (mix), MI-2: Miserey-2, MI-2-Mix: Miserey-2 (mix), MI-3-Mix: Miserey-3 (mix), MO-1: Moutherot-1, MO-2: Moutherot-2, MO-CD-4: Moutherot Cd-4, MOI-1: Moiron-1, MON-1: Montbouton-1, MRC-1: Montrond-le-Château-1, MRC-1-Bis: Montrond-le-Château-1bis, MSI-1: Messia-1, MTM-1: Montmorot C.d.F.-1, MTM-2: Montmorot C.d.F.-2, OFT-1: Oftringen-1, ORS-1: Orsans-1, OS-1: Oiselay-1, OST: Osterfingen, OTT-2: Otterbach-2, PA-1: Paladru-1, PER-1: Perrigny-1, PER-101: Perrigny-101, PER-2: Perrigny-2, PFA-1: Pfaffnau-1, PO-1: Pontailler-1, POE-1: Plainoiseau-1, PRS-101: Peronnas-101, PSX-1: Poisoux-1, PU-1: Publy-1, PU-101: Publy-101, RAT-101: Ratenelle-101, RIN-1: Riniken-1, ROM-1: Romanens-1, RUP-1: Ruppoldsried-1, RVY-1: Revigny-1, RX-1: Risoux-1, SCH-1: Schafisheim-1, SER-101: Sermoyer-101, SGT-1: Saugeot-1, SIB-1: Siblingen-1, SIM-101: Simandre-101, SLA-1: Schlattingen-1, SON-1: Sonnengarten-1, SRY-1: St-Rémy-1, ST-101-Bis: St-Trivier-101bis, SUN-201: Sundgau-201, SUN-203: Sundgau-203, SV-106: Savoie-106, SV-107: Savoie-107, SV-108: Savoie-108, SV-109: Savoie-109, TH-1: Thun-1, THO-1: Thônex-1, THY-1: Thésy-1, TLN-1: Toillon-1, TRE-1: Treycovagnes-1, VE-1: Velesmes-1, VEB-4: Vaux-en-Bugey-4, VI-1: Villette-lès-Dole-1, VLB-1: Vellerot-les-Belvoir-1, VLP-1: Valempoulières-1, VLP-101: Valempoulières-101, VLP-102: Valempoulières-102, VLP-2: Valempoulières-2, VLP-3: Valempoulières-3, VSP-1: Vaux-sur-Poligny-1, VTS-1: Vernantois-1, VV-101: Vevy-101, VVE-1: Villeneuve-1, VVE-2: Villeneuve-2, WEI-1: Weiach-1, WIN-1: Wintersingen-1, WOE: Wölflinswil-1.

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This enclosure belongs to the PhD thesis "*The Development of the Jura Fold-and-Thrust Belt: pre-existing Structures and the Formation of Ramps*", Marc Schori (2021), University of Fribourg, Fribourg, Switzerland.

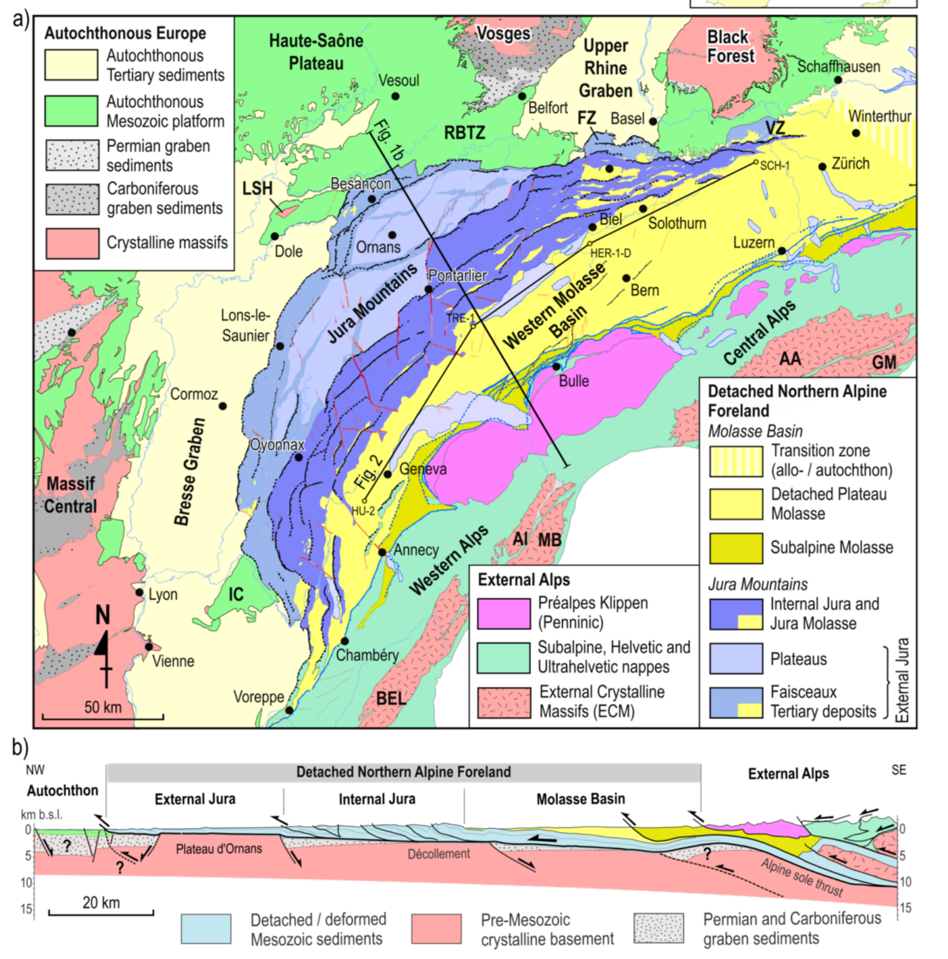
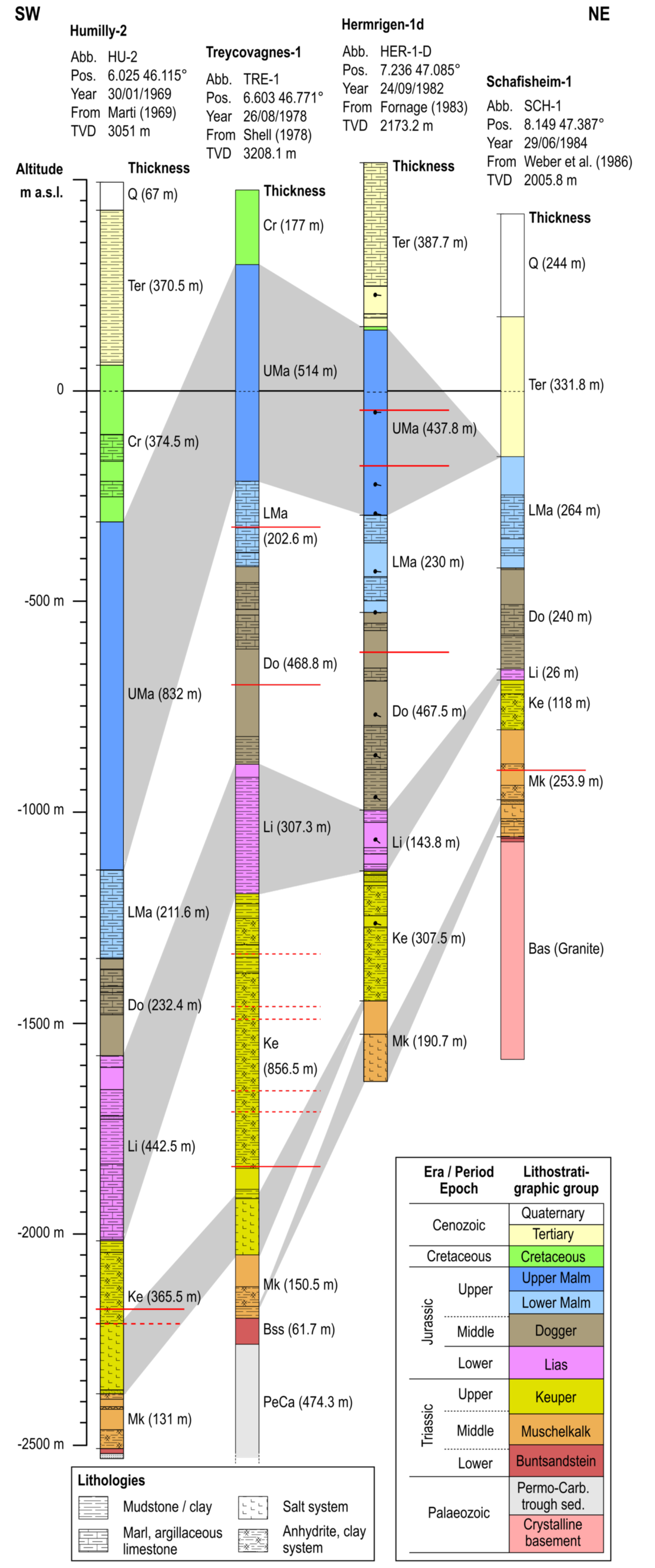


Fig 1. a) Tectonic overview map of the Jura Mountains and surroundings. b) Regional cross-section modified from Sommaruga et al. (2017). BEL: Belledonne Massif, MB: Mont Blanc Massif, AI: Aiguilles Rouges Massif, AA: Aar Massif, GM: Gotthard Massif, FZ: Ferrette Zone, LSH: La Serre Horst, IC: Ile Crémieu, RBTZ: Rhine Bresse Transfer Zone, VZ: Vorfaltenzone. Boreholes are HU-2: Humilly-2, TRE-1: Treycovagnes-1, HER-1-D: Hermrigen-1d and SCH-1: Schafisheim-1.



Humilly-2
Abb. HU-2
Pos. 6.025 46.115°
Year 30/01/1969
From Marti (1969)
TVD 3051 m

Treycovagnes-1
Abb. TRE-1
Pos. 6.603 46.771°
Year 26/08/1978
From Shell (1978)
TVD 3208.1 m

Hermrigen-1d
Abb. HER-1-D
Pos. 7.236 47.085°
Year 24/09/1982
From Fornage (1983)
TVD 2173.2 m

Schafisheim-1
Abb. SCH-1
Pos. 8.149 47.387°
Year 29/06/1984
From Weber et al. (1986)
TVD 2005.8 m

Era / Period Epoch		Lithostratigraphic group
Cenozoic		Quaternary
		Tertiary
Cretaceous		Cretaceous
Jurassic	Upper	Upper Malm
		Lower Malm
	Middle	Dogger
	Lower	Lias
Triassic	Upper	Keuper
	Middle	Muschelkalk
	Lower	Buntsandstein
Palaeozoic		Permo-Carb. trough sed.
		Crystalline basement

Fig 2. Selected boreholes within the Molasse Basin (see Fig. 1a for locations) illustrating thickness and altitude changes of lithological units from SW to NE, along the southern border of the Jura fold-and-thrust belt. The true vertical thickness is given in brackets. Lithostratigraphic groups are Q: Quaternary, Ter: Tertiary, Cr: Cretaceous, UMa: Upper Malm, LMa: Lower Malm, Do: Dogger, Li: Lias, Ke: Keuper, Mk: Muschelkalk, Bss: Buntsandstein, PeCa: Permo-Carboniferous sediments, Bas: crystalline basement.

Specification of data sources for the geological map

Lithologies are compiled from the vectorised Geological Atlas of Switzerland 1:25'000 (GeoCover, swisstopo 2012) and vectorised Geological maps of France 1:50'000 (BRGM 2004), with interpolations across Quaternary deposits from the vectorised Swiss Geological map 1:500'000 (GK500, swisstopo 2005). Interpretations of structures (folds and faults) within the Jura Mountains is according to Schori (2021) based on available geolocial maps, published cross-sections and analysis of terrain models. Names of structures, as well as structures in the surrounding of the Jura Mountains are based on various publications: Affolter & Gratier (2004), Bergerat et al. (1990), Bersier (1932), Bosshardt et al. (2017), BRGM Geological maps 1:50'000, Caer (2016), Chauve & Pérriaux (1974), Chauve et al. (1980), Chauve et al. (1988), Coromina & Fabbri (2003), Debelmas (1974), Dupuy et al. (2014), Egli et al. (2016), Faber et al. (1994), GeoCover 1:25'000 (swisstopo 2012), Gruber (2017), Guellec et al. (1990), Geologische Übersichtskarte 1:200'000, Jordan et al. (2015), Jordi (1990), Larroque & Laurent (1988), Laubscher (1982, 1986), Madritsch et al. (2009, 2018), Marescot (2000), Martin & Mercier (1996), NAB 10-40 (Meier 2010), Mock & Herwegh (2017), NTB 14-02 (Madritsch et al. 2014), Otto (1994), Philippe (1995), Philippe et al. (1994), Philippe et al. (1996), Rime et al. (2019), Rocher et al. (2004), Rotstein et al. (2005), Schori et al. (2015), Schuppli (1950), Sommaruga (1997), Sommaruga et al. (2012), Spottke et al. (2005), Trümpy (1980), Ustaszewski (2004), Ustaszewski & Schmid (2006, 2007), Wildi & Huggenberger (1993).

Lakes and rivers are according to Open Street Map (OSM 2019). The hillshade model is compiled from the French numerical terrain model RGE ALTI 5m (IGN-F 2018) and the Swiss digital terrain model SwissALTI3D (swisstopo 2016), with gaps filled using the SRTM 1-Arc second elevation model from NASA (2014).