UNIVERSITÄT SALZBURG

Geoinformation und Geokommunikation VU

Vorlesungsteil

Katharina Wöhs & Johannes Scholz

katharina.woehs@plus.ac.at; johannes.scholz@plus.ac.at

LV Übersicht (Vormittags-Teil)

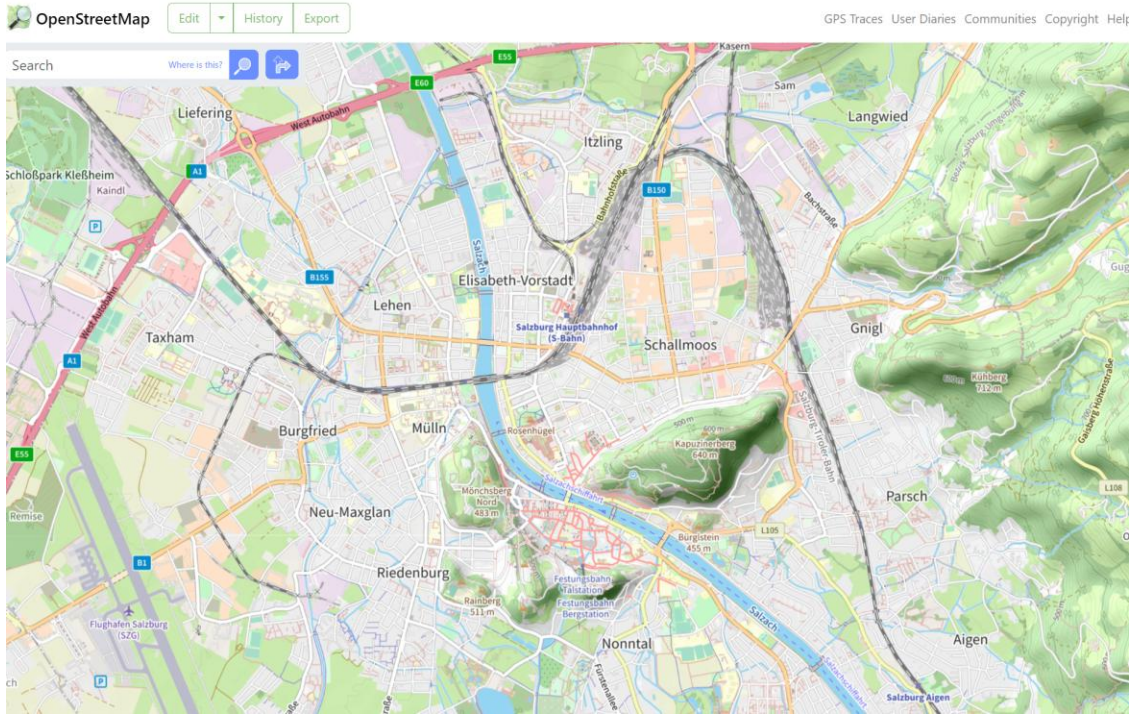
Nr.	Datum	Inhalte	Vortragende
1	06.10.2026	Einführung: Karten, Geomedien und Geokommunikation	JS
2	13.10.2026	Gestalt der Erde und Gradnetz	JS
3	20.10.2026	Kartographische Projektionen	JS
4	**27.10.2026**	**Landeskoordinaten: G-K und UTM**	**JS**
5	03.11.2026	Topographische Karten und Kartenwerke (incl. Maßstab und Generalisierung)	JS
6	10.11.2026	Erdbeobachtung aus Satellitenperspektive	JS
	18.11.2026	(GIS Day - **Mittwoch**!)	
7	24.11.2026	Vom Luftbild zum Orthophoto	KW
8	01.12.2026	Multispektrale Aufnahmen	KW
	15.12.2026	EX ideas:lab (Details folgen)	
9	12.01.2027	GNSS - Satellitenpositionierung	KW
10	19.01.2027	Relief und 3D; Offene Datenportale I	KW
11	26.01.2027	Offene Datenportale II / Raumordnung / Katastralmappe	KW

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Wiederholung

Projektionen





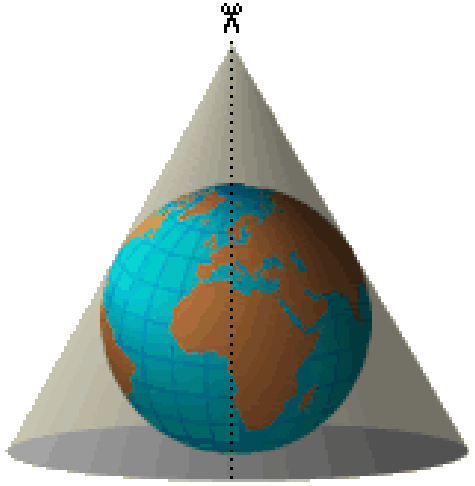
Projektionen



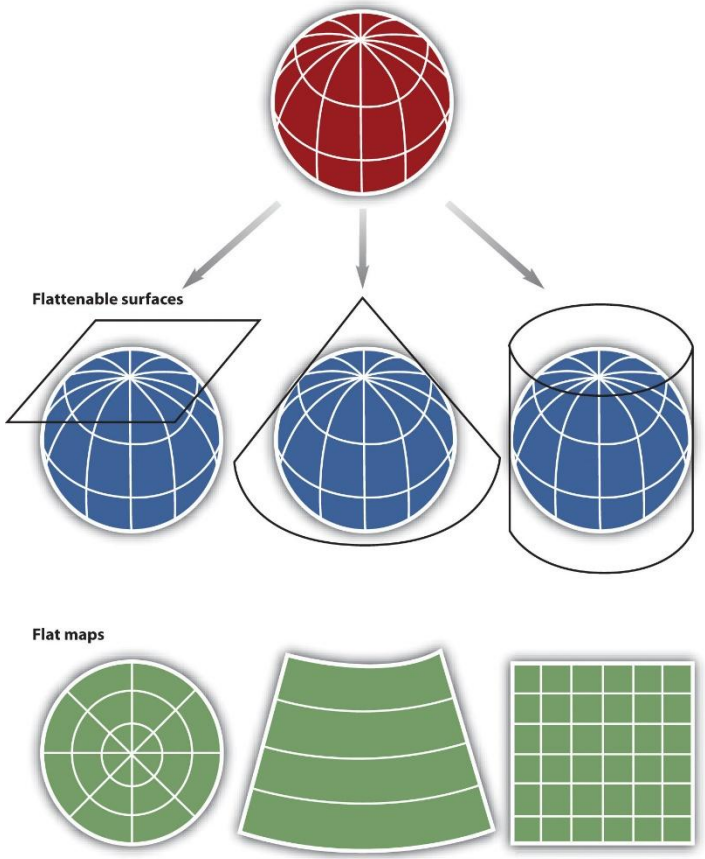
Azimutale Projektion



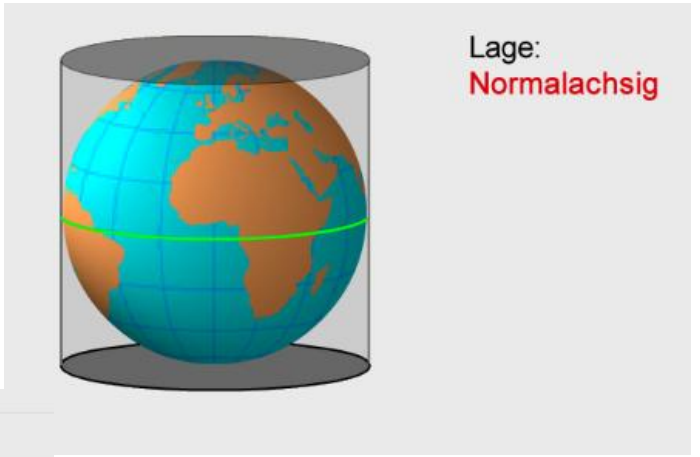
Zylindrische Projektion

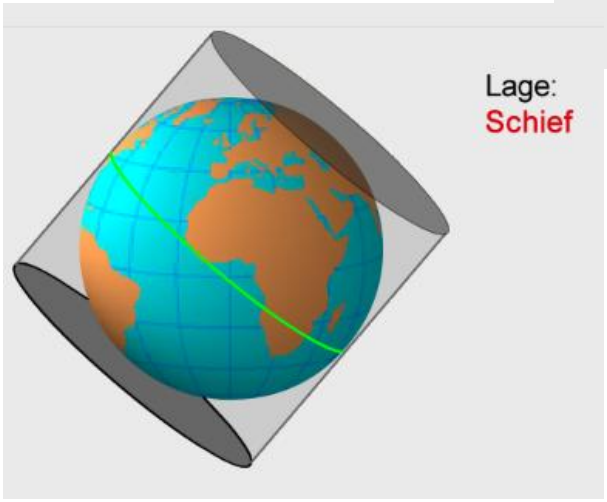


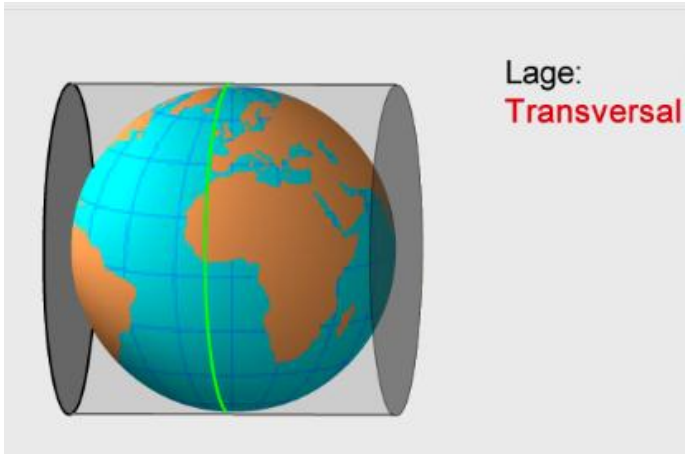
Kegelprojektion



Projektionen







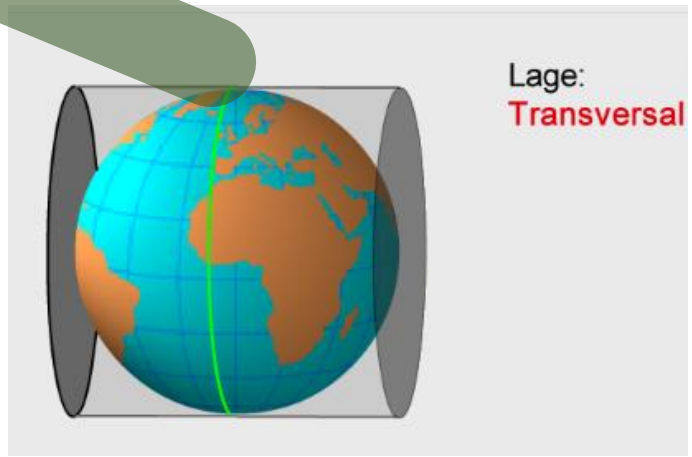
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Landeskoordinaten GK & UTM

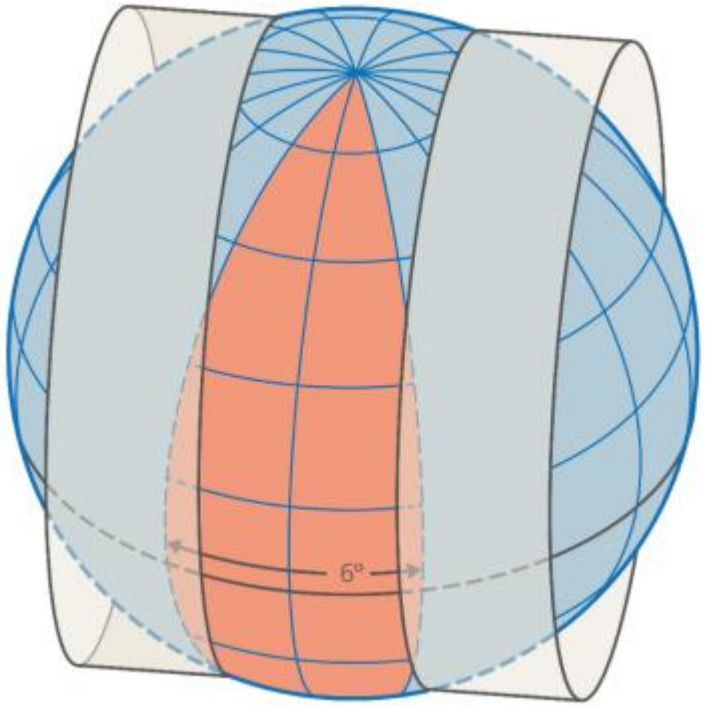
Ausgangspunkt: Typen von Projektionen

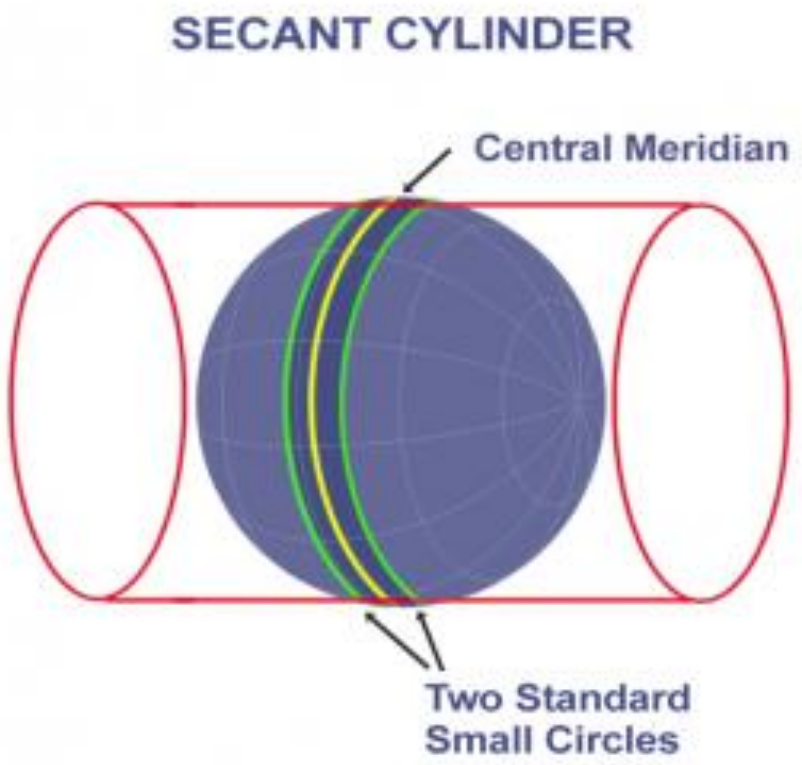


Zylindrische Projektion

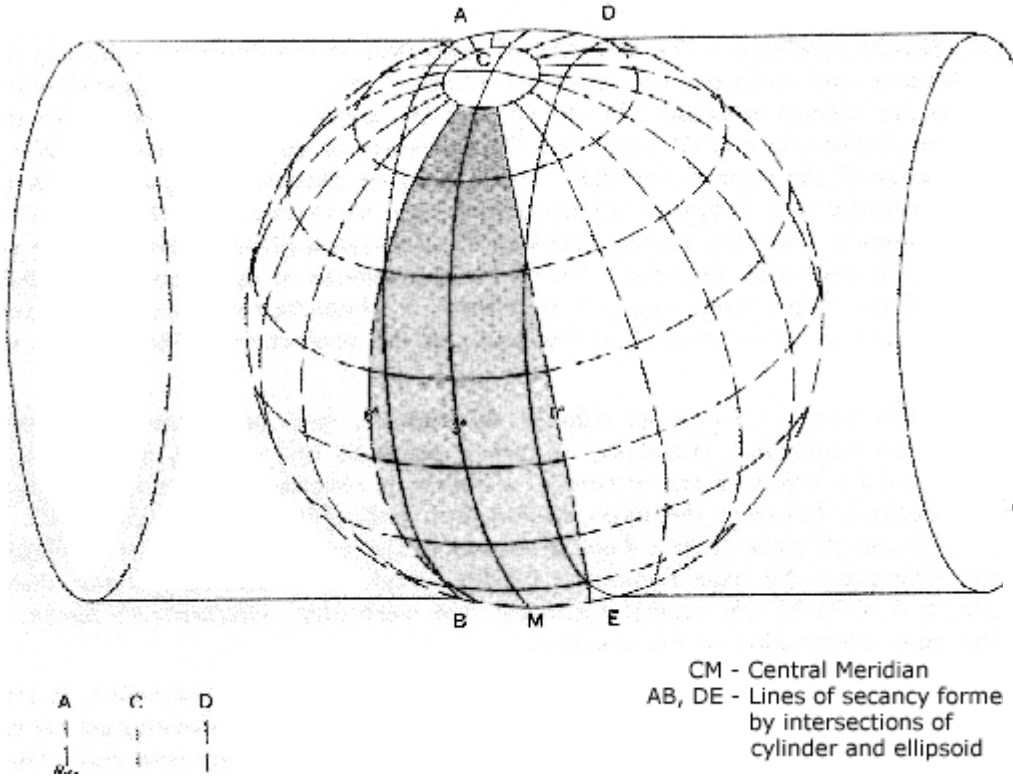


Transversale Mercator Projektion





Transversale Mercator Projektion



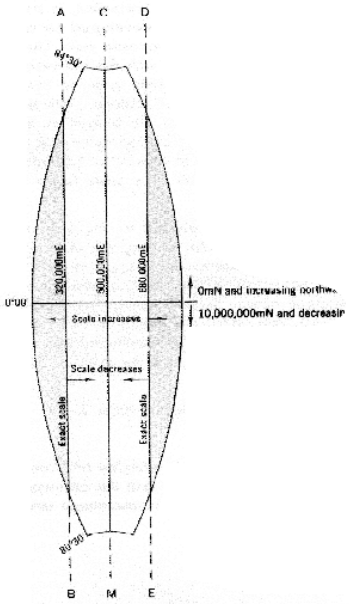
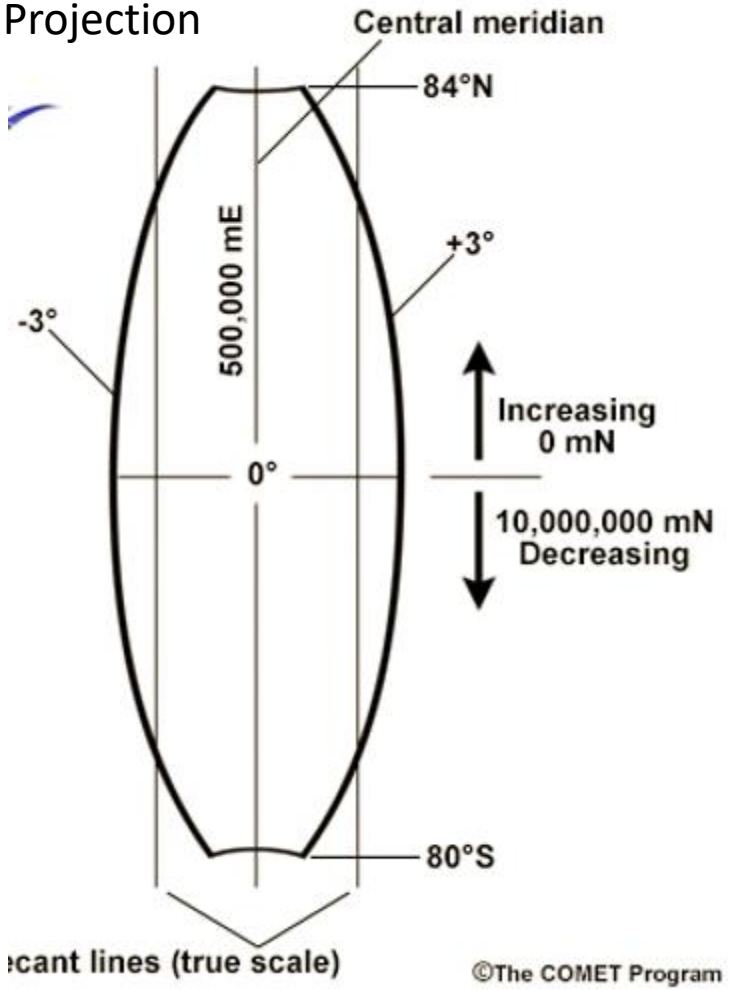


Figure 4. Secant Condition of Transverse Mercator Projection; Typical 6-degree Projection Zone.

Single-Zone UTM Projection



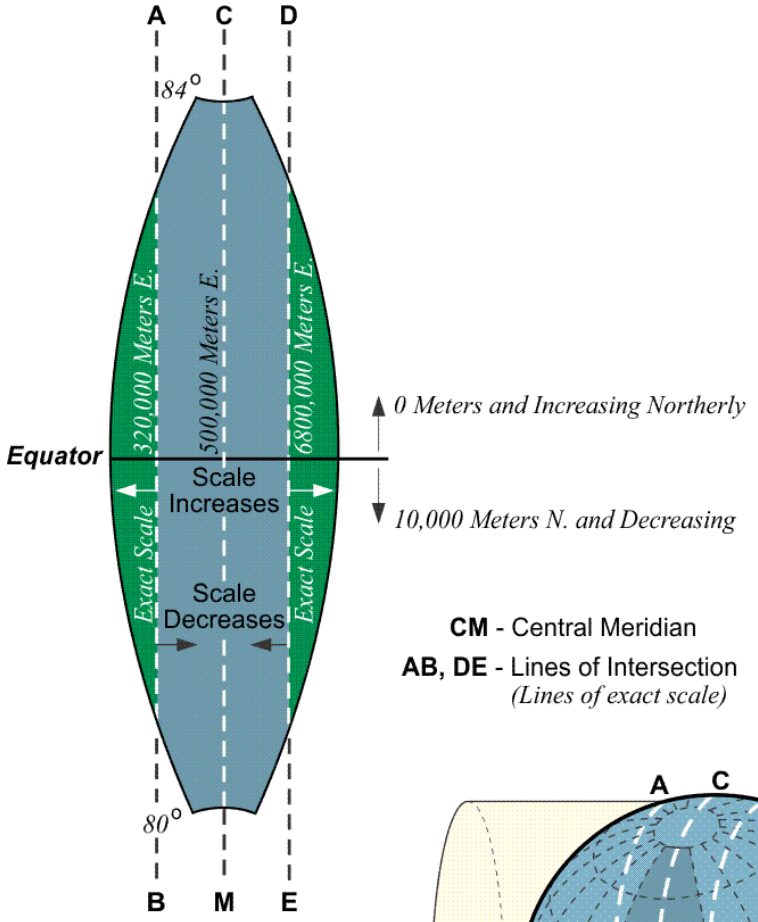
AB, DE - Lines of secancy formed by intersections of cylinder and ellipsoid

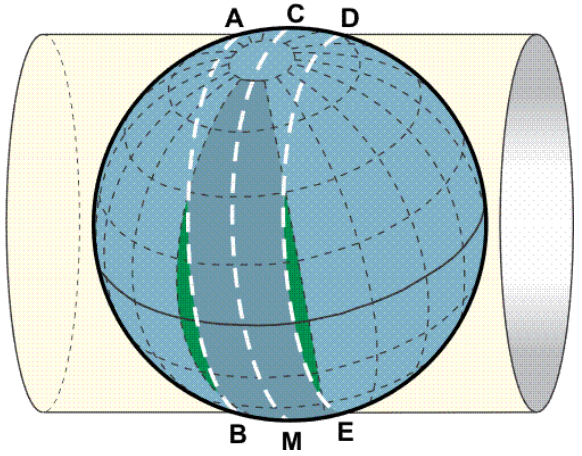
(Size and shape of zones are exaggerated for illustration purposes)

ecant lines (true scale)

Spezifikationen: UTM

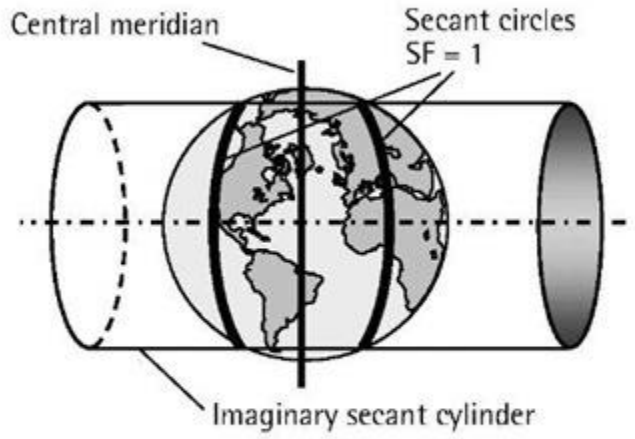
- Transversale Mercator Projektion (schneidend)
- Ellipsoid / Datum: WGS 84
- Meridianstreifen: 6 Grad
- Ursprung: Datumsgrenze/Äquator
- Skalierungsfaktor: 0,9996
- False Northing: 0
- False Easting: 500.000

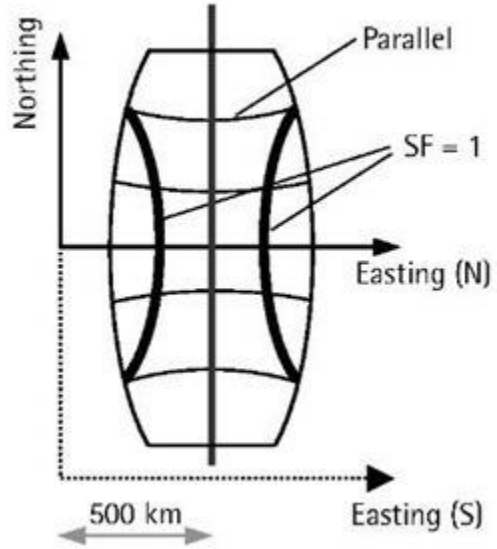


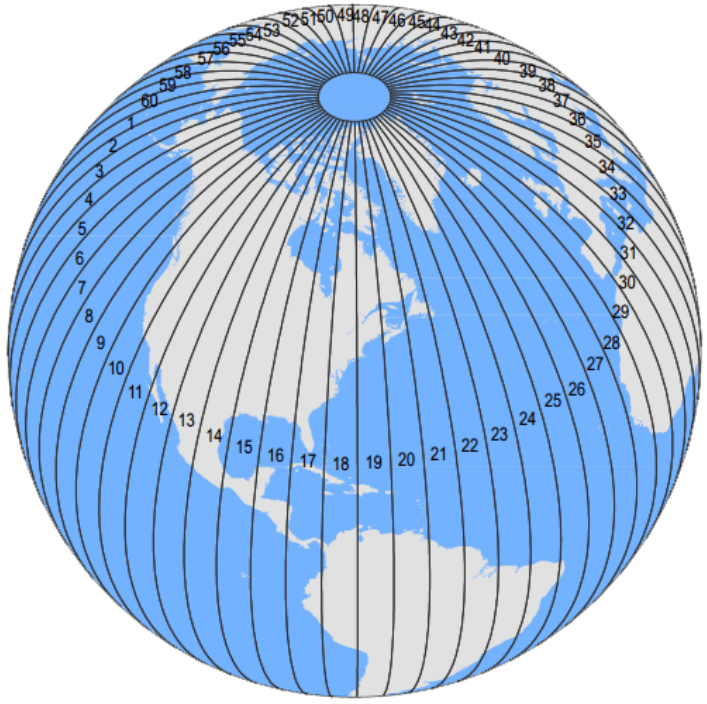


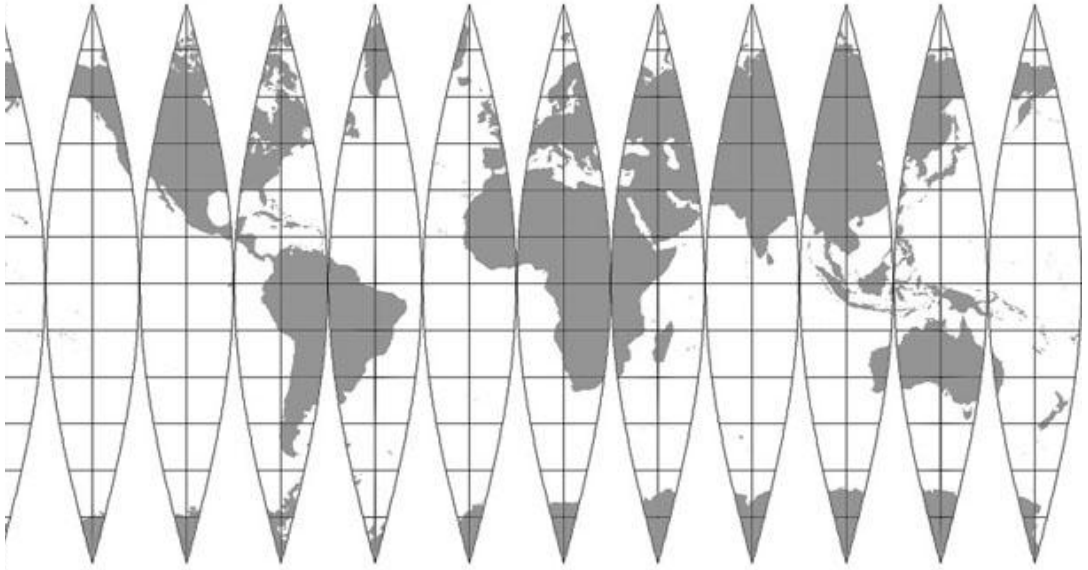
UTM – Universal Transverse Mercator

- The central meridian provides the name for the UTM zone
- Scale factors vary from 0.9996 at the central meridian to 1.0004 at the zone boundaries

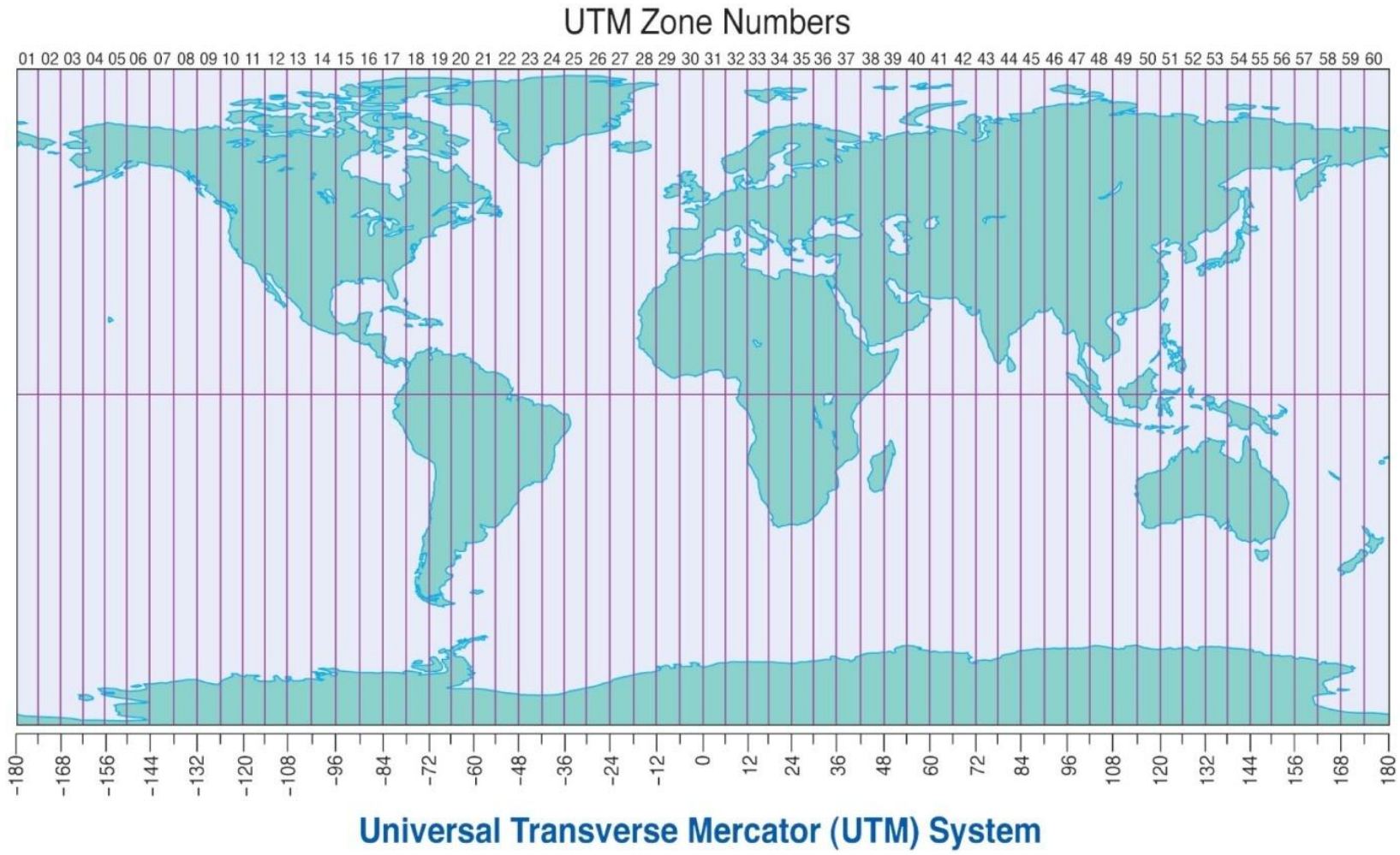








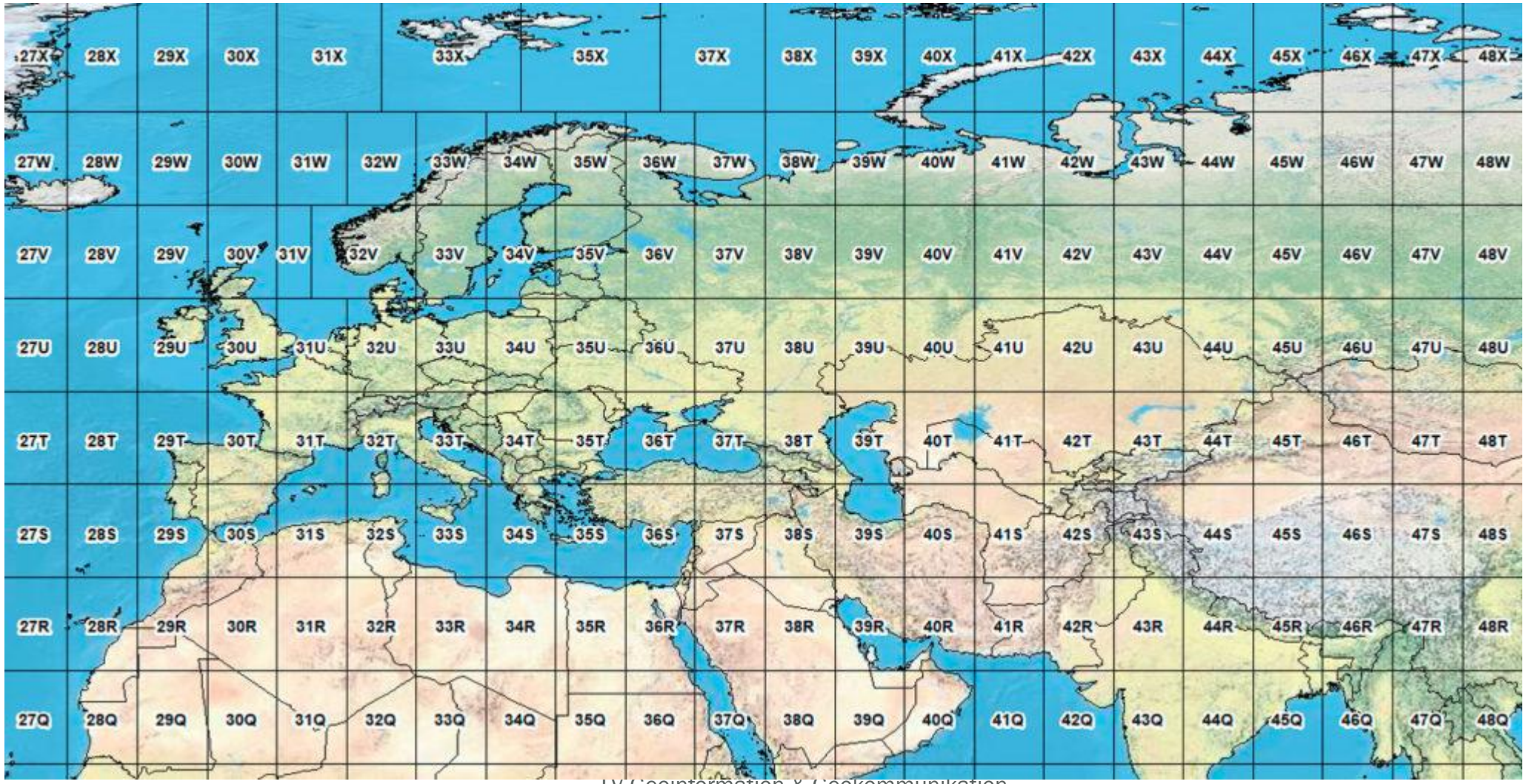
UTM – Universal Transverse Mercator



The system of zones of the Universal Transverse Mercator system. The zones are identified at the top. Each zone is six degrees of longitude in width

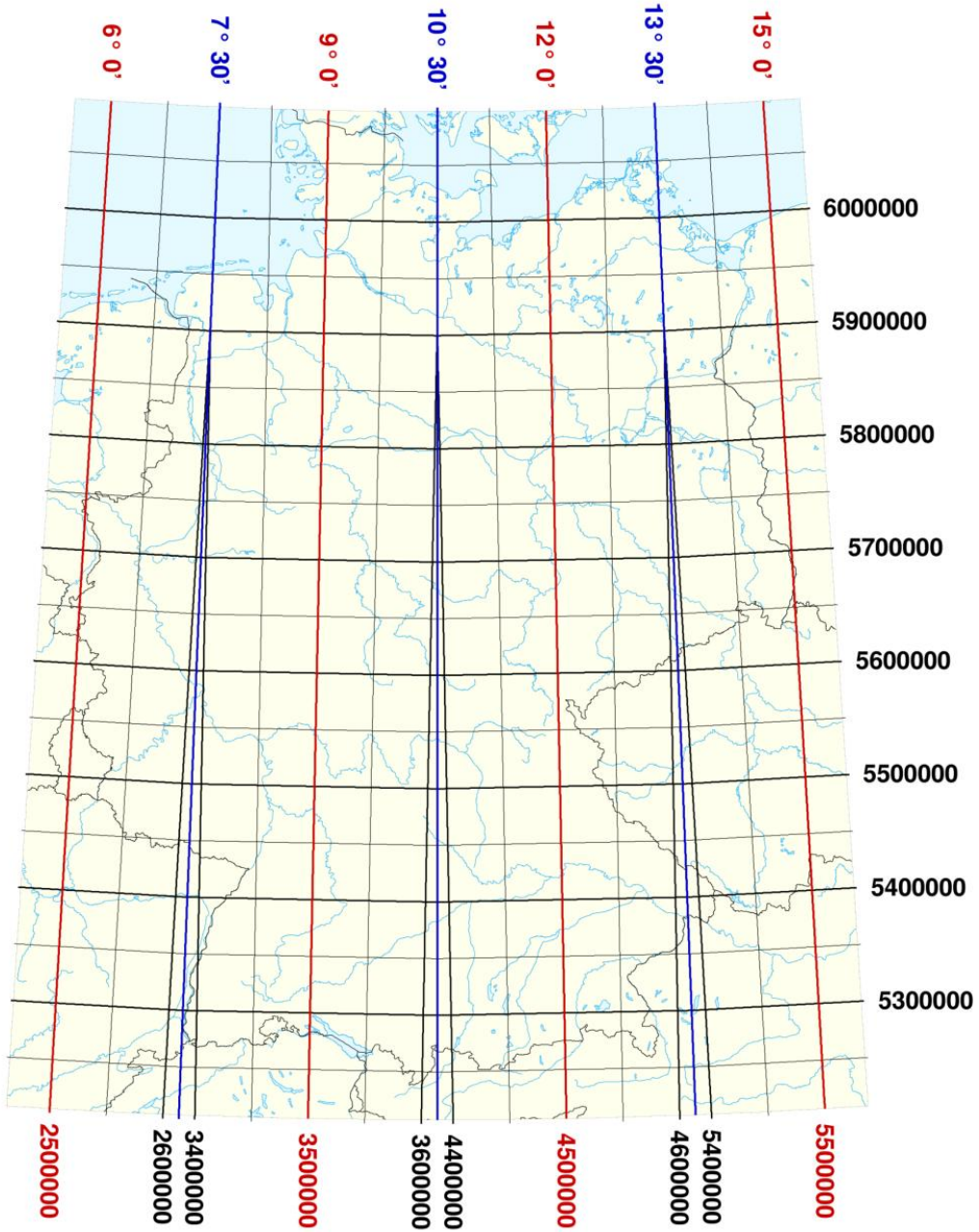
(Reproduced by permission of Peter H. Dana)

UTM Zonen in Europa



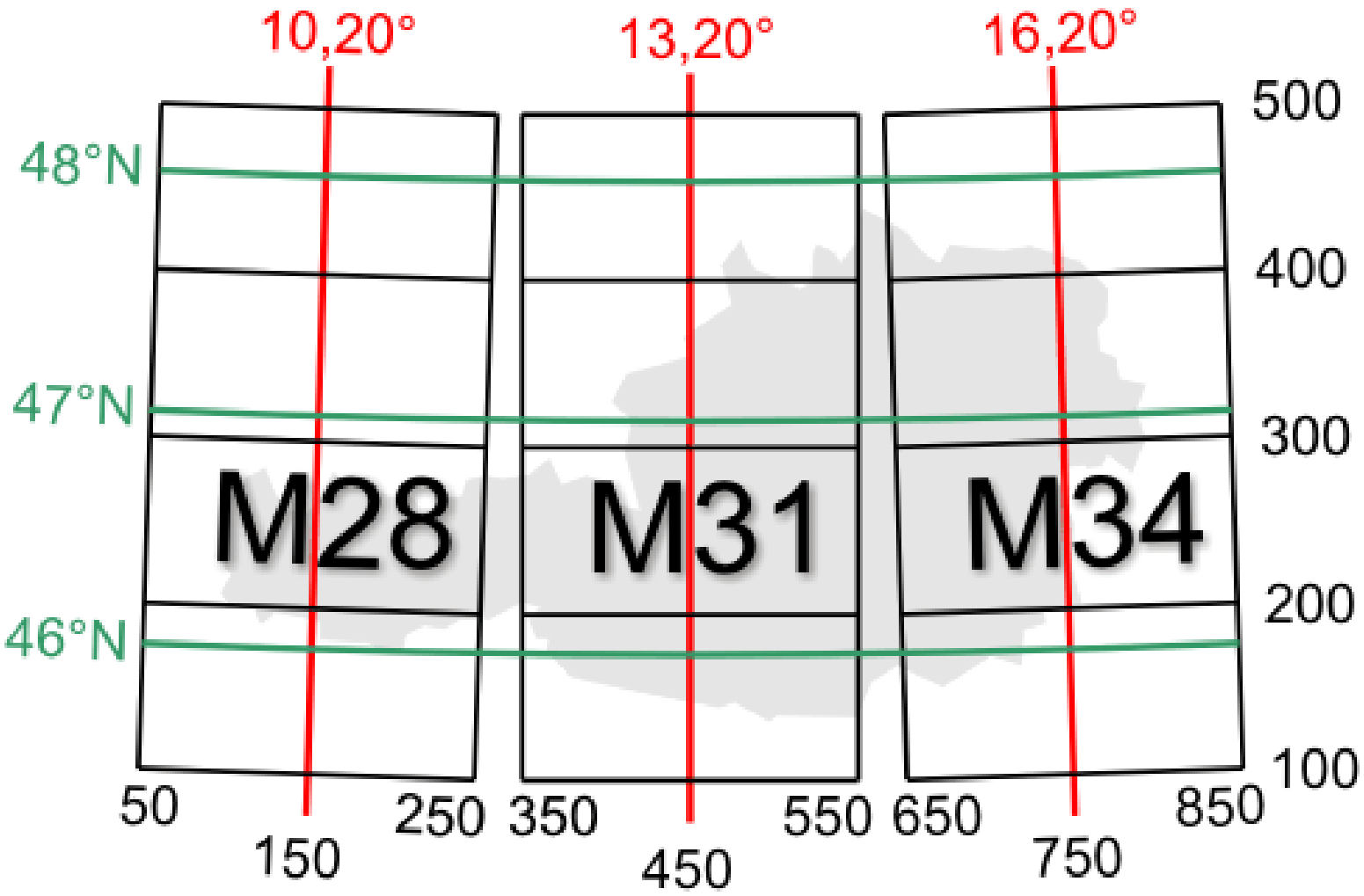
Gauß-Krüger

- Koordinatensystem der Landesvermessung(en)
- Meridianstreifen nach Greenwich, z. B. 9°
- konvergierend bzw. überlappend > Nord
- „false easting“
- Ursprung: Äquator/ Bezugsmeridian

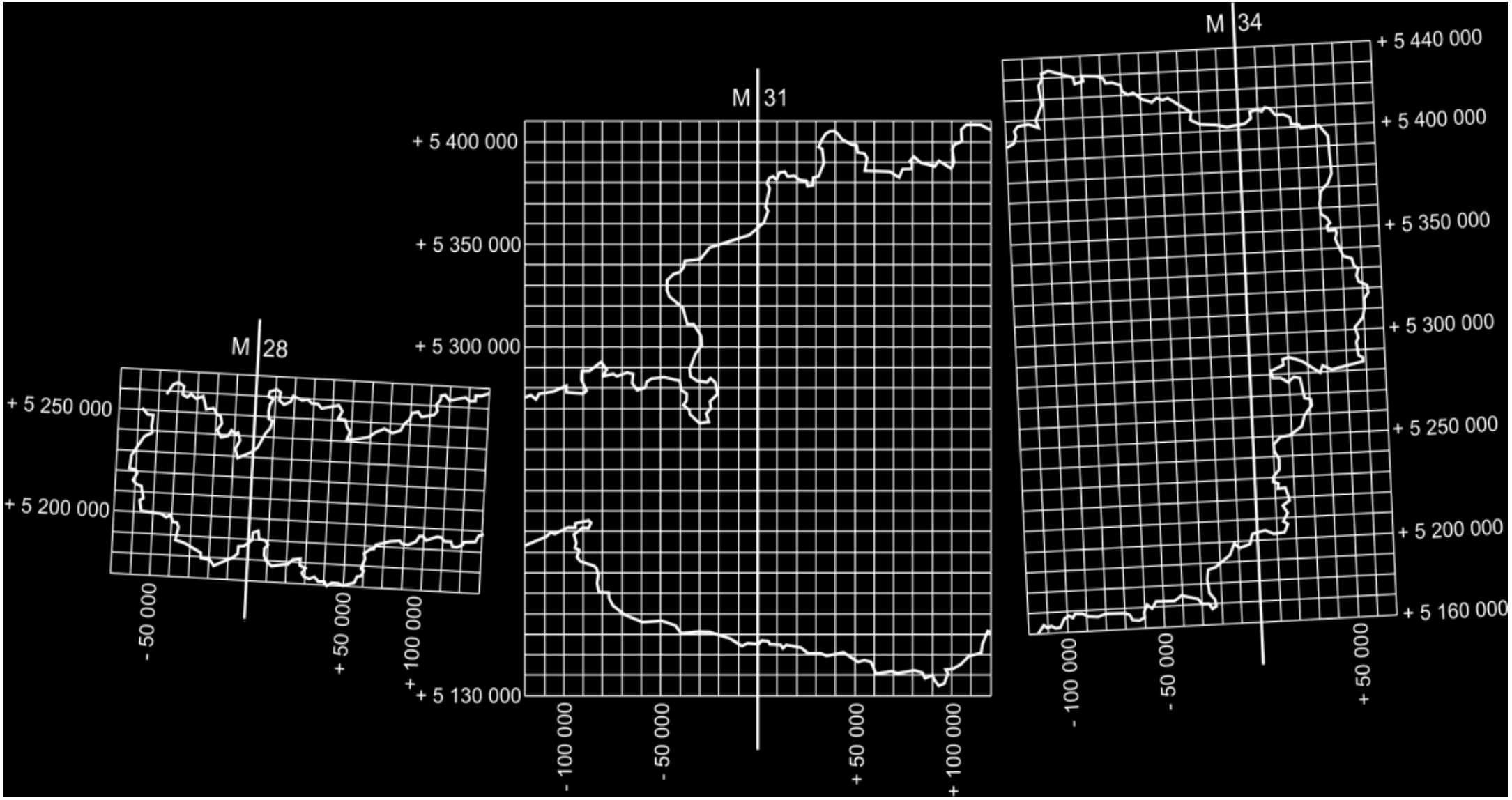


Gauß-Krüger in Österreich & Bundesmeldenetz

- Transversale Mercator Projektion (berührend)
- Ellipsoid / Datum: Bessel / MGI
- Meridianstreifen: 3 Grad Breite (28/31/34)
- Ursprung: Ferro/Äquator
- Skalierungsfaktor: 1



Gauß-Krüger in Österreich



Gauß-Krüger in Österreich & Bundesmeldenetz

Gauss-Krüger		Bundesmeldenetz	
		False Easting	False Northing
M28	Vbg, Tirol	150km	-5000km
M31	OstTirol, Ktn, Sbg, OÖ, westl. Stmk.	450km	-5000km
M34	NÖ, Bgld, Wien, restl. Stmk.	750km	-5000km

- False Northing: -5.000.000
- False Easting: 150.000/450.000/750.000
- Differenz: Greenwich vs. Ferro: 17°40‘

Republic of Austria

Clifford J. Mugnier, C.P., C.M.S.

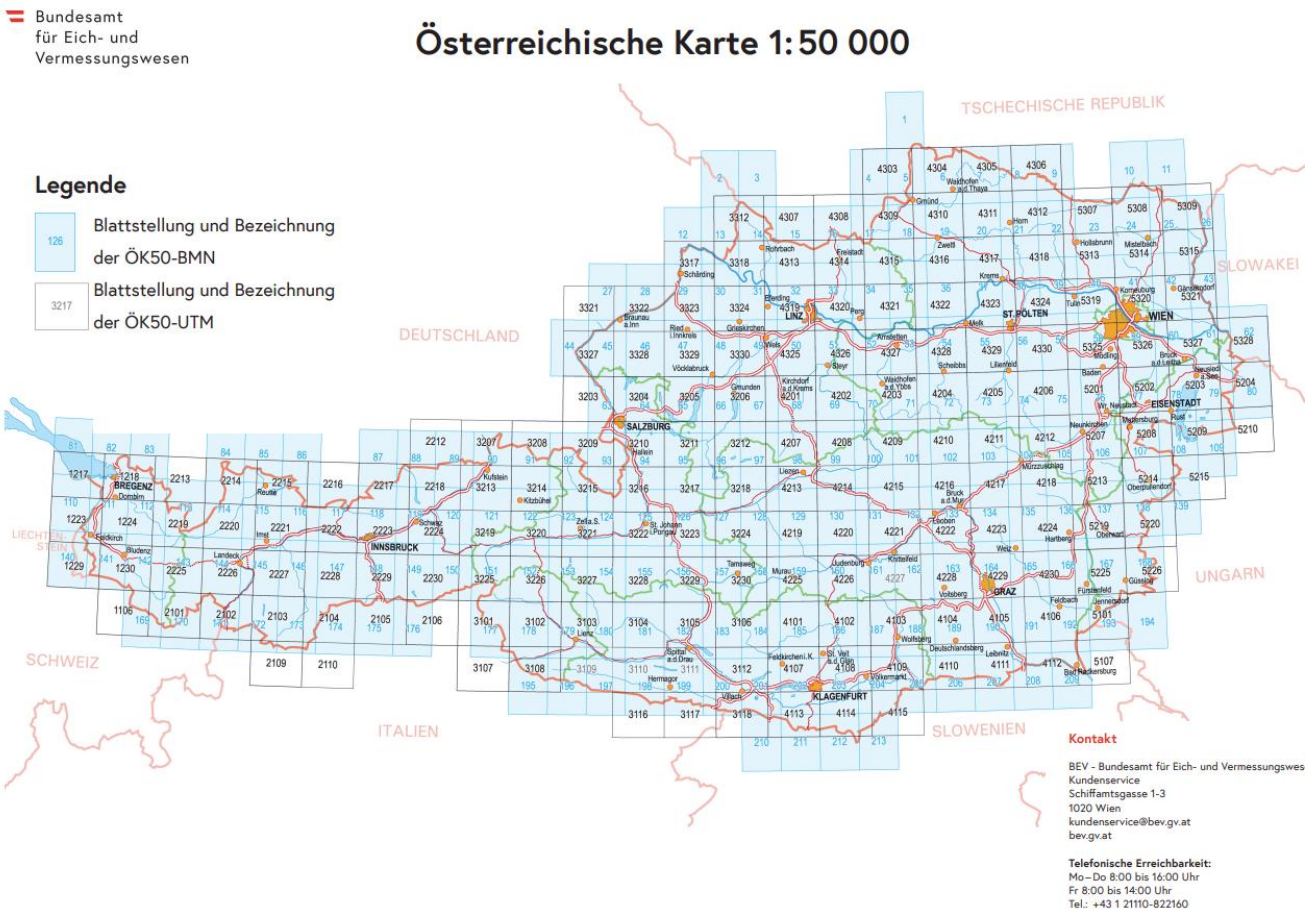
On 1 November 996, an area of land popularly known as "Ostarrichi" was given by Emperor Otto the Third to the Bishop of Friesing as a gift. In 1156 the Priviglium Minus elevated Austria to the status of a Duchy. When of the Habsburg dynasty ascended to power, the lands of Vorarlberg were added, with Bohemia and Hungary added as provinces to their holdings. These acquisitions, completed under the Habsburg rule, were the foundation for the country of Austria as it appears today. After the crowning of Maria Theresa as Queen of Bohemia in 1743, her husband Franz was elected Holy Roman Emperor in 1745. As a measure of standing to other royal courts, Queen-Empress Maria Theresa ordered a survey of all of the Hapsburg holdings in 1763. This was the First Topographical Survey (Josephinishe Aufnahme) of the Hapsburg provinces. The Liesganig triangulation and attached supplemental surveys were executed graphically with plane table and alidade. There was no geodetic survey used as a foundation. The associated topographic survey was performed at a scale of 1:28,800 and was based on the Vienna Klafter System where 1 Zoll = 400 Klafters = 758.6 meters. Altogether there were about 4,500 sheets surveyed and all of ince of Steiermark where φ_o = 42° 11' 54.8745" N, λ_o = 15° 27' 59.9472" East of Greenwich; the Krimberg (Laibach) Grid near Ljubljana was for the provinces of Carinthia, Carinola, and Littoral (now Italy) where φ_o = 45° 55' 43.7228" N and λ_o = 14° 28' 18.8027" East of Greenwich; and the Innsbruck Grid, centered at the tower of the city-parish church (Pfarrturm), was for the provinces of Tyrol and Vorarlberg where φ_o = 47° 16' 11.3060" N and λ_o = 11° 23' 39.3157" East of Greenwich. The Bohnenberger ellipsoid was used from 1810 to 1845 where a = 6,376,602 meters and $1/f$ = 324. The Zach ellipsoid was used from 1845 to 1863 where a = 6,376,602 meters and $1/f$ = 324. From 1847 to 1851 the Walbeck ellipsoid was also used where a = 6,376,896 meters and $1/f$ = 302.78. Some small-scale derivative mapping was done on the Bonne projection. The main chains of the second military triangulation surveyed from 1806 to 1829 covered the western part of the Empire (west of the Budapest meridian) and the chain which extended along the Carpathian Mountains to Transylvania. The baselines used were at Wiener-Neustadt (1762), 6410.90 Klafters; at Wels (1806), 7904.045 Klafters ±0.360 Klafters; at Raab (1810), 9429.429 Klafters ±0.010 Klafters; (1849), 5972.501 m; at Hall, Tyrol (1851), 5671.317 m; at Weiner Neustadt (1857), 9484.065 m; at Maribor, Styria (1860), 5697.405 m; at Josefov (Josefstadt) Bohemia (1862), 5257.266 m; and at Sinj, Dalmatia (1870), 2475.474 m. The Walbeck ellipsoid was used in computing the chains in Balicia and Bucovina so that ties could be made with the Russian triangulation.

The most common classical datum (prior to the European 1950) found in Austria and still used extensively is the Militärgeographisches Institut (Military Geographic Institute or MGI) Hermannskogel, *Habsburgwarte* 1871 Datum where Φ_o = 48° 16' 15.29" N, Φ_o = 16° 17' 41.06" East of Greenwich, and the azimuth to Hundsheimer is α_o = 107° 31' 41.7". I developed the seven-parameter datum shift relation between Hermannskogel 1871 and ED 50 for Yugoslavia (*PE&RS*, September 1997), but most of the points were not in present Austria. The Austrian government has made transformation parameters available for "AT_MGI to ETRS89 (WGS 84) where ΔX = +577.3 m, ΔY = +90.1 m, ΔZ = 463.9 m, Δs = 2.42 ppm, R_X = –5.137", R_Y = –1.474", and R_Z = –5.297". (The seven parameters are stated to be suitable "for applications with an accuracy of about 1.5 m). "The three-di-

http://www.asprs.org/a/resources/grids/03-2004-austria.pdf

Österreichische Karte ÖK 50ff (nationales Kartenwerk)

- Amtliches nationales Kartenwerk des Bundesamts für Eich- und Vermessungswesen
  - https://www.bev.gv.at/Services/Produkte/Landkarten/OEK50-UTM.html



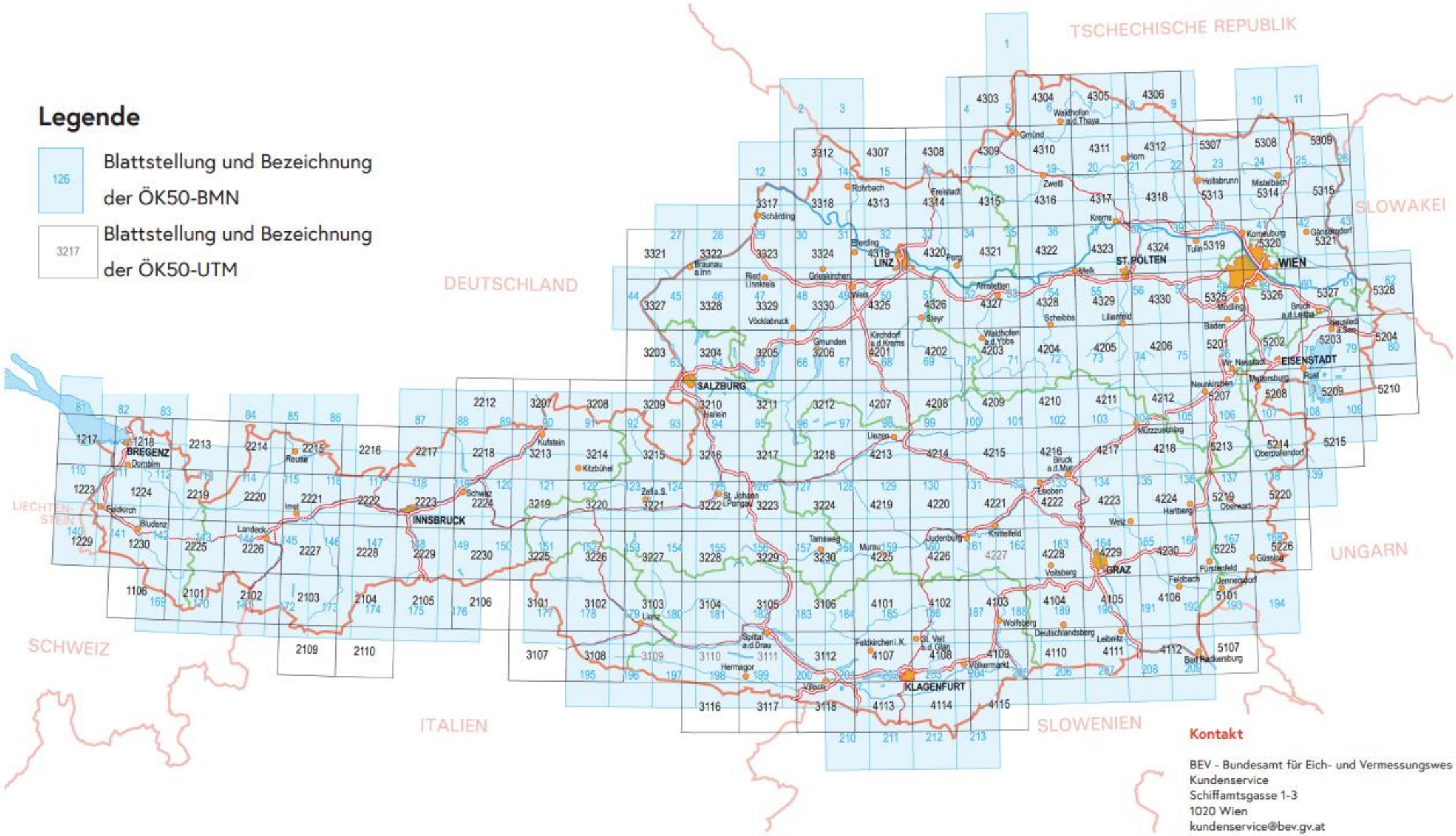
Bundesamt
für Eich- und
Vermessungswesen

Österreichische Karte 1:50 000

Legende

126 Blattstellung und Bezeichnung der ÖK50-BMN

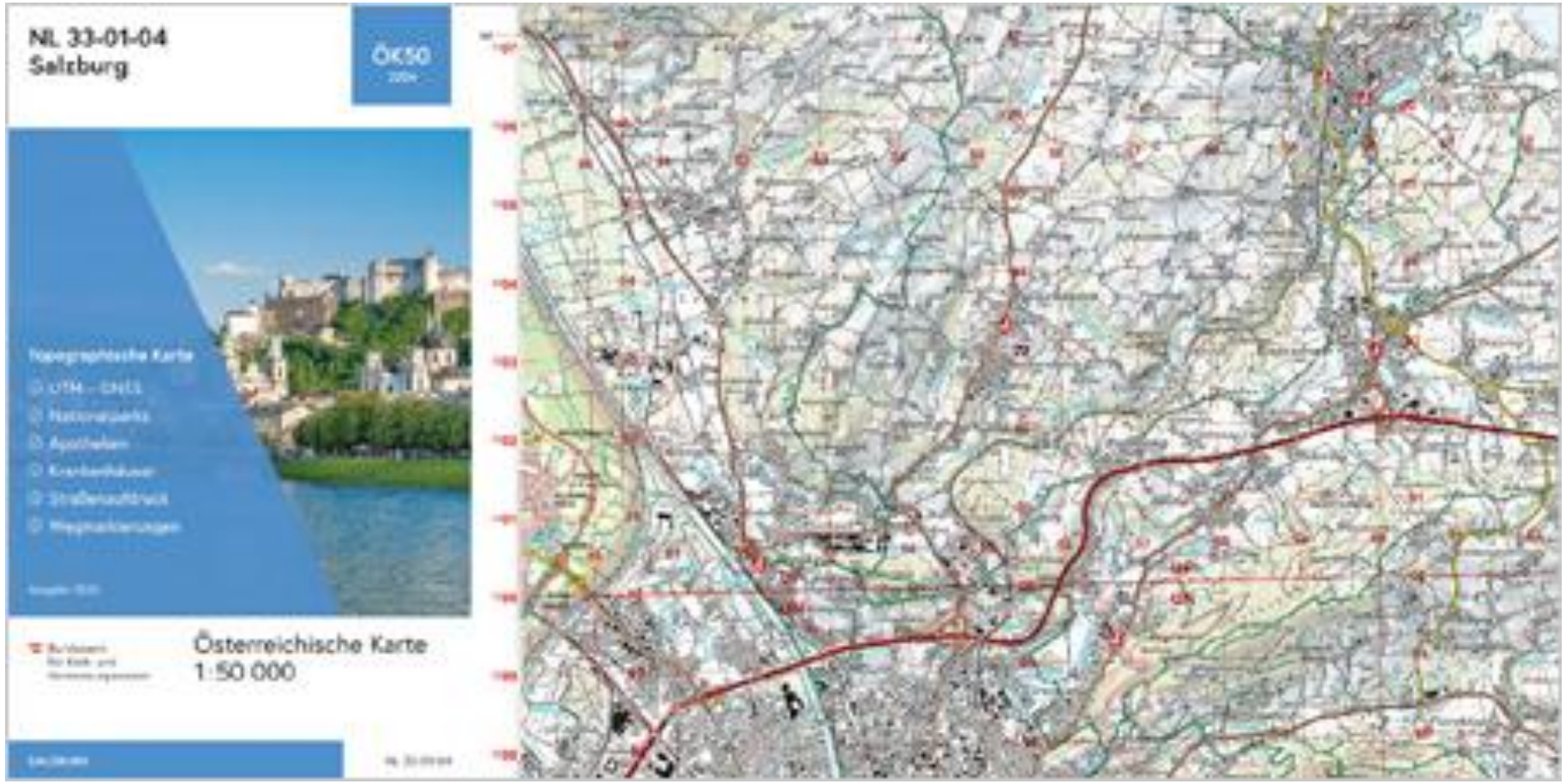
3217 Blattstellung und Bezeichnung der ÖK50-UTM



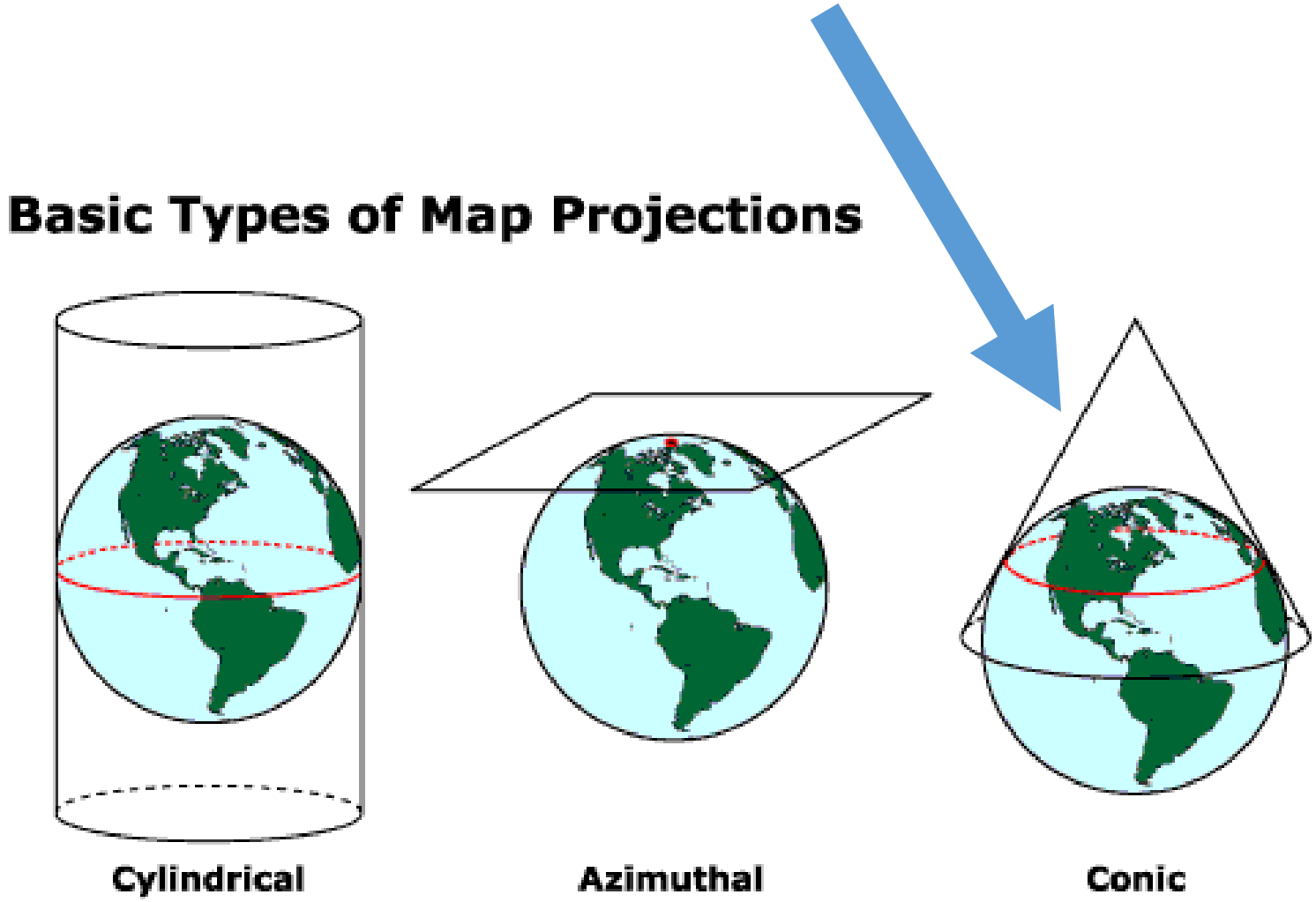
Kontakt

BEV - Bundesamt für Eich- und Vermessungswes
Kundenservice
Schiffamtsgasse 1-3
1020 Wien
kundenservice@bev.gv.at
bev.gv.at

Österreichische Karte ÖK 50ff (nationales Kartenwerk)

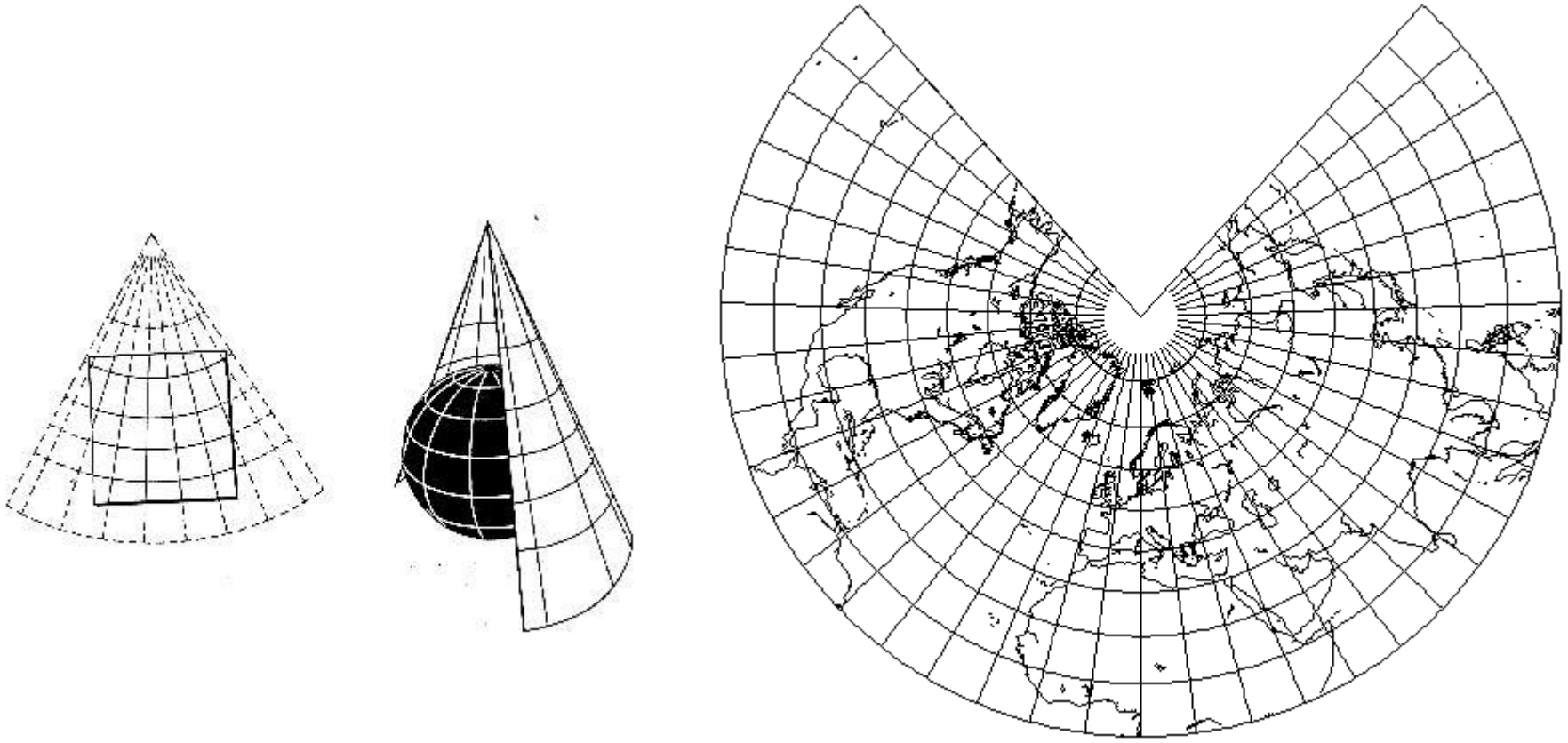


Ausgangspunkt:



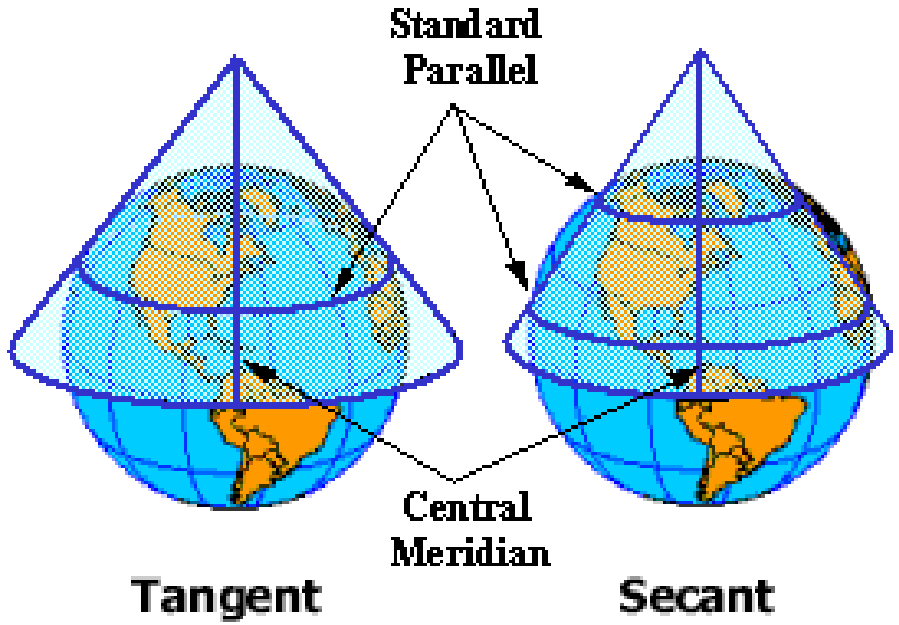
Lambert‘sche Kegelprojektion:

- Notwendig wenn das gesamte Bundesgebiet abgebildet werden soll…!



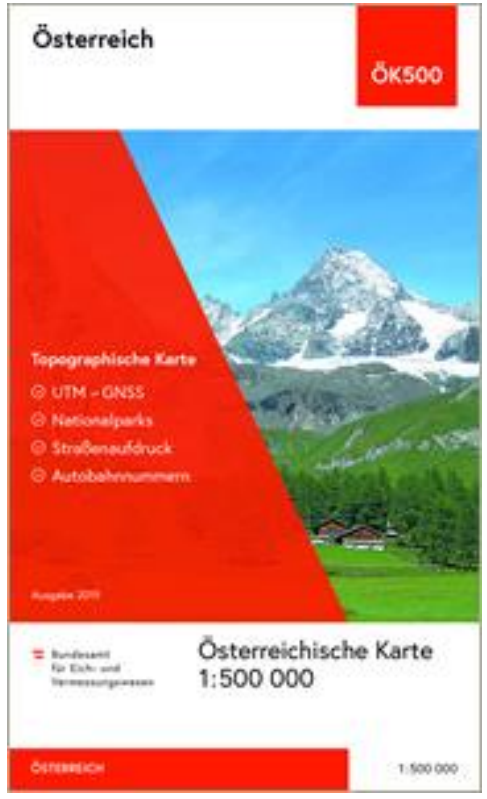
Lambert‘sche Kegelprojektion:

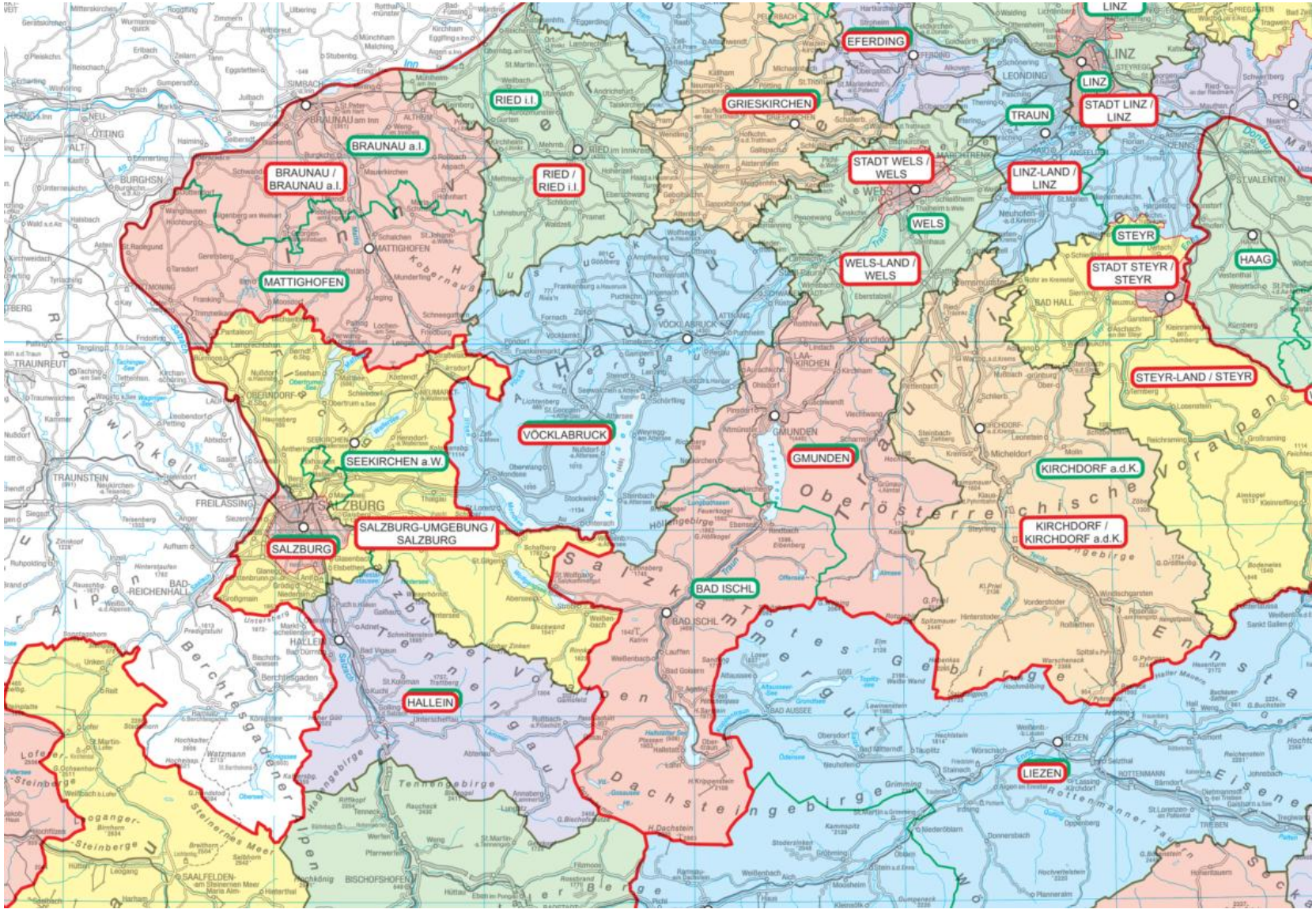
- Projektion: winkeltreu (konform), sekant
- Datum: Bessel / MGI
- Schnittbreitenkreise: 46°N, 49°N
- Ursprung: 13°20‘E, 47.5°N
- False Northing: 400000
- False Easting: 400000





Lambert‘sche Kegelprojektion:





Bezug zum Curriculum

- GWB (Oberstufe):
- Beiträge zu den Bildungsbereichen
- *Sprache und Kommunikation*
  - Erwerb von Sprachkompetenz durch Auswertung von Texten, Bildern und grafischen Darstellungsformen (zB Geomedien, Karten, kartenverwandte Darstellungen); Einbeziehung aktueller Massenmedien und sozialer Medien; Kommunikation mittels fachspezifischer und überfachlicher Medien; Entwicklung einer Konflikt- und Diskussionskultur; Berücksichtigung der Mehrsprachigkeit (zB Einsatz von Dokumenten in Originalsprachen)

- RIS - Lehrpläne – allgemeinbildende höhere Schulen - Bundesrecht konsolidiert, Fassung vom 22.10.2024

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