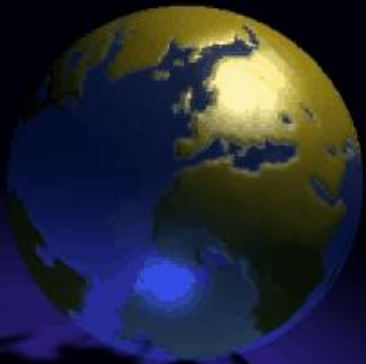


ANALISIS GEOMETRI FRAKTAL UNTUK EKSPLORASI HIDROGEOLOGI

Sari Bahagiarti Kusumayudha
UPN “Veteran” Yogyakarta

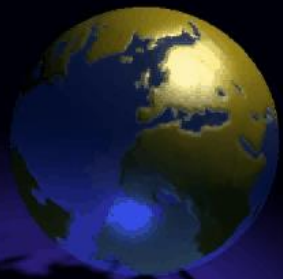


FRACTAL CHARACTERISTICS

- Self- similarity
- Self- affinity
- Scale invariant



Analisis Fractal untuk memetakan fasies batugamping

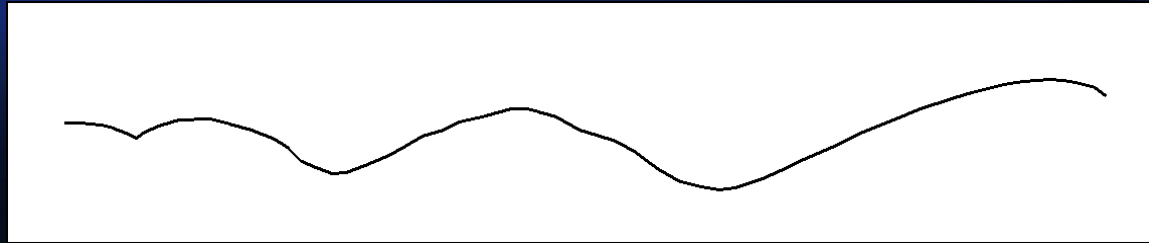


4/2/2020

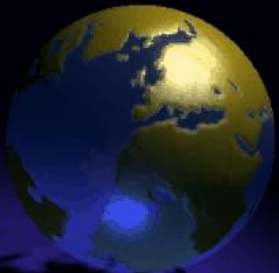
Topografi Karst



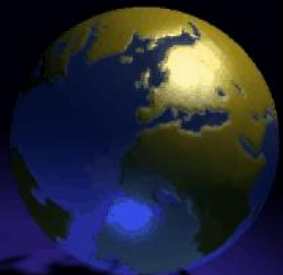
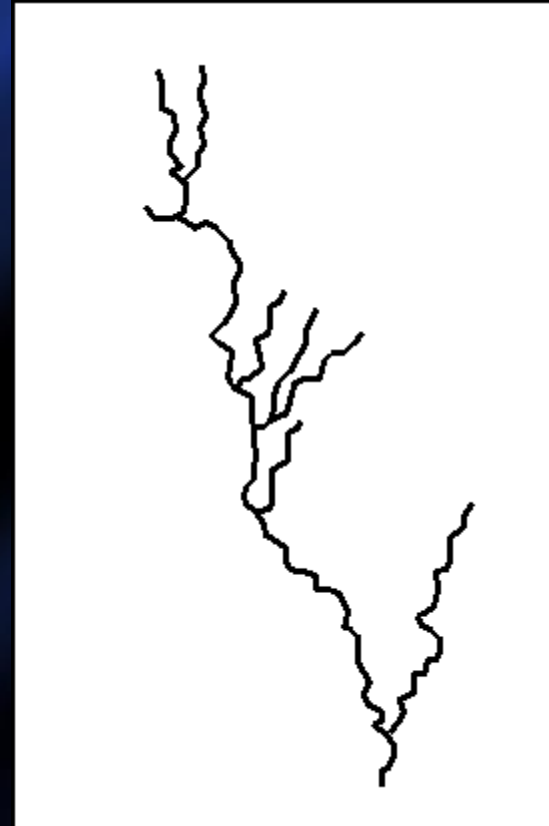
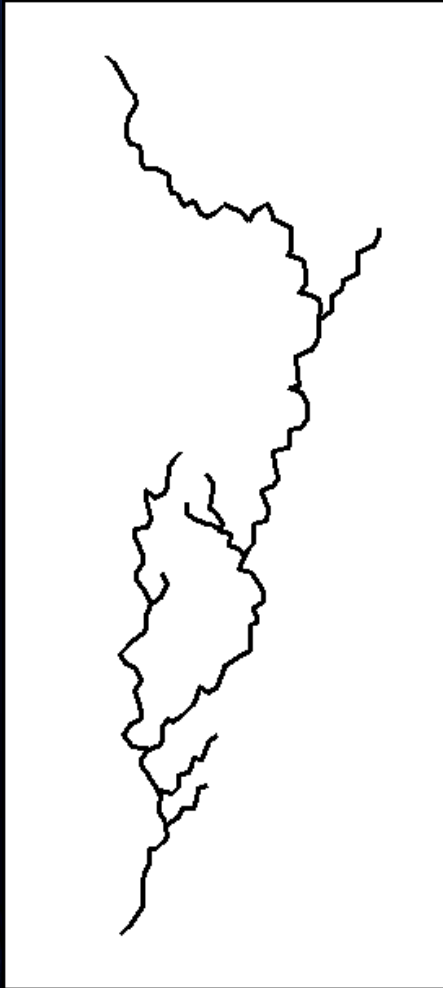
Penampang Morfologi Perbukitan Karst



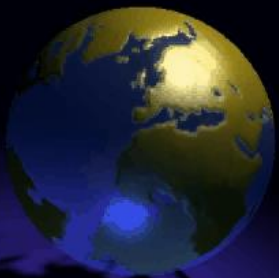
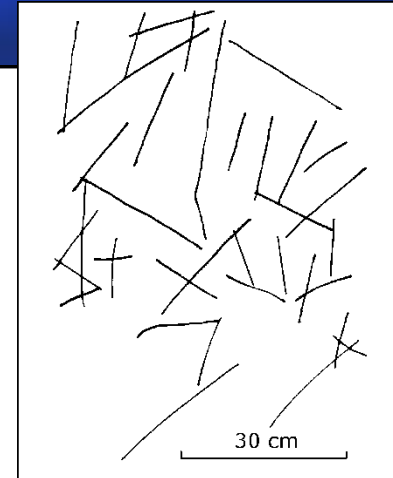
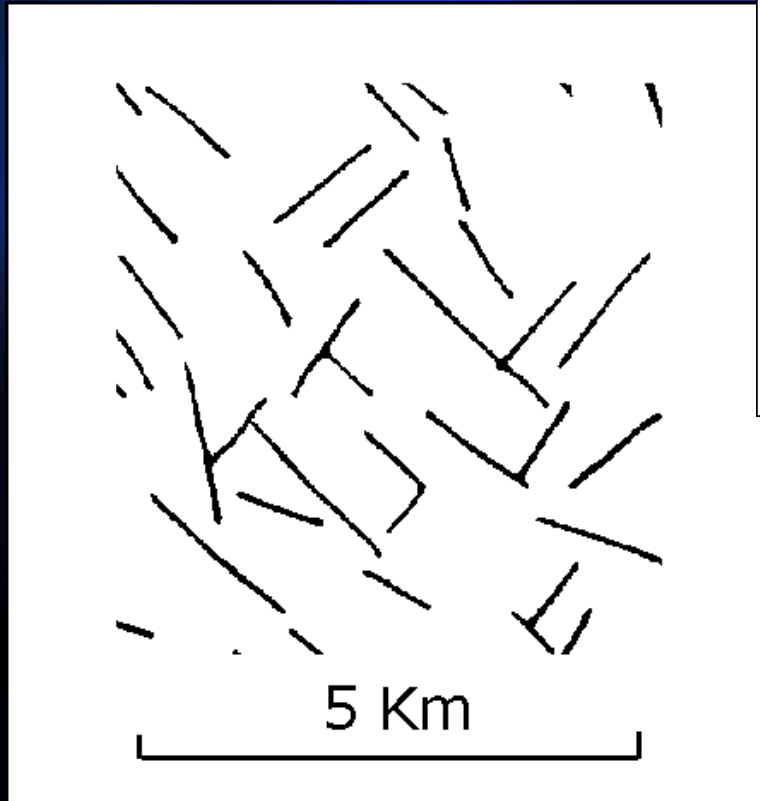
200 m



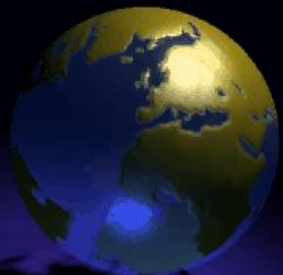
Alur-alur erosi pada permukaan batugamping



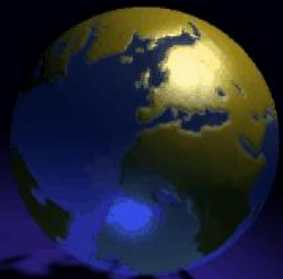
Pola Struktur Rekahan pada batugamping Gunungsewu

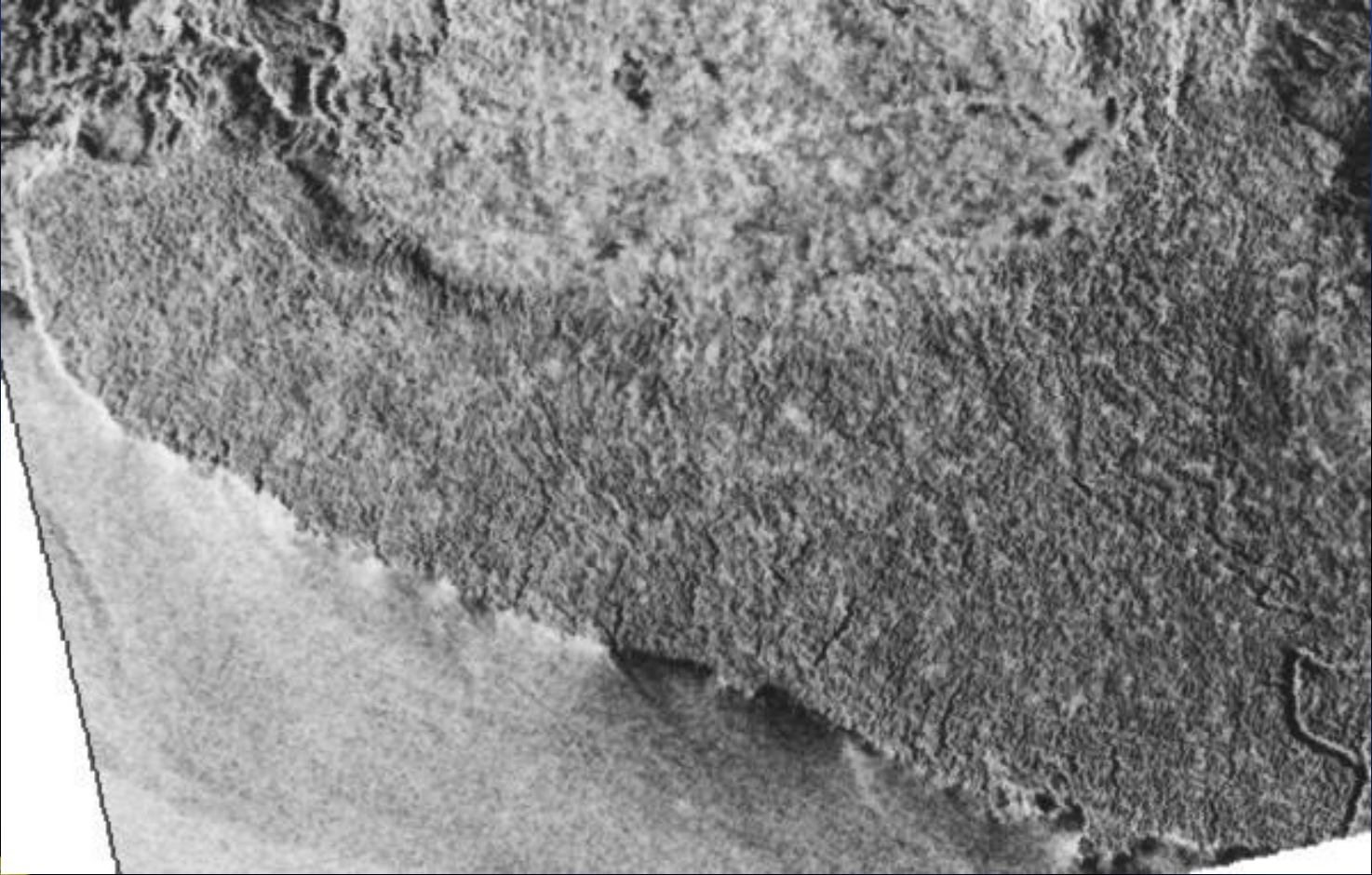


Saluran Sungai
Bawah Tanah:
Kali Tegoan -
Baron

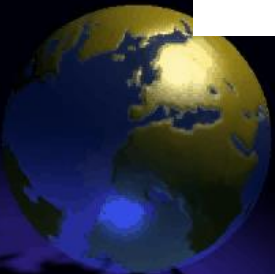


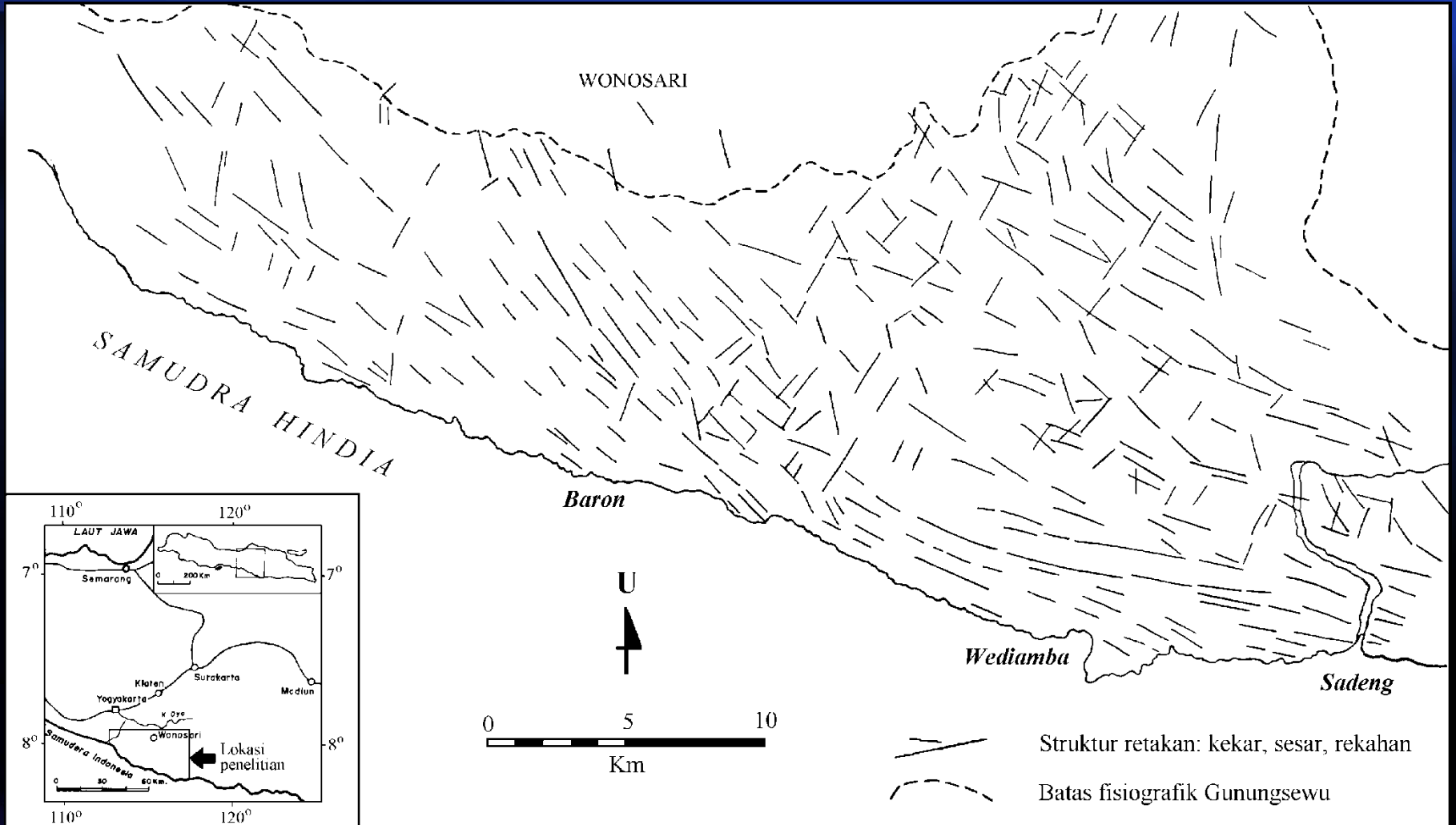
Batugamping karstik (Dok: Sari BK)

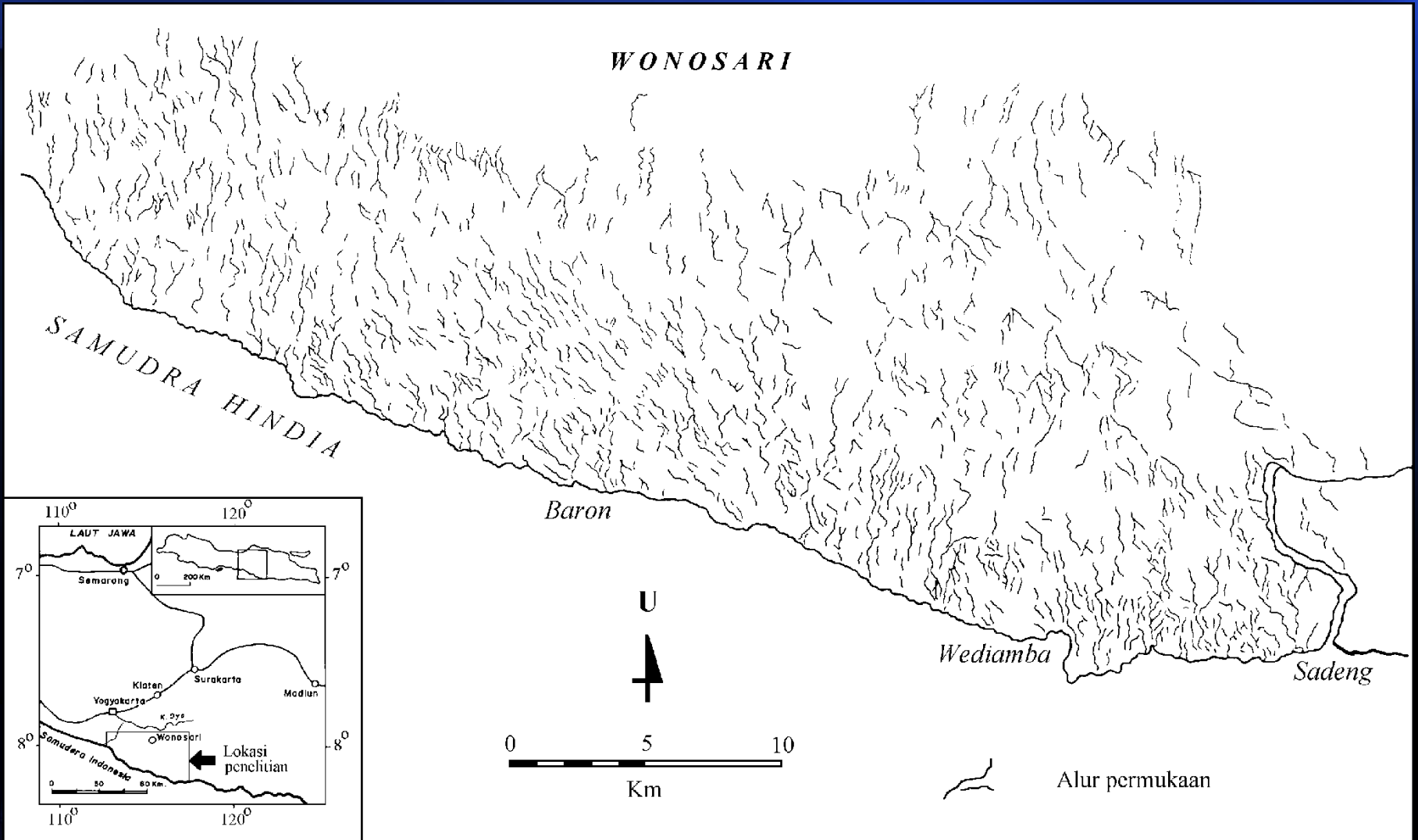


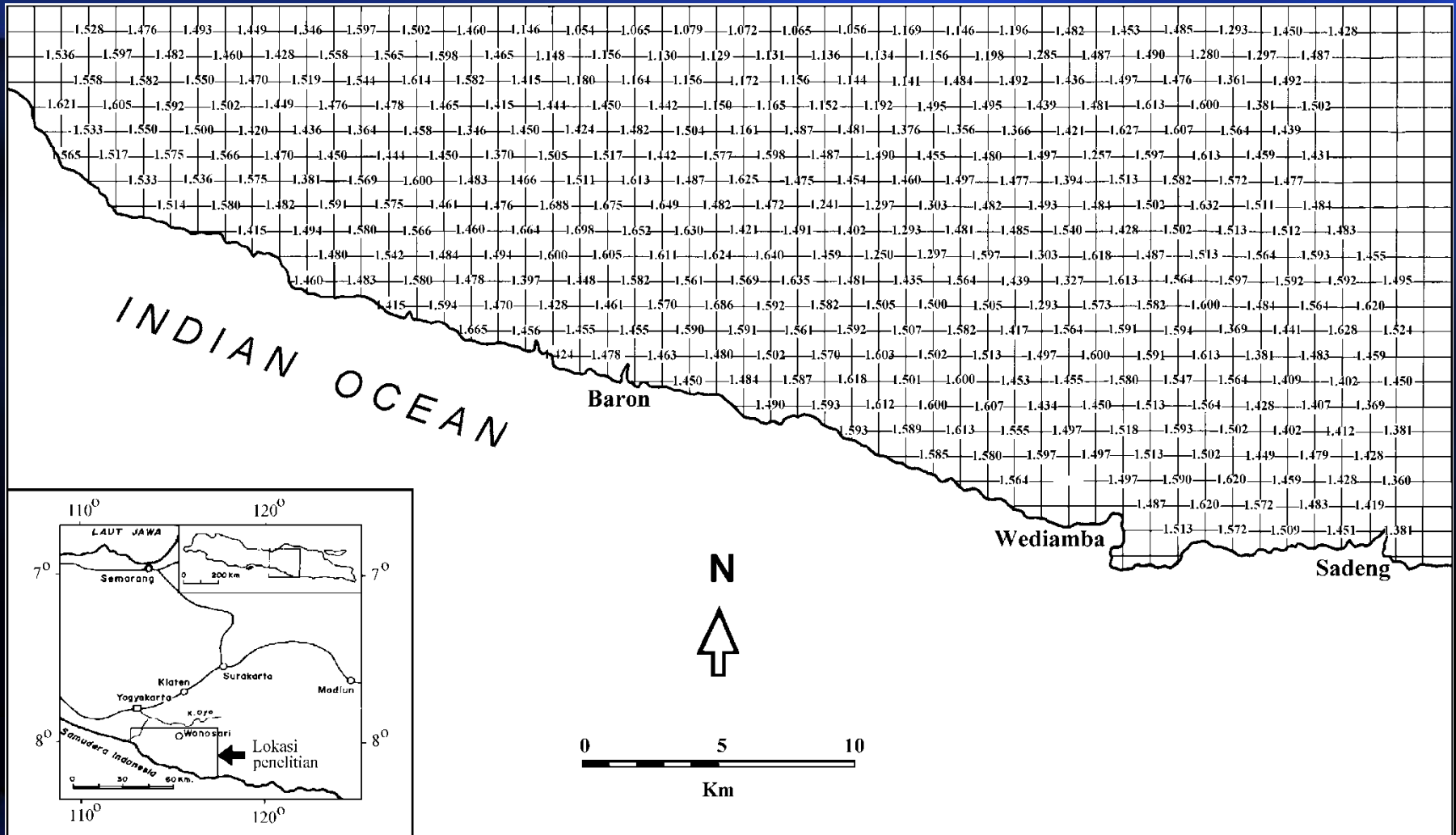


Citra ERS Daerah Gunungsewu

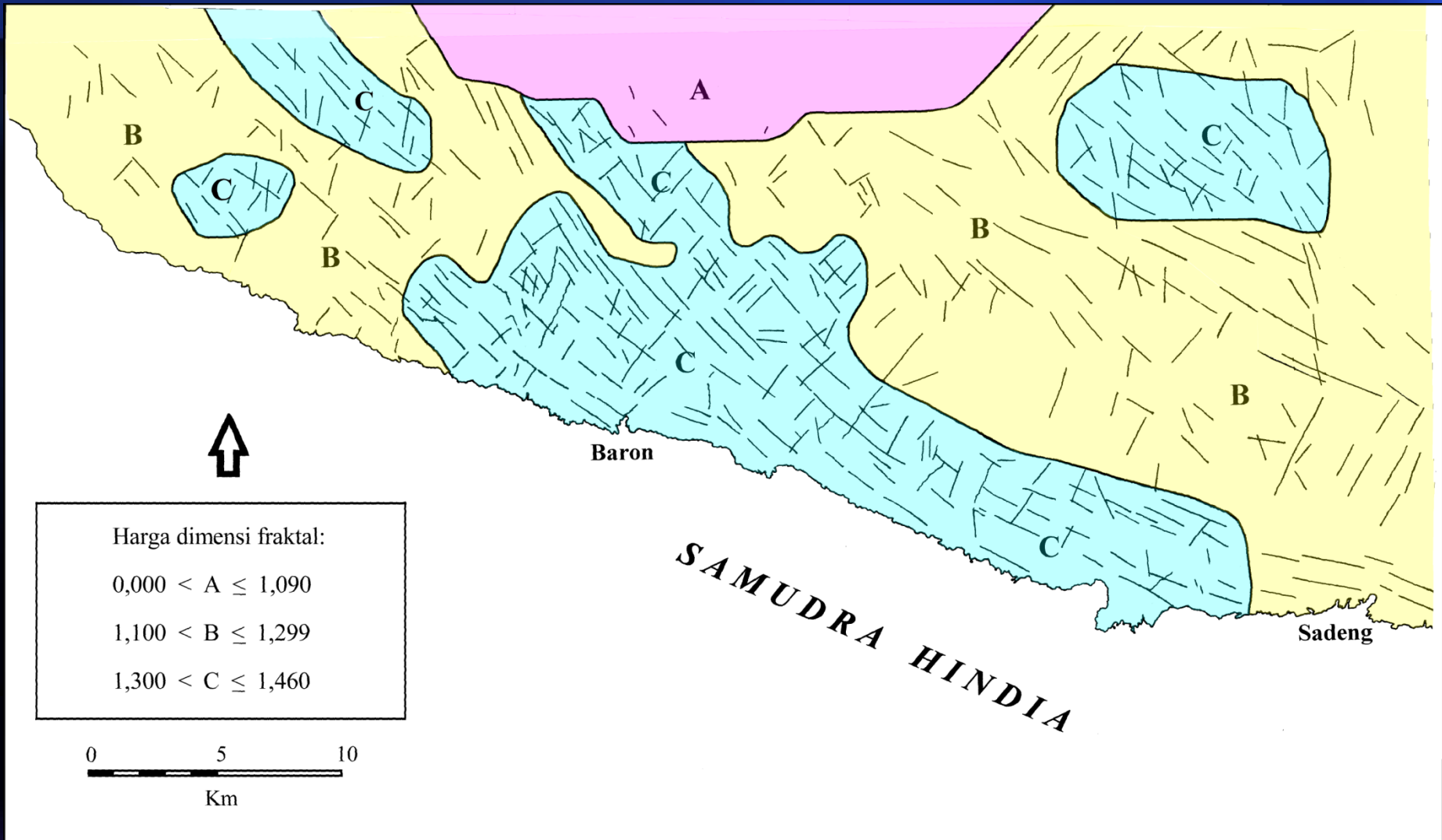




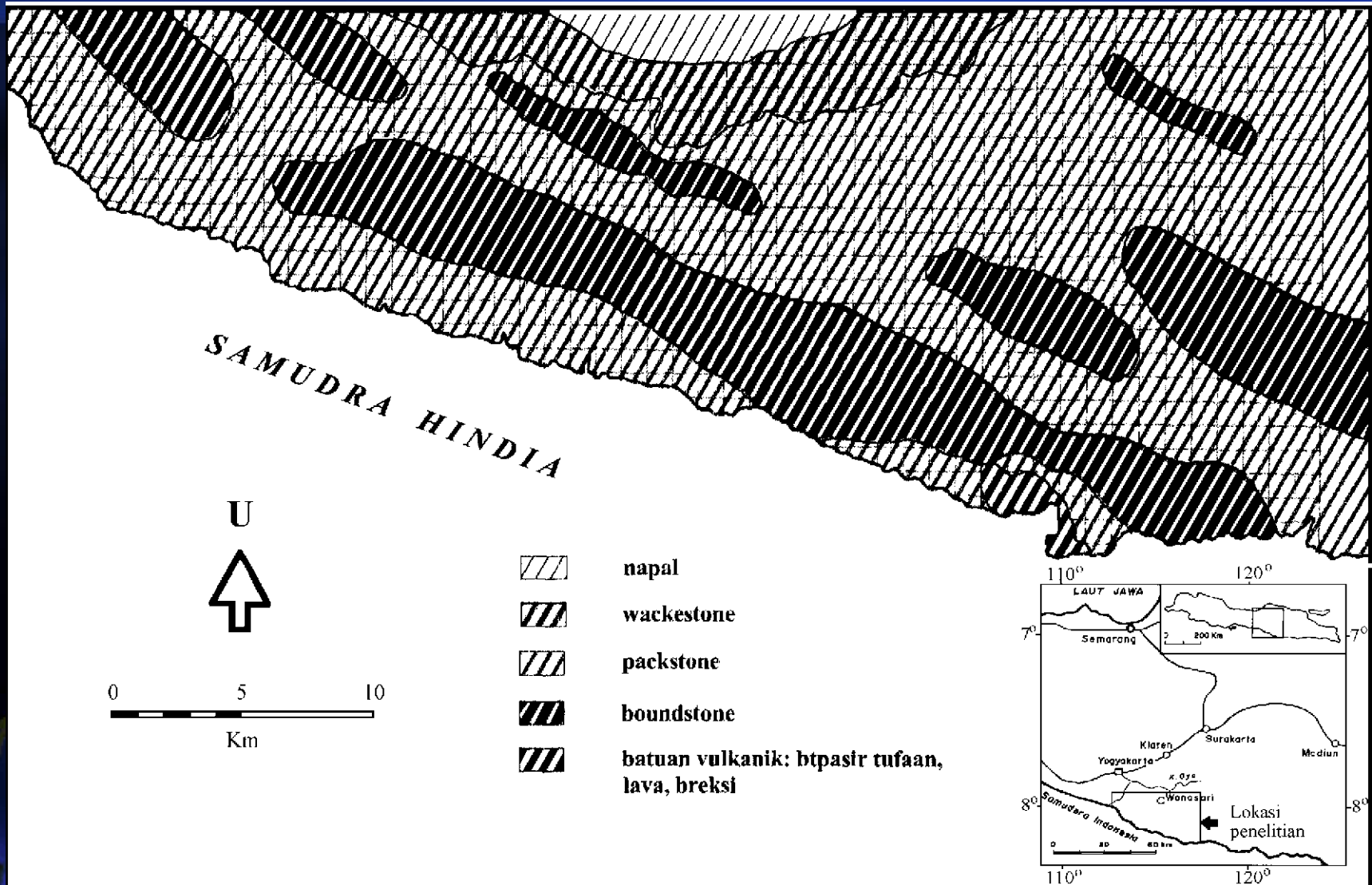




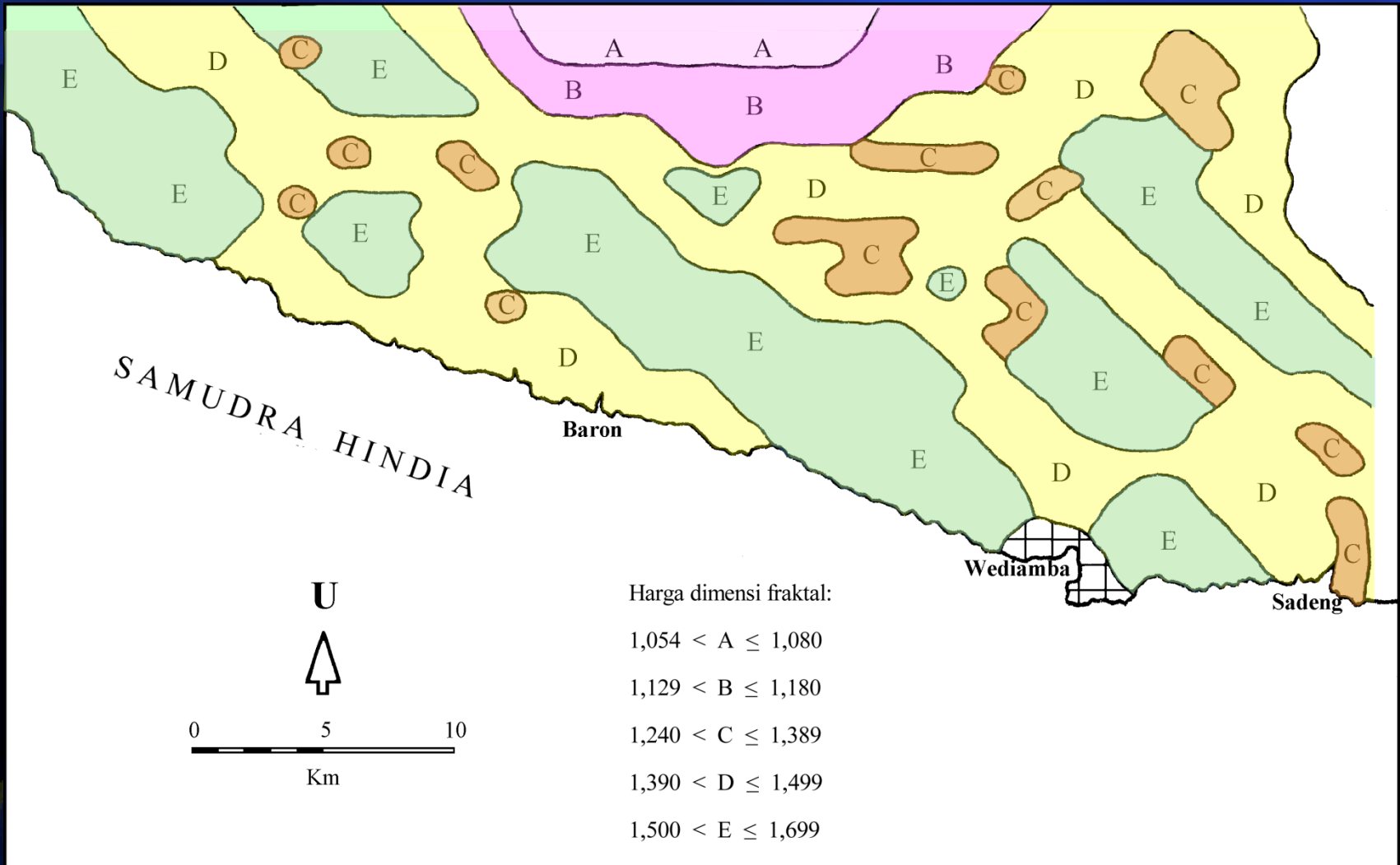
Peta Zonasi Rekahan berdasarkan Analisis Fraktal



Peta Distribusi Fasies batuan Karbonat Gunungsewu berdasarkan metode konvensional



Peta distribusi Fasies Batuan Karbonat Gunungsewu berdasarkan Analisis Fraktal



A. Napal

B. Wackestone

C. Kaliche

D. Packstone

E. Boundstone



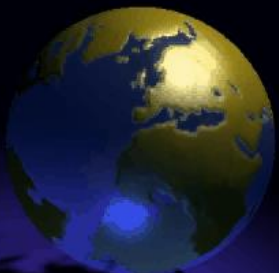
Batugamping Terumbu



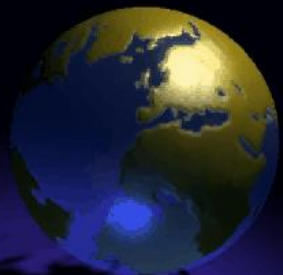
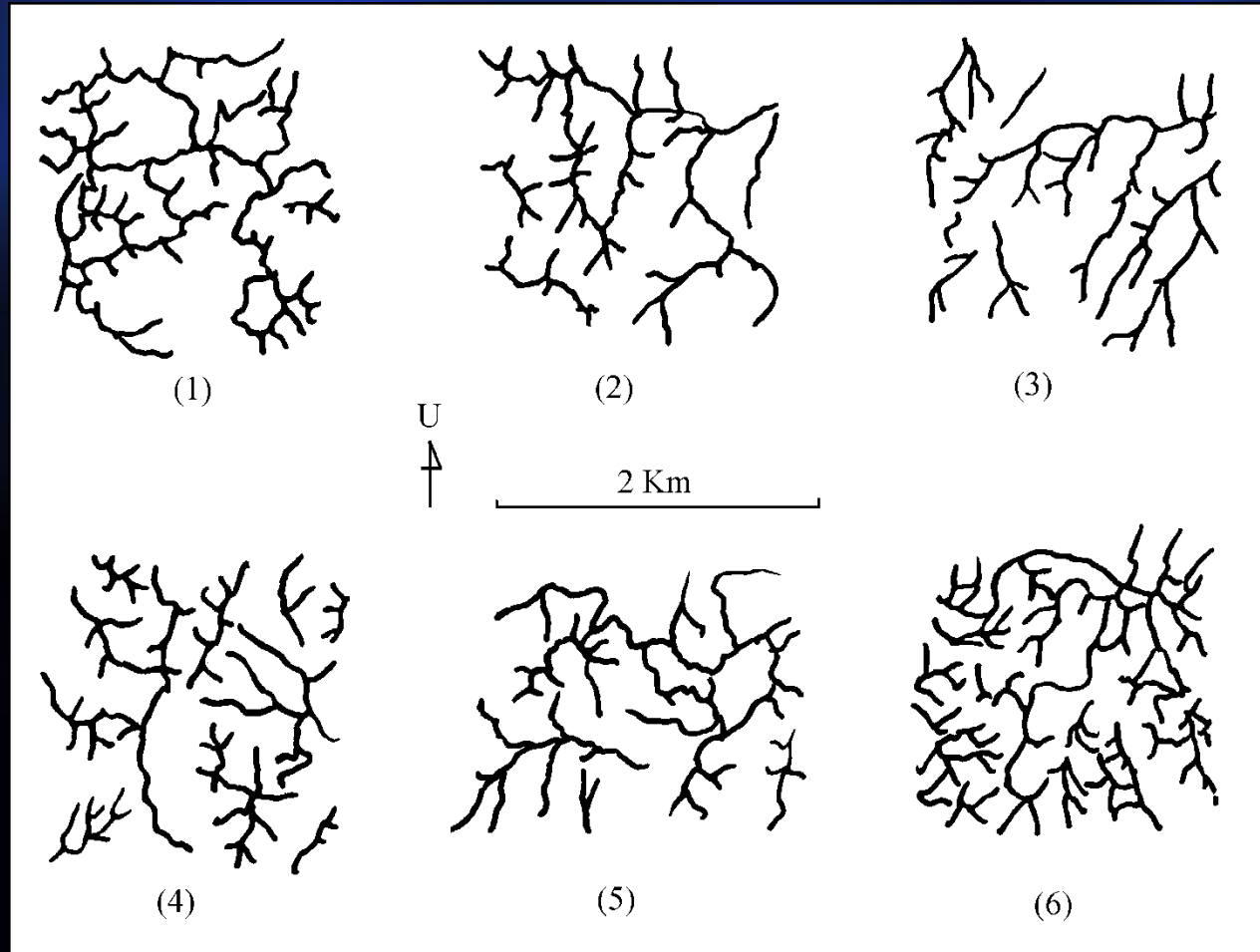
Batugamping Kalice



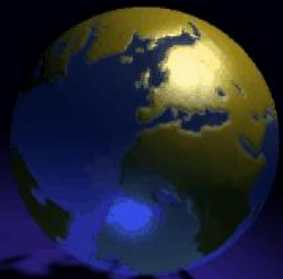
Batugamping
Berlapis



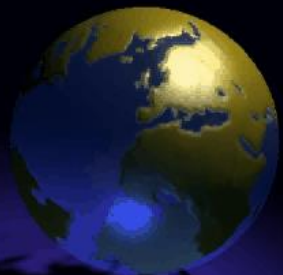
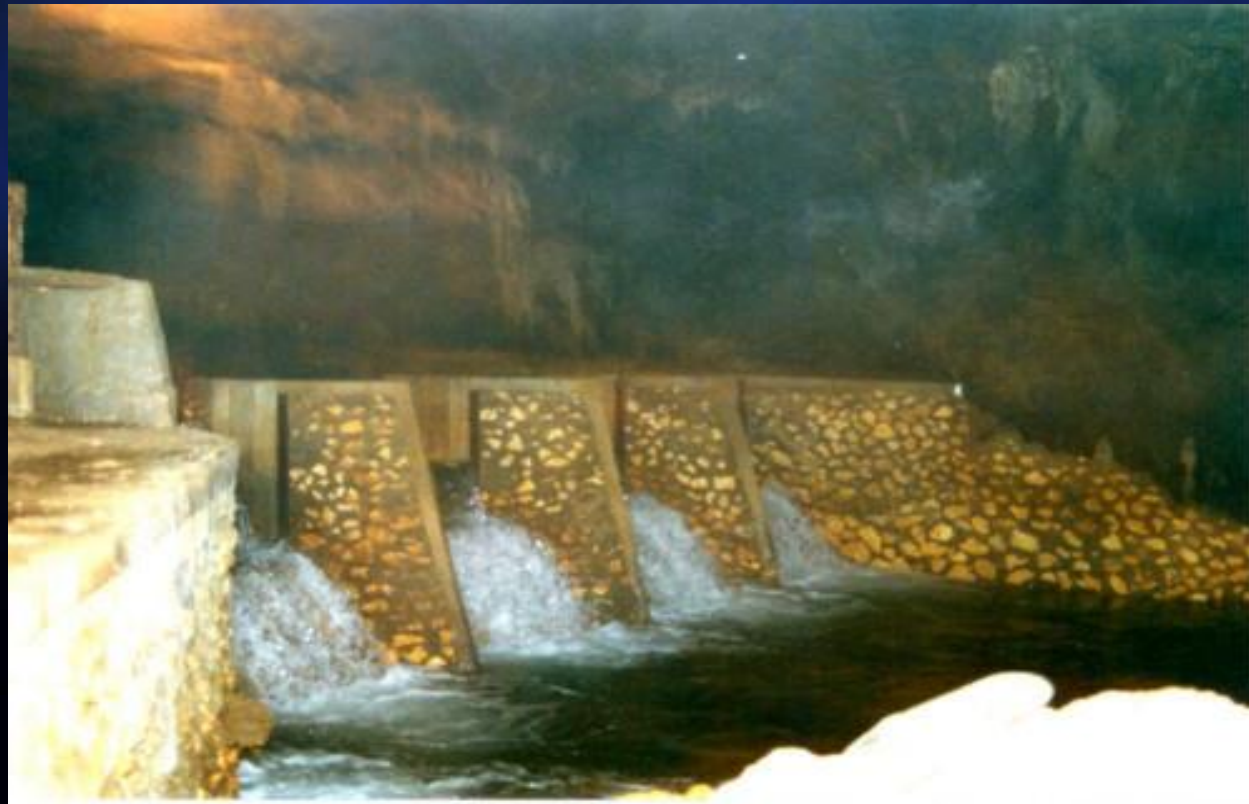
Pola-pola alur-alur permukaan di daerah karst



Kali Suci
di Semanu,
masuk ke
dalam gua



Sungai Bawah Tanah: di Gua Bribin (Dok: Sari BK)



Garis Pantai Selatan Gunungkidul

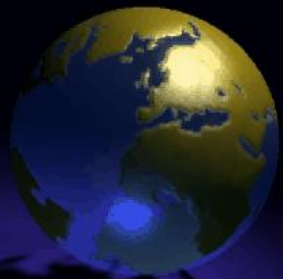


Image © 2008 TerraMetrics
Image © 2008 DigitalGlobe

© 2007 Google

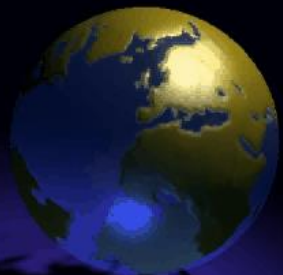
Tabel 3. Dimensi Fraktal Garis Pantai dan Keberadaan Mata-air Pantai

No.	Lokasi	Dimensi Fraktal (D)	Mata-air/Debit
1	Pantai Baron	1,192	➤ 9000 l/det
2	Pantai Slili	1,072	100 – 200 l/det
3	Pantai Sundak	1,111	100 – 200 l/det
4	Pantai Sepanjang	< 0,90	tidak ada
5	Pantai di seb timur Drini	0,932	tidak ada
6	Pantai di seb timur Wediamba	0,966	tidak ada

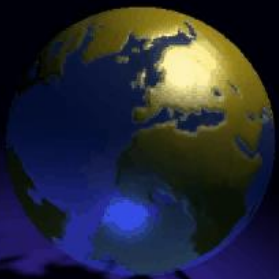
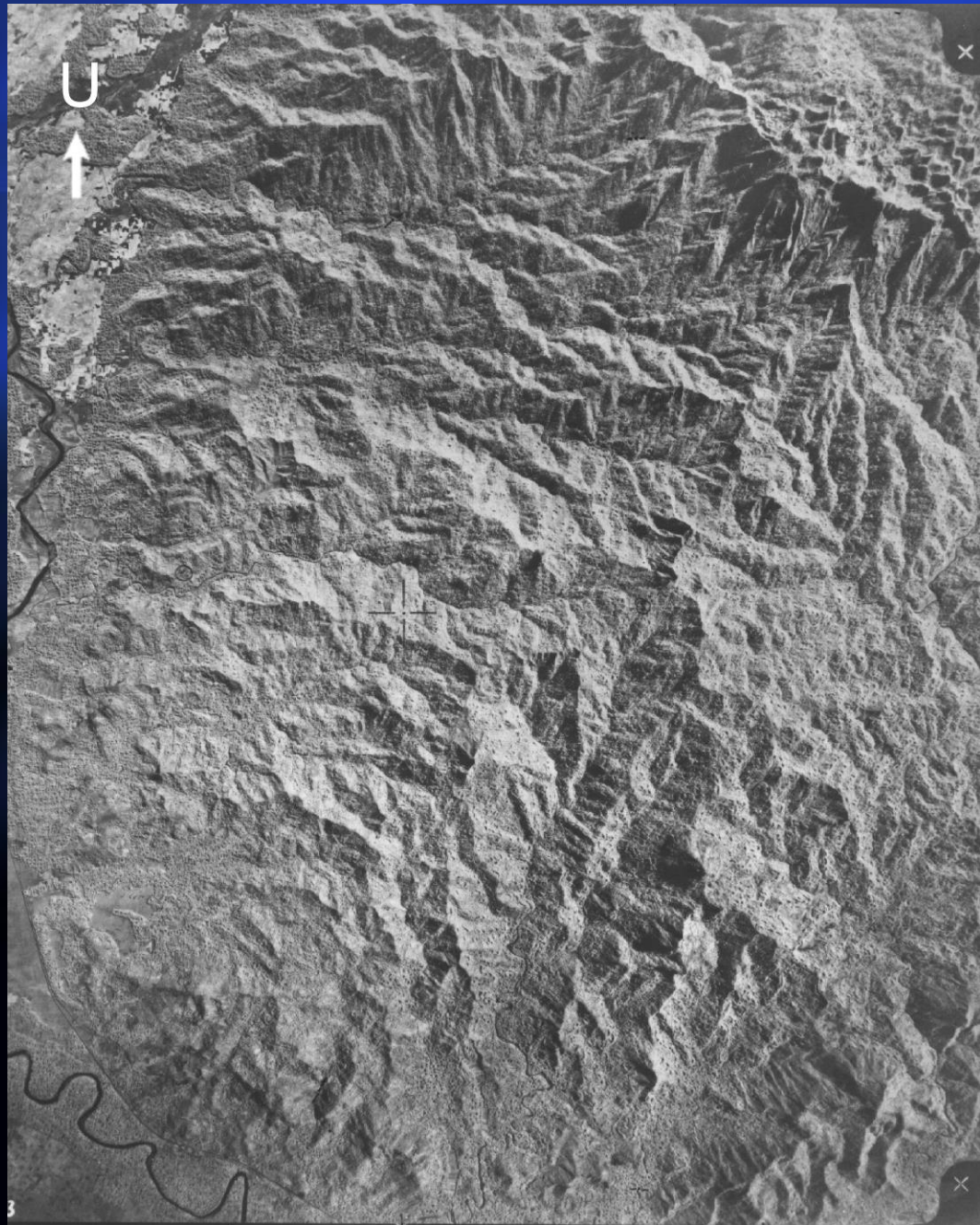


Segment	Location	Fractal Dimension	Spring	Rate (l/sec)	Remarks
1	Teluk Becici	1.230 ± 0.01	absent		verified
2	Teluk Pule - Gebangkara	1.284 ± 0.01	absent		verified
3	Teluk Nungguh - Karangtelu	1.445 ± 0.01	present	?	presumed
4	Pantai Gesing	1.251 ± 0.01	absent		verified
5	Ngobaran - Ngreanean	1.382 ± 0.01	present	200	verified
6		$469. \pm 0.01$	present	300	verified
	Teluk Baron - western coast				
7	Kukup - Spanjang - Drini	1.239 ± 0.01	absent		verified
8	Watulawang	1.315 ± 0.01	present	?	presumed
9	Watulawang - Wediamba	1.308 ± 0.01	present	1 – 50 (episodic)	verified
10	Wediamba – western coast	1.365 ± 0.01	present	?	presumed
11	Eastern coast of Wediamba	1.355 ± 0.01	present	?	presumed
12	Ngungap - Sadeng	1.630 ± 0.01	present	> 5000	verified
13		1.448 ± 0.01	present	5 – 50 (episodic)	verified
	Eastern coast of Sadeng – Tanjung Dadapan				
14	Slili	1.324 ± 0.01	present	50 - 200	verified
15	Sundak	1.317 ± 0.01	present	50 - 200	verified
16	Baron Beach	1.665 ± 0.01	present	9000	verified

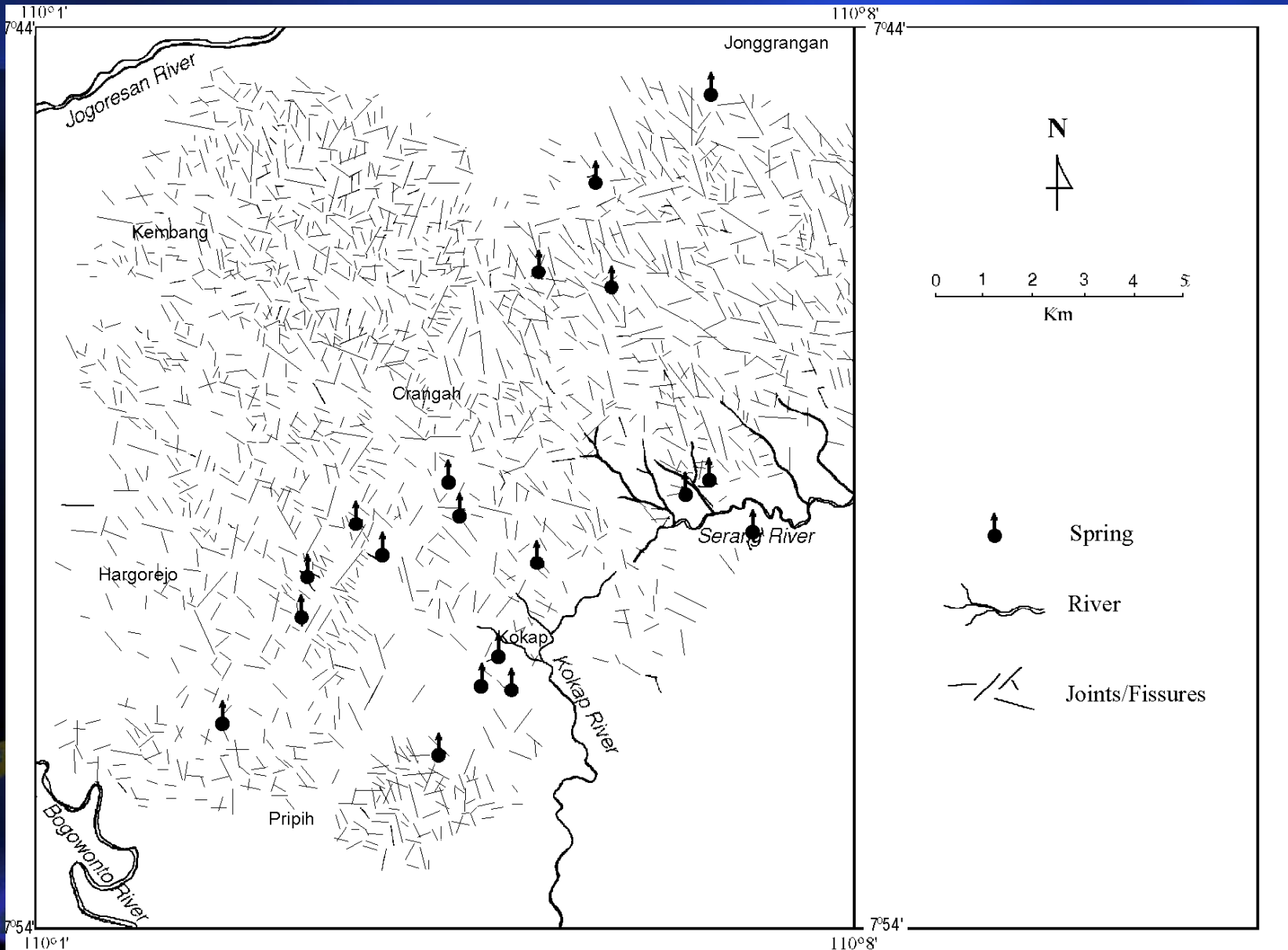
Pantai dengan D garis pantai > 1
berpotensi dijumpai mata-air

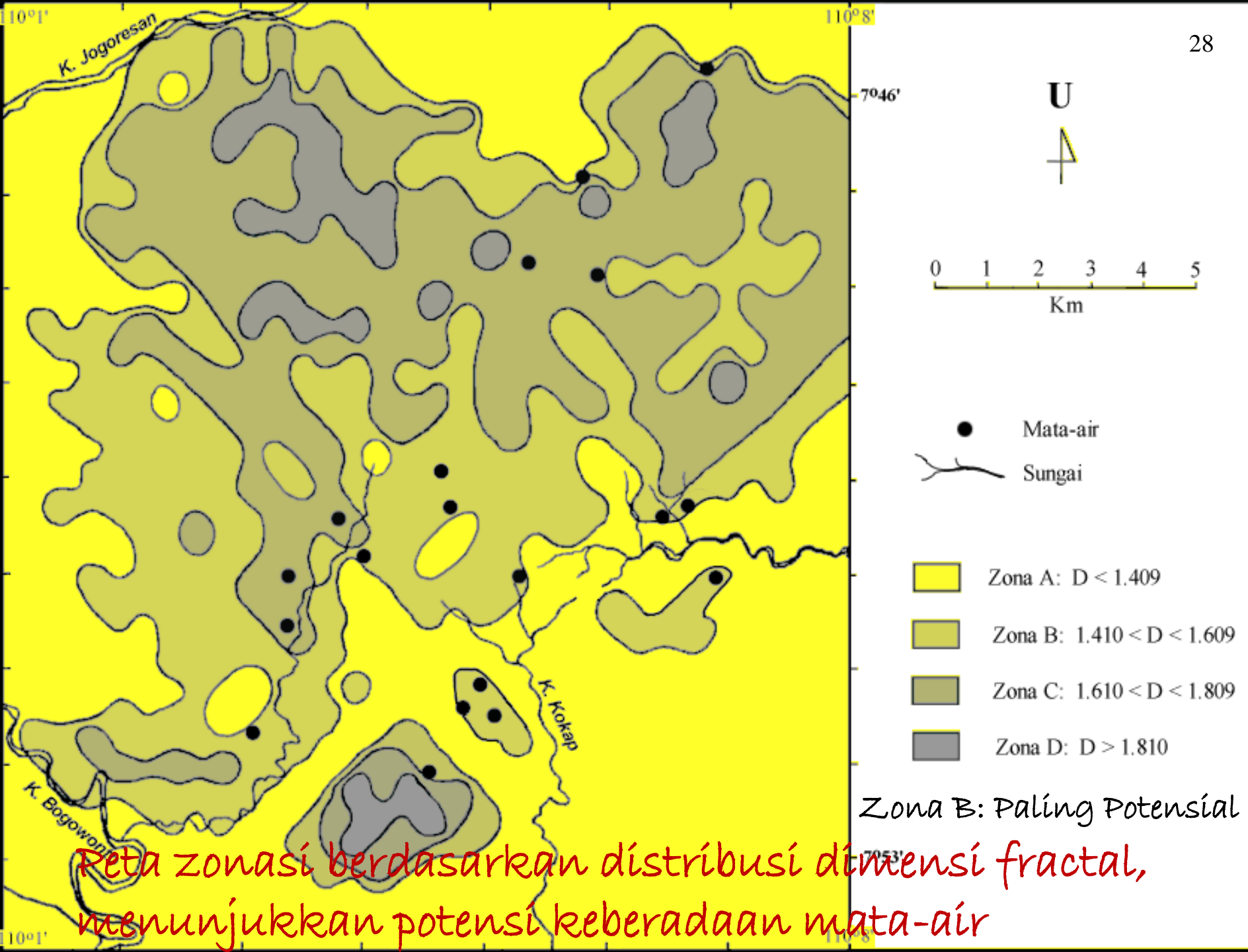


Citra Satelit
Topografi
Daerah
Kulon Progo
Berdasarkan
citra ini, dapat
ditarik pola
kelurusan
struktur
geologinya

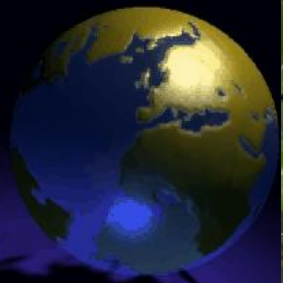
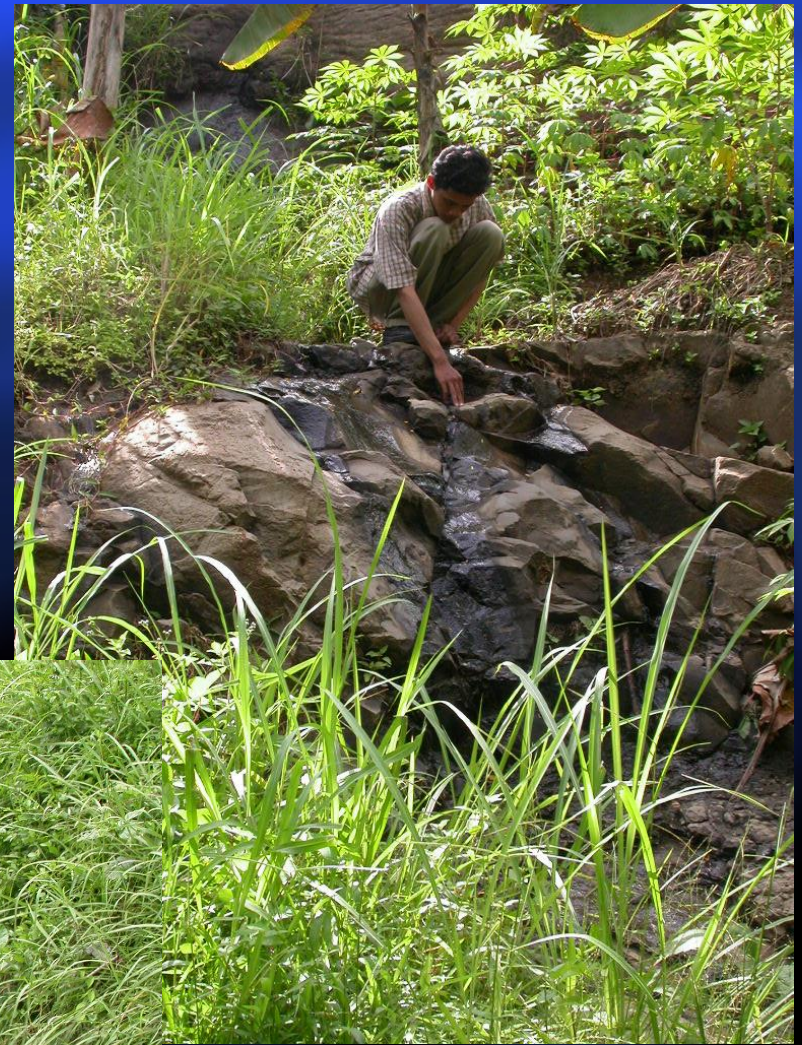


Peta Pola Retakan dan Mata-air Daerah Kulonprogo





Mata-air Retakan
di Pegunungan
Kulonprogo
(Dok: Sari BK)



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- Kusumayudha, SB, Listyani, Purwanto, HS, Isjudarto (2011), Fractal Analysis on the Correlation of Coastal Line Geometry and Tsunami Impact in Maumere, Flores, Indonesia, IJEEG

sekian
Terima Kasih

