本プロジェクトで取り組みたい地下の熱環境に関するいくつかの問題

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2005. 6. 9.　谷口プロジェクト研究打ち合わせ会

地下温度分布に関する問題

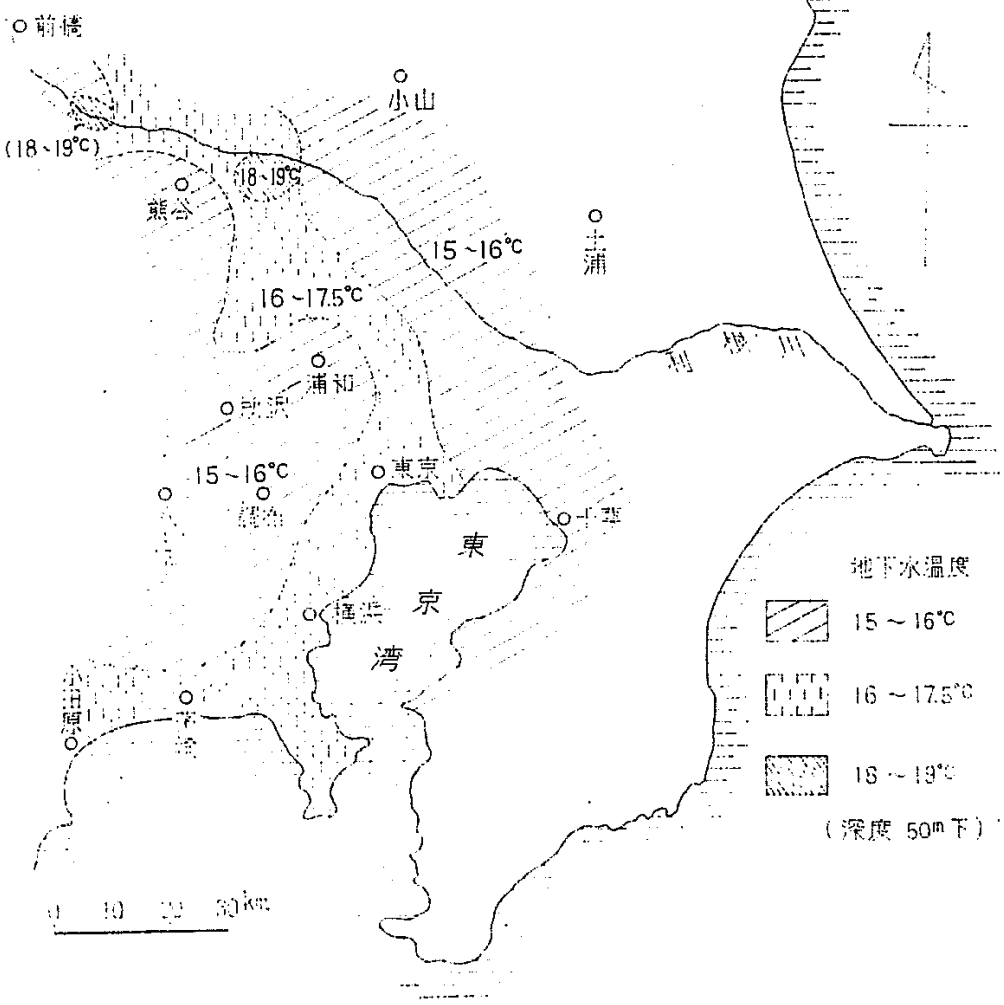
1）東京湾への地下水流出と東京湾の東西での温度差の関係　ーシミュレーション

2）東京都観測井を用いた繰り返し温度測定による温度変化の把握

3）都市域の異常高温による地下の温暖化現象

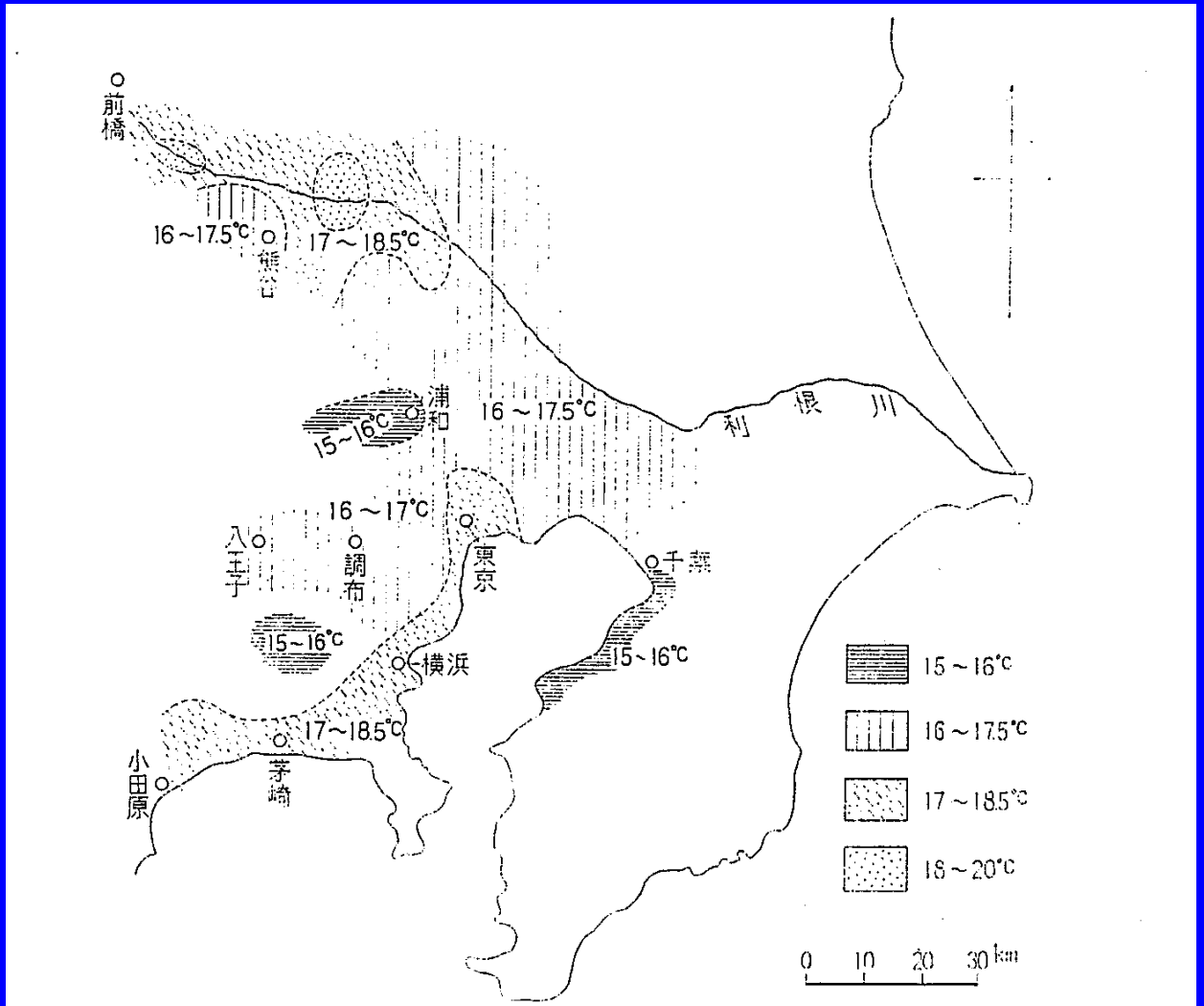
4）インドネシア、ジャカルタの地下温度分布と人間活動

問題－1
地下50mにおける温度分布（高橋、1667）



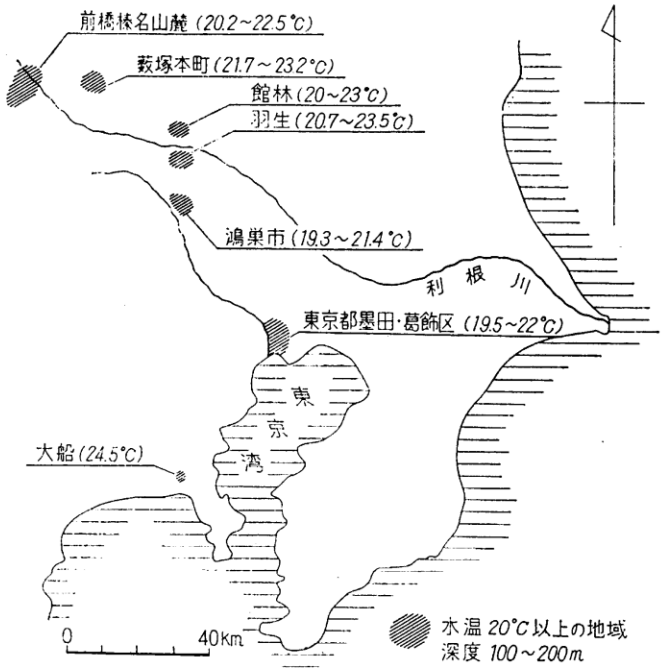
第45図　関東付近における深度50mの地下水温度

地下100mにおける地下温度分布（高橋、1967）

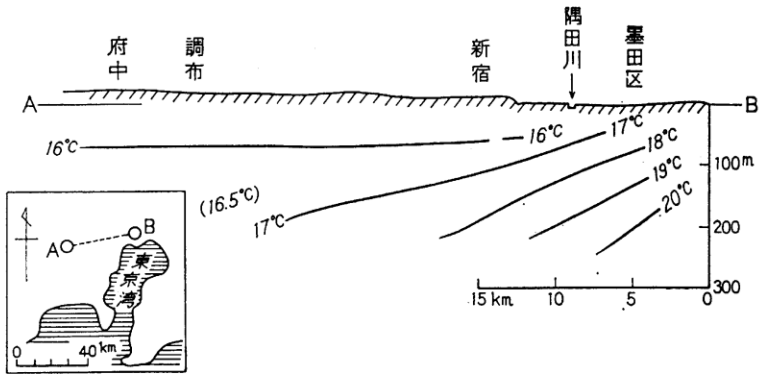


第46図　関東付近における深度 100mの地下水温度

東京周辺の地下温度

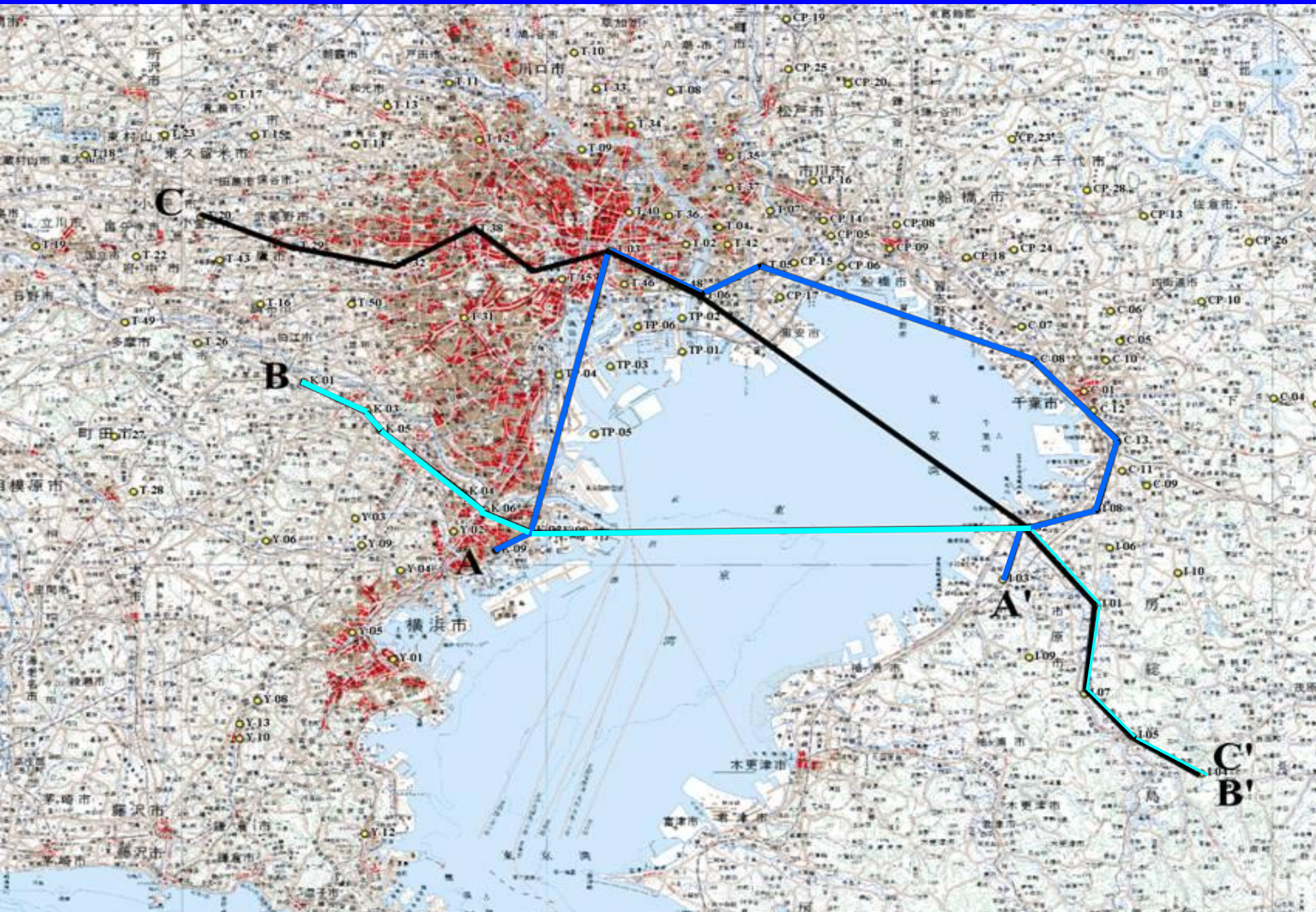


第47図　関東地方のとくに地下水温度が高い地域

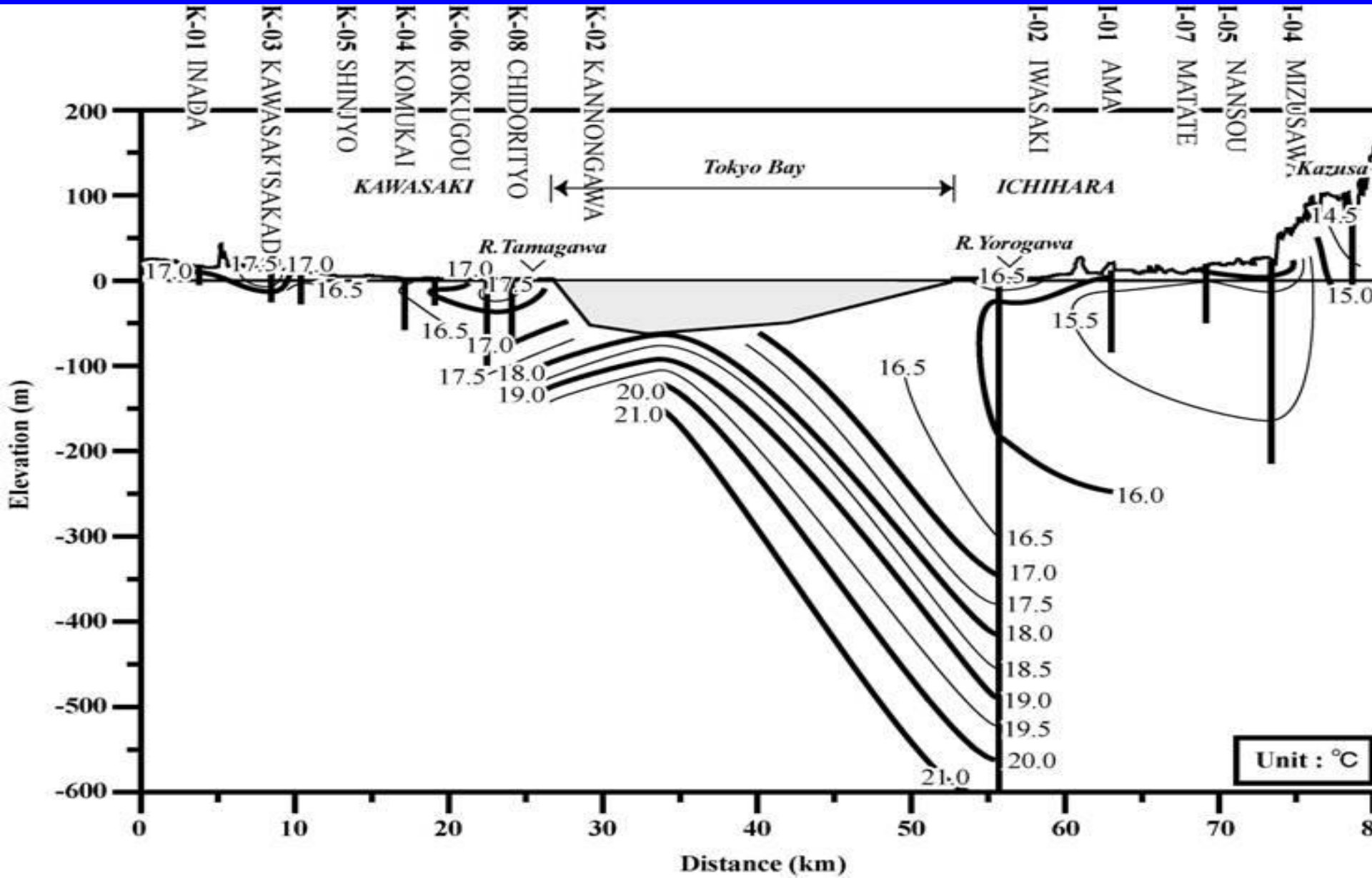


第48図　東京付近における地下水温度の模式地下断面図

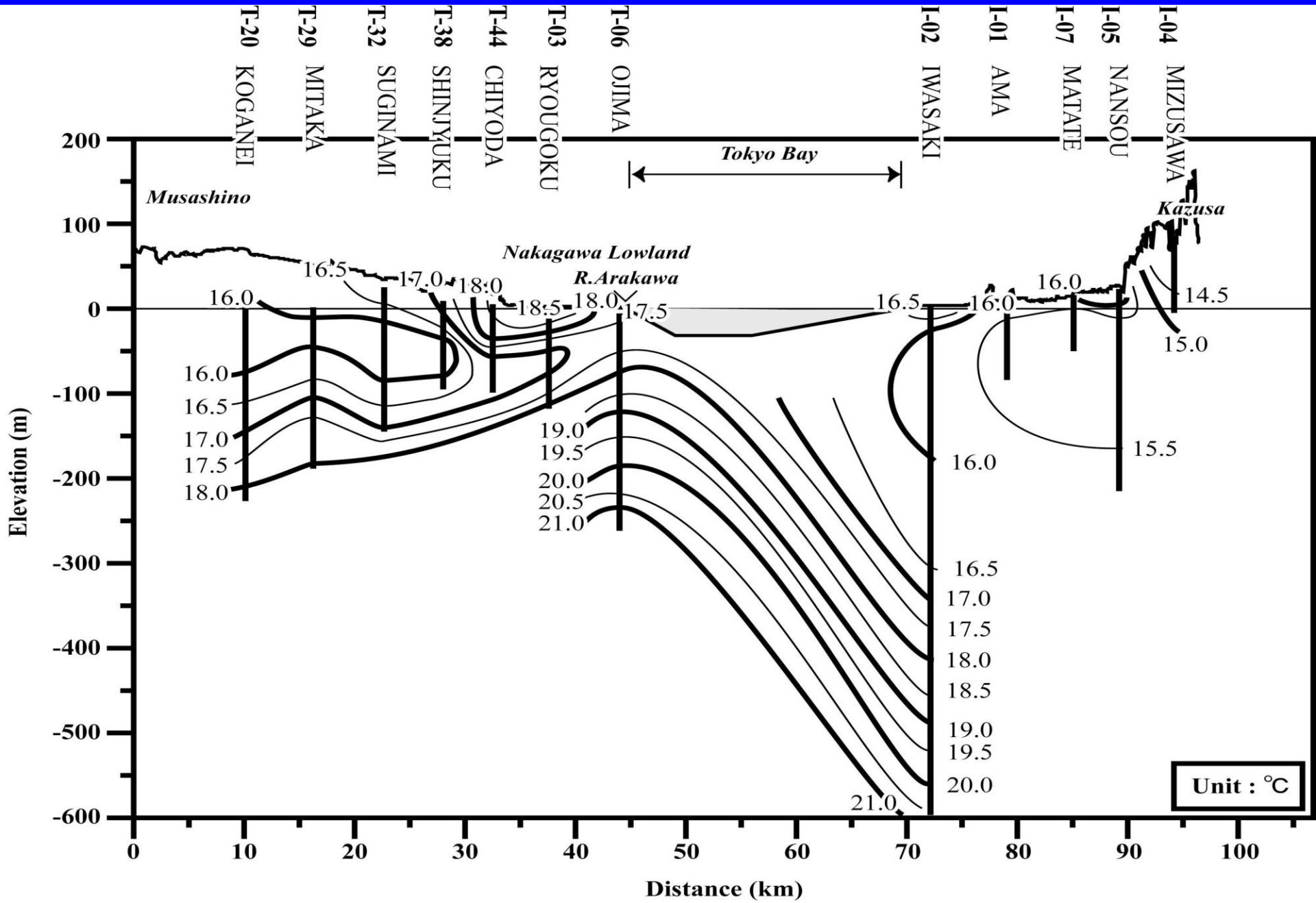
Location of cross-sections



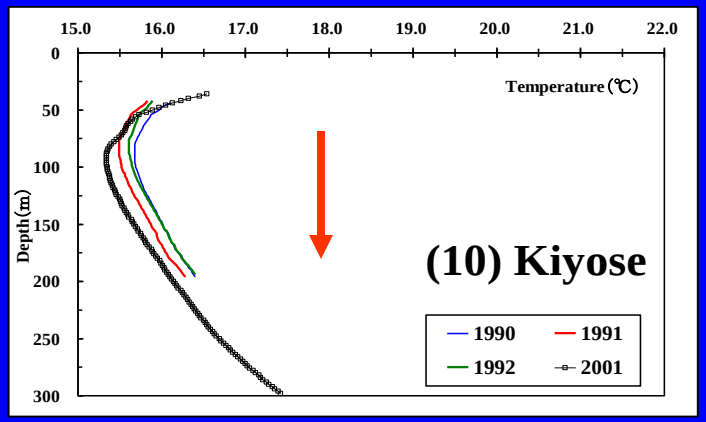
B-B’

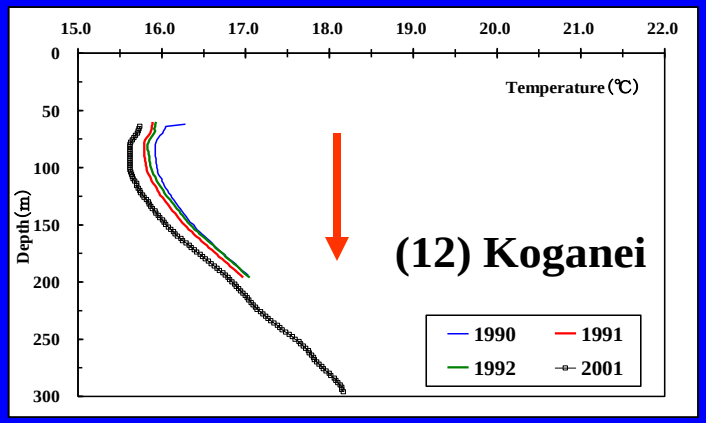

K-01 INADA
K-03 KAWASAKISAKADO
K-05 SHINJYO
K-04 KOMUKAI
K-06 ROKUGOU
K-08 CHIDORITYO
K-02 KANNONGAWA
I-02 IWASAKI
I-01 AMA
I-07 MATATE
I-05 NANSOU
I-04 MIZUSAWA
KAWASAKI
Tokyo Bay
ICHIHARA
Kazusa
R. Tamagawa
R. Yorogawa
Elevation (m)
Distance (km)
Unit : ℃

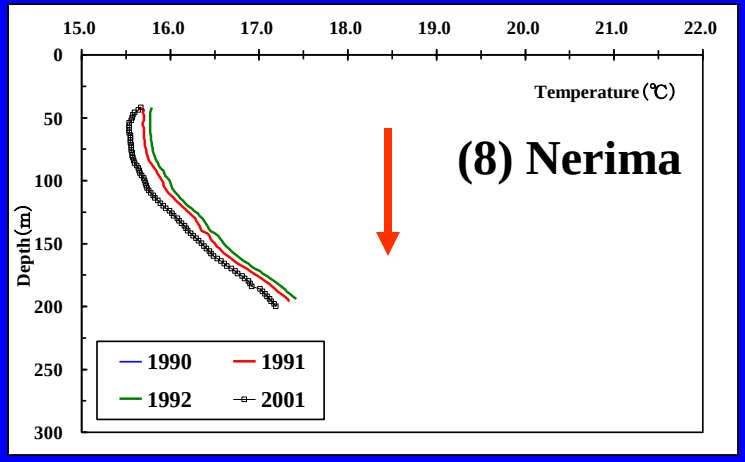
C-C’

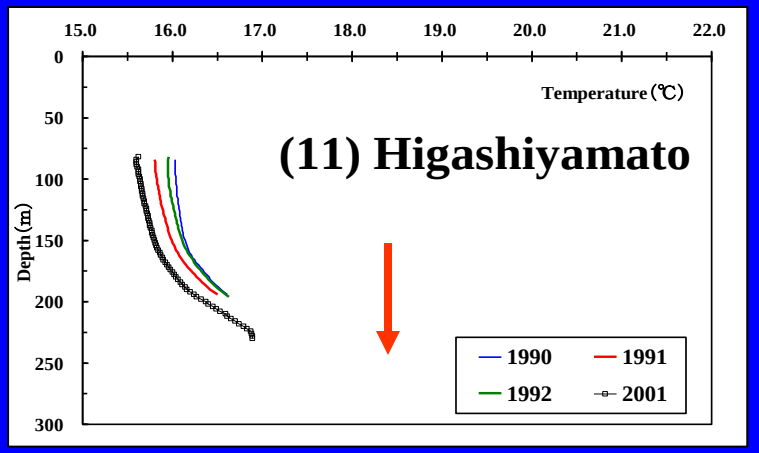

T-20 KOGANEI
T-29 MITAKA
T-32 SUGINAMI
T-38 SHINJYUKU
T-44 CHIYODA
T-03 RYOUGOKU
T-06 OJIMA
I-02 IWASAKI
I-01 AMA
I-07 MATATE
I-05 NANSOU
I-04 MIZUSAWA
Tokyo Bay
Musashino
Nakagawa Lowland
R.Arakawa
Kazusa
Elevation (m)
Distance (km)
Unit : ℃

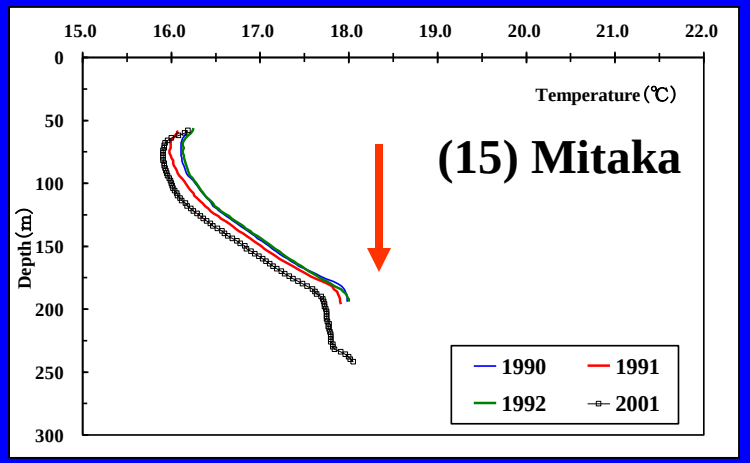
問題 - 2
Recharge (original data)



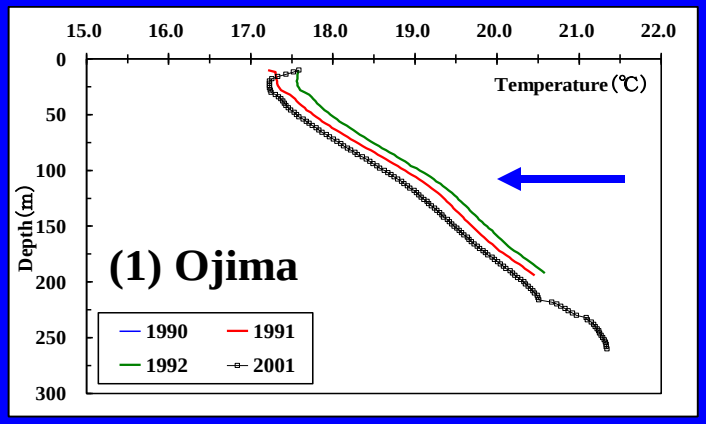


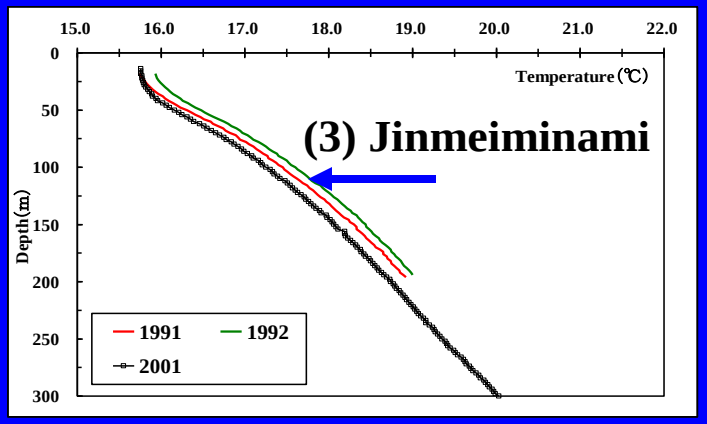


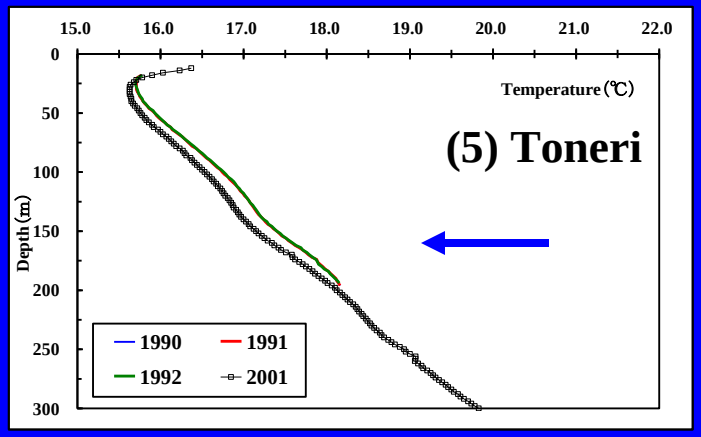


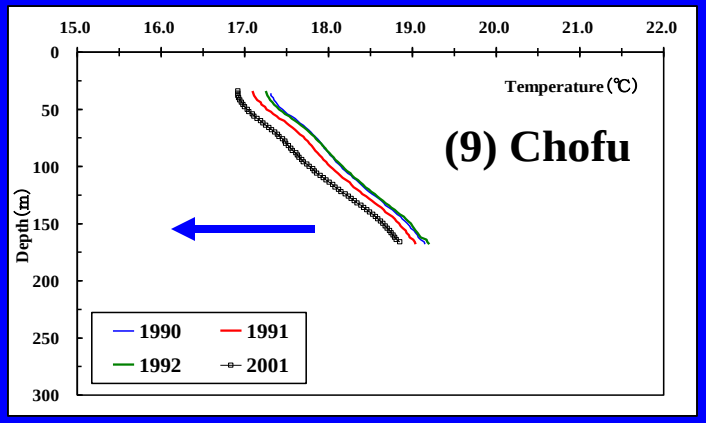


Discharge (original data)

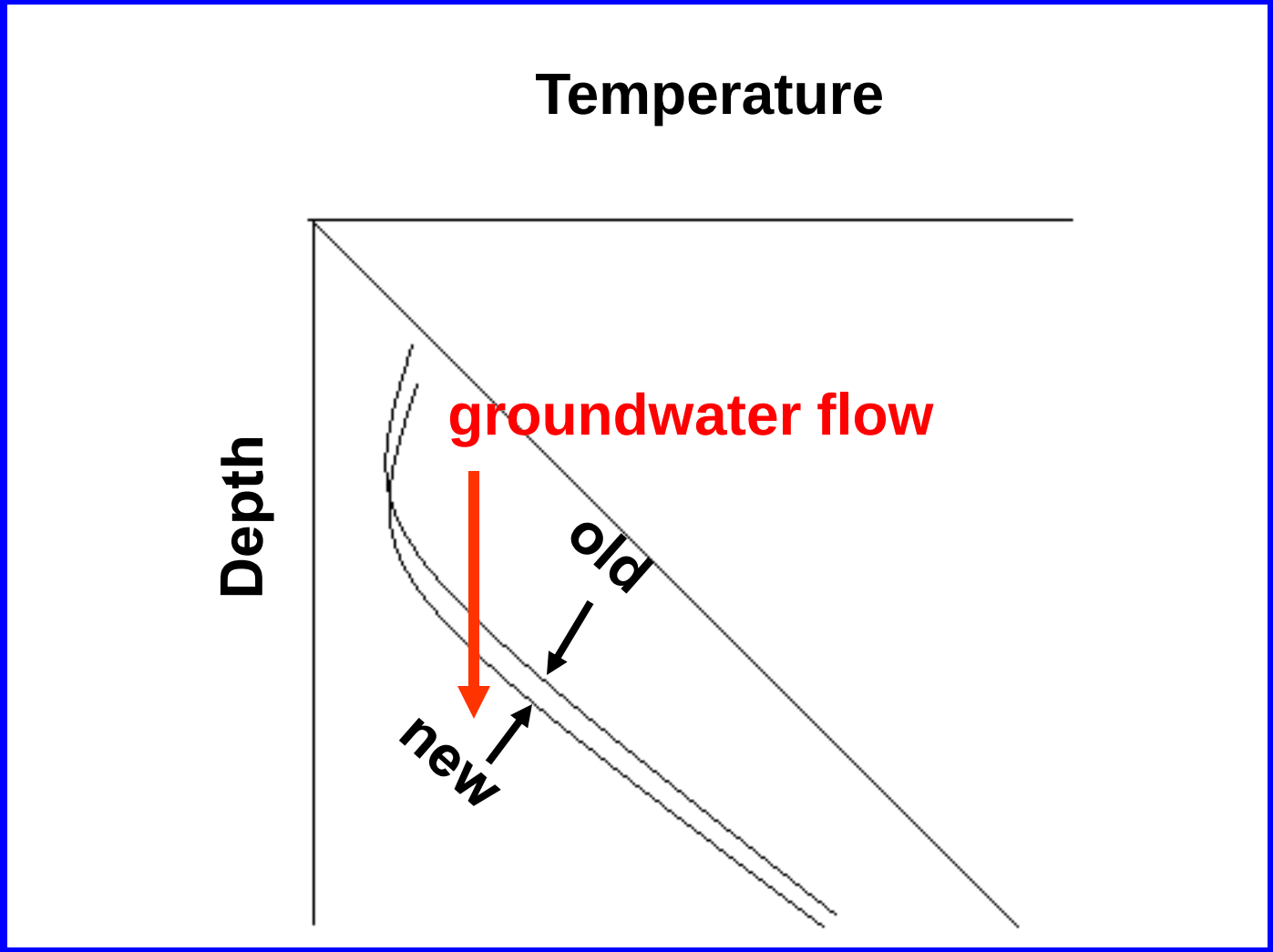




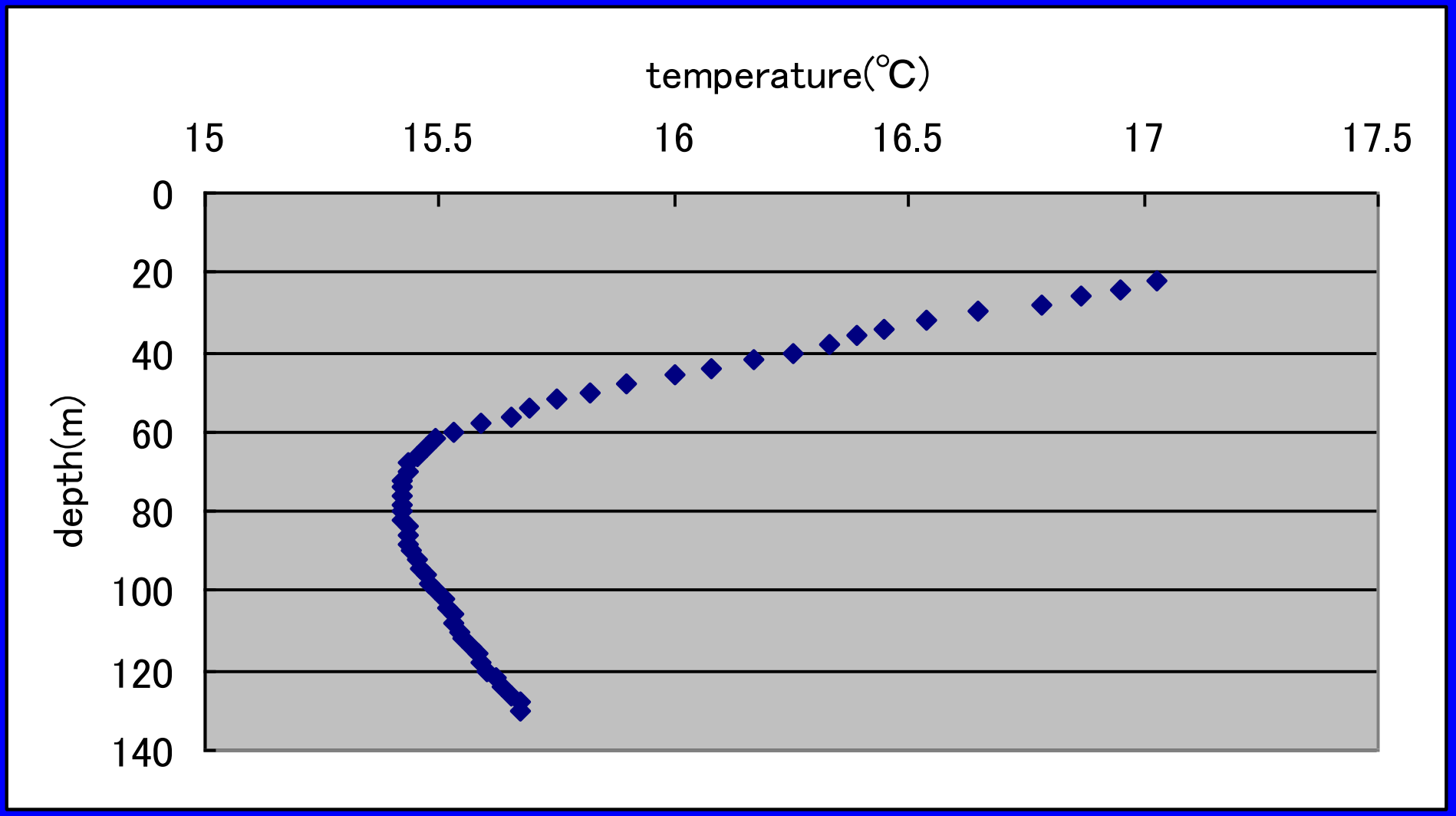




Hypothesis for subsurface temperature change due to advection

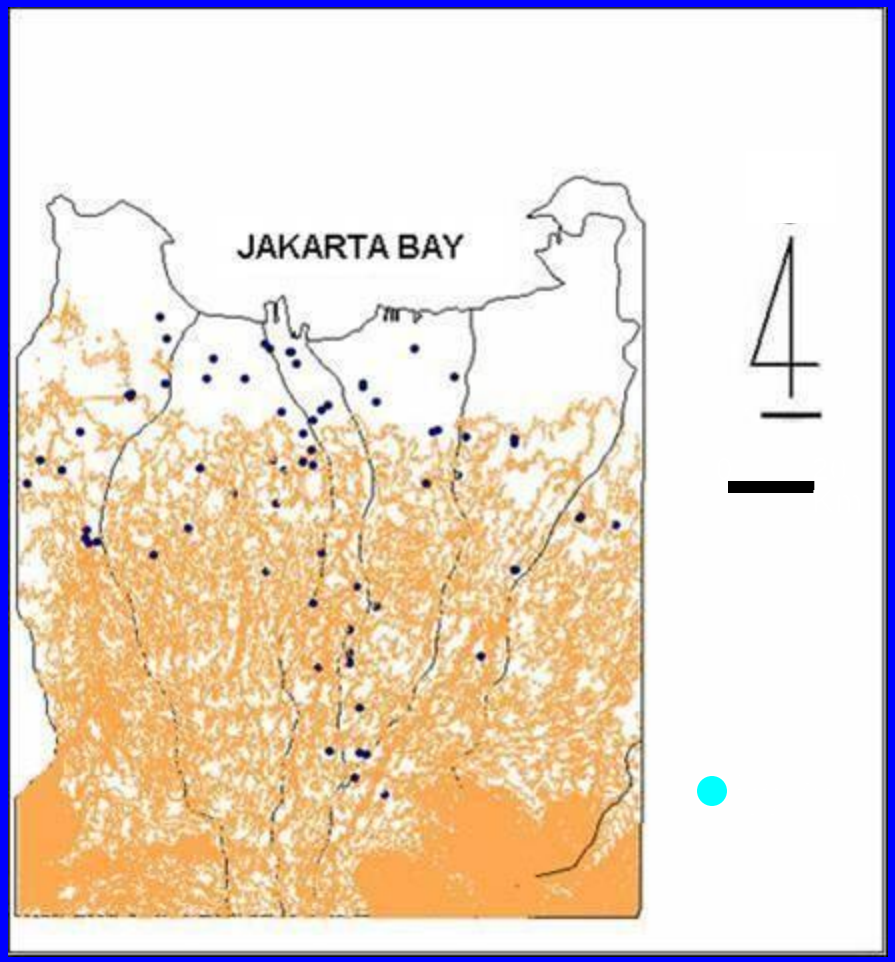


問題－3
千葉大学理学部観測井における温度プロファイル



問題 - 4

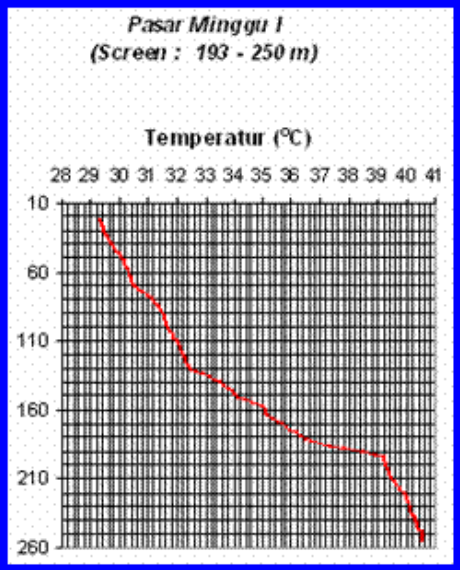
Preliminary Study Has Been Done



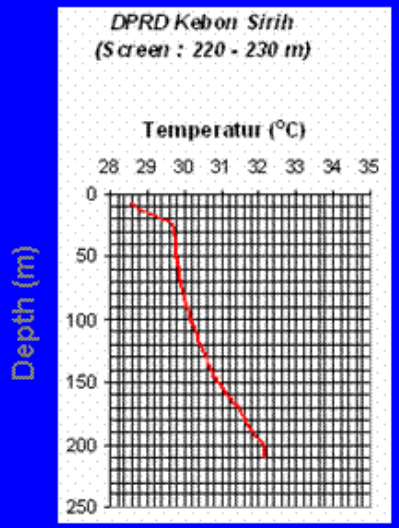
- Subsurface thermal measurements were generally made in observation wells, which are assumed to be in thermal equilibrium with the surrounding aquifer.
- Temperature measurements were carried out in 51 observation wells (40 – 200 m deep).
- The equipment used for the measurement was a sophisticated digital thermister thermometer (resolution of 0.01 ^{o}C) attached to a 300m long cable.
- Data were recorded from water table to the bottom of the hole in 2 m intervals in the downward direction. The observation wells are constructed of steel casing. The diameter of the observation wells ranges from 4 – 6 inch. Temperature profiles is plotting versus depth

Thermal profiles for selected wells in the southern, middle and northern parts of area, 2004

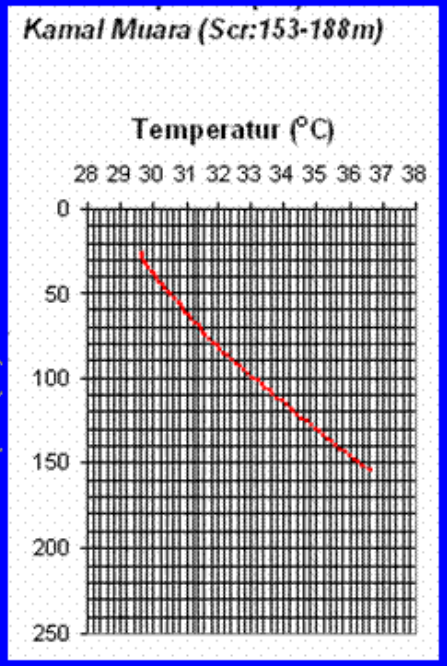
South West

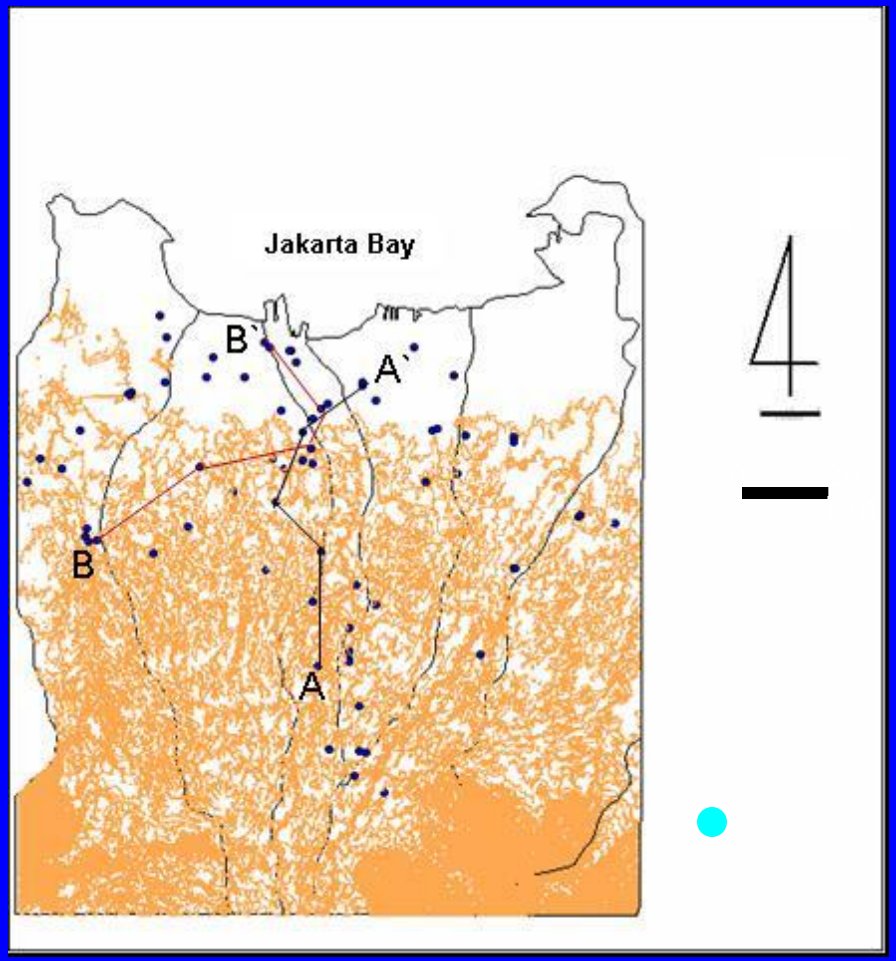


Central Jakarta



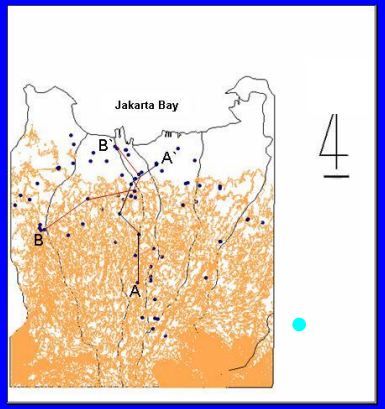
North West

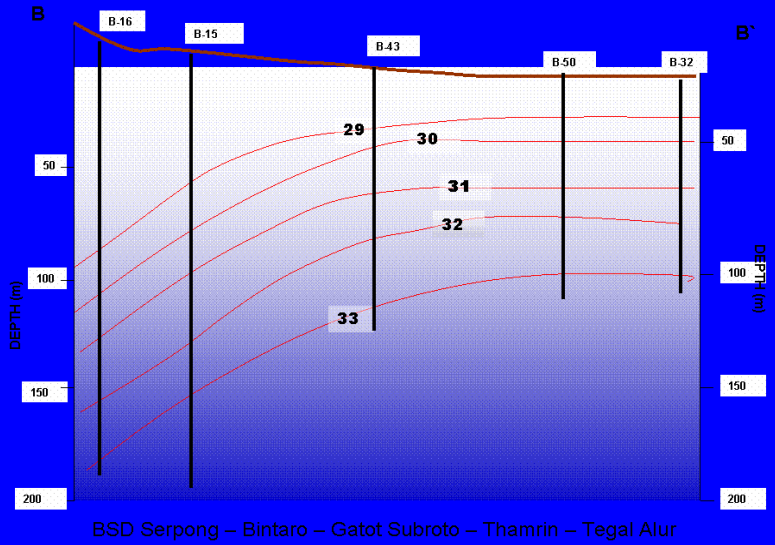




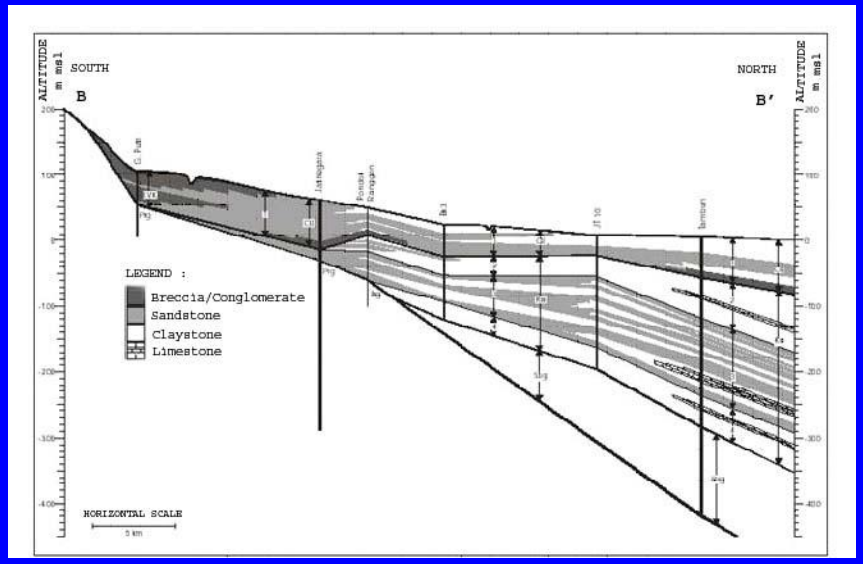
Some temperature distribution in cross section were constructed

Subsurface temperature distribution in the cross section of B – B’



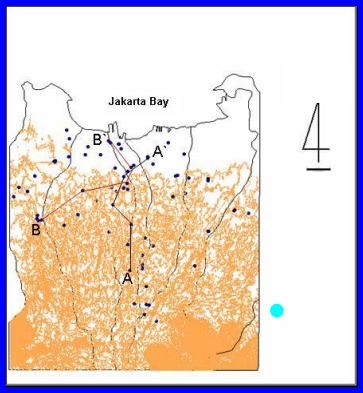


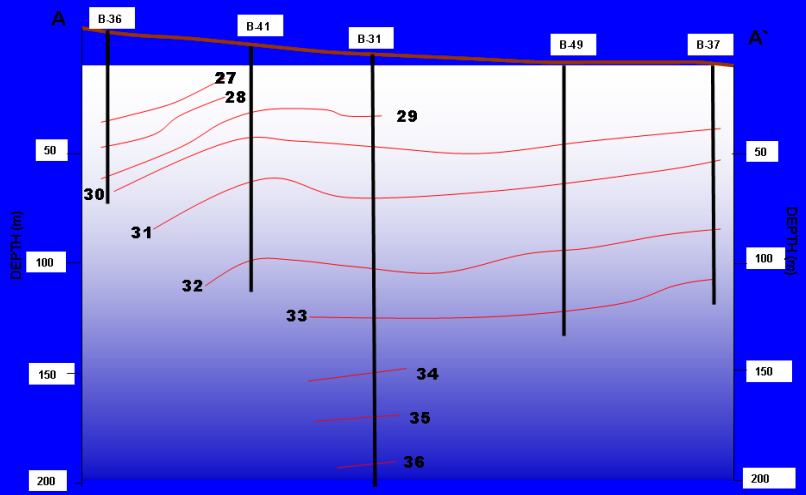
BSD Serpong – Bintaro – Gatot Subroto – Thamrin – Tegal Alur



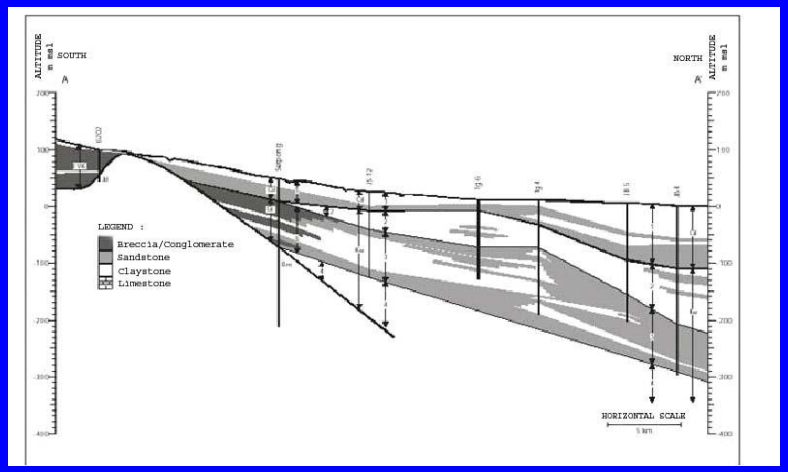
Cross section B-B` showing convective heat flow distribution along the primary groundwater-flow path as well as it`s reflection in the geological cross section

Subsurface temperature distribution in the cross section of A – A'





Ades – Malaktek Bogor – Pasar Minggu – Kebon Sirih - Sunter



Cross section showing some local pattern that can be identified as a local recharge. Compare to the geological cross section it`s reflection some Limestone Formation (Depok High) that controlled the groundwater flow. This difference presumably reflects a shallow thermal regime.