水グループ　2007-2008成果報告と年度内計画・次年度計画について

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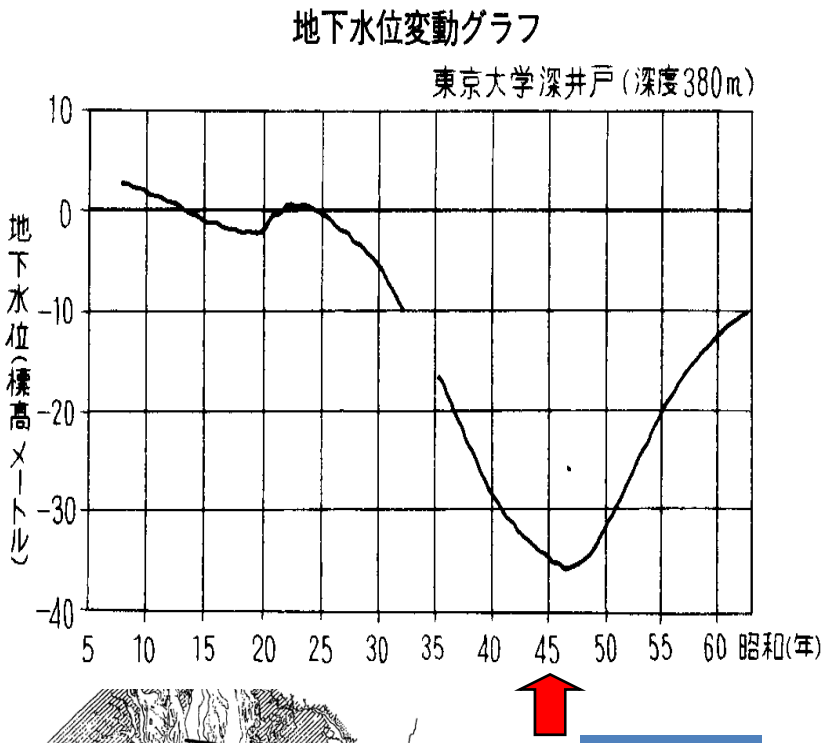
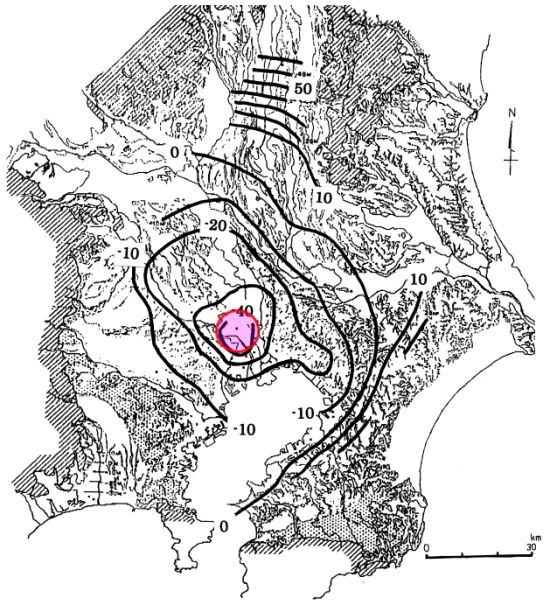
水Gの目標

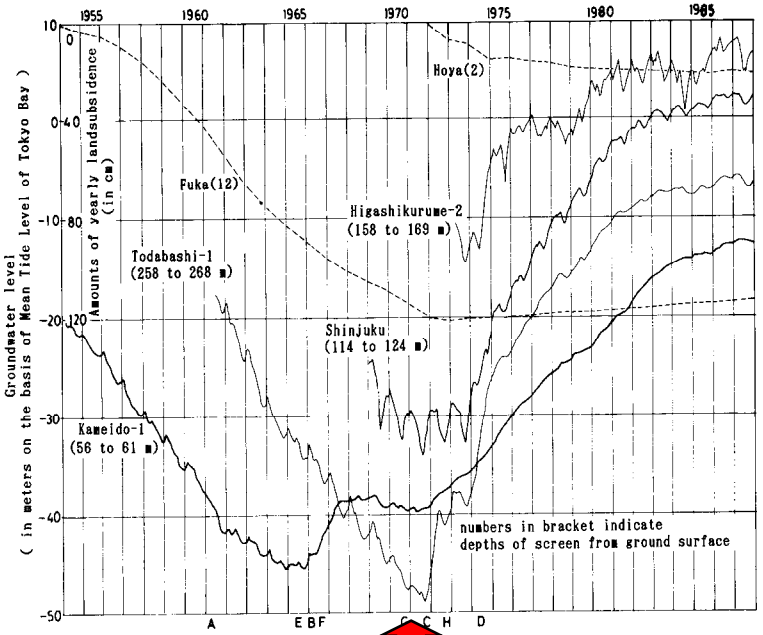
- 水グループの目標は、対象としているアジア諸都市（関東、バンコク、ジャカルタ、大阪、etc）において以下の4項目を実施することである。
- 都市化に伴う地下水流動の変遷を捉えるための地下水ポテンシャルデータの収集
- 地下水帯水層に保存されている都市化に伴う人為的な影響の時系列変化の抽出
- その解析に必要とされる若い地下水年代トレーサー（CFCs、Kr85）手法の開発
- これらの諸都市からのデータを比較検討することで異なる都市発達段階の違いの認識

Groundwater change in Kanto plain (Tokyo)





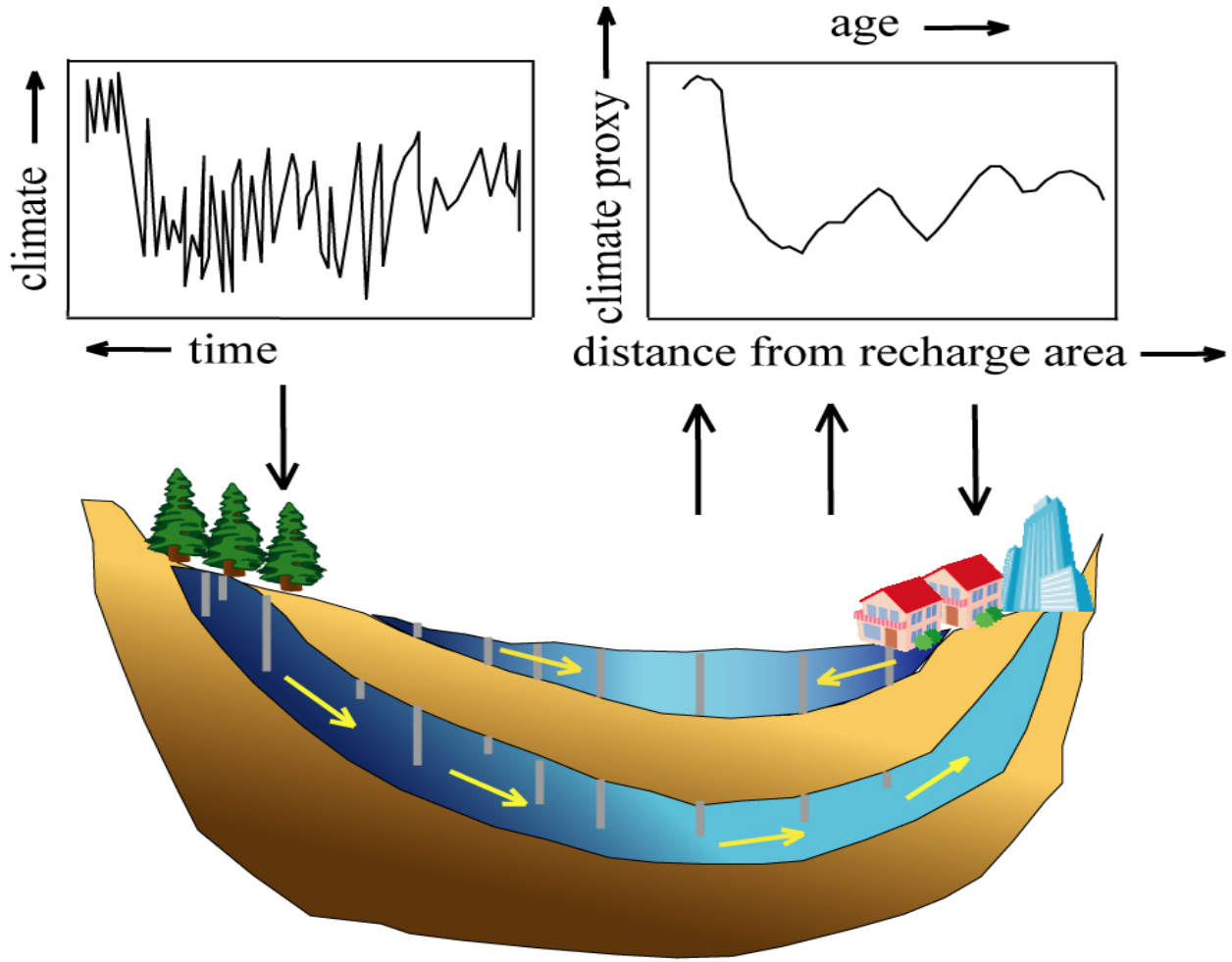
1970



A: In January 1961, southern part of Alluvial [illegible]land, Koto Region, was designated by the Industrial Water Law(IWL) as a restricted area [illegible]re no new wells were to be installed for industrial usage.
B: January and June 1966, pumping of groundwater for industrial usage in Koto Region was restricted by IWL.
C: In December 1971, pumping of groundwater for industrial usage in the northern part of Alluvial Lowland called Johoku Region was restricted by IWL.
D: In April 1974, pumping of groundwater for industrial usage was more reinforced in Johoku Region by IWL.
E: In July 1965, pumping of groundwater for airconditioning in Alluvial Lowland of Wards District was restricted by the Law Controlling Pumping of Groundwater for Use in Building(LCB).
F: In July 1966, pumping of groundwater for airconditioning in Terrace of Wards District was restricted by LCB.
G: In November 1970, drilling of new wells for industrial and non-drinking usages was restricted in Tama District under the Metropolitan Ordinance.
H: December 1972, extraction of water-soluable natural gas was suspended in the estuary of the Ara River by the means of purchase of the mining rights by Tokyo Metropolitan Government.

Paleo information
(time record)
from groundwater aquifer
（recharge temperature, etc)

Groundwater flow system
information
by environmental isotopes
(residence time, recharge
temperature/altitude, etc)



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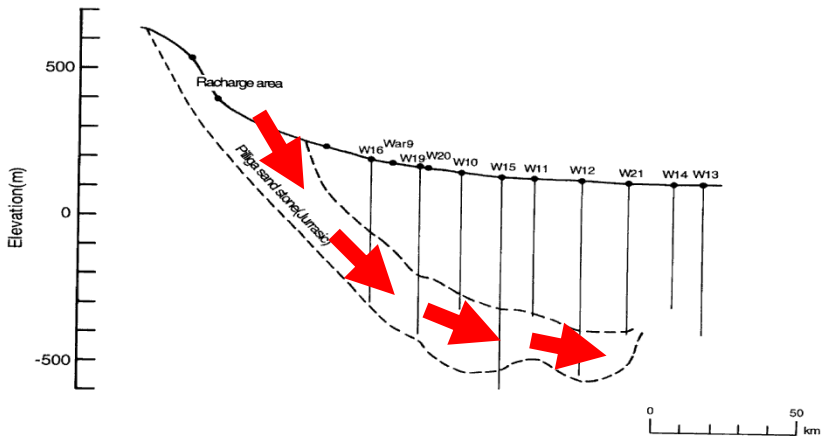


CFC and ^{85}Kr for modern groundwater age tracer

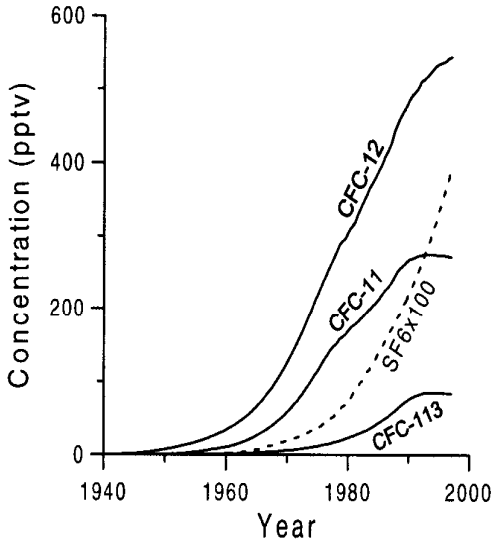


Figure 15.1 Atmospheric mixing ratios of CFC-11, CFC-12, CFC-113, and SF_6 in North American air.

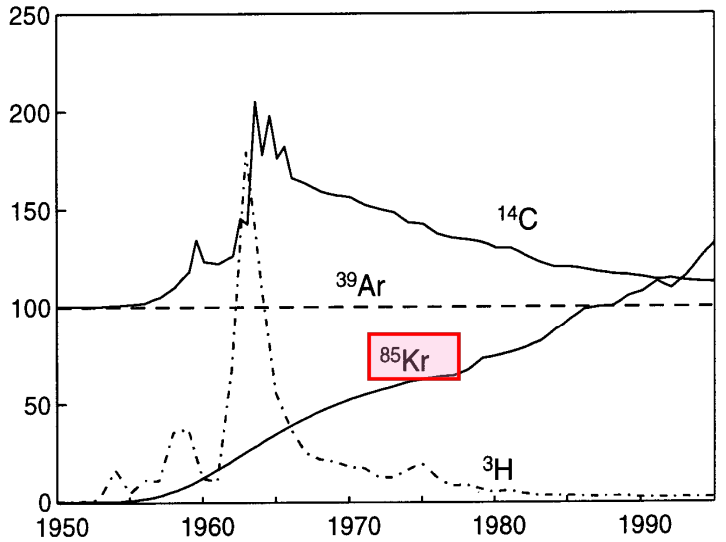


Figure 12.1 ^{85}Kr activity of tropospheric air between 1950 and 1995 compared to those of ^{39}Ar and ^{14}C, and to ^{3}H data representative for precipitation in central Switzerland. The vertical scale factors are: 100 = 1 Bq m^{-3} of air for ^{85}Kr, 100 % modern for ^{39}Ar (equal to 1.67 x 10^{-2} Bq m^{-3} of air), 100 pmC for ^{14}C, and 1000 TU for ^{3}H.

Used as refrigeration and air conditioning or spray-gas until 1990

Kr-85: half life 0.7yr

Kr-85 : origin Nuclear power plant, reprocessing plant

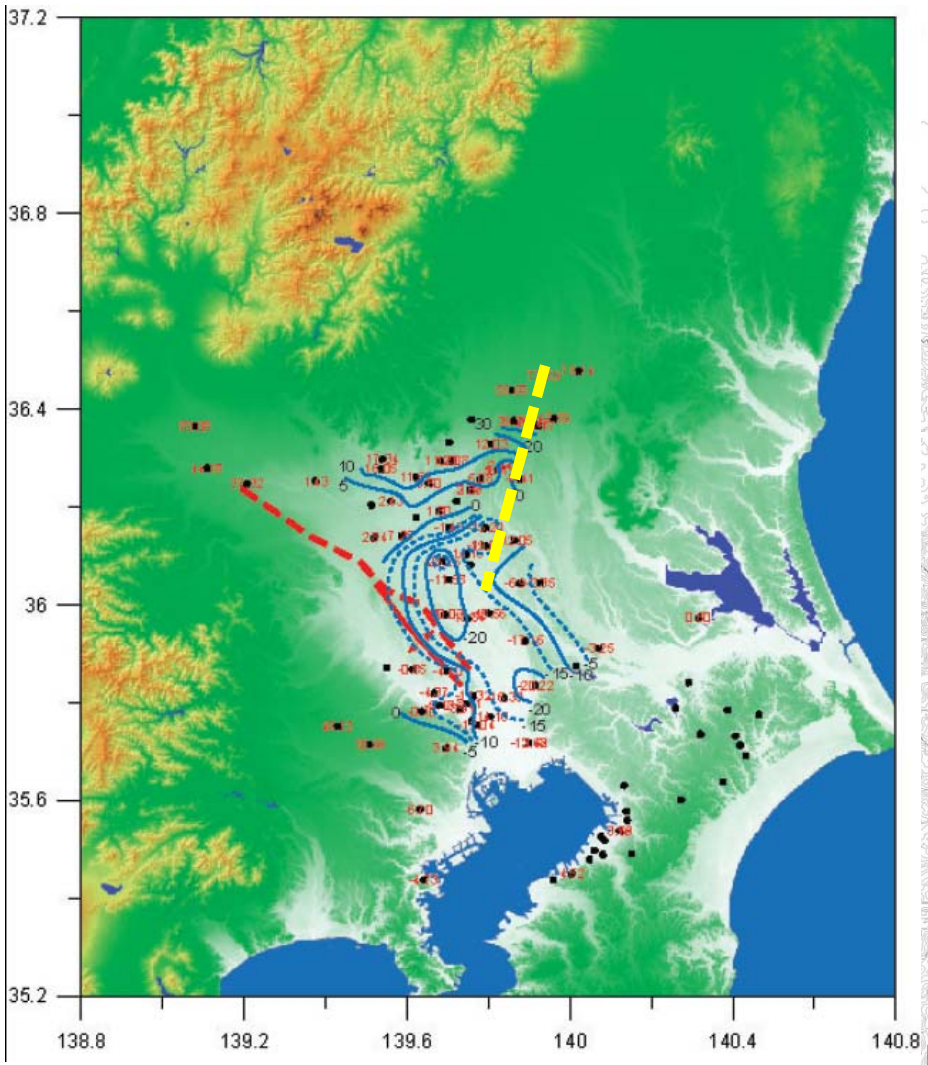
本日の話

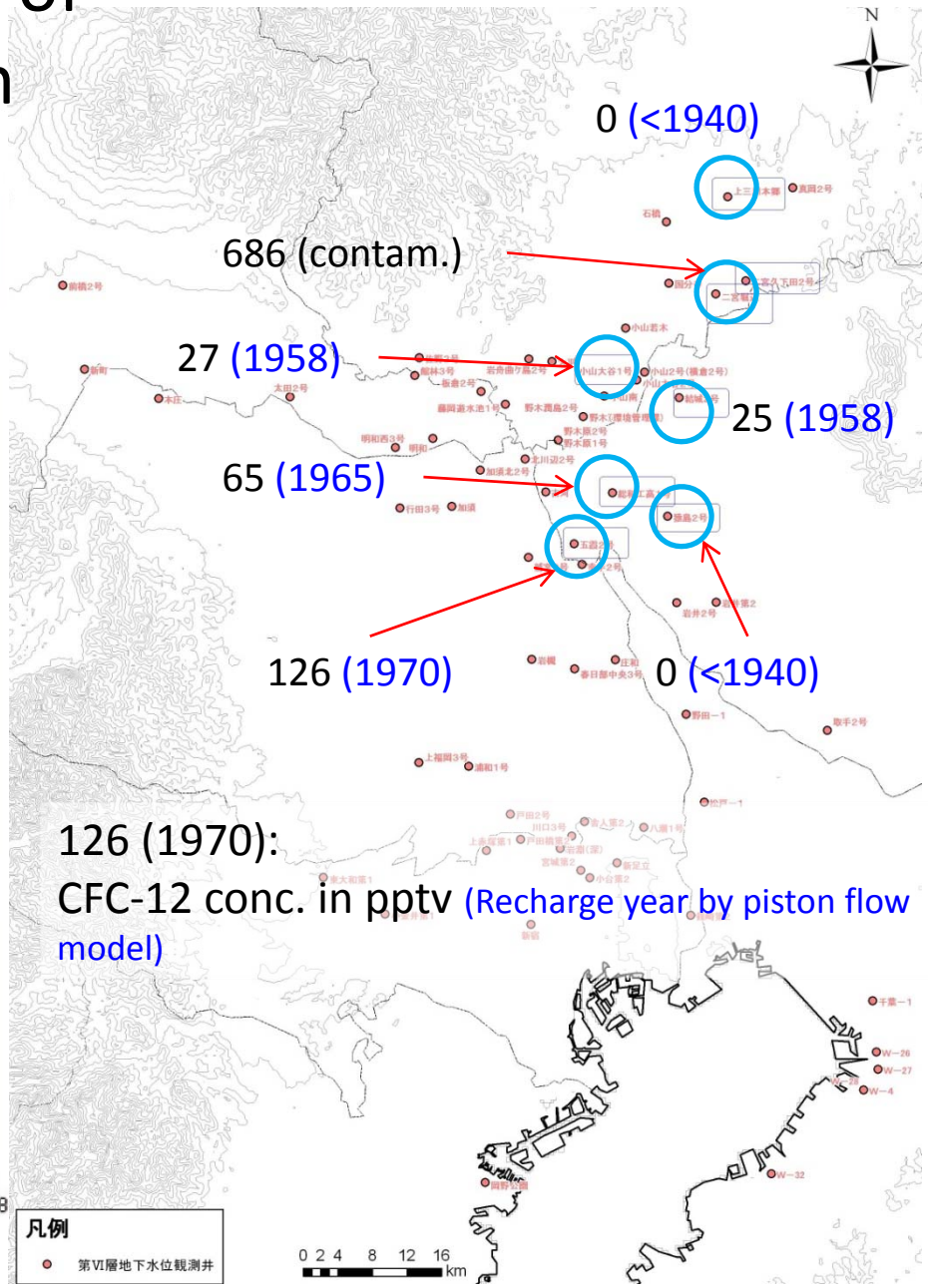
- 水Gの当初目標と今年度の実施項目について(嶋田）
- BKK地下水流動の実態と今後の展望(山中）
- Kr抽出法と減容法の開発、その現場適用と問題点（馬原・百島）
- 今年度の計画(嶋田）

2008年度後半の計画

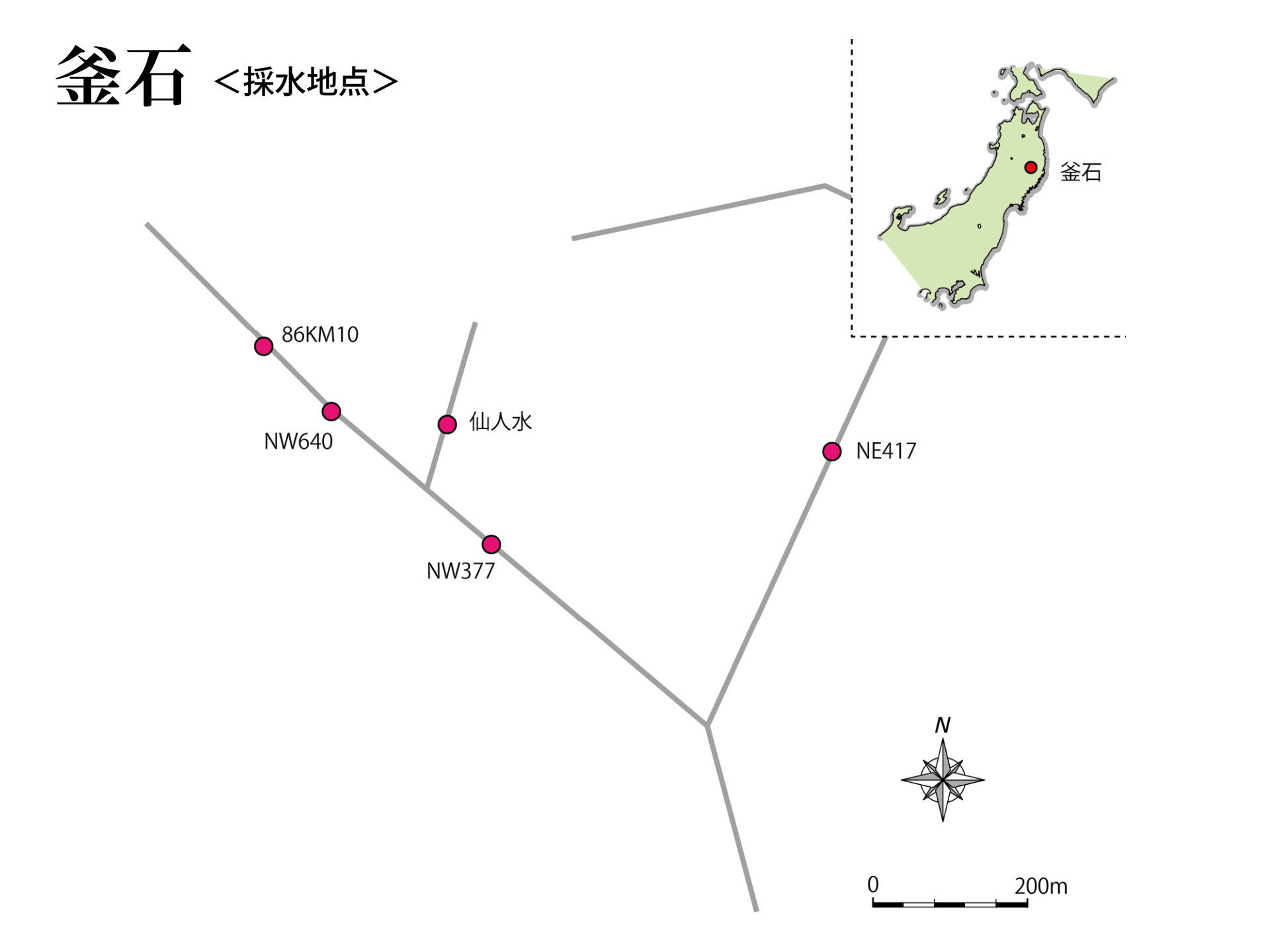
- 北関東地域におけるKr採水調査（3月）
- 釜石鉱山　におけるKr法、CFCs法の検証(3月）
- Jakarta帯水層シミュレーションの着手

CFC-12 and recharge year of aquifer VI in Kanto Plain

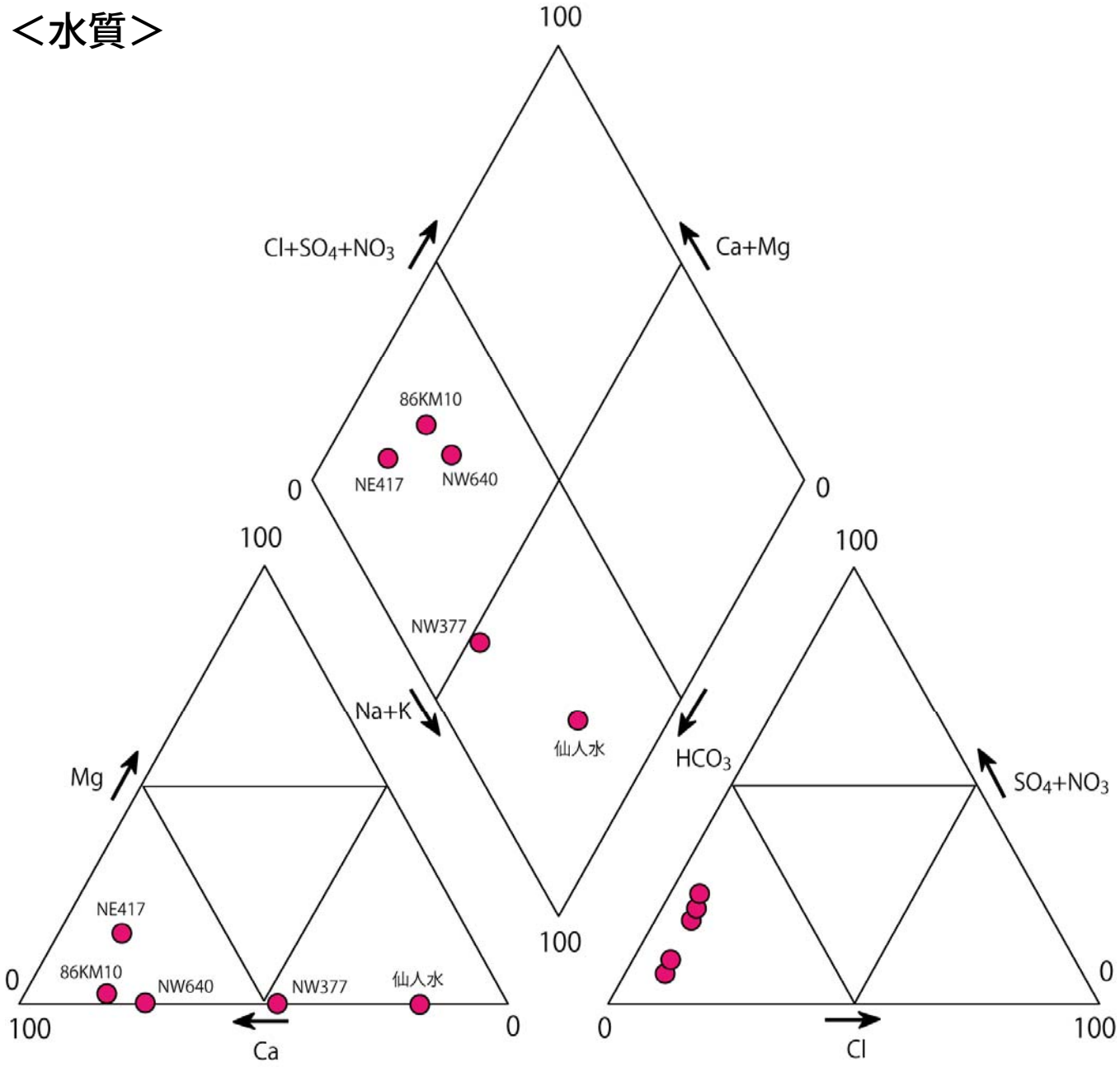




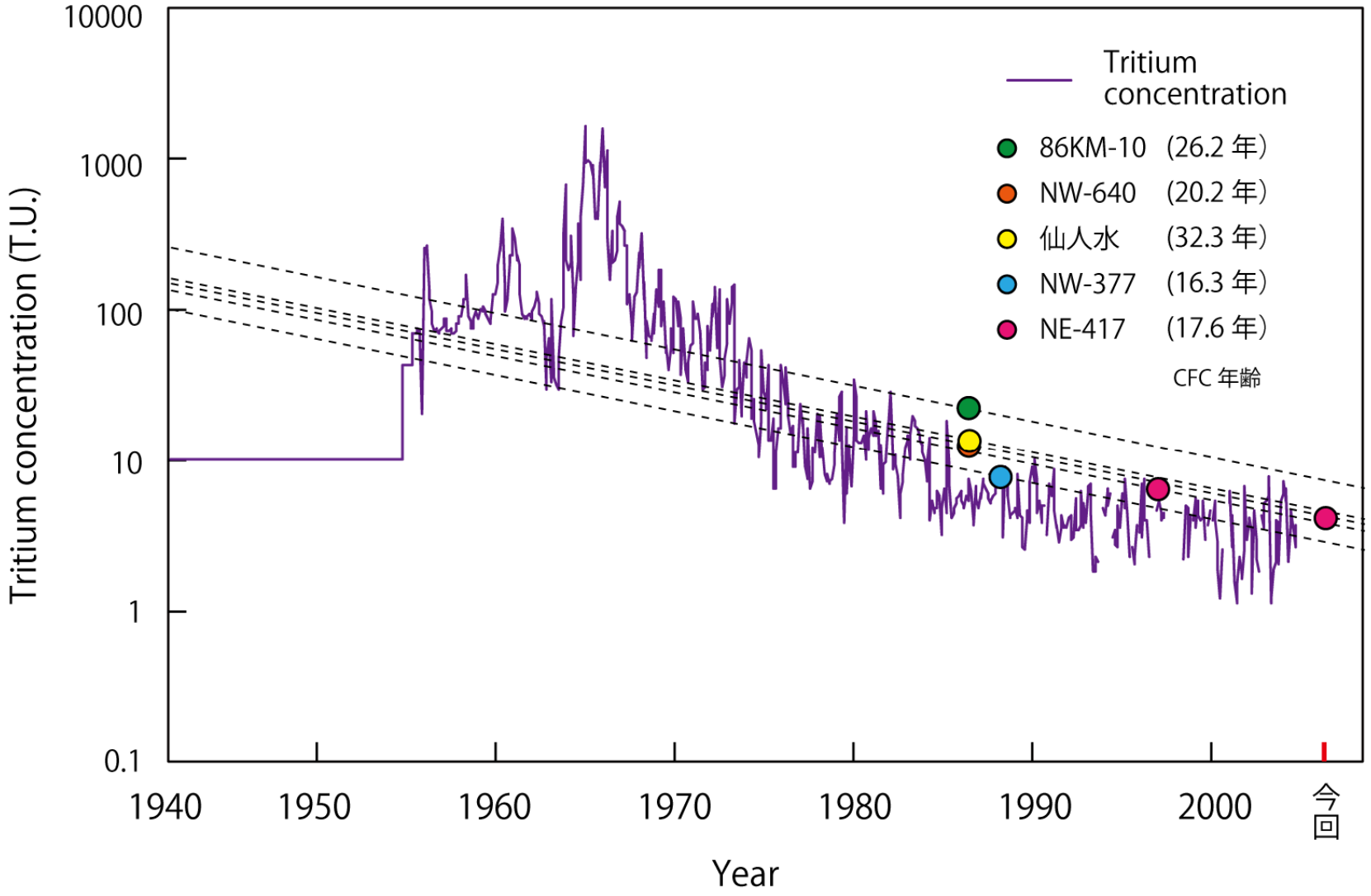
釜石 ＜採水地点＞



釜石 <水質>


100
Cl+SO4+NO3
Ca+Mg
86KM10
NE417
NW640
0
0
100
100
NW377
Na+K
仙人水
HCO3
Mg
SO4+NO3
NE417
86KM10
NW640
NW377
仙人水
0
100
0
100
Ca
0
100
Cl

釜石 <トリチウム濃度>


10000
1000
100
10
1
0.1
Tritium concentration (T.U.)
1940
1950
1960
1970
1980
1990
2000
今回
Year
Tritium concentration
86KM-10 (26.2 年)
NW-640 (20.2 年)
仙人水 (32.3 年)
NW-377 (16.3 年)
NE-417 (17.6 年)
CFC 年齢