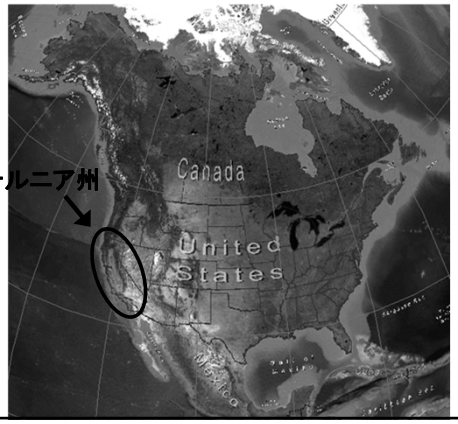
2024年度（R06年度）

地下水盆管理学

福島大学　共生システム理工学類
地球環境コース
柴崎　直明

15. 地下水盆の評価と管理



カリフォルニア州の地下水盆

Department of Water Resources, State of California

加州の地下水盆管理法律系統

CALIFORNIA WATER CODE

The Groundwater Management Act (AB 3030)

Local Groundwater Management Assistance Act

Amendments to Local Groundwater Management Water Code

Other legislation related to water supply planning

City and County Ordinances

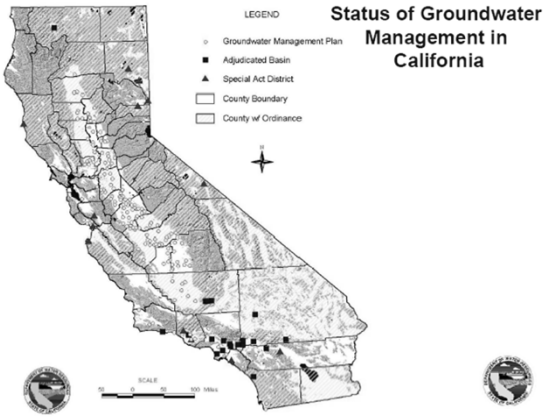
加州 Groundwater Bulletin 118 (Update 2003)

原版:　1953年

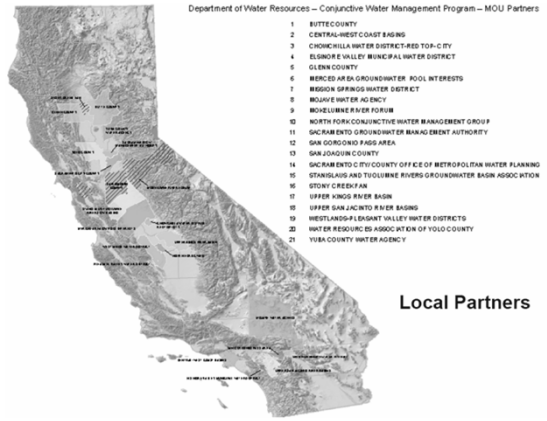
更新:　1975年
　　1980年

最新版:　2003年

加州の地下水管理状況



地下水管理のローカルパートナー



AB 3030 Procedures

1.地下水管理計画採用公聴会実施（地方機関）
2.地下水管理計画案作成
3.地下水管理計画案公聴会（2回）
4.反対意見考慮
5.計画実施方法制定
6.計画実施
7.地下水盆内関係機関協調会議（年1回）

AB3030 Technical Components (1)

1. 塩水浸入制御
2. 水源保護地域・涵養地域抽出・管理
3. 汚染地下水移動制御
4. 井戸利用停止・井戸撤去実施方法策定
5. 過剰揚水対策立案
6. 地下水位・地下水貯留量観測
7. 井戸複合利用方法確立

AB3030 Technical Components (2)

8. 地下水人工涵養
9. 井戸建設政策策定
10. 地方機関による汚染地下水浄化、涵養促進、貯留増加、水再利用、取水事業の運営・管理
11. 地方機関と州政府・連邦政府の技術連携

管理実施地下水位(Sacramento)

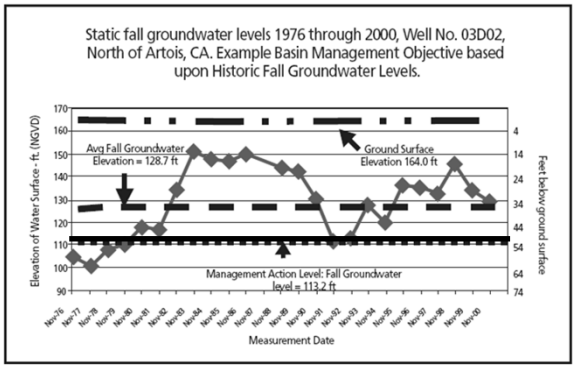
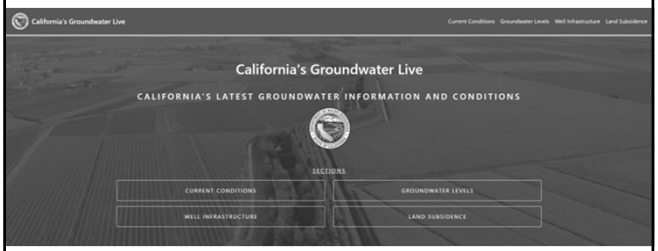
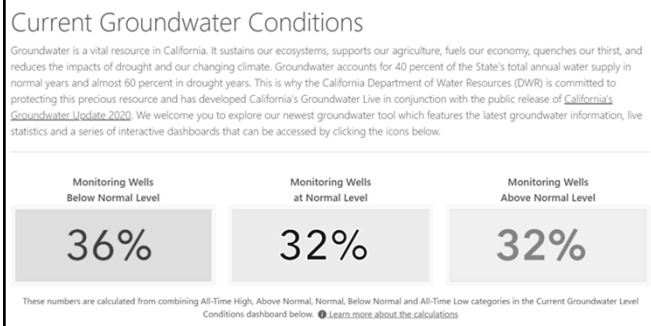


Figure 2. Example Basin Management Objective (BMO) for a specific well within a sub-area of Glenn County.

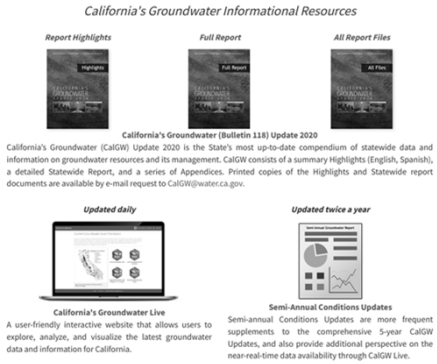
California's Groundwater Live



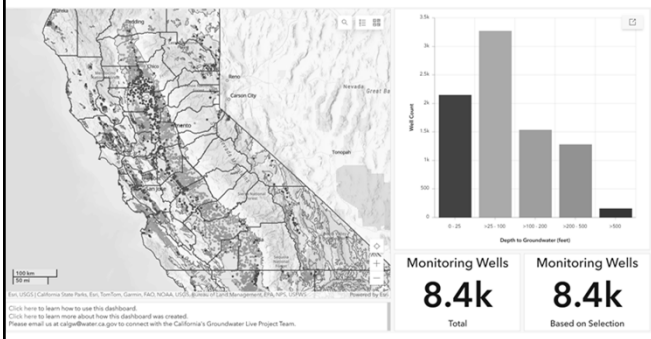
Current Groundwater Conditions



California's Groundwater Informational Resources



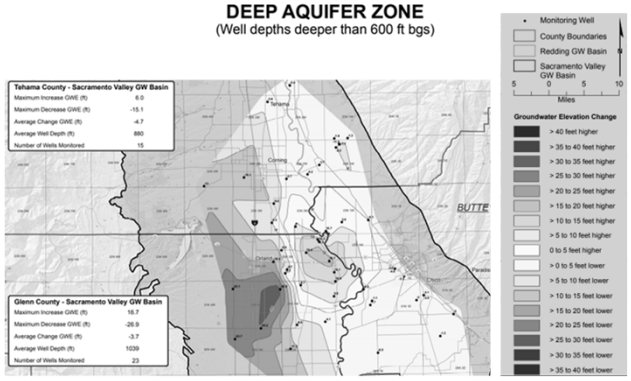
California's Groundwater Live: Groundwater Levels



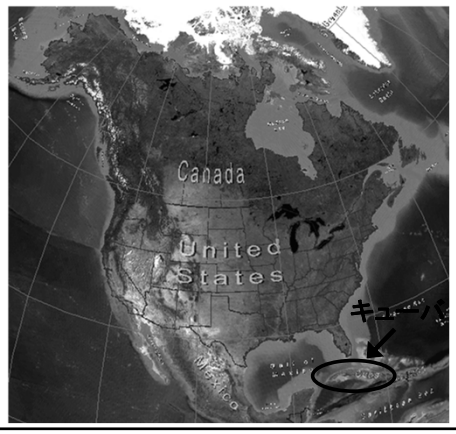
NORTHERN SACRAMENTO VALLEY CHANGE IN GROUNDWATER ELEVATION MAP FALL 2013 TO FALL 2014

DEEP AQUIFER ZONE

(Well depths deeper than 600 ft bgs)

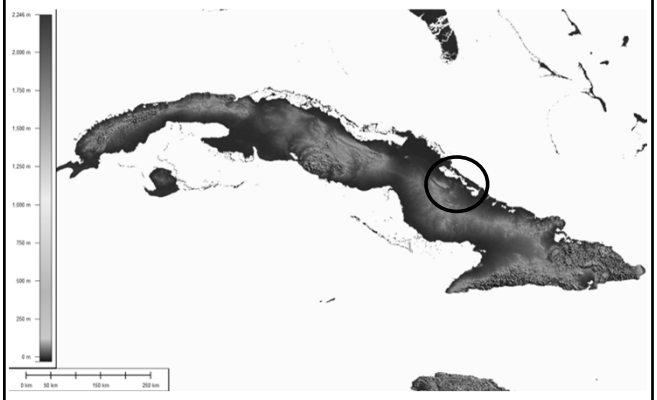


キューバでの地下水管理の事例



GW Modeling Seminar in CUBA

Topography of CUBA



Main Goals of GWM Seminar

Create Sola Groundwater Model

- Input Actual Hydrogeologic Data
- Assign Salt Concentrations of GW from Resistivity Data

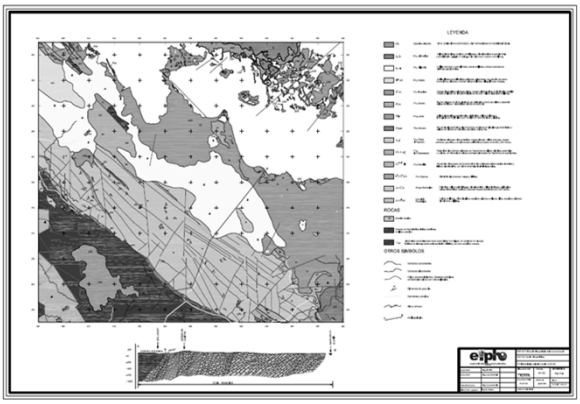
Simulate Flow and Solute Transport

- Use MODFLOW and SEAWAT Codes
- Model Calibration by Historical Match

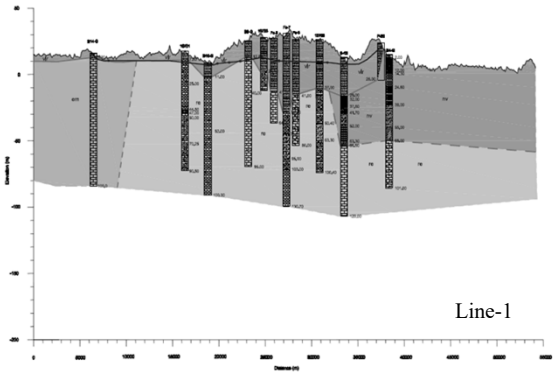
Prepare Future Prediction

- Instruct Future Scenarios & Cases

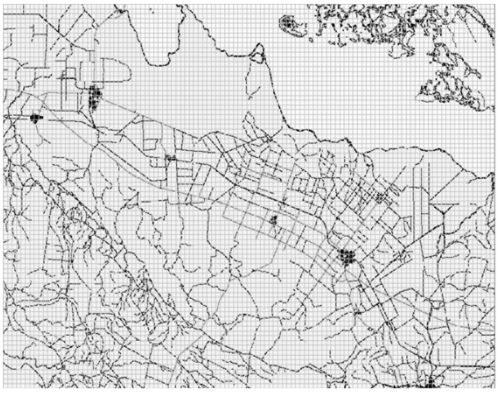
Geological Structure of Sola Area, CUBA



Geological Structure in Sola Area (L-1)



Model Area and Size (500m by 500m)



Model Extent

Analysis area

- X: 804,500 – 860,000
- Y: 195,500 – 235,500

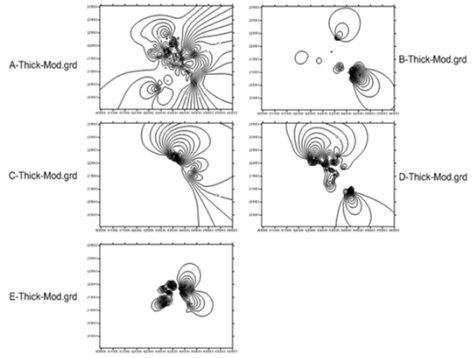
Mesh size (Grid size)

- X: 500m (1 – 111 Column)
- Y: 500m (1 – 80 Row)

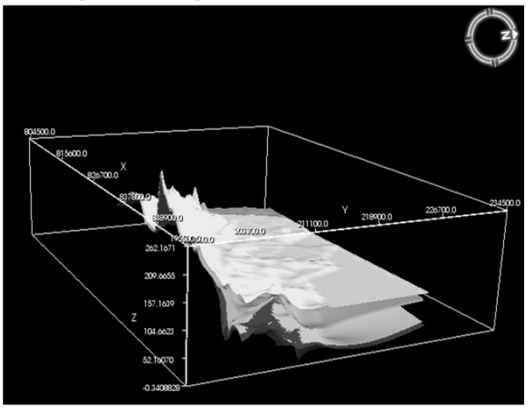
Vertical extent (25 layers)

- Model Top: +200 m
- Model Bottom: -300 m

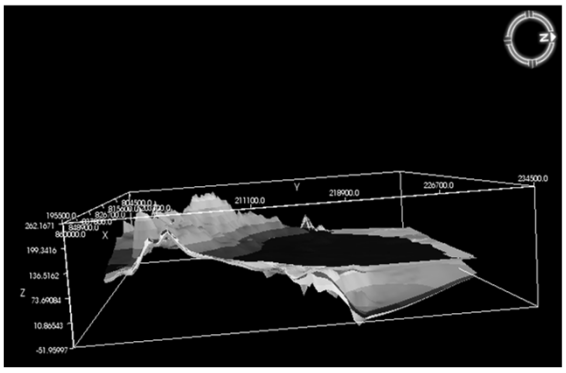
Thickness of A to E Layers



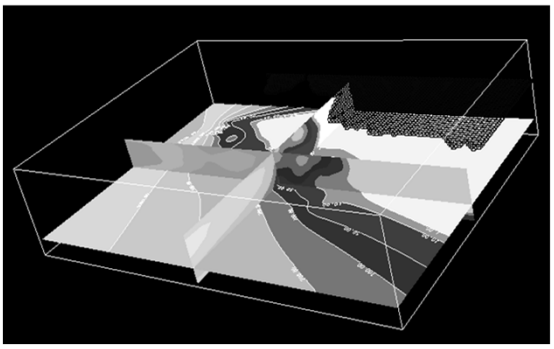
Input Aquifer Structure



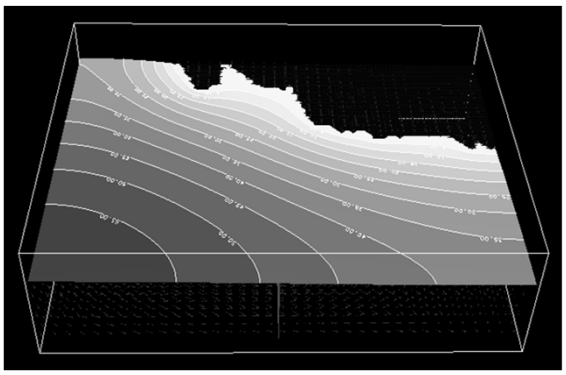
Bottom Elev. of A to E Layers



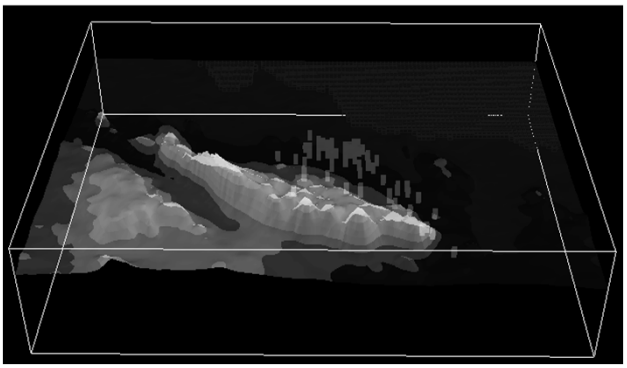
Process 3D Resistivity Data



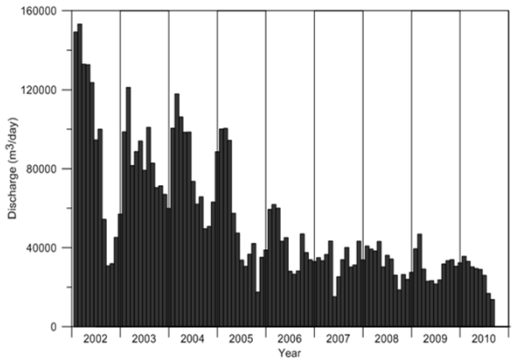
Steady-State Simulation



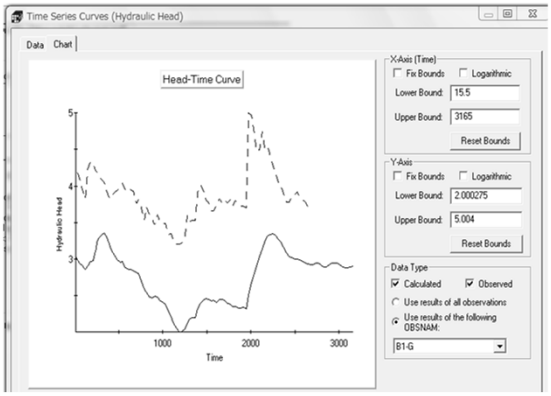
Prepare Well Discharge Data



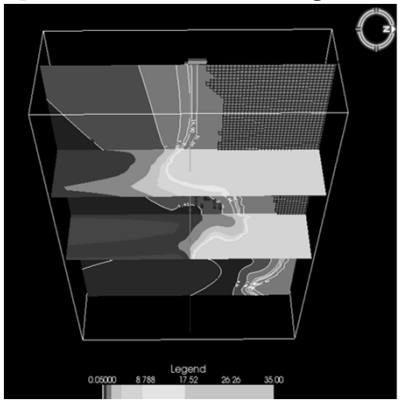
Well Discharge from 2002 to 2010



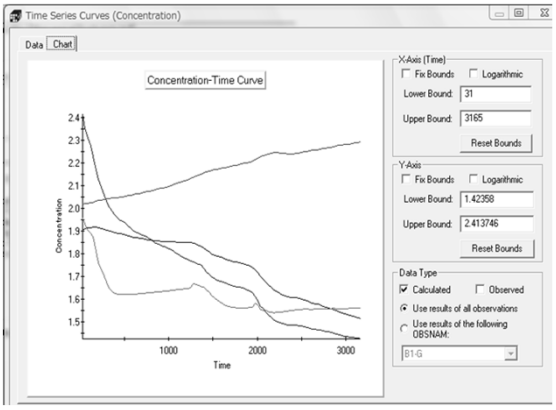
Actual Head and Simulated Head



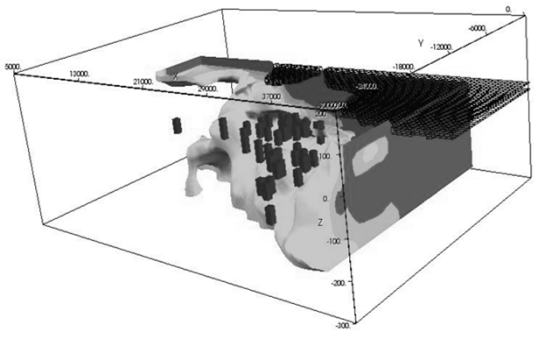
Prepare GW Salinity Data



Simulate Salt Concentrations



Simulated Salt Concentration Isosurface



地下水資源の管理のために

- 地下水盆構造の把握
- 水文地質特性の評価
- 地下水位分布と変動の把握（モニタリング）
- 水質分布・変動の把握
- 地下水盆ごとの揚水量把握
- 水収支の解明
- 地下水障害の監視

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参考文献

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「Proyecto para el Fortalecimiento de las Capacidades del Manejo del Agua Subterránea y el Control de la Intrusión Salina en la República de Cuba」
独立行政法人国際協力機構（JICA），2009年

DWR
「California's Groundwater (Bulletin 118) Update 2020」
カリフォルニア州政府、2024年