



International investment in storage infrastructure supporting WINGAS' sales activities

World Gas Conference 2006

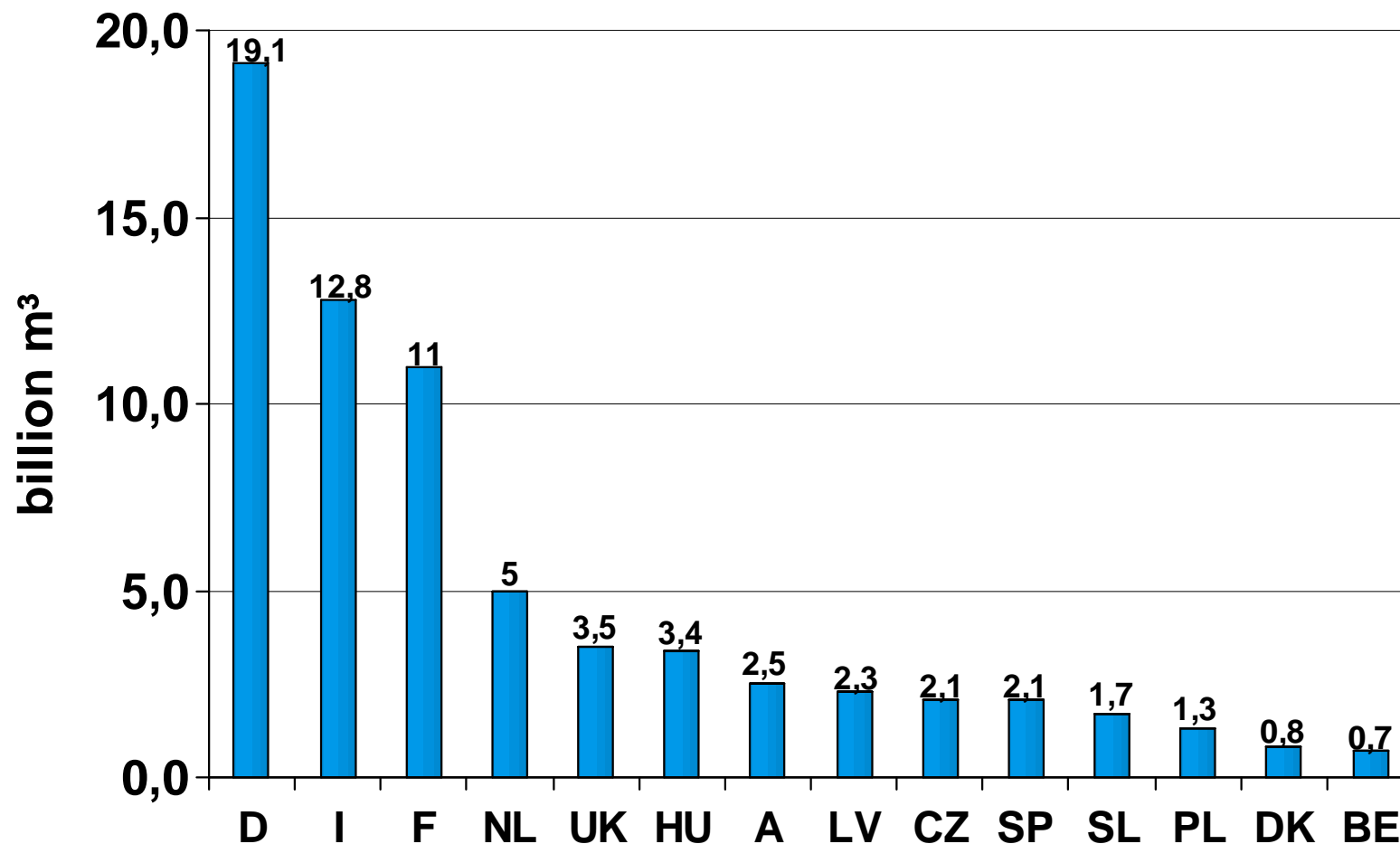
6 June 2006

Amsterdam

Dr. Peter Klingenberger
Director Natural Gas Sales Europe
WINGAS GmbH, Kassel, Germany

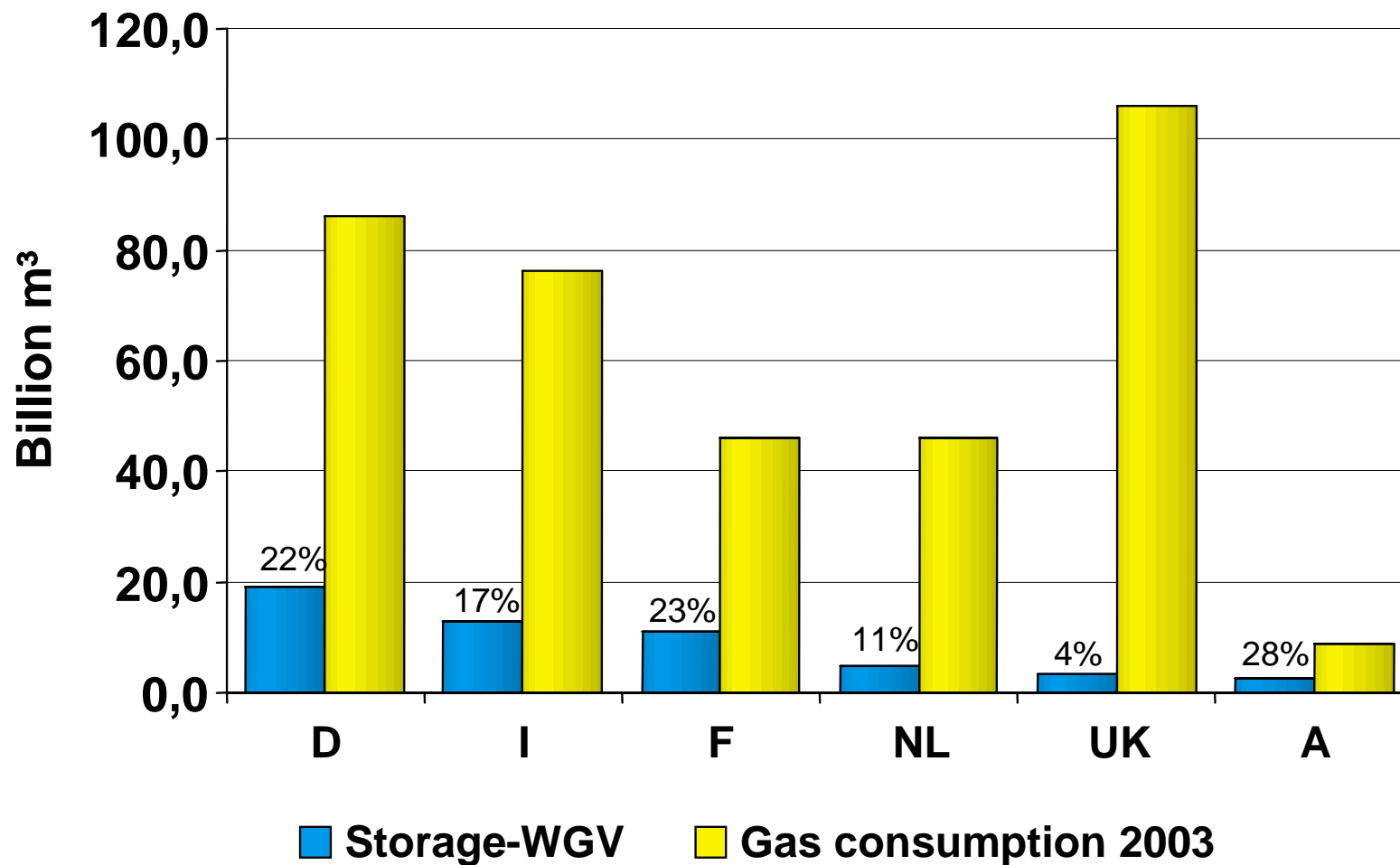
Storage capacities compared

Large differences between EU Member States



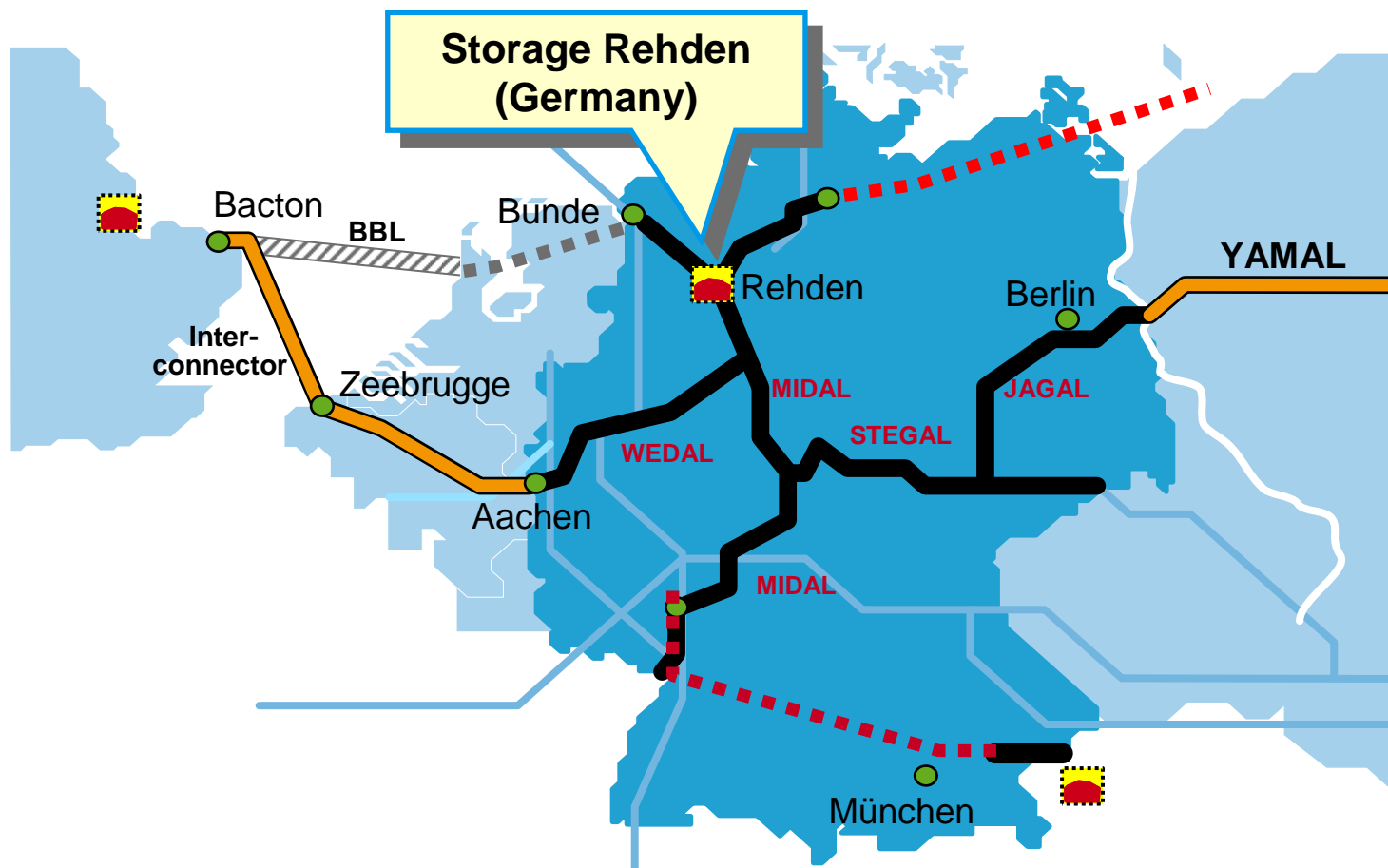
[ERGEG 2005]

Working Gas Volume and Consumption European Comparison



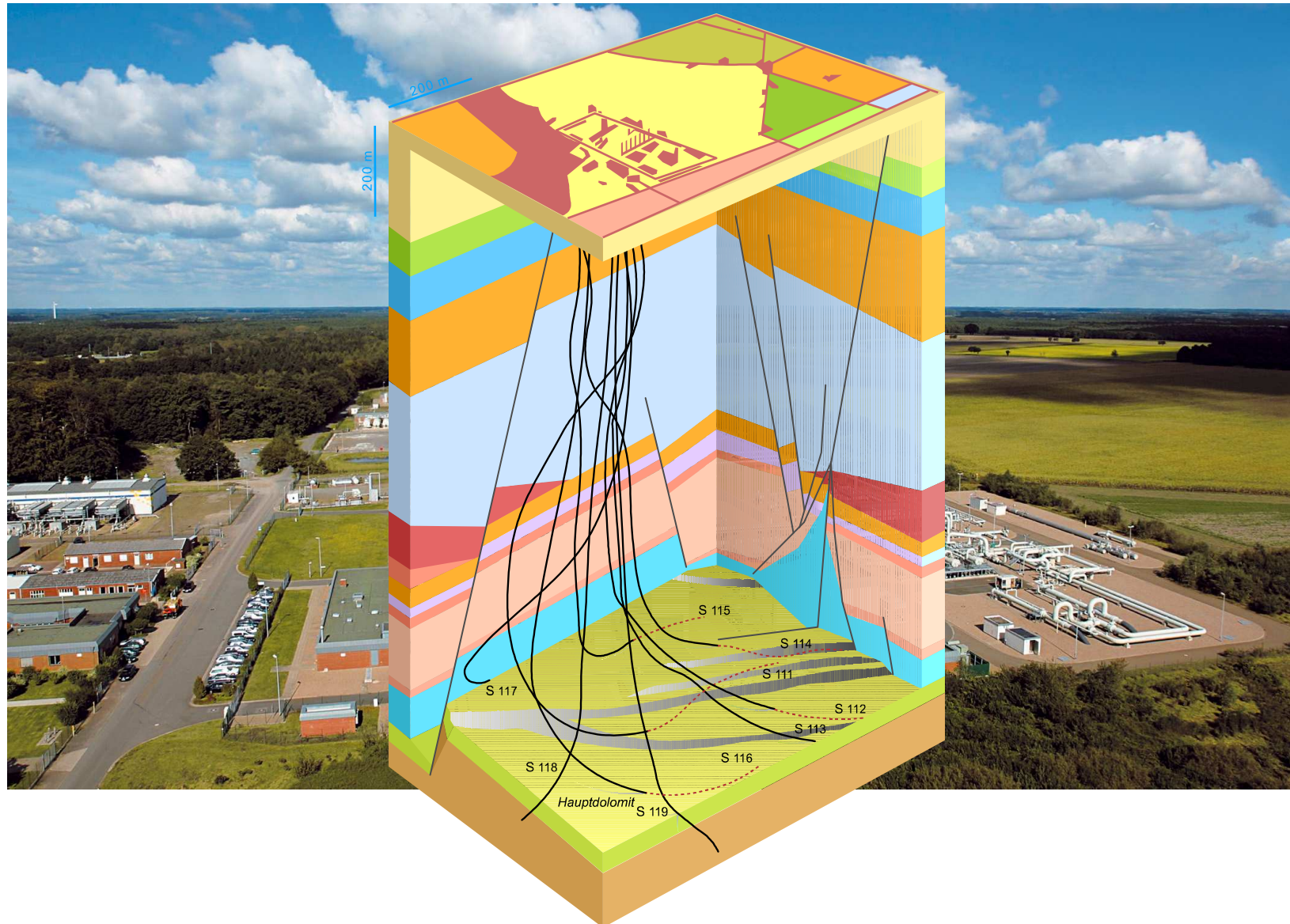
WINGAS' Storage

Outstanding logistical integration



Rehden Storage Facility

Storage based on a depleted gas field



Rehden Storage Facility

Key Figures



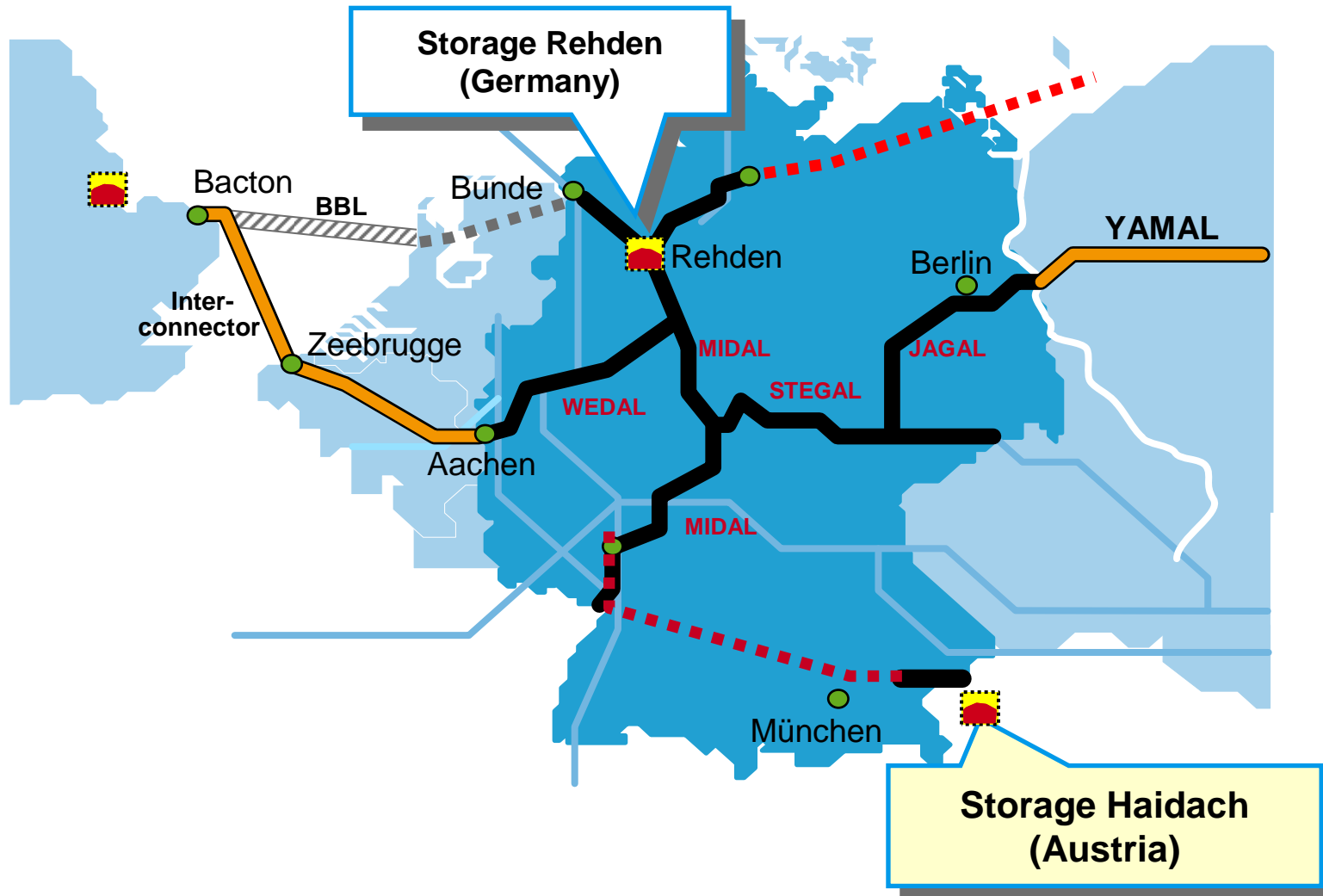
- depleted gas field (Upper Permian)
- gas production 1954 - 1992
- storage operation since 1993

■ working gas volume	4.2 bcm
■ max. withdrawal rate	2.4 m cbm/h
■ max. injection rate	1.4 m cbm/h
■ cushion gas volume	2.8 bcm
■ total power installed	88.0 MW



WINGAS' Storage

Outstanding logistical integration



Underground Storage Haidach (Austria) Under Construction...



Cluster preparation



- Start of construction in September 2005
- Commencement scheduled mid 2007

Joint-Venture together with

- Rohöl-Aufsuchungs AG, Vienna (Operator)
- OAO Gazexport, Moscow



Underground Storage Haidach (Austria)

Location and Grid connection



Underground Storage Haidach (Austria) Crossing River Salzach



Underground Storage Haidach (Austria)

Cluster 1 / Well 103



Januar 2006

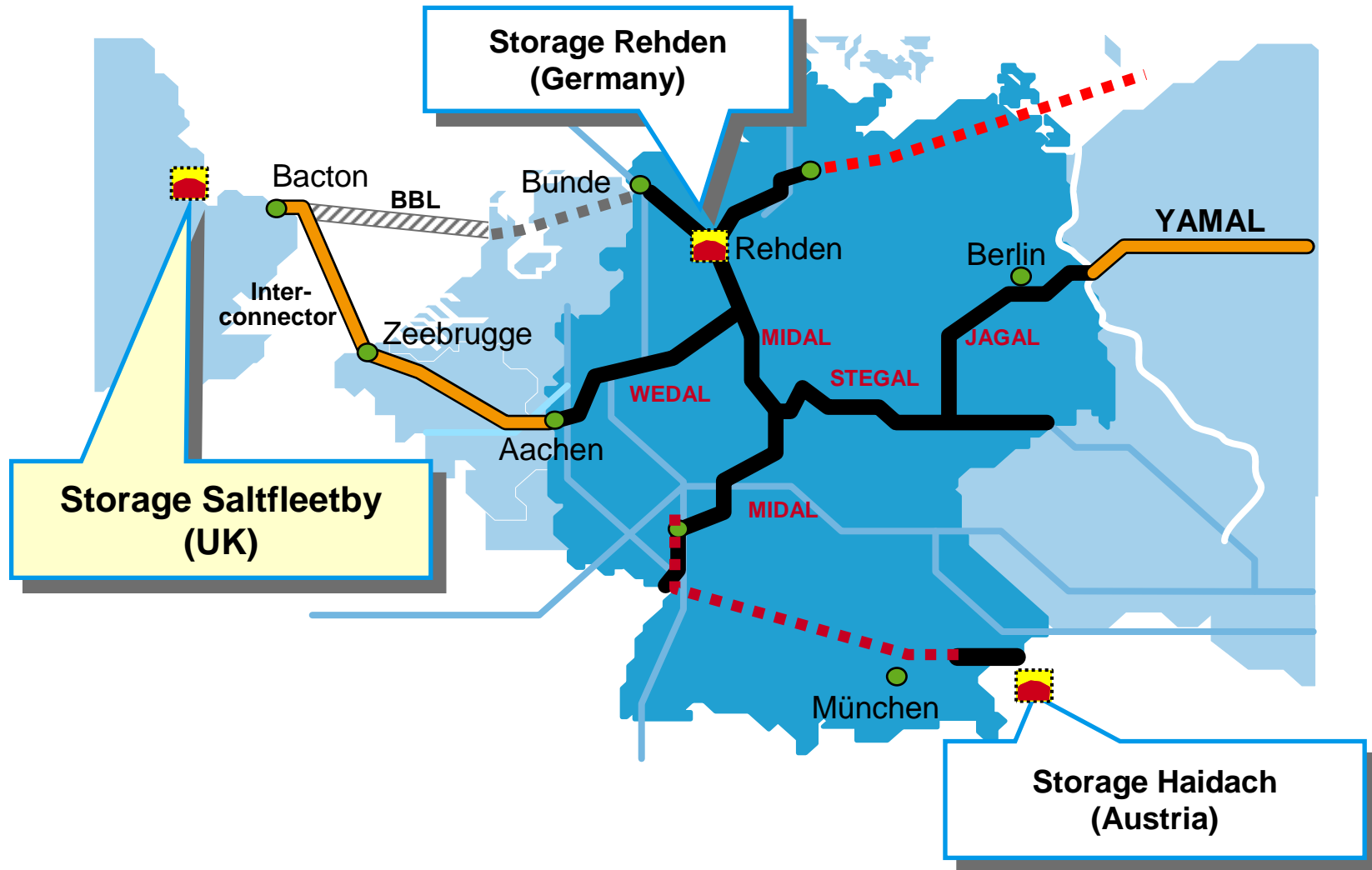
Underground Storage Haidach (Austria) Cluster 2



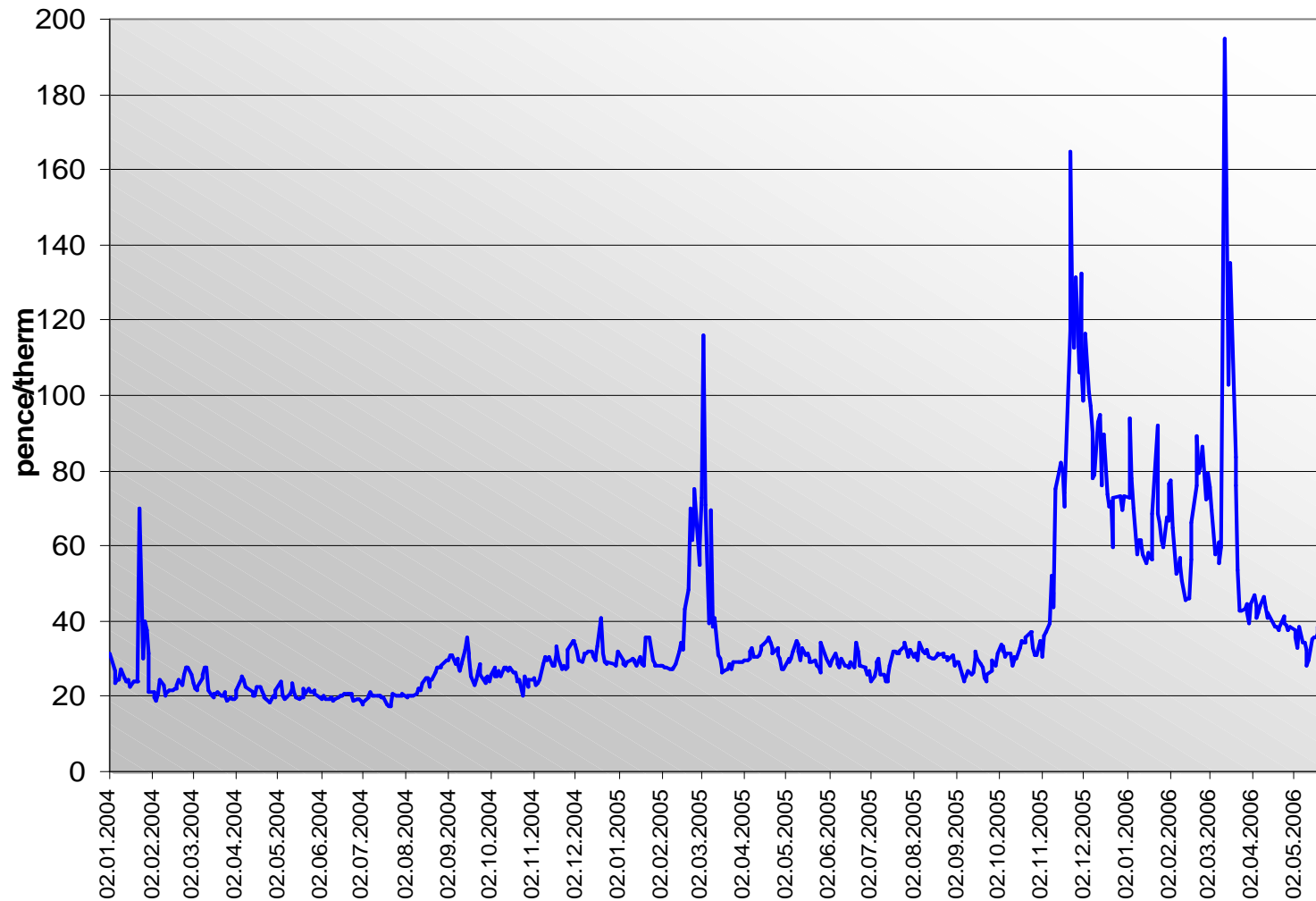
Januar 2006

WINGAS' Storage

Outstanding logistical integration

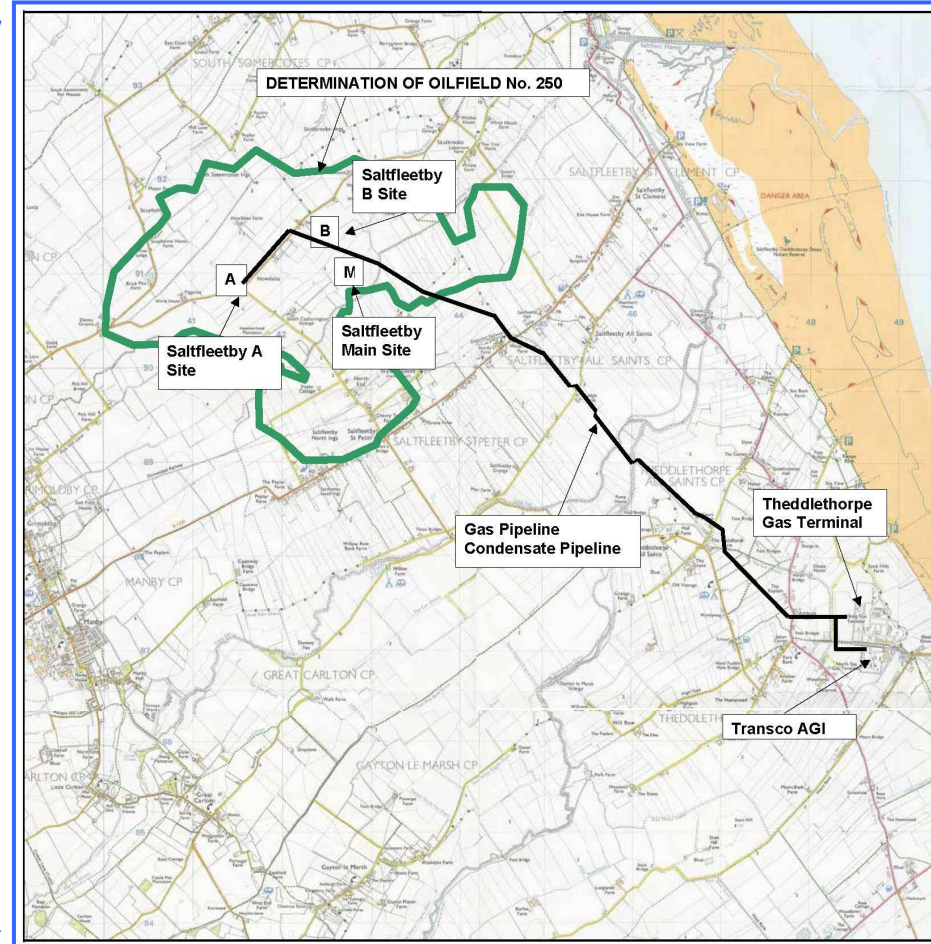
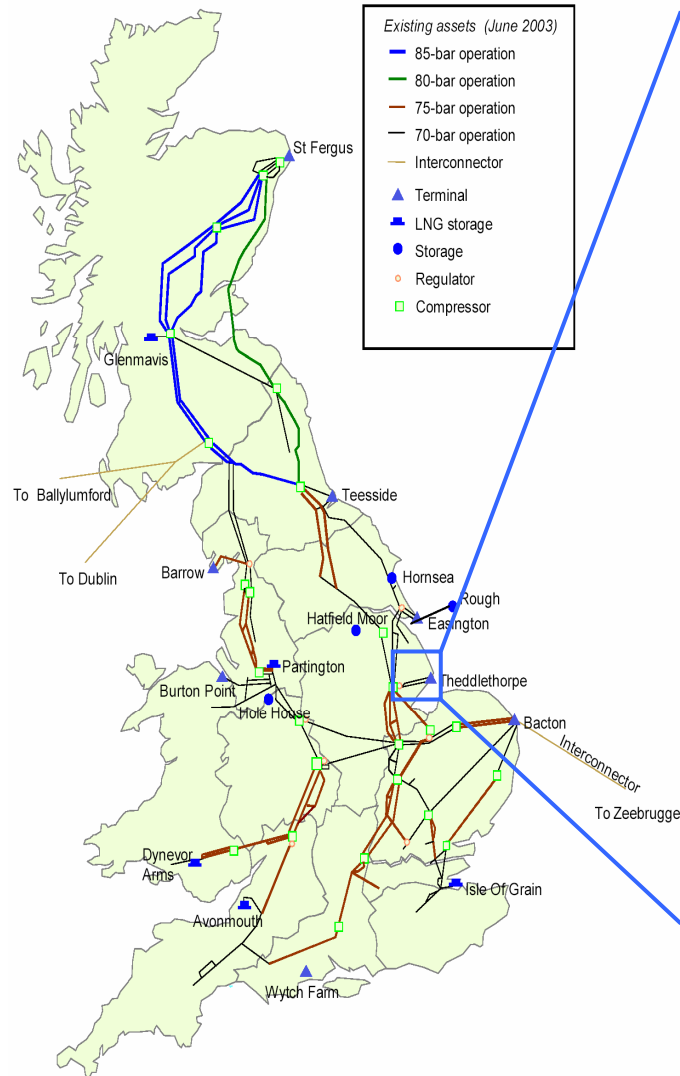


Gas Prices in the UK NBP Day Ahead (Midpoint)

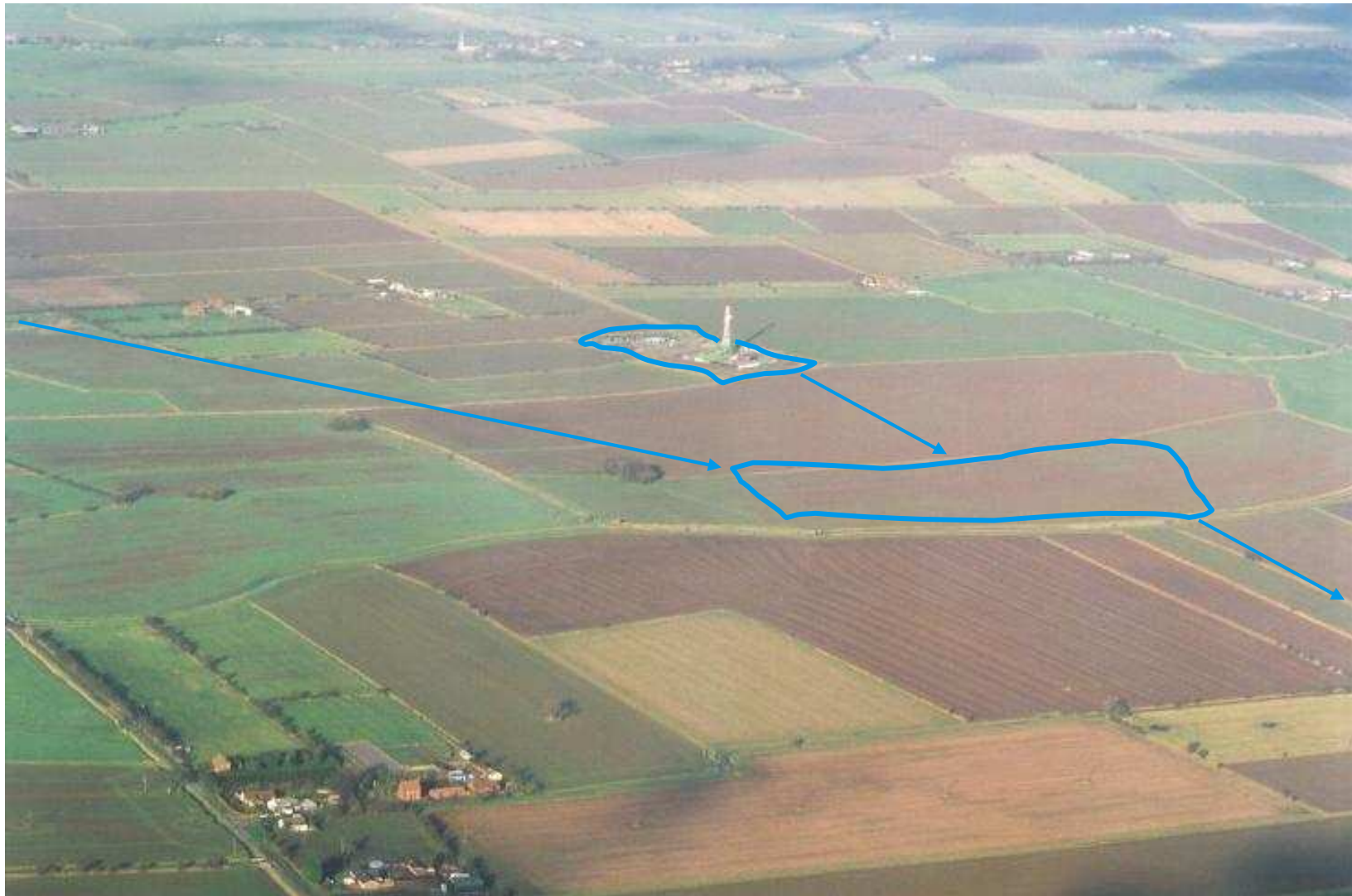


Saltfleetby Gas Storage Project

Location

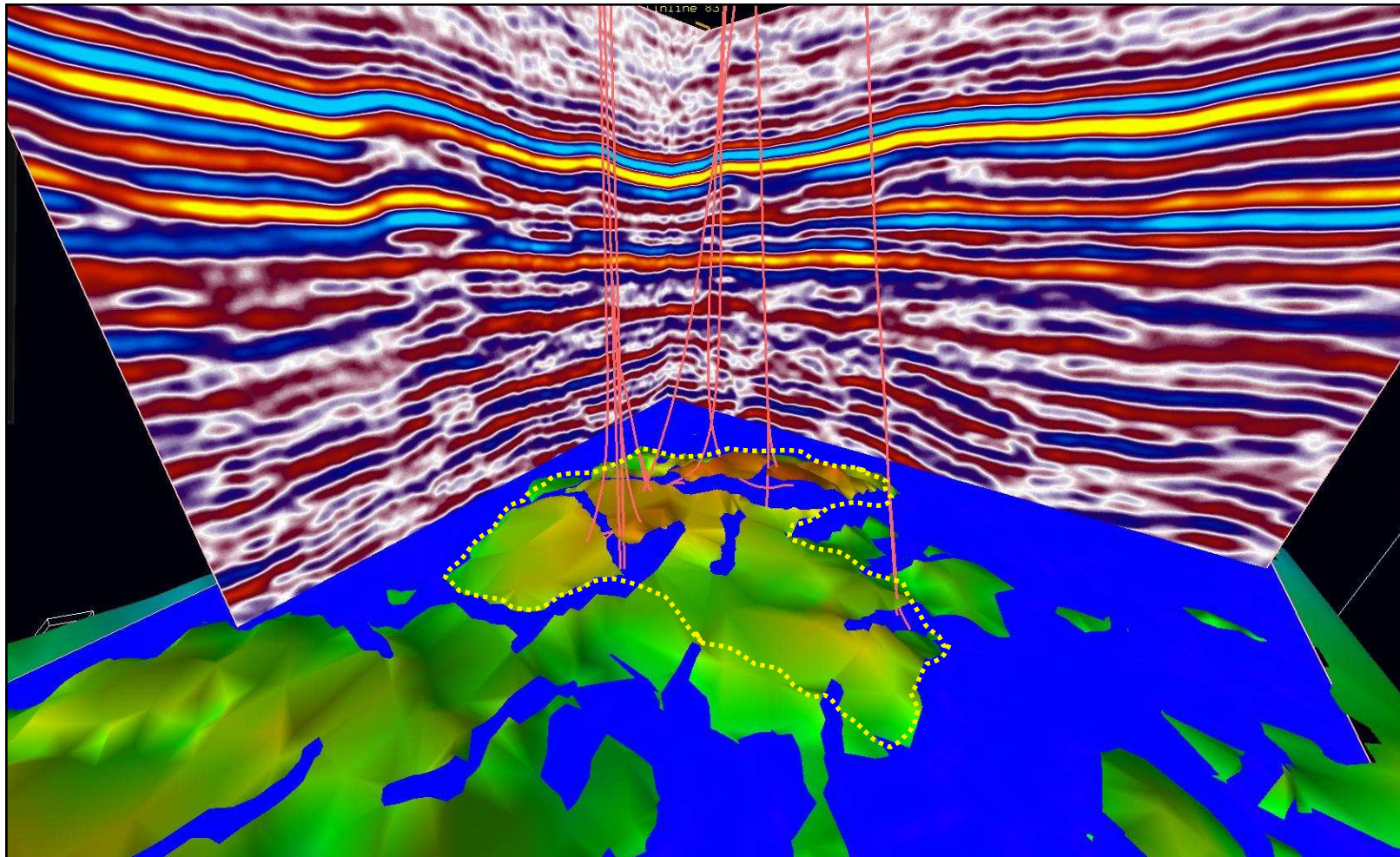


Saltfleetby Gas Storage Project Location



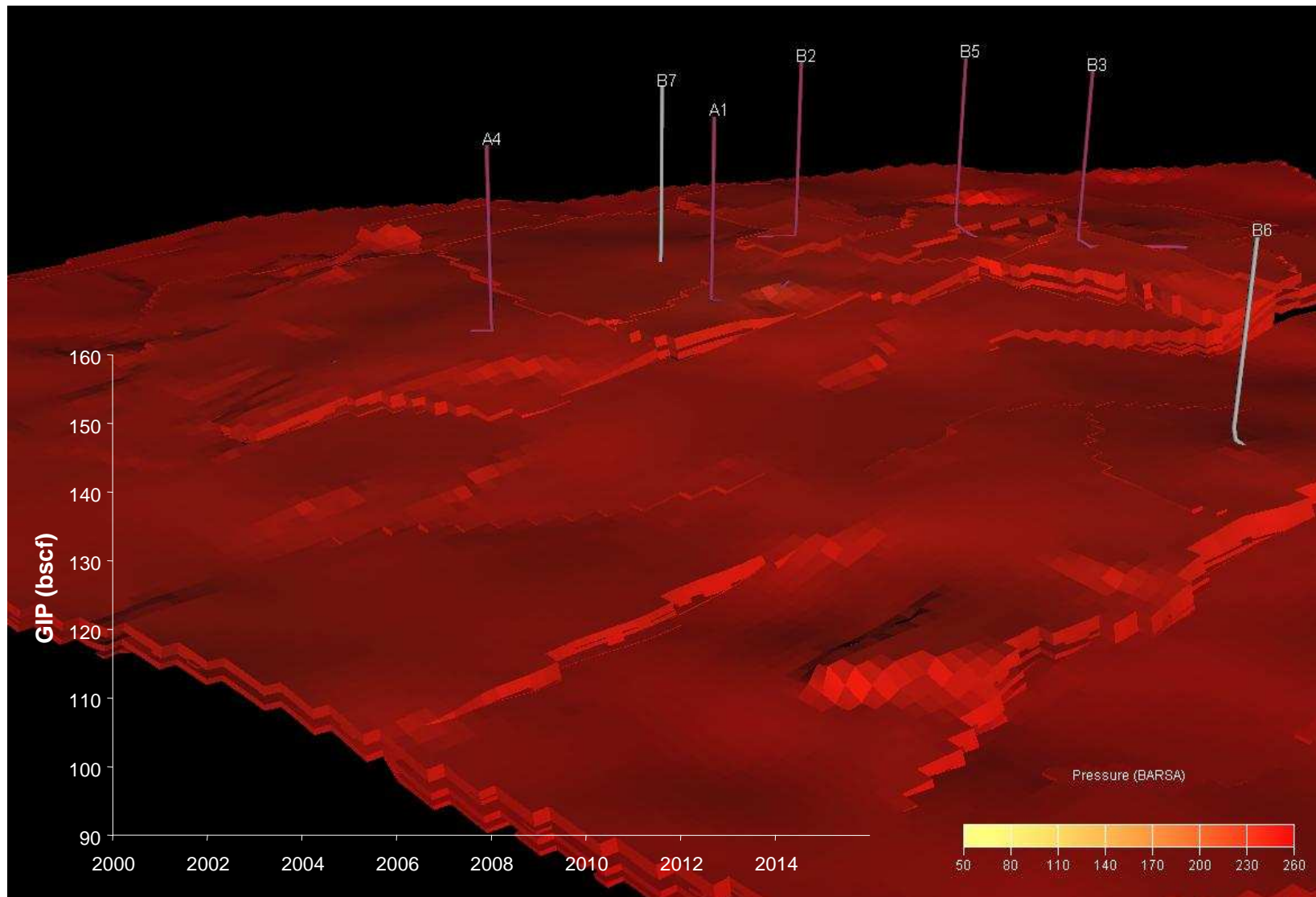
Saltfleetby Gas Storage Project

Seismic Interpretation



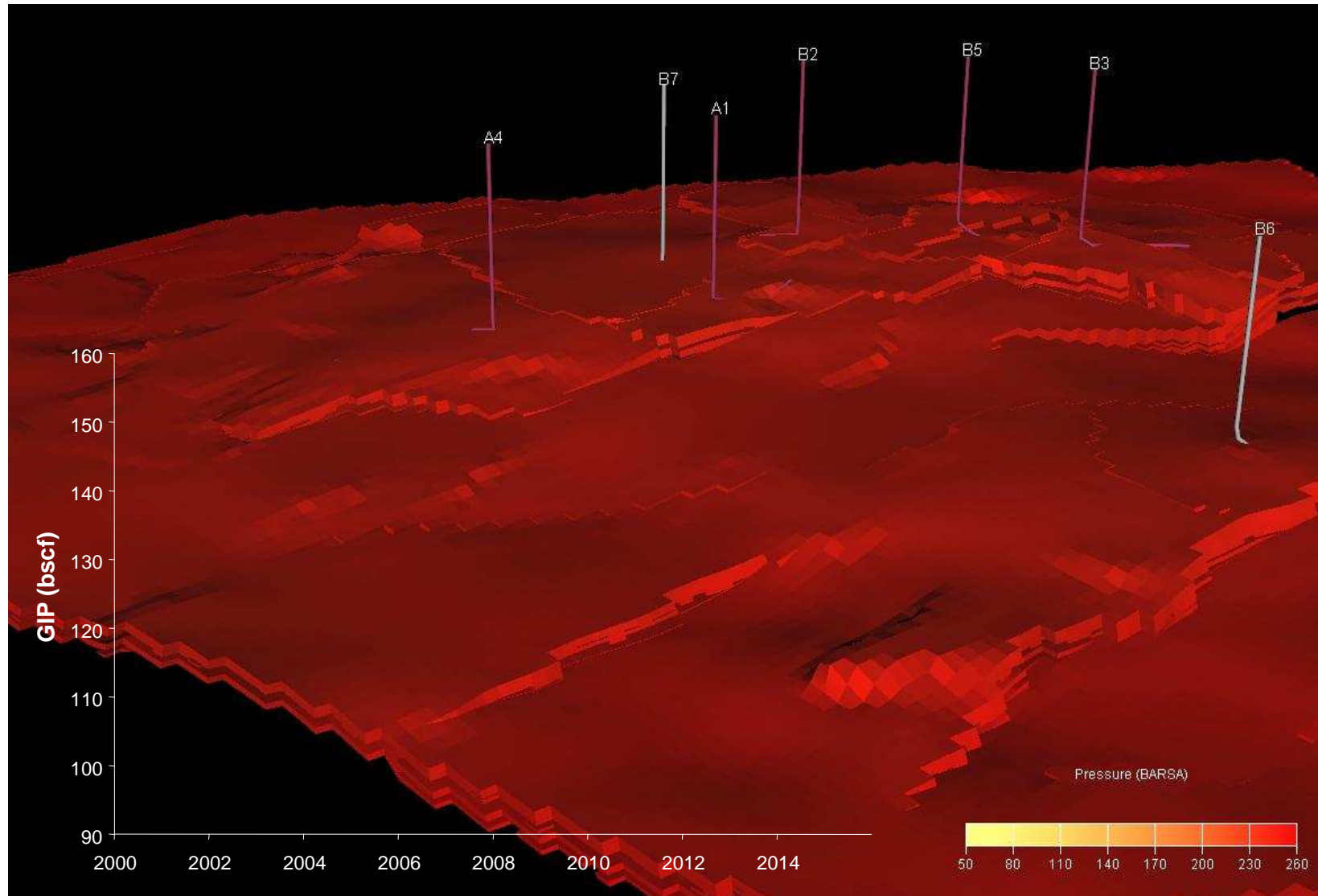
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



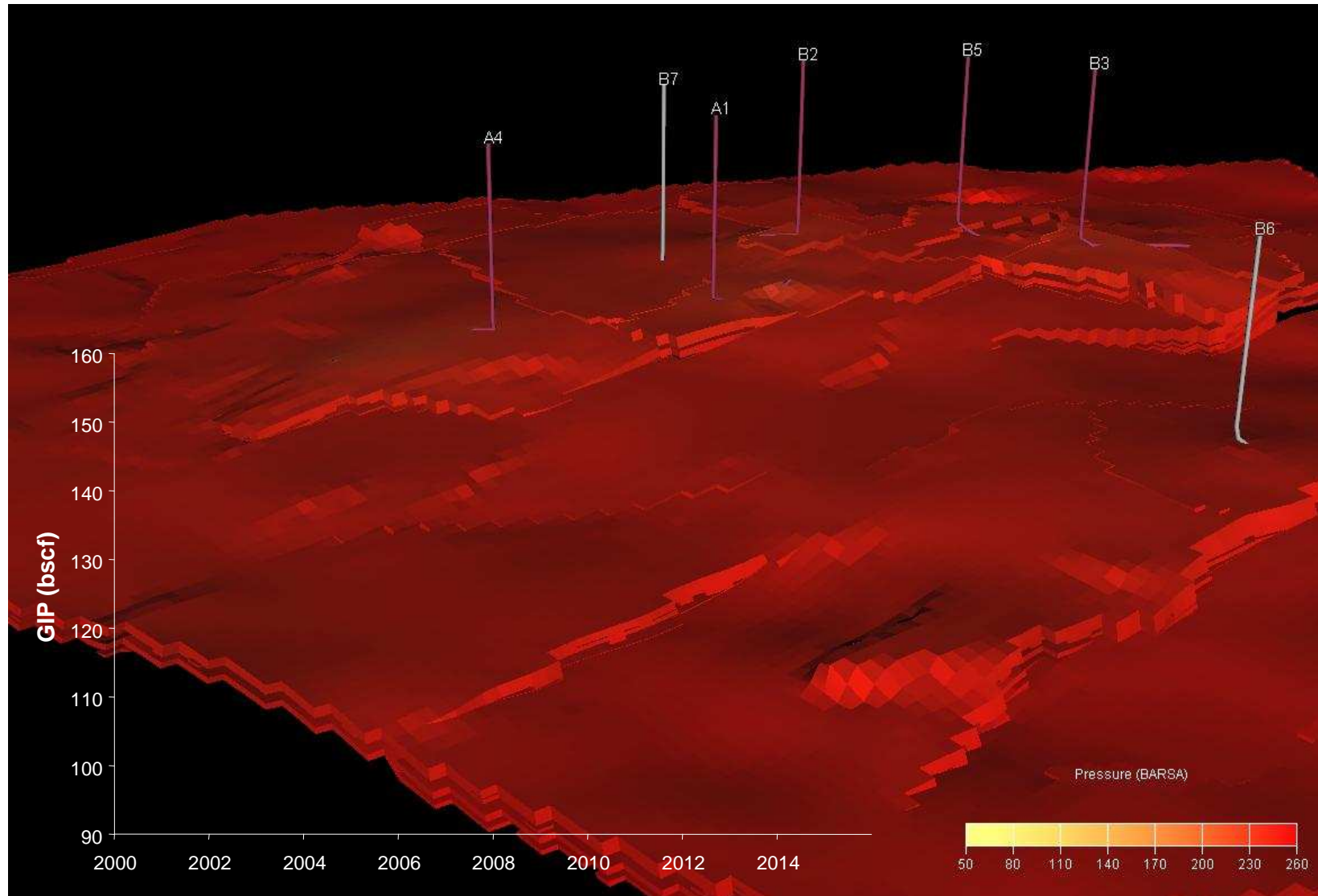
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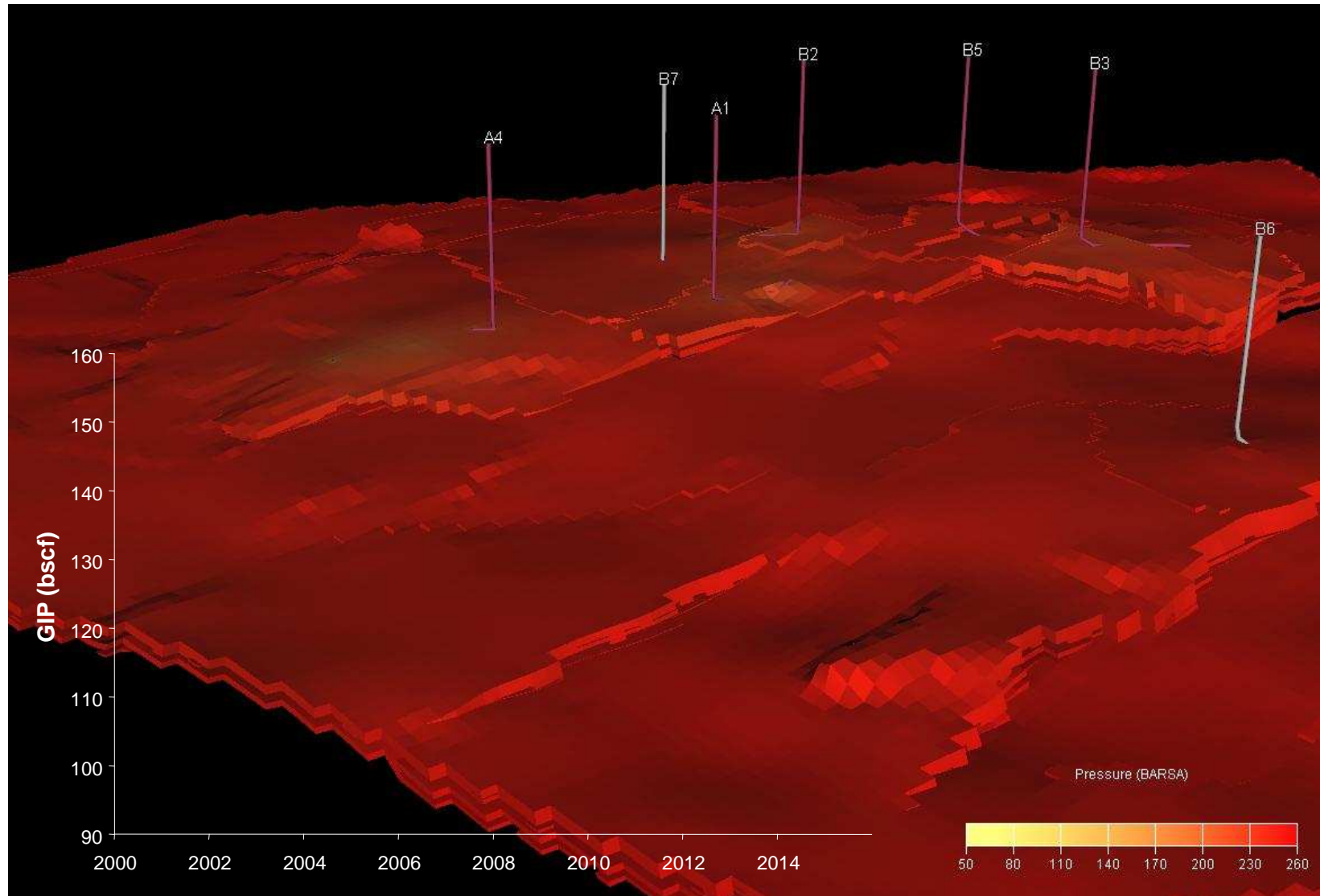
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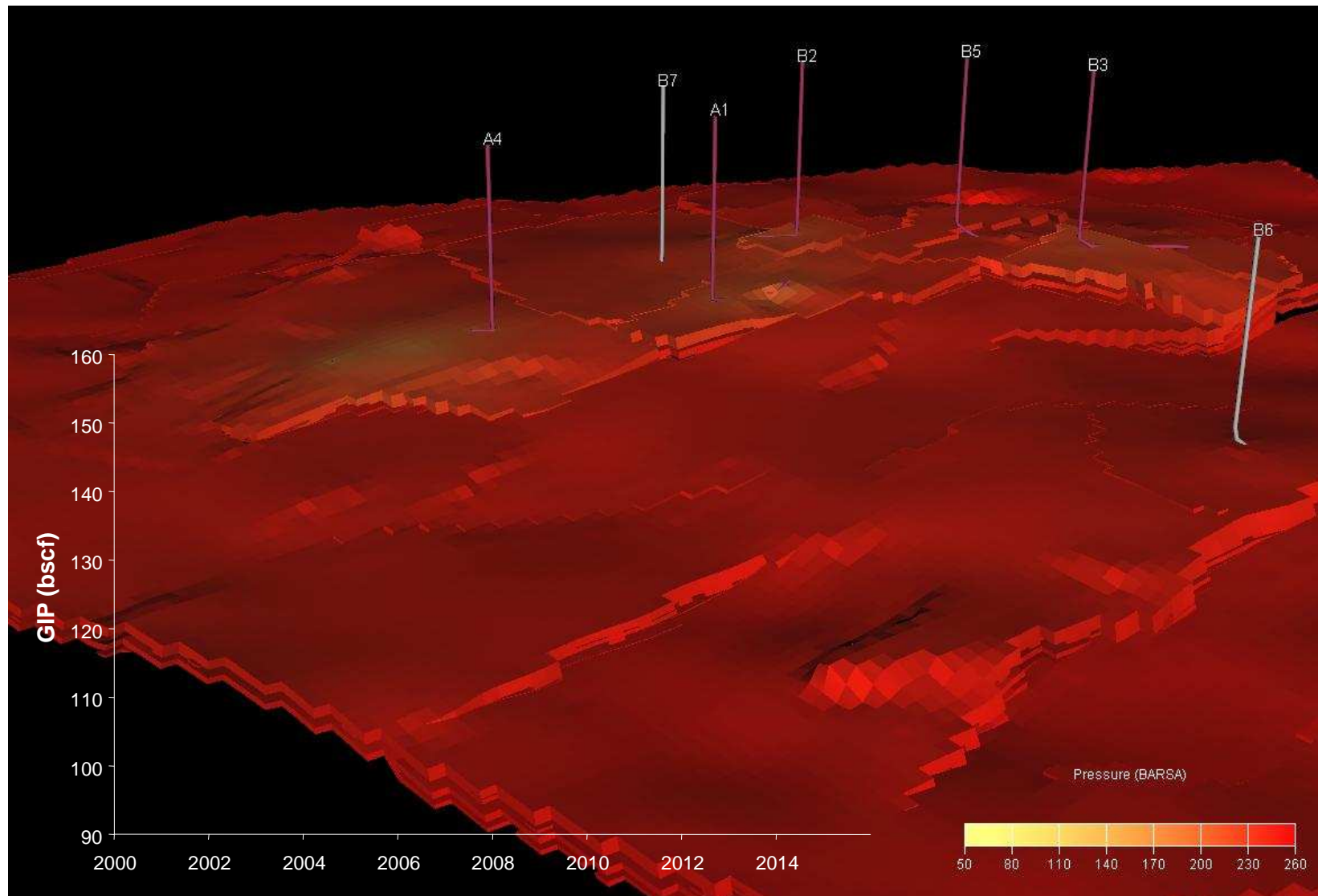
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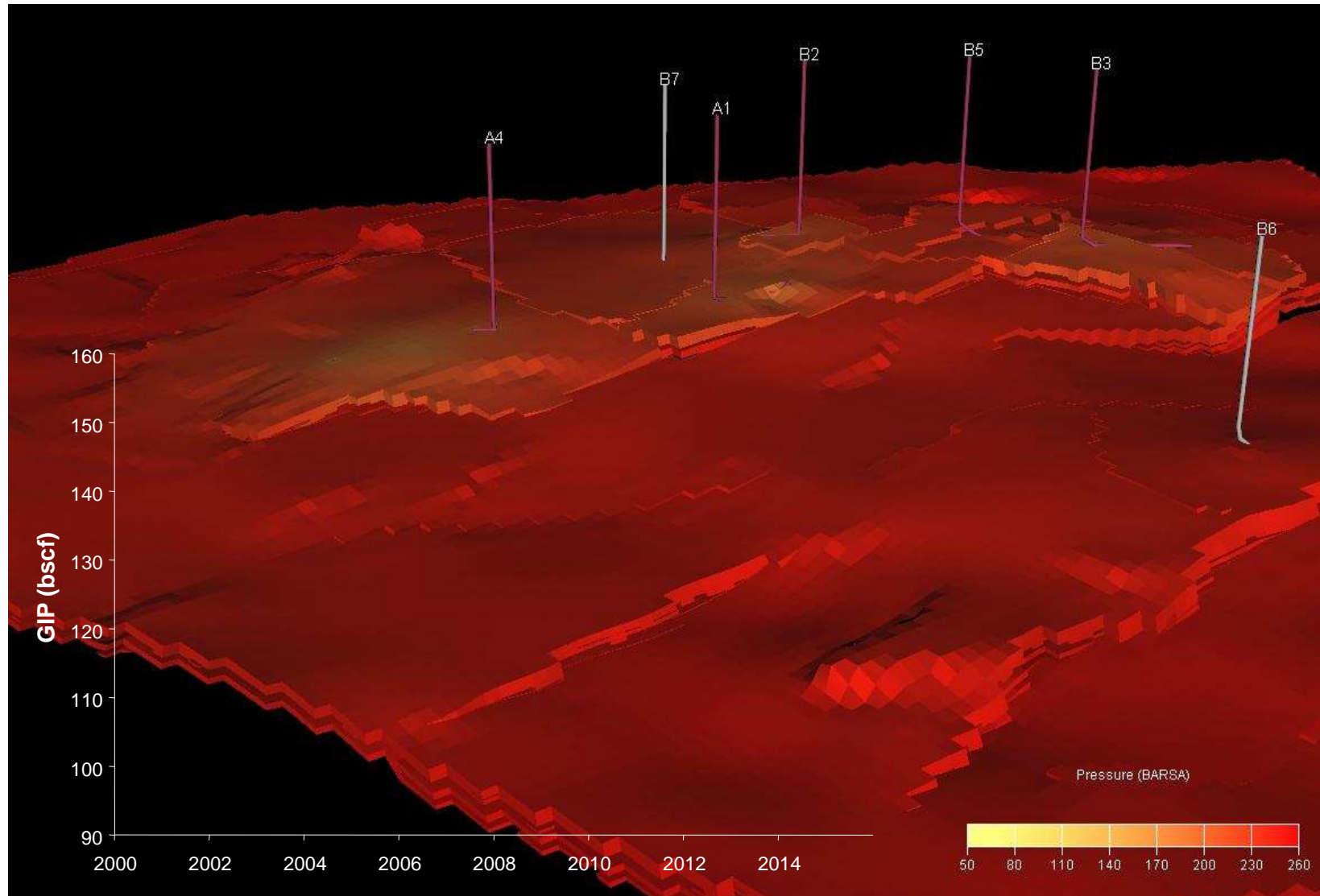
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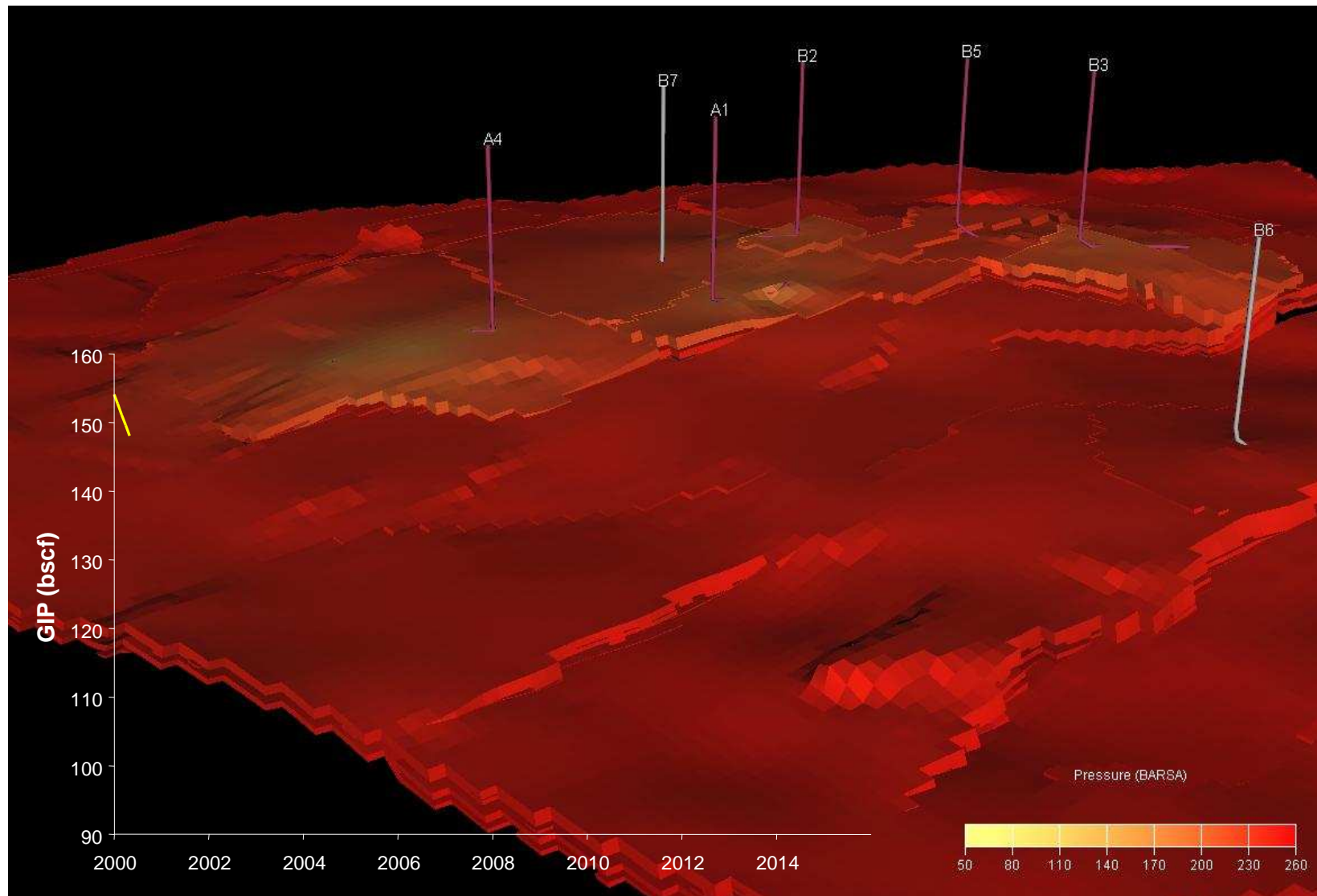
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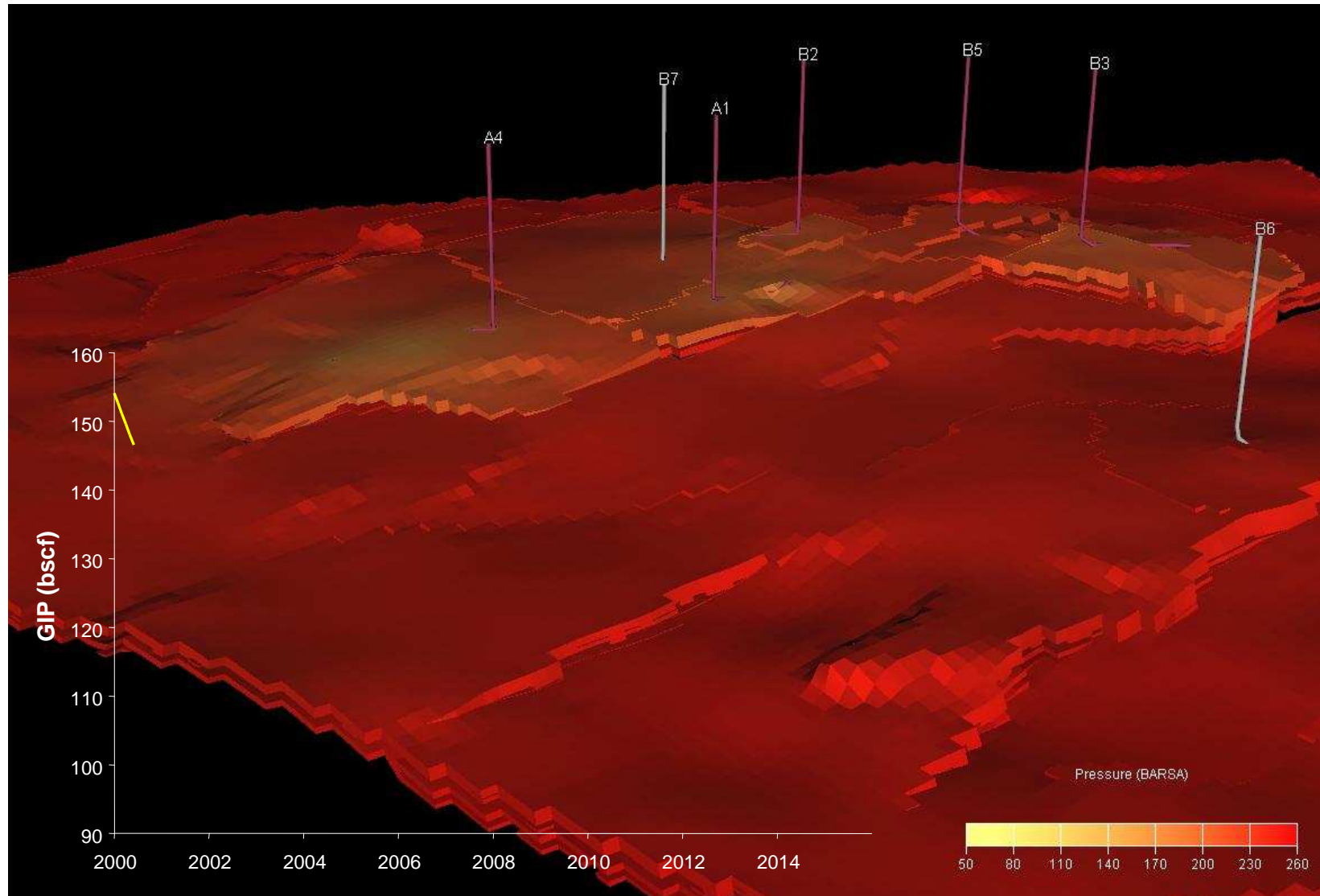
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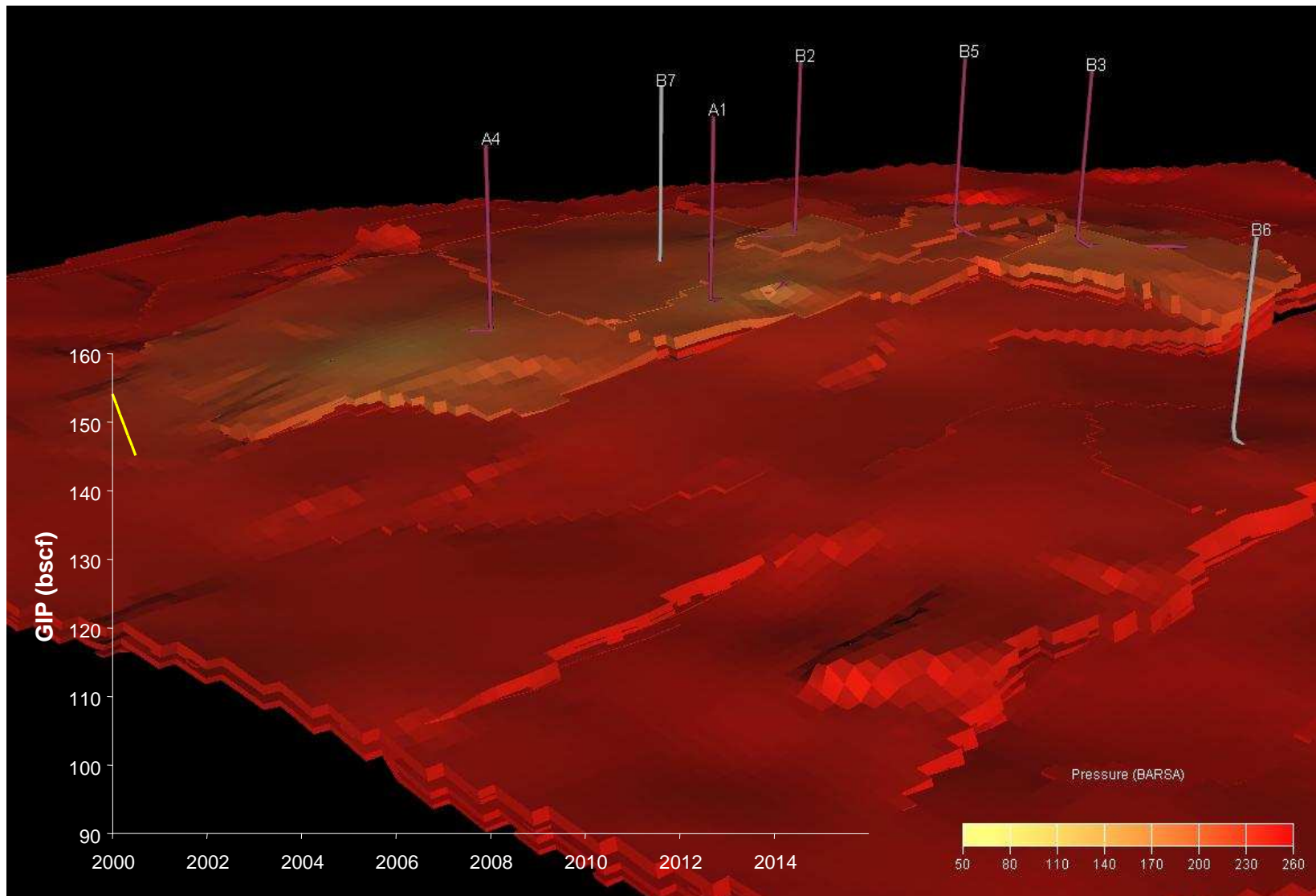
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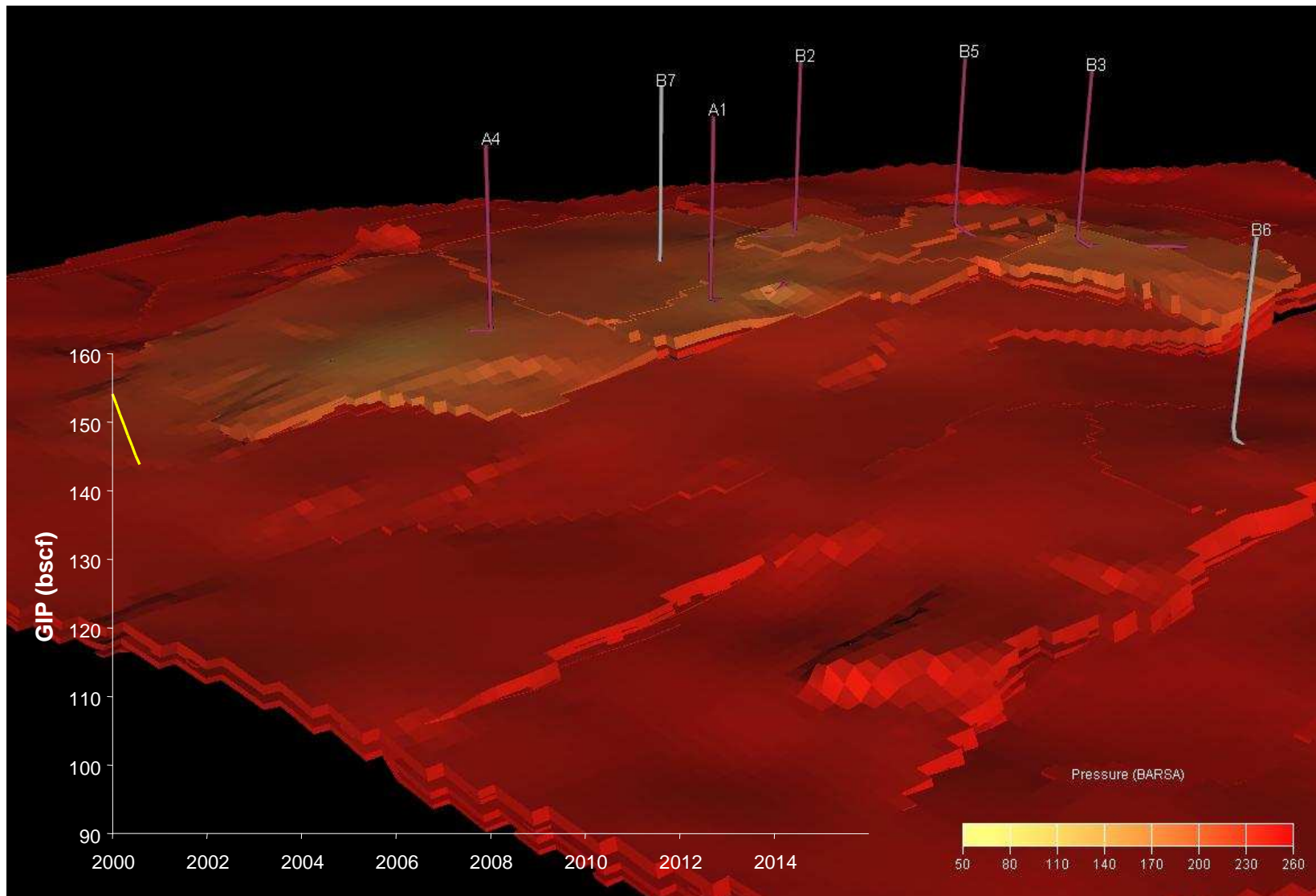
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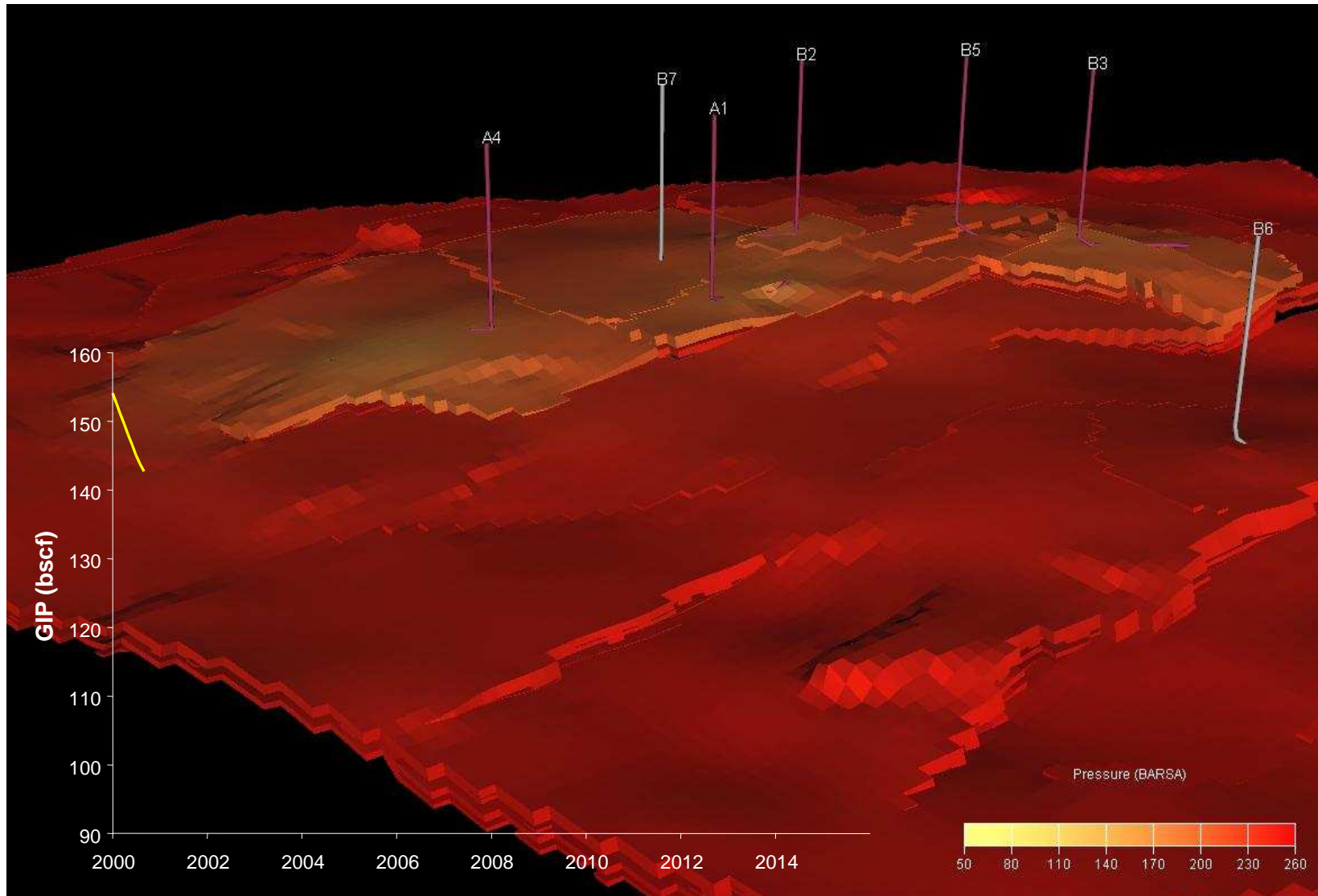
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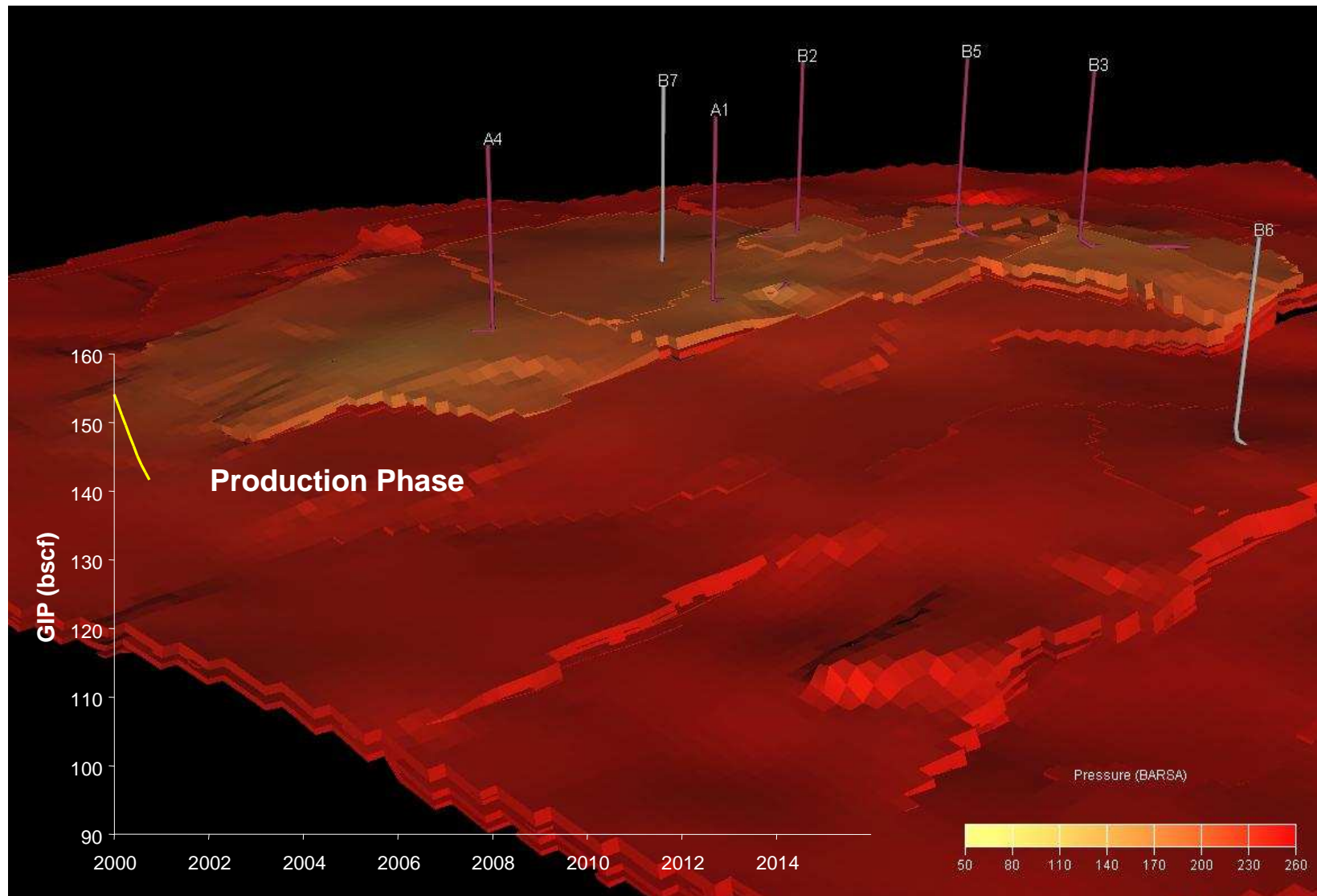
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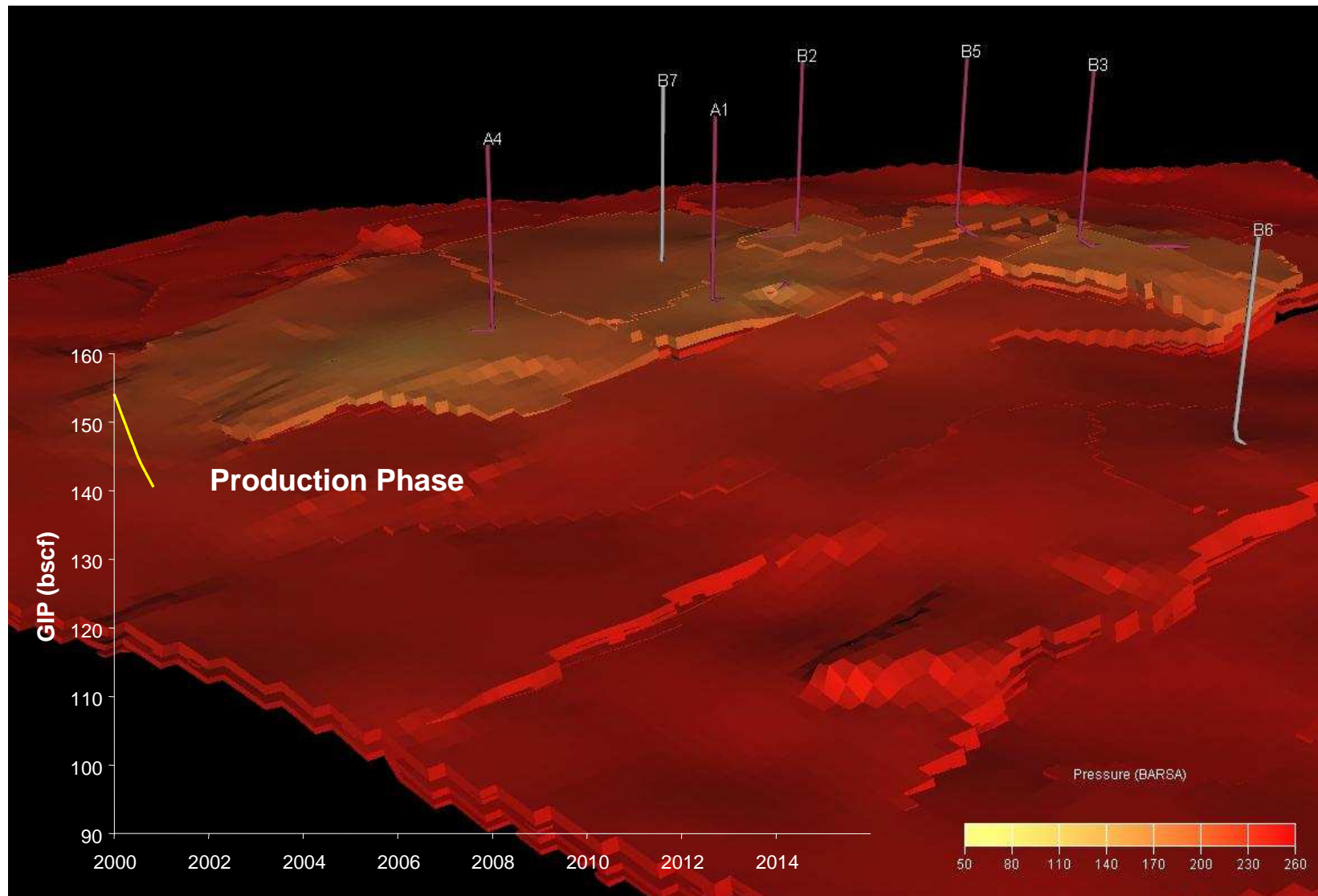
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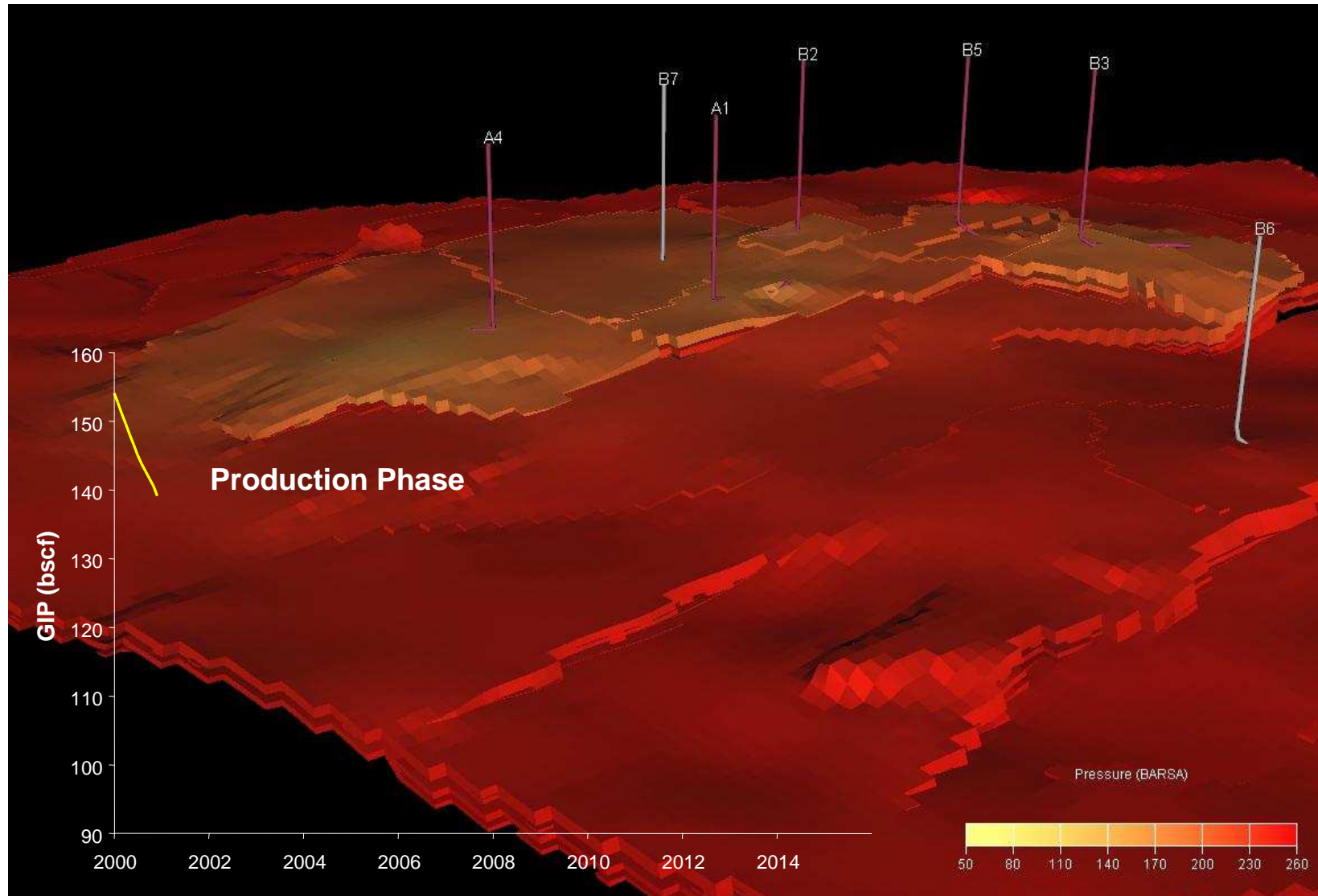
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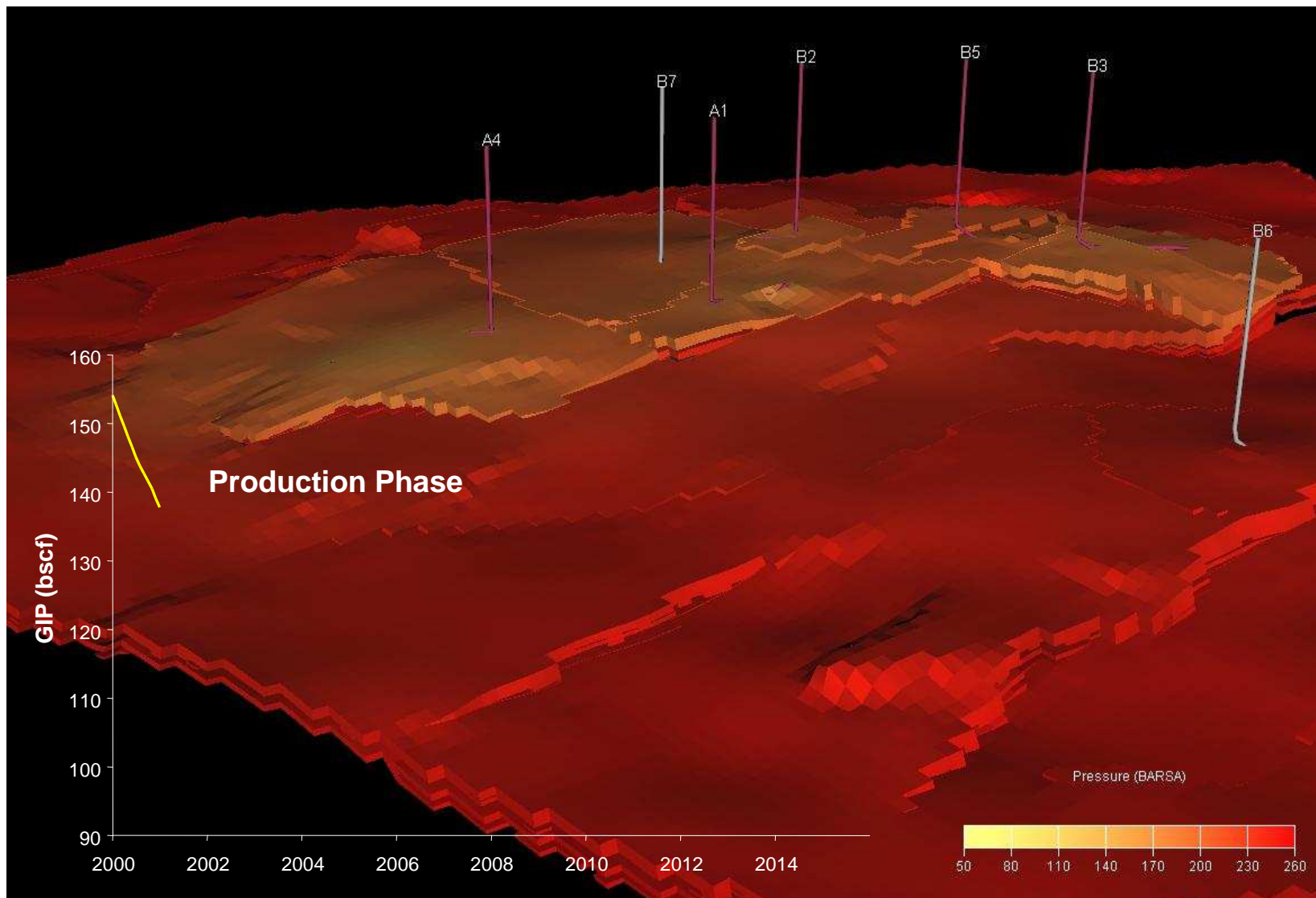
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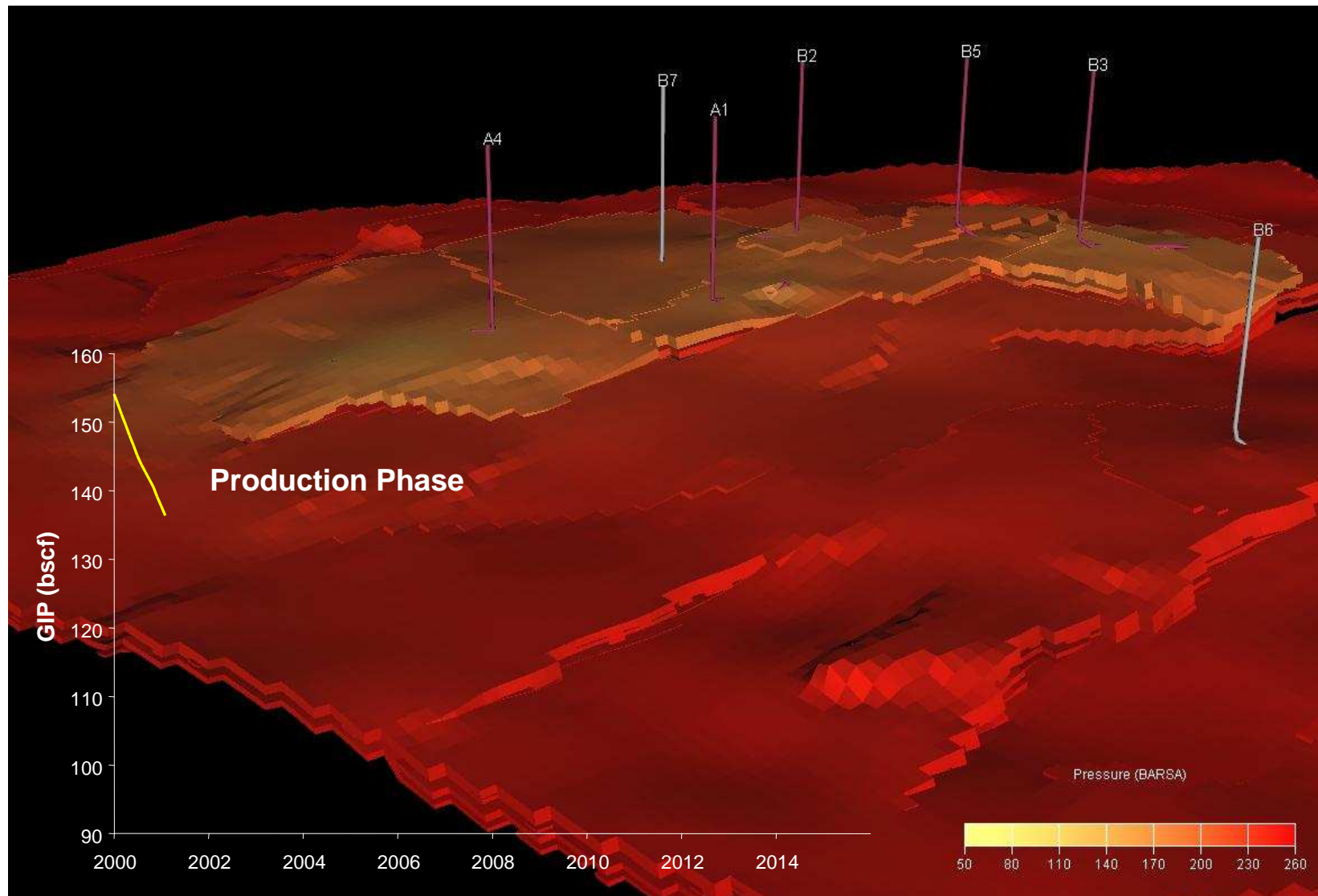
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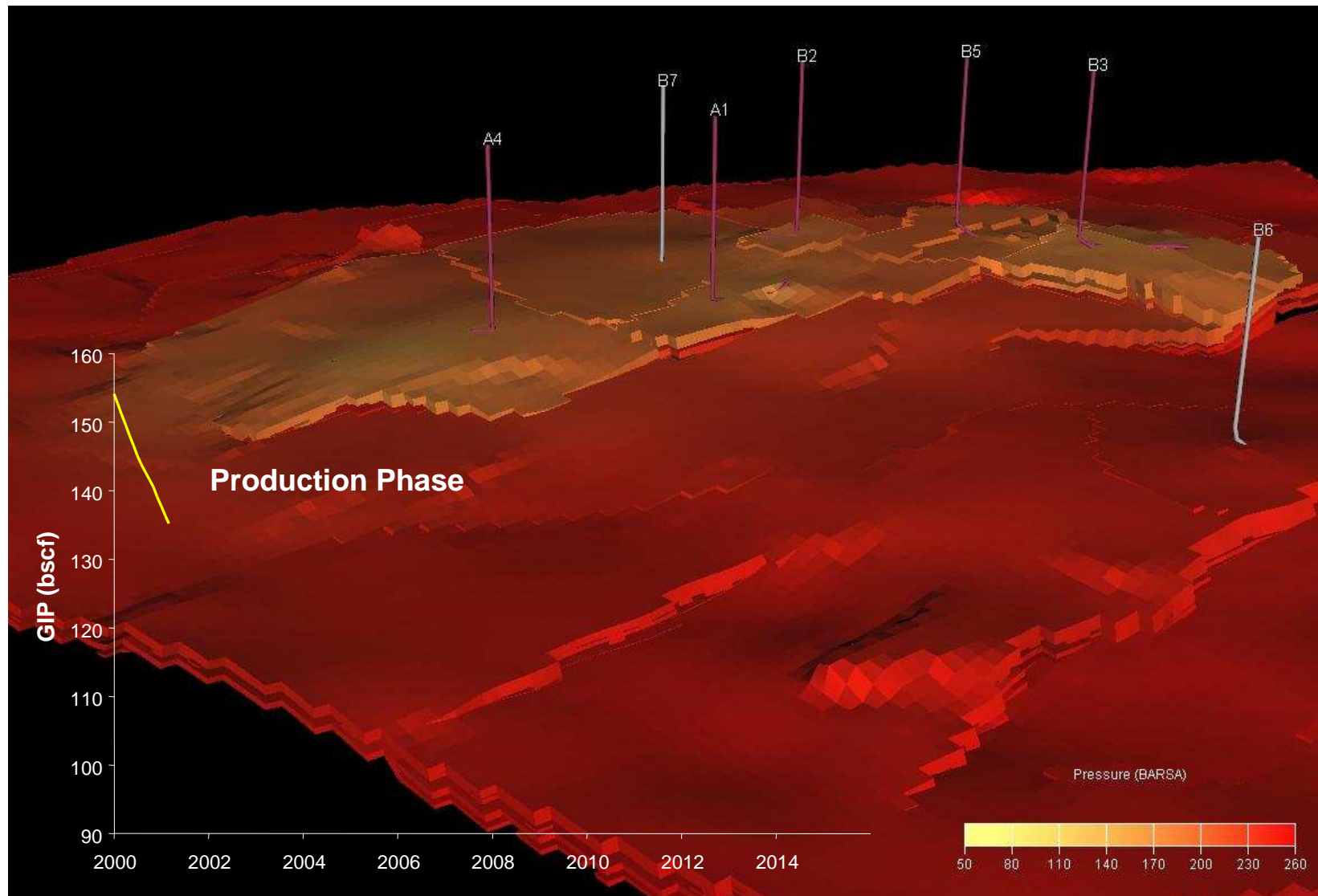
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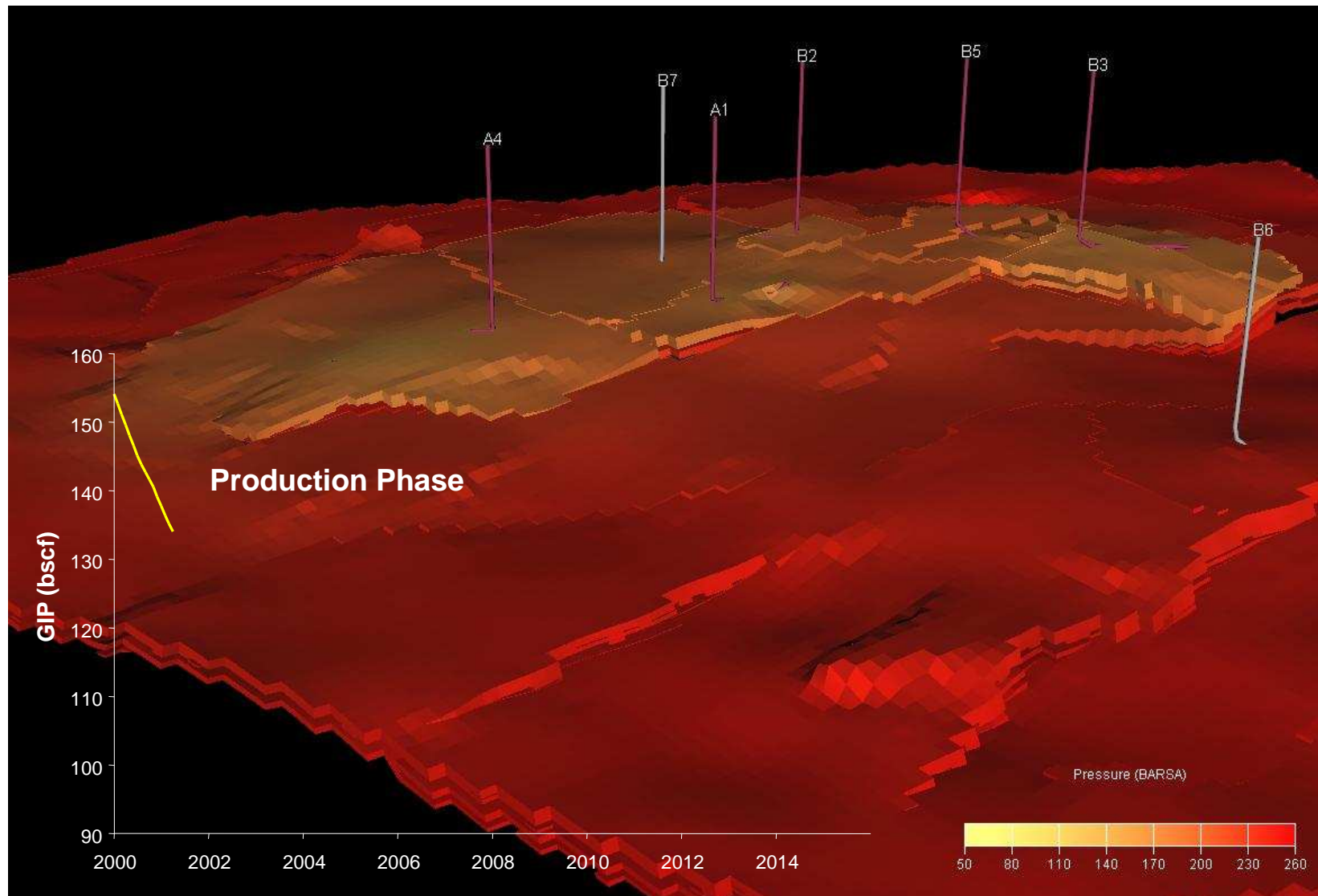
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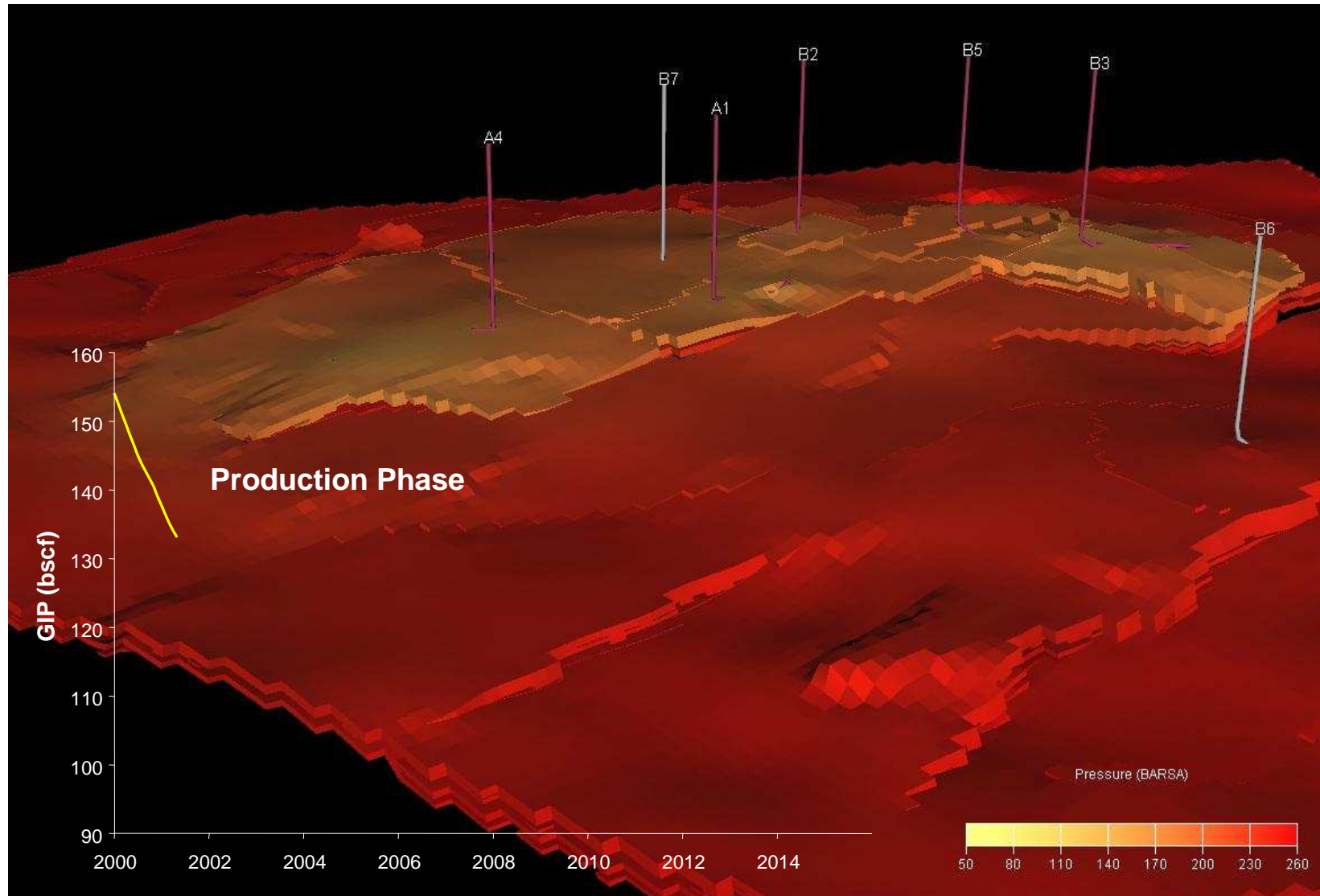
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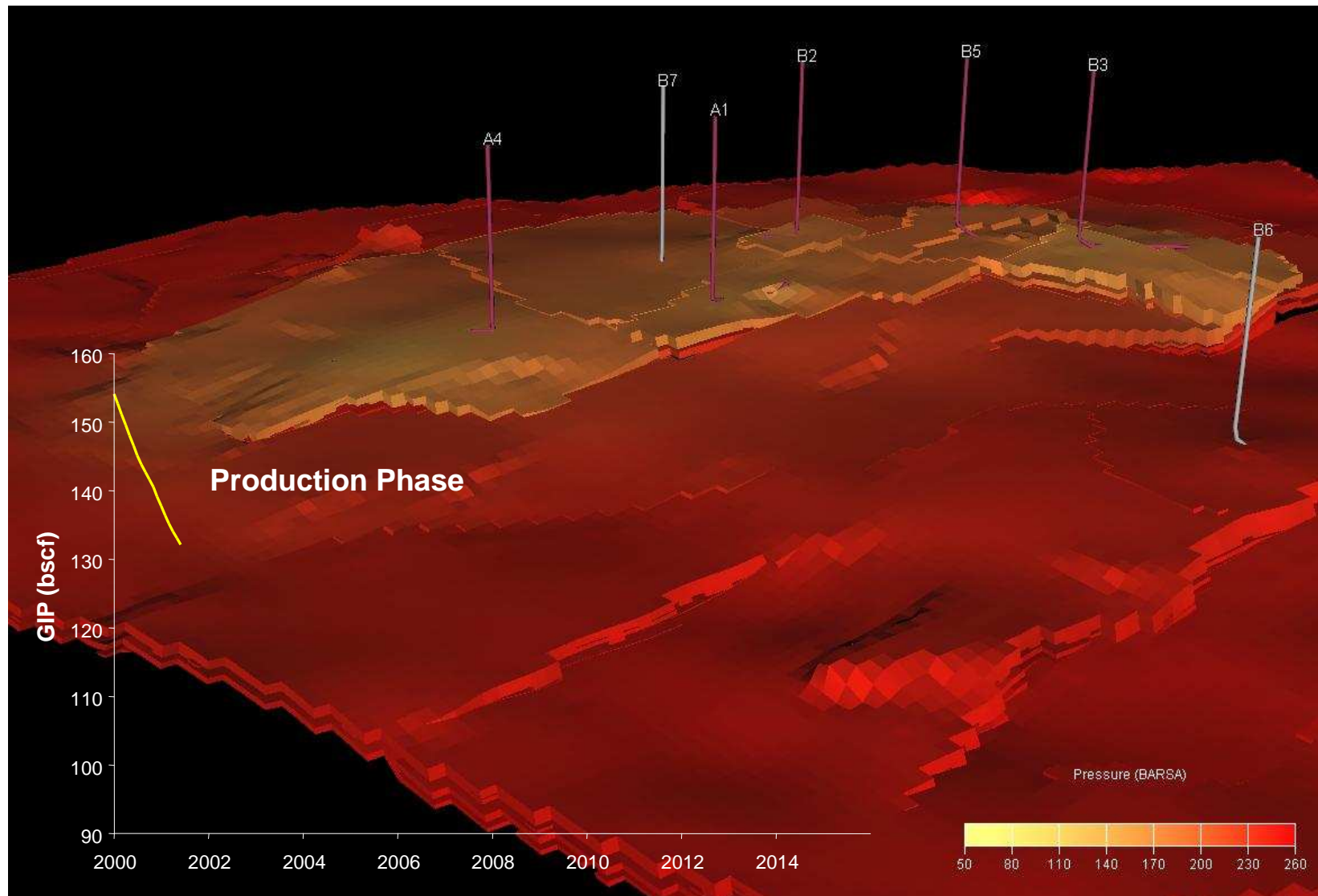
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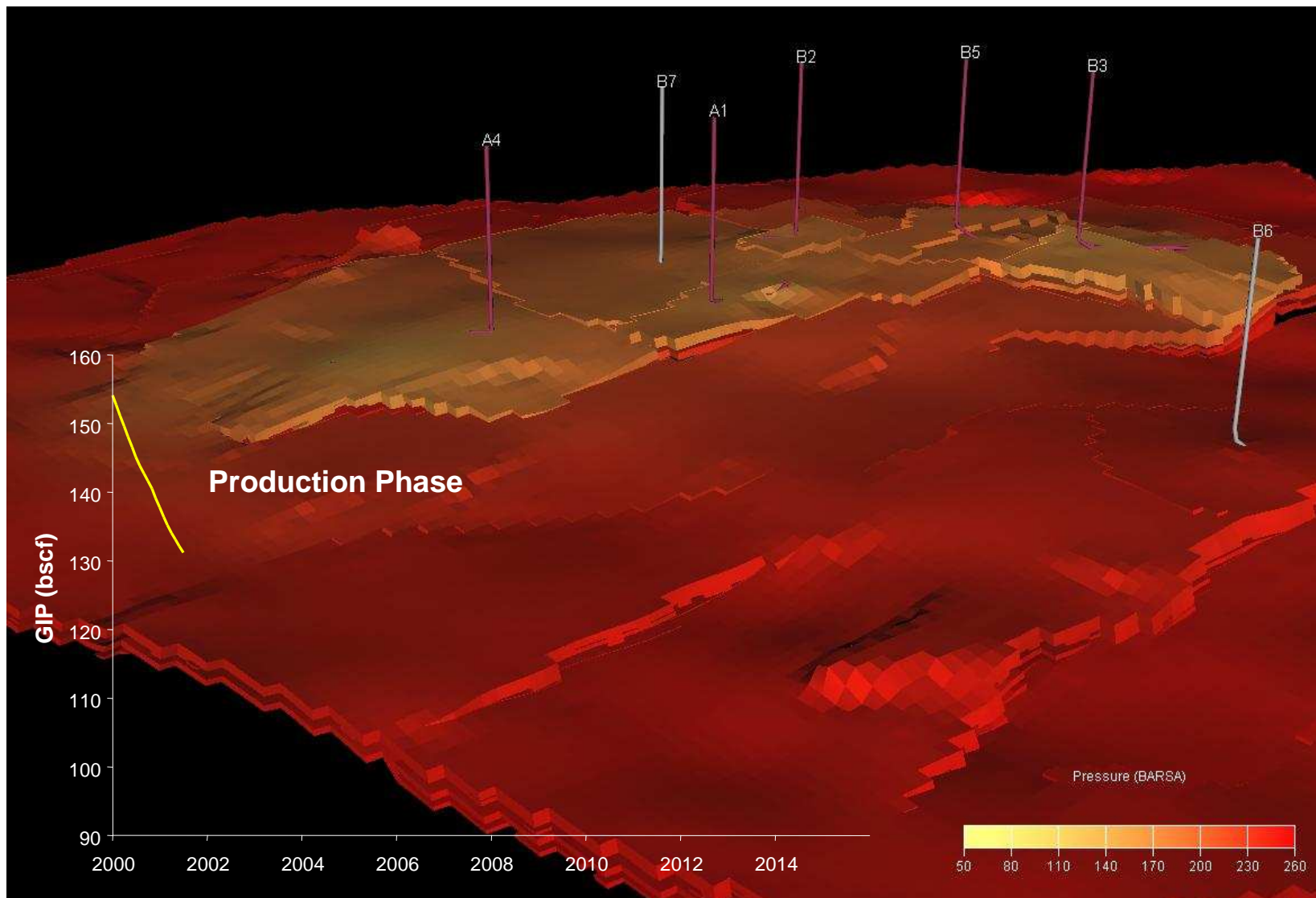
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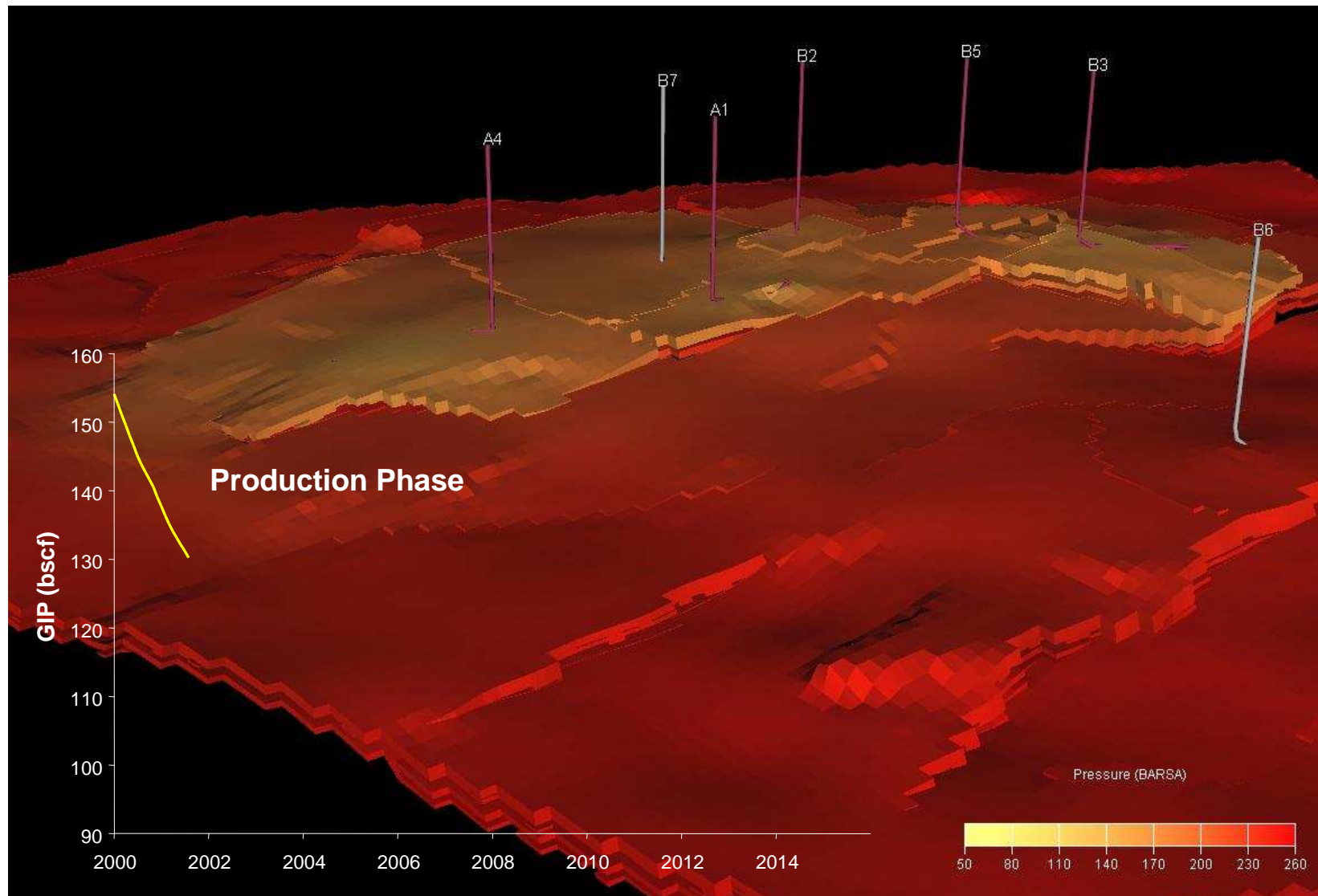
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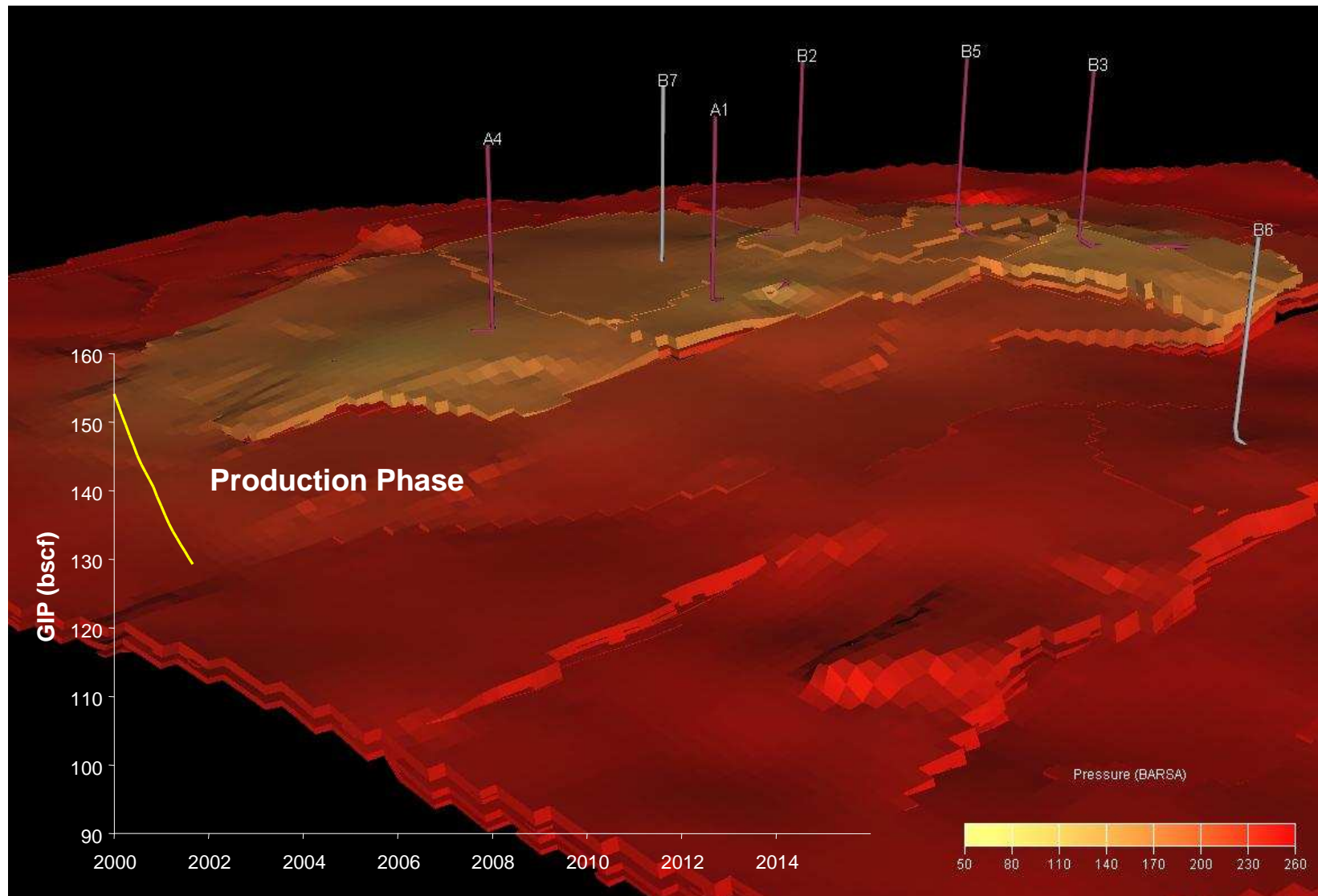
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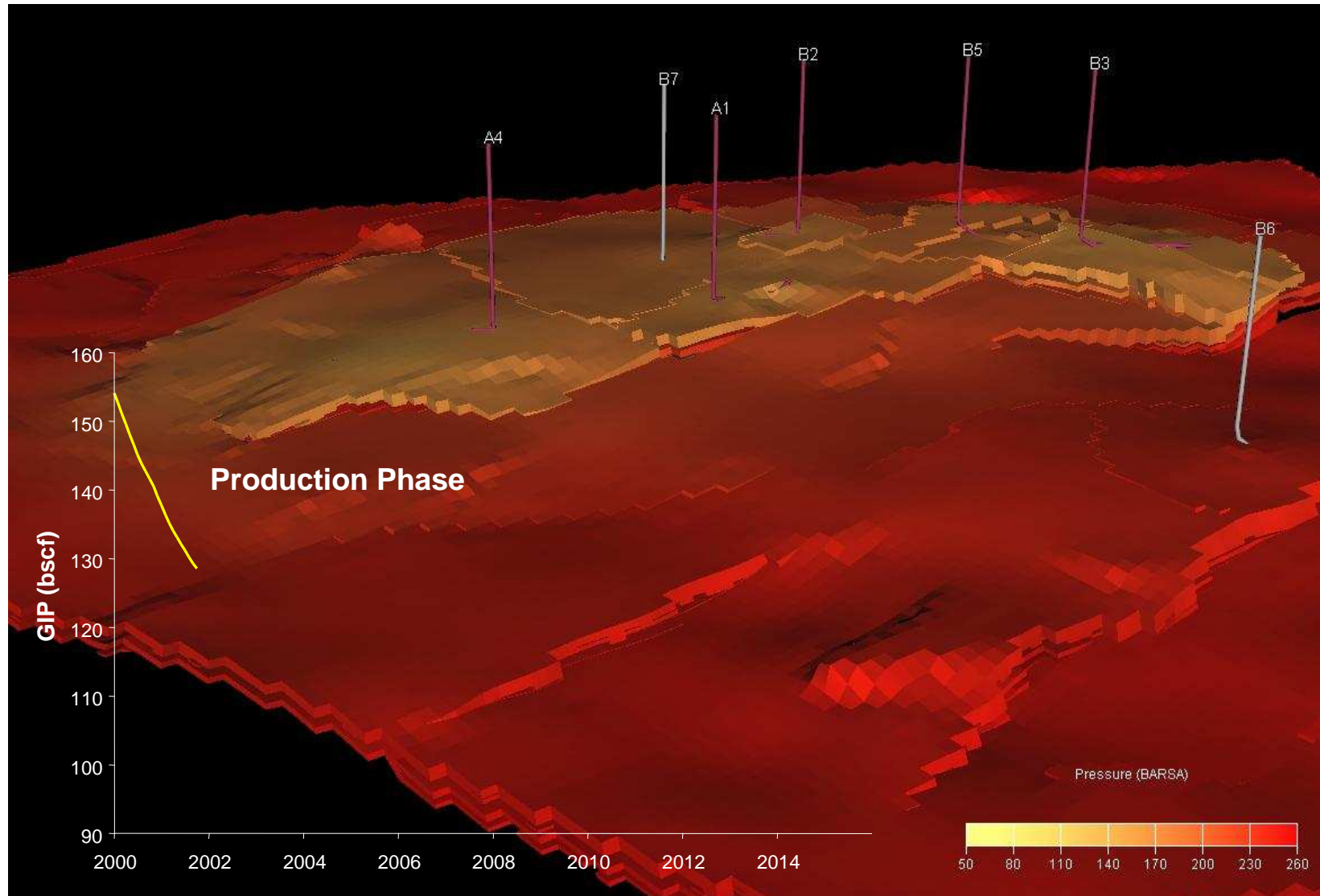
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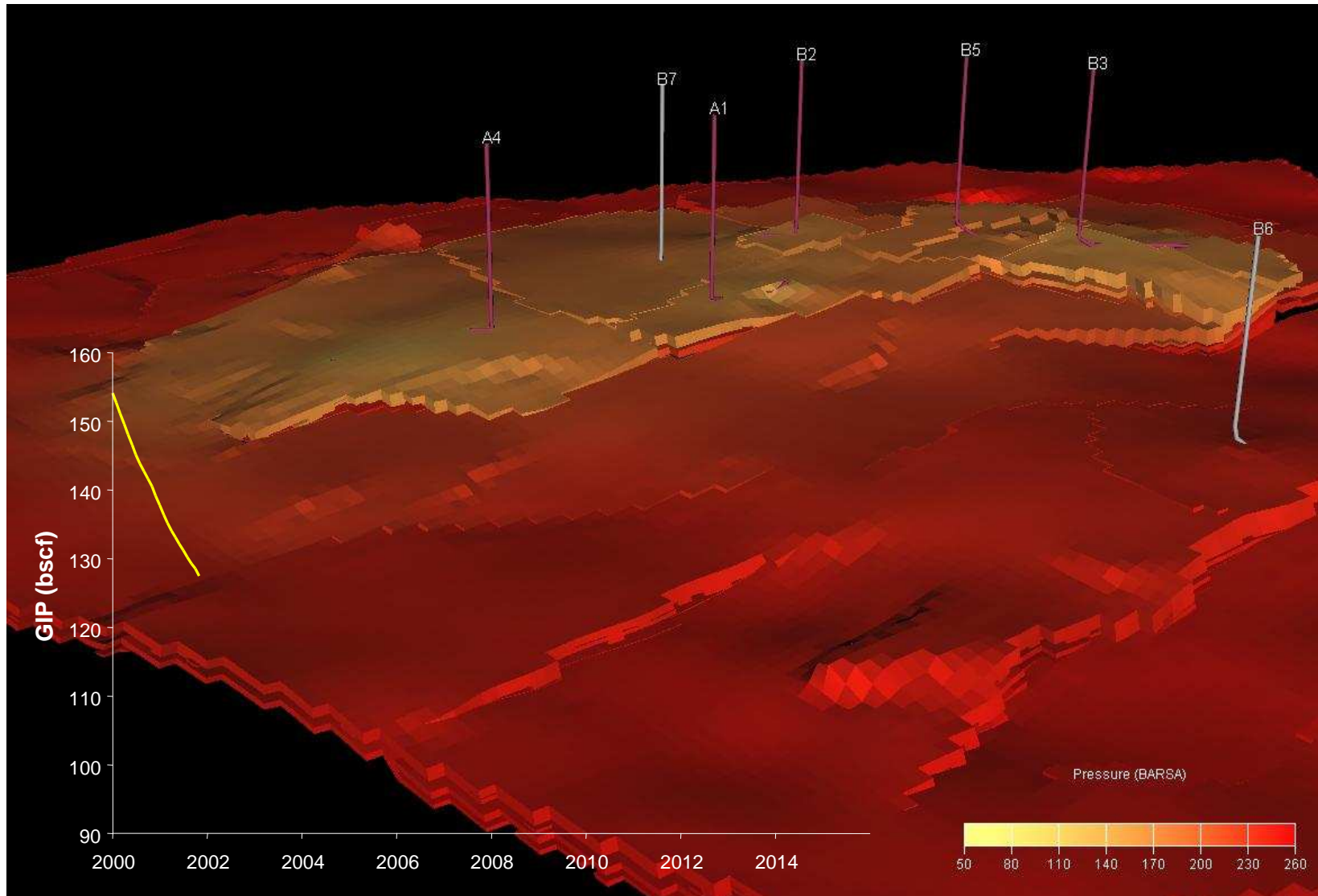
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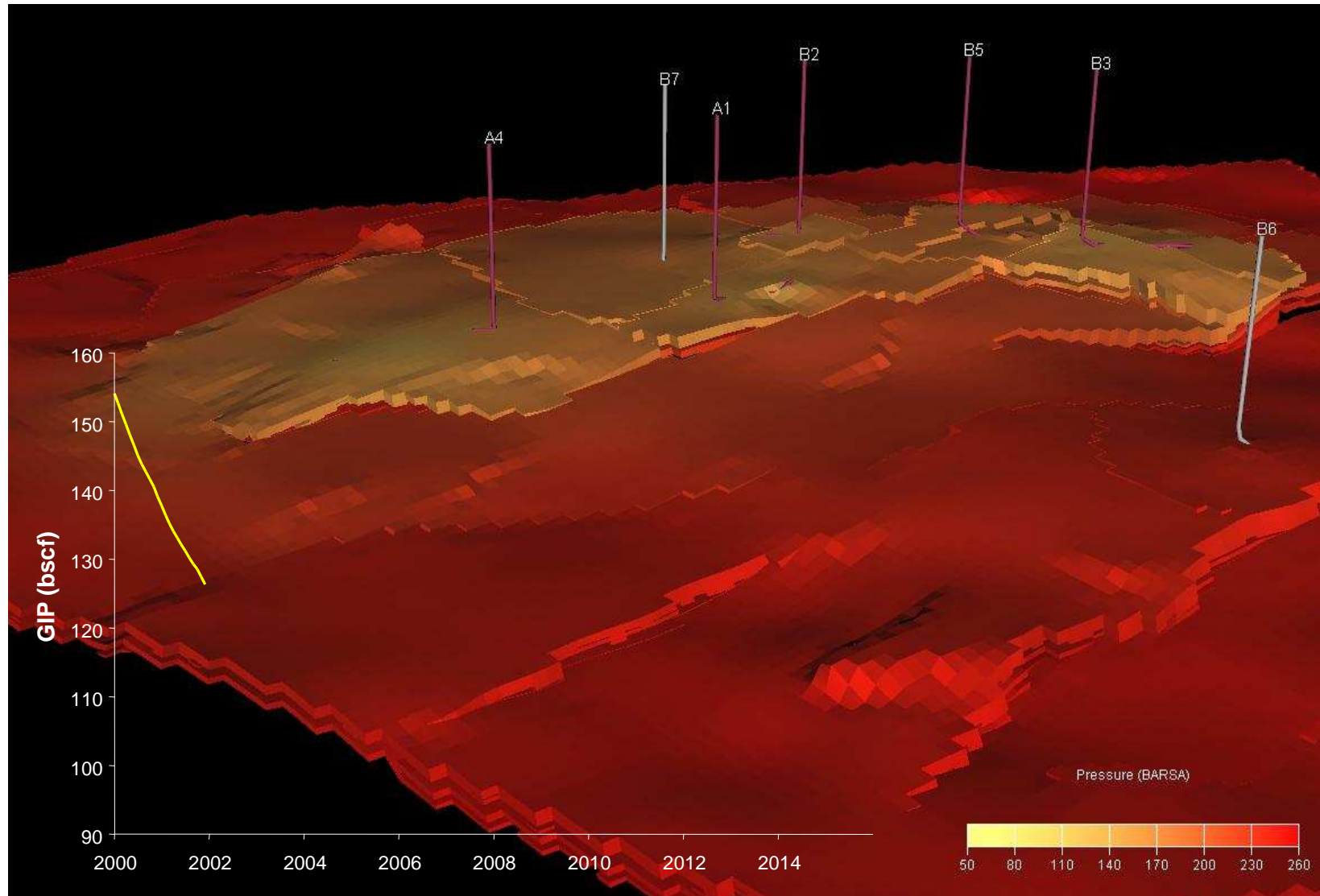
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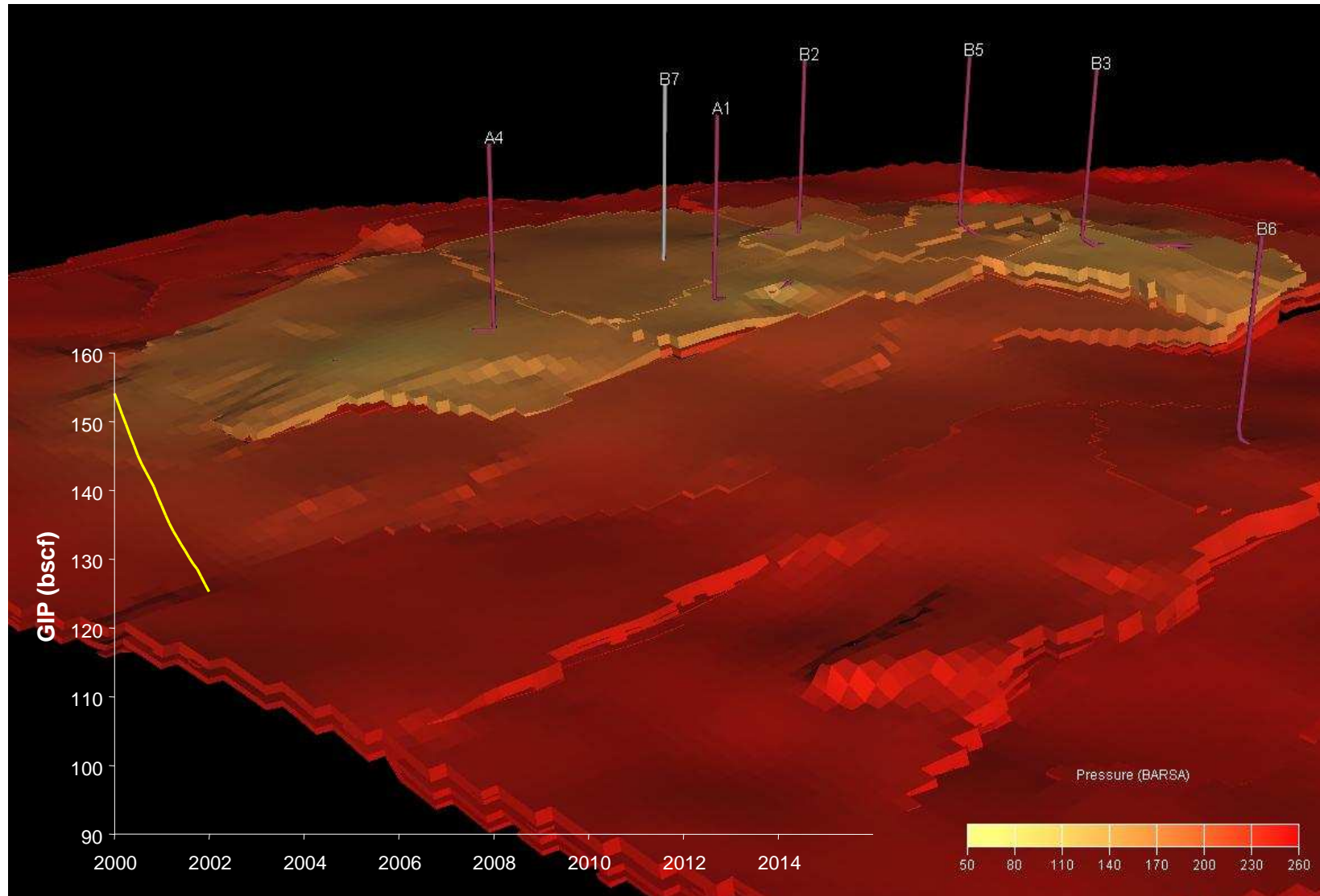
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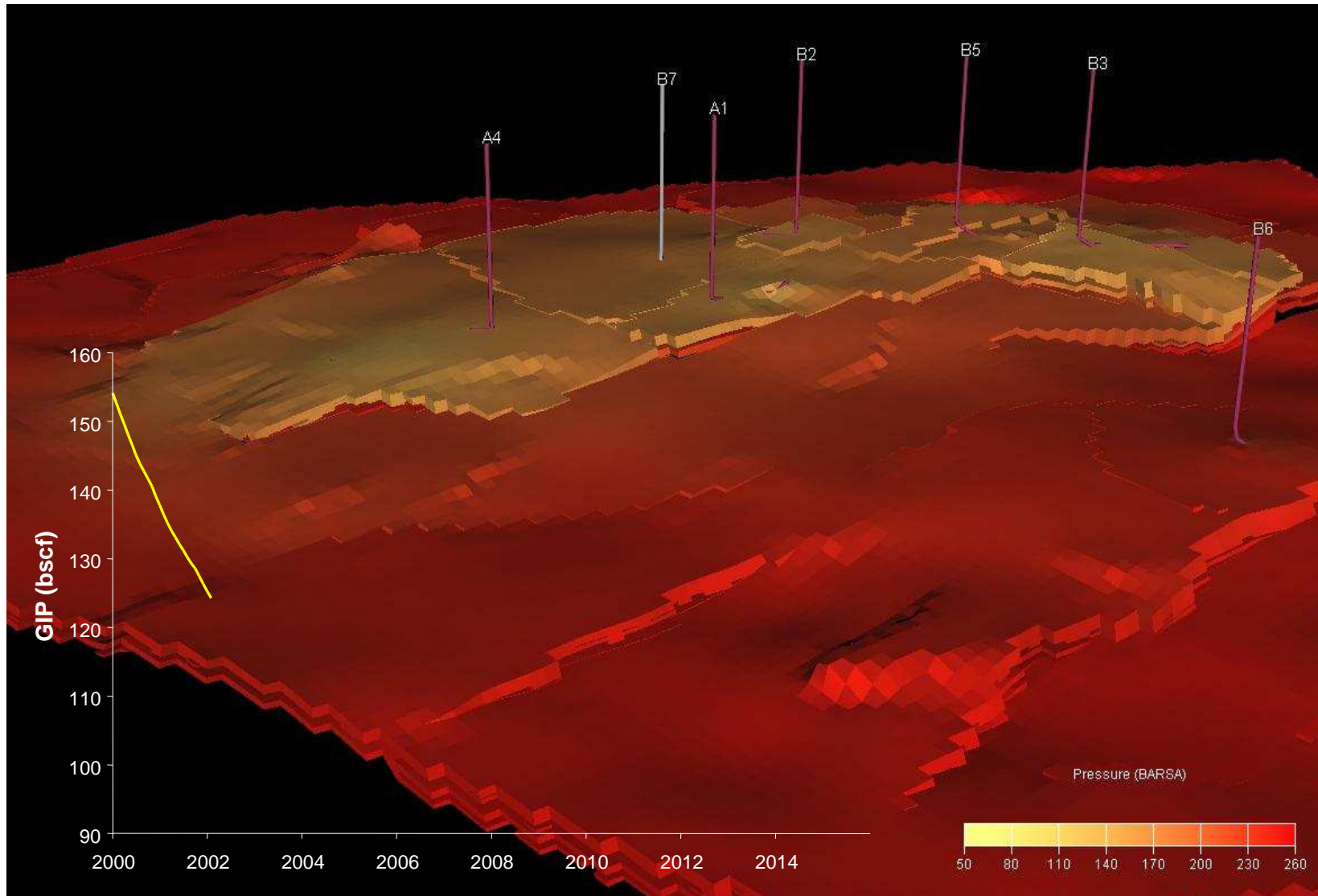
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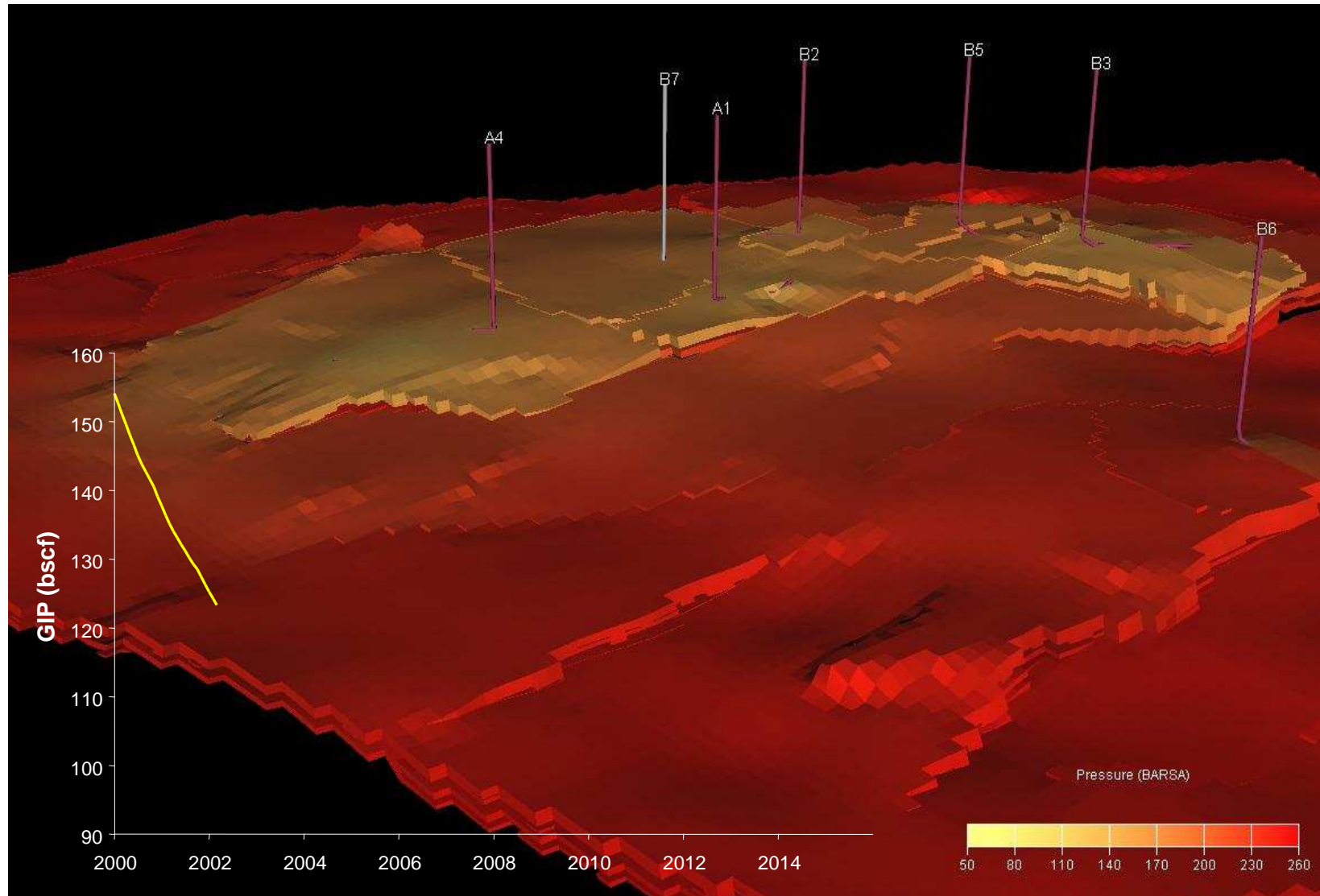
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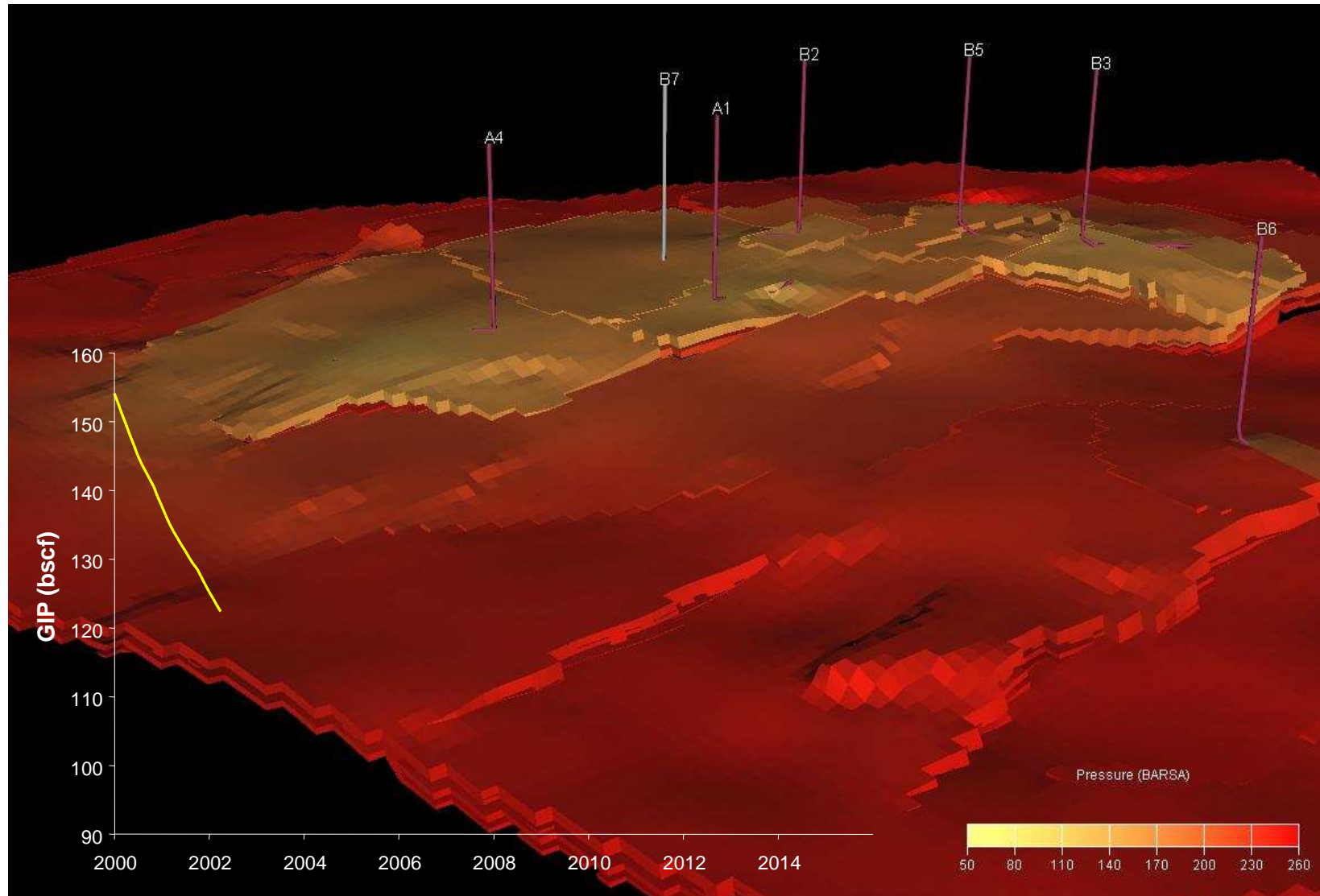
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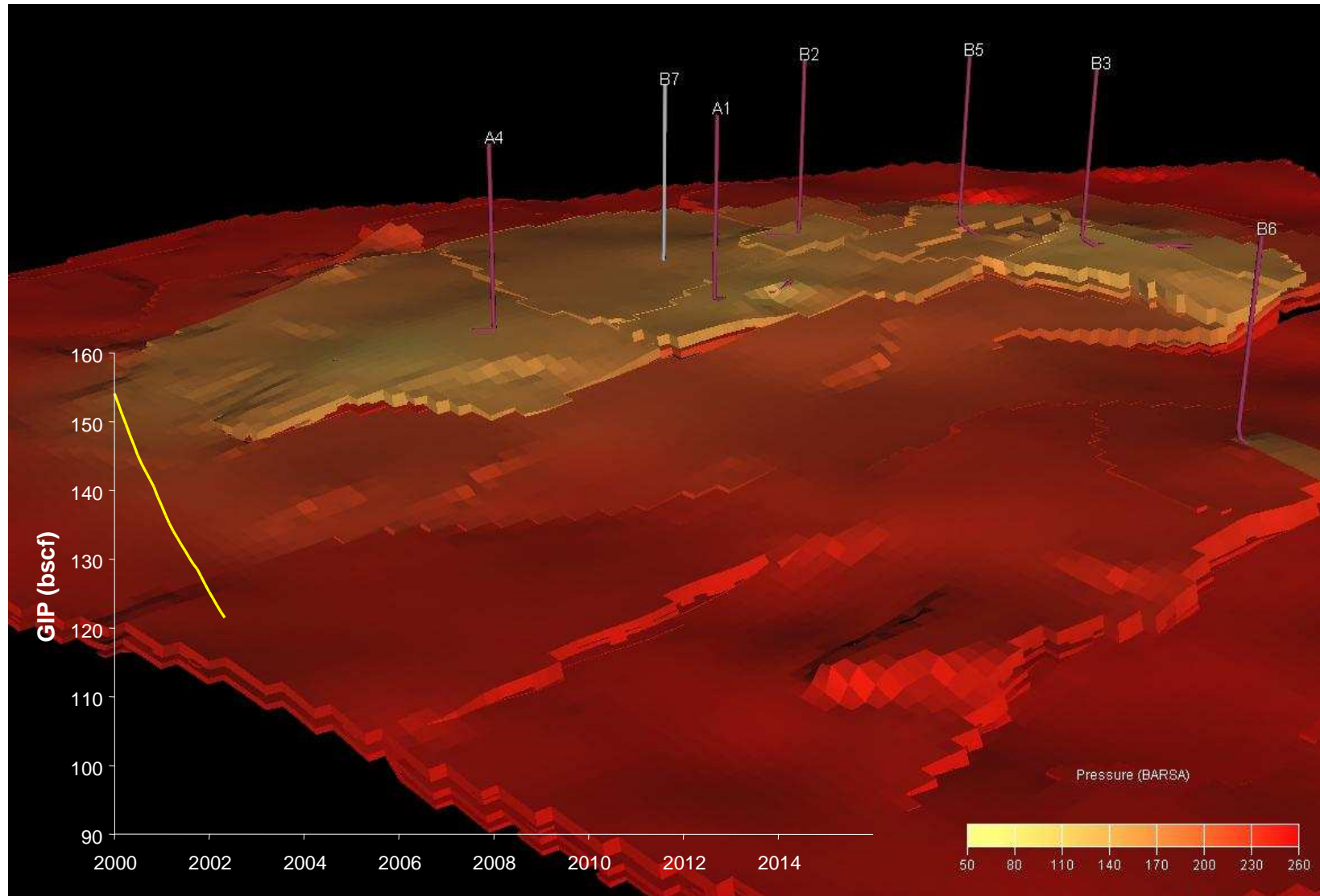
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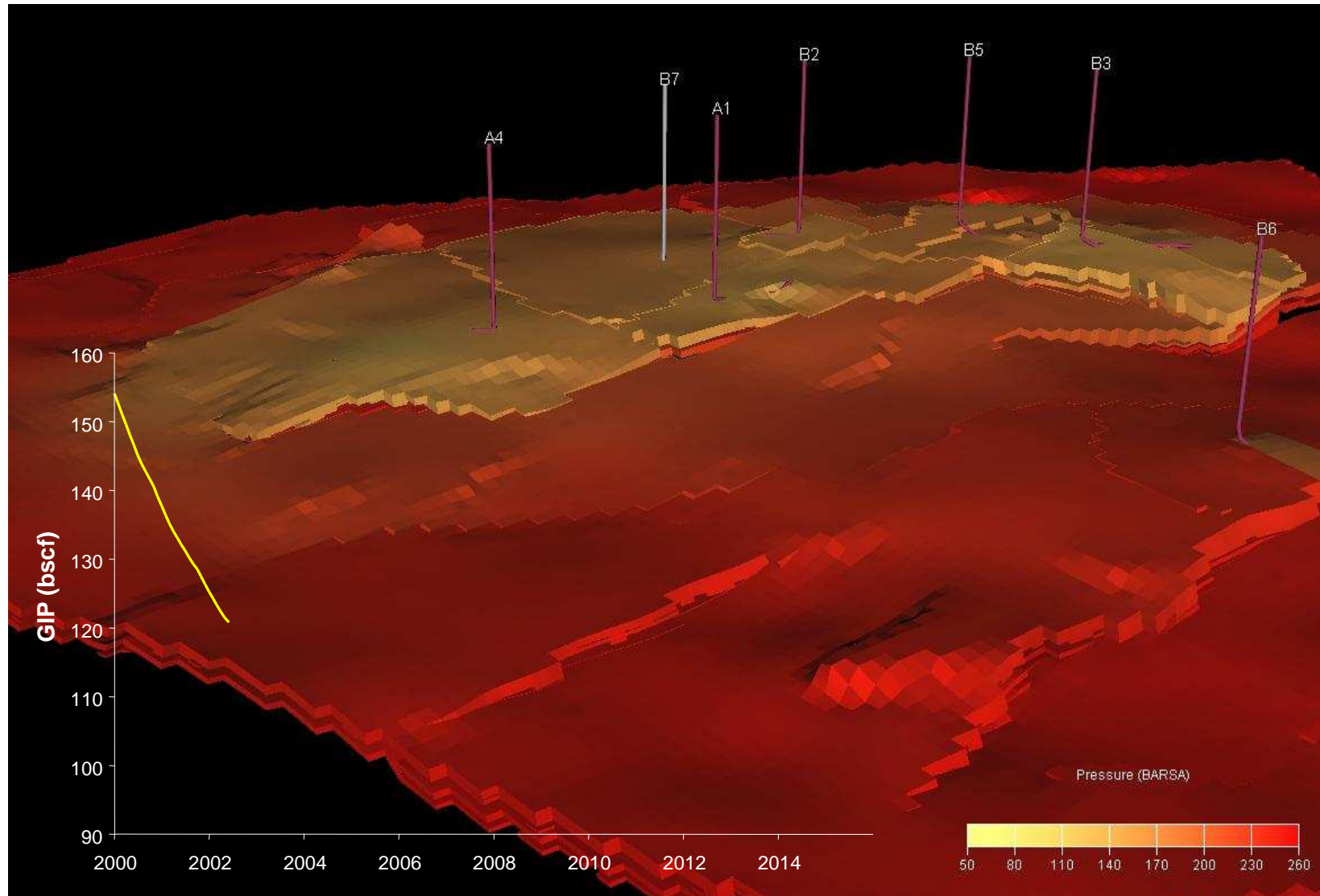
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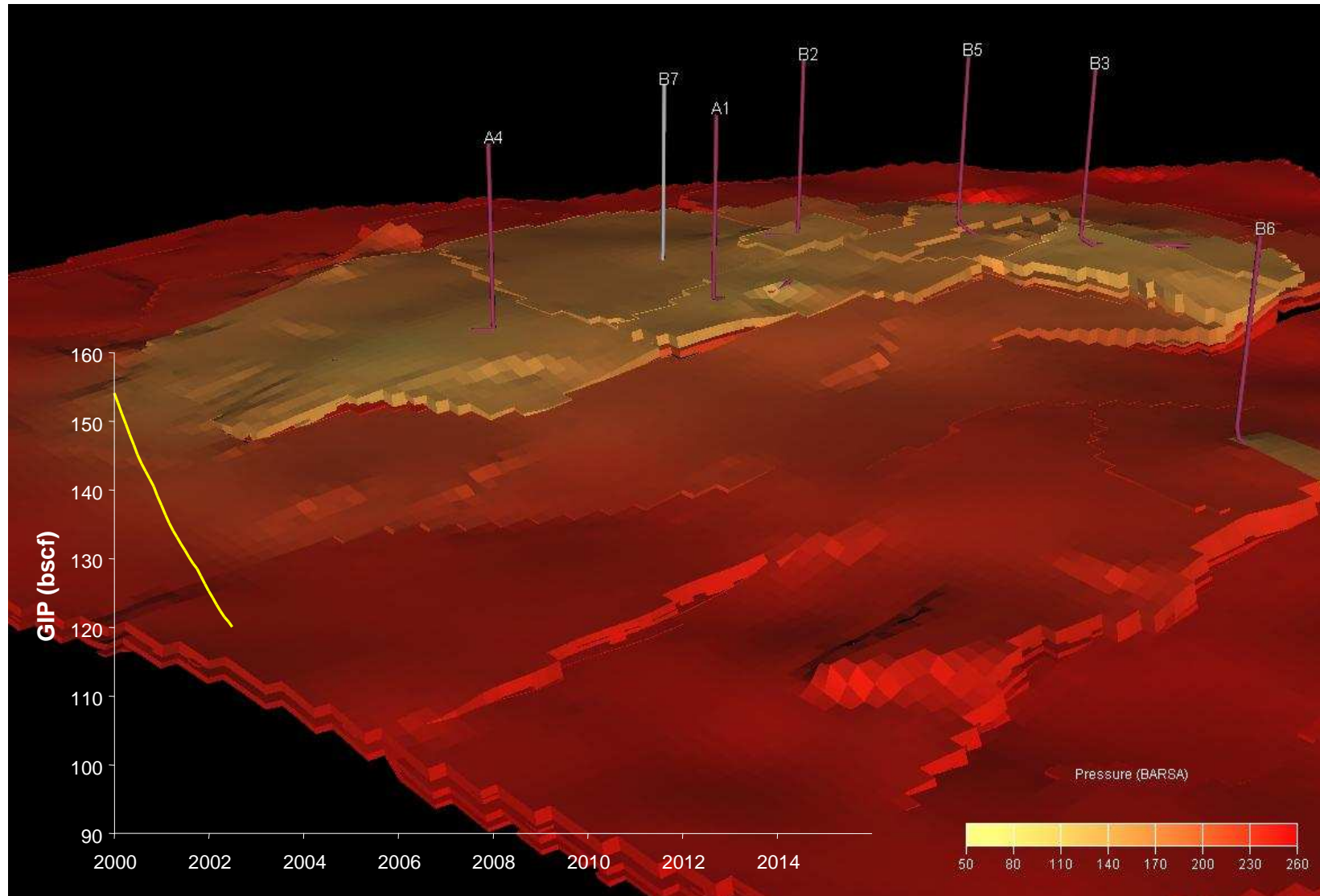
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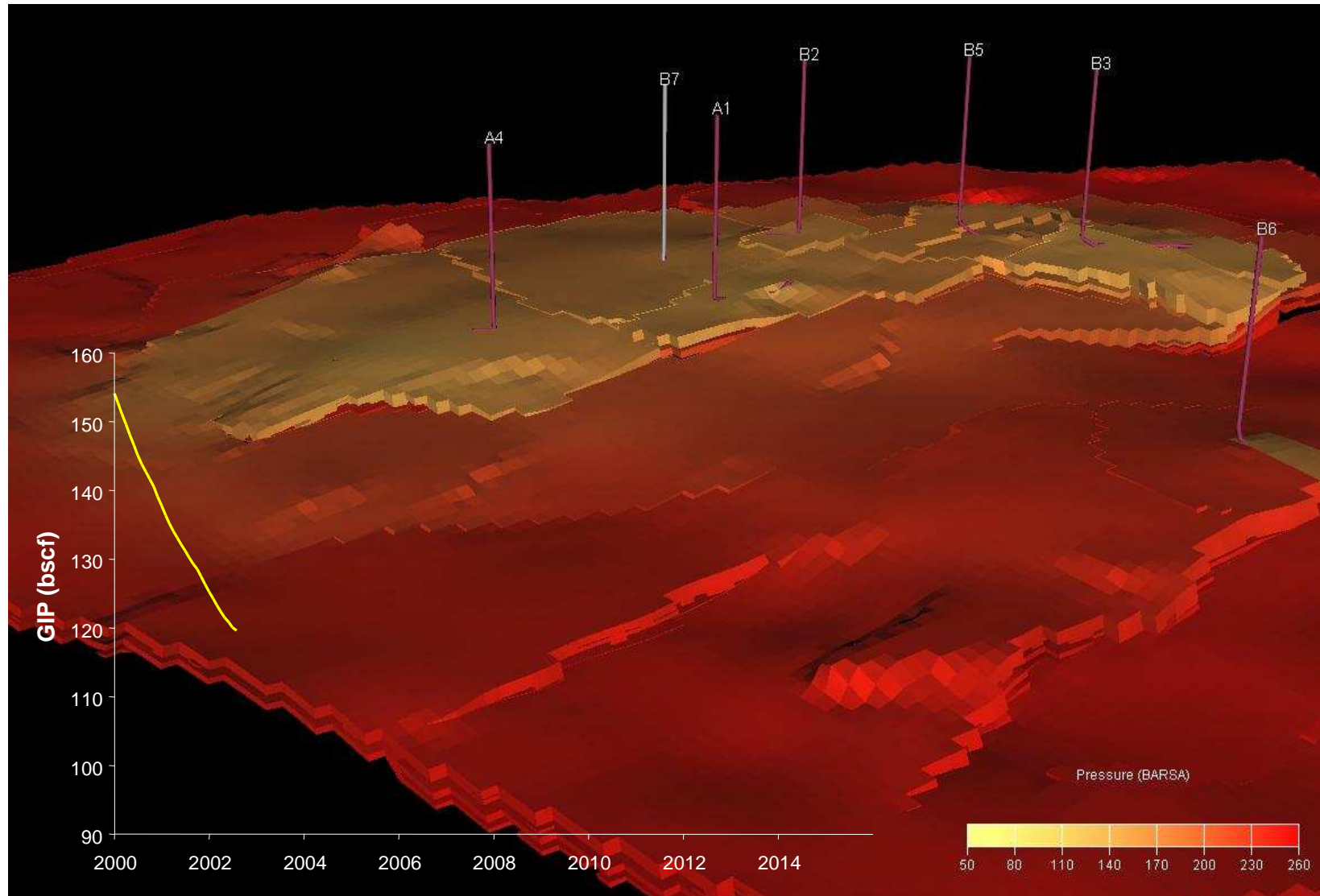
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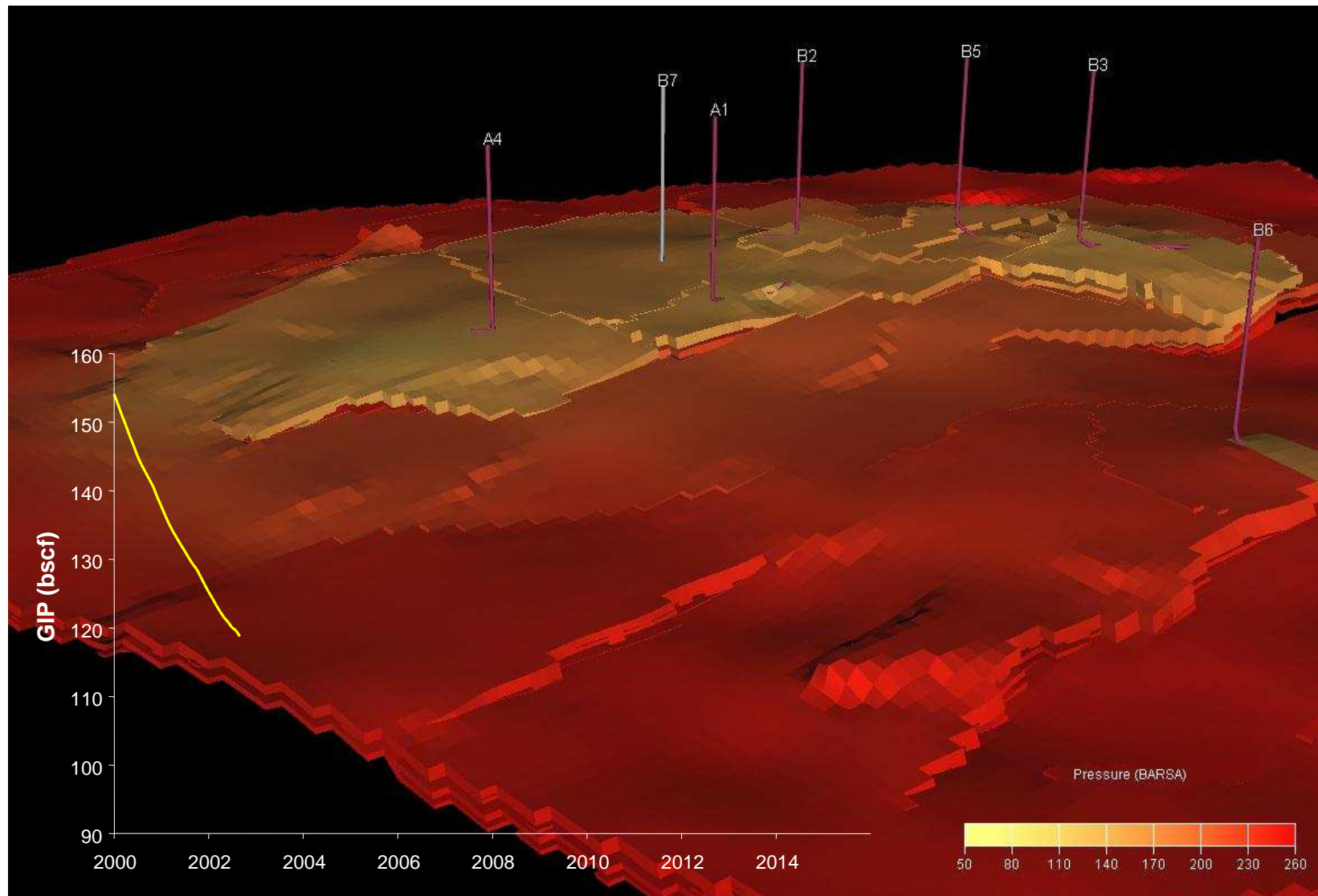
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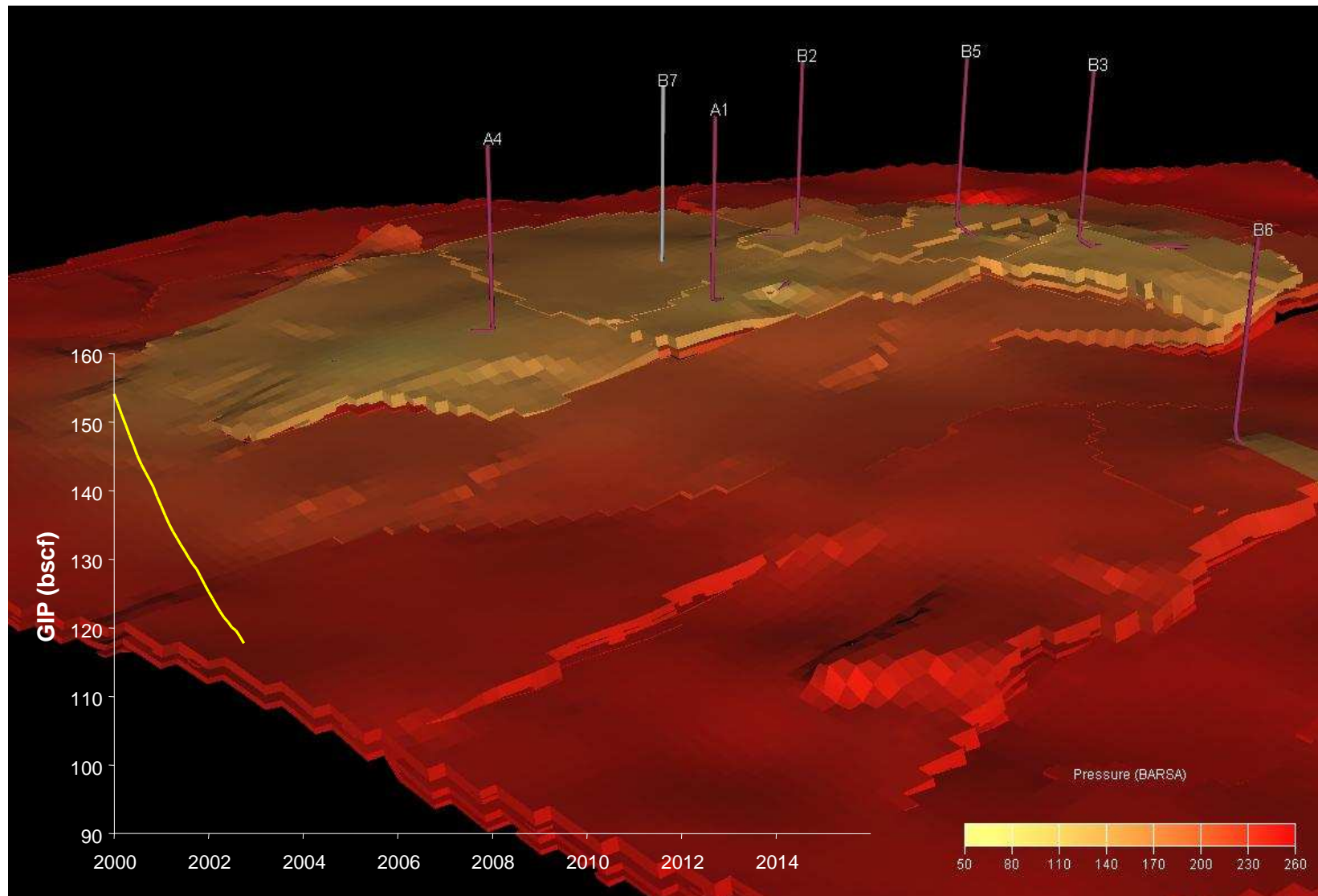
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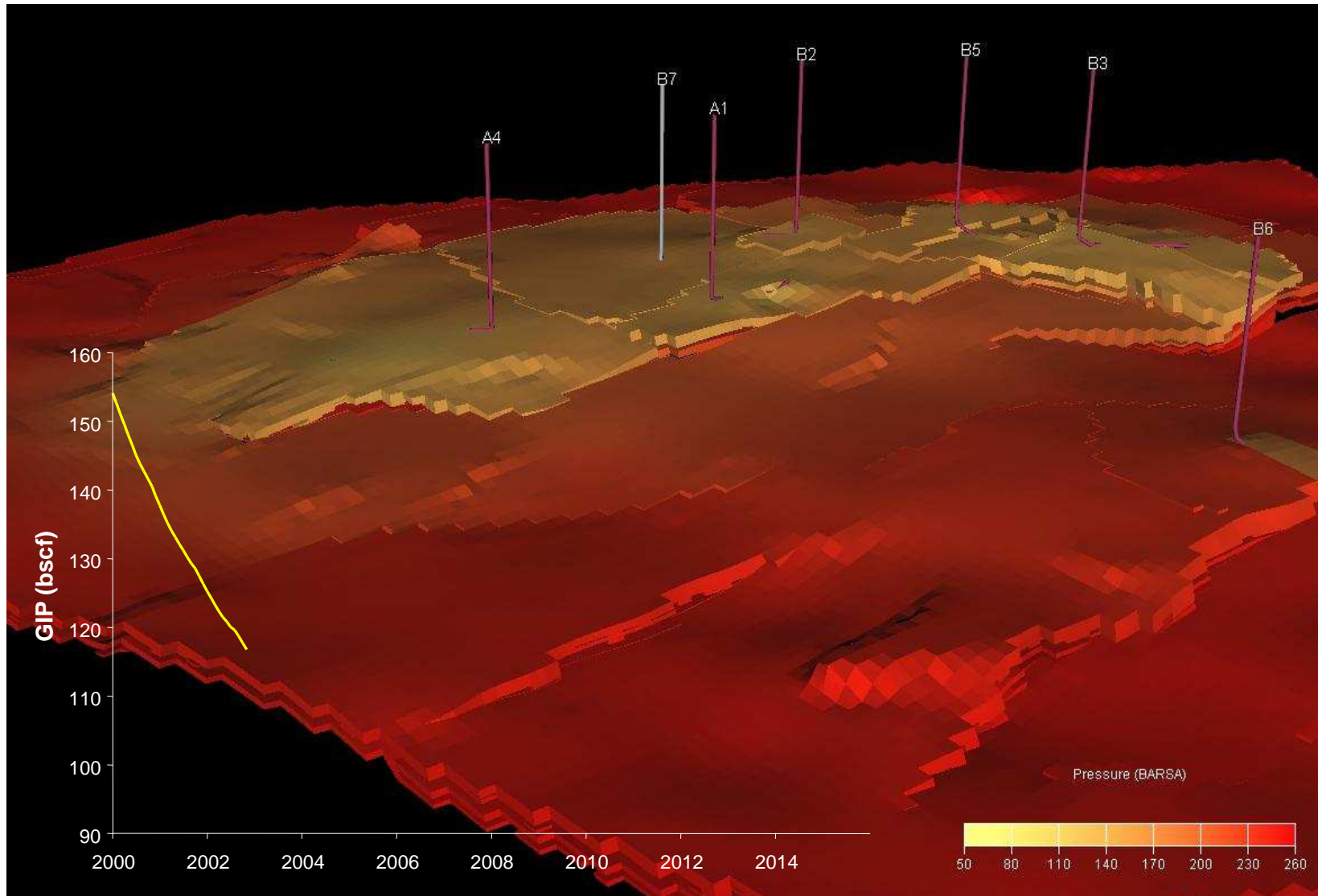
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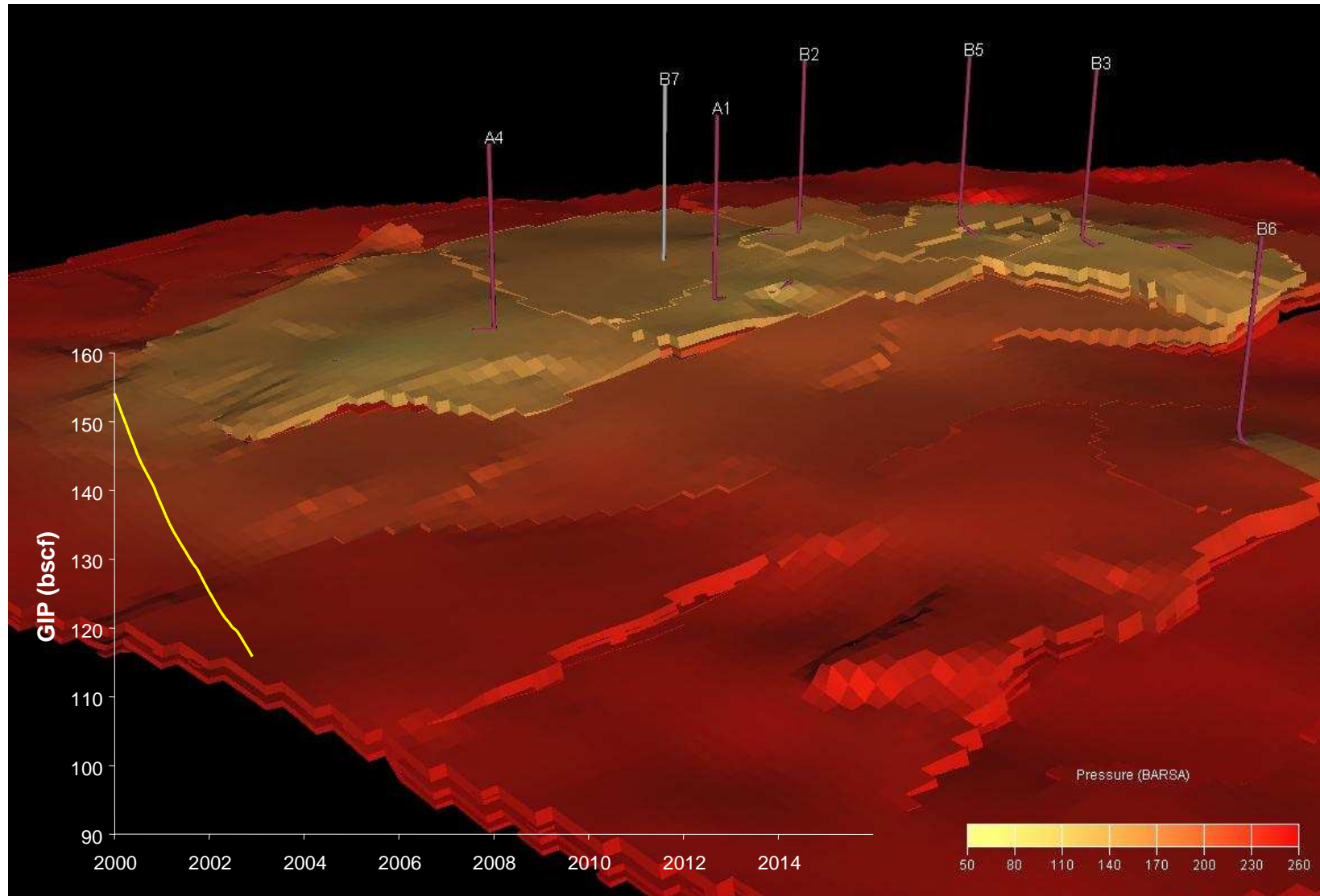
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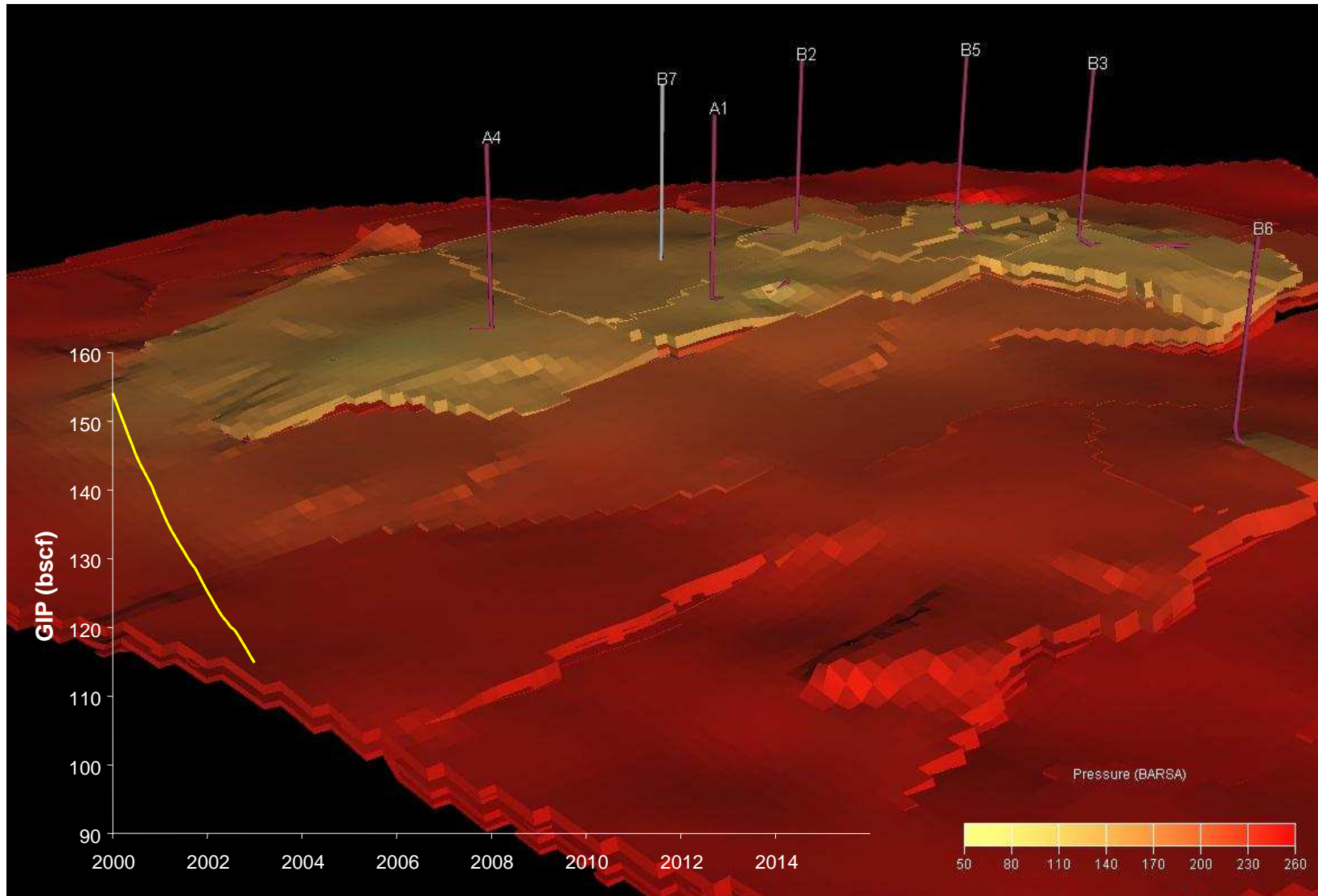
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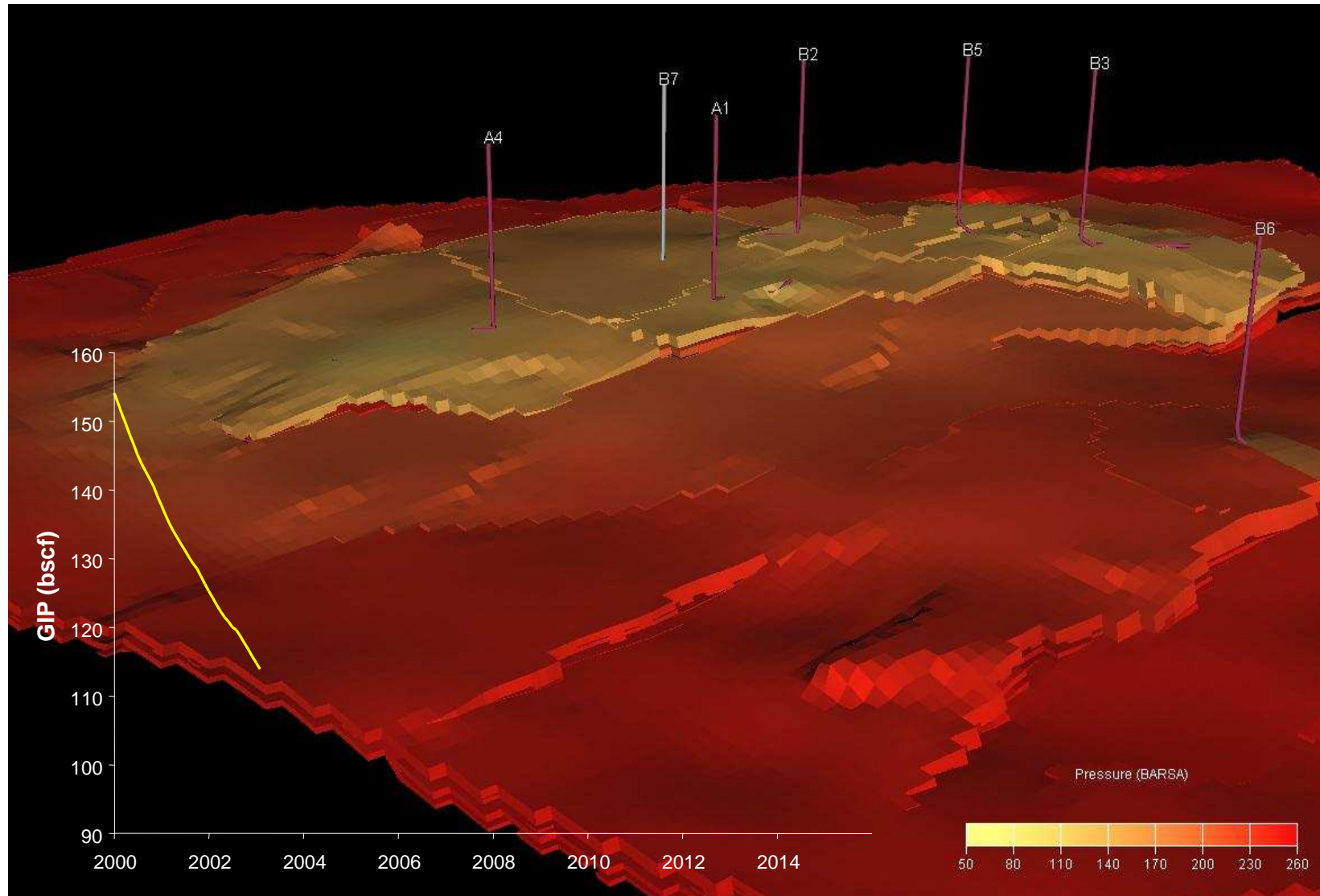
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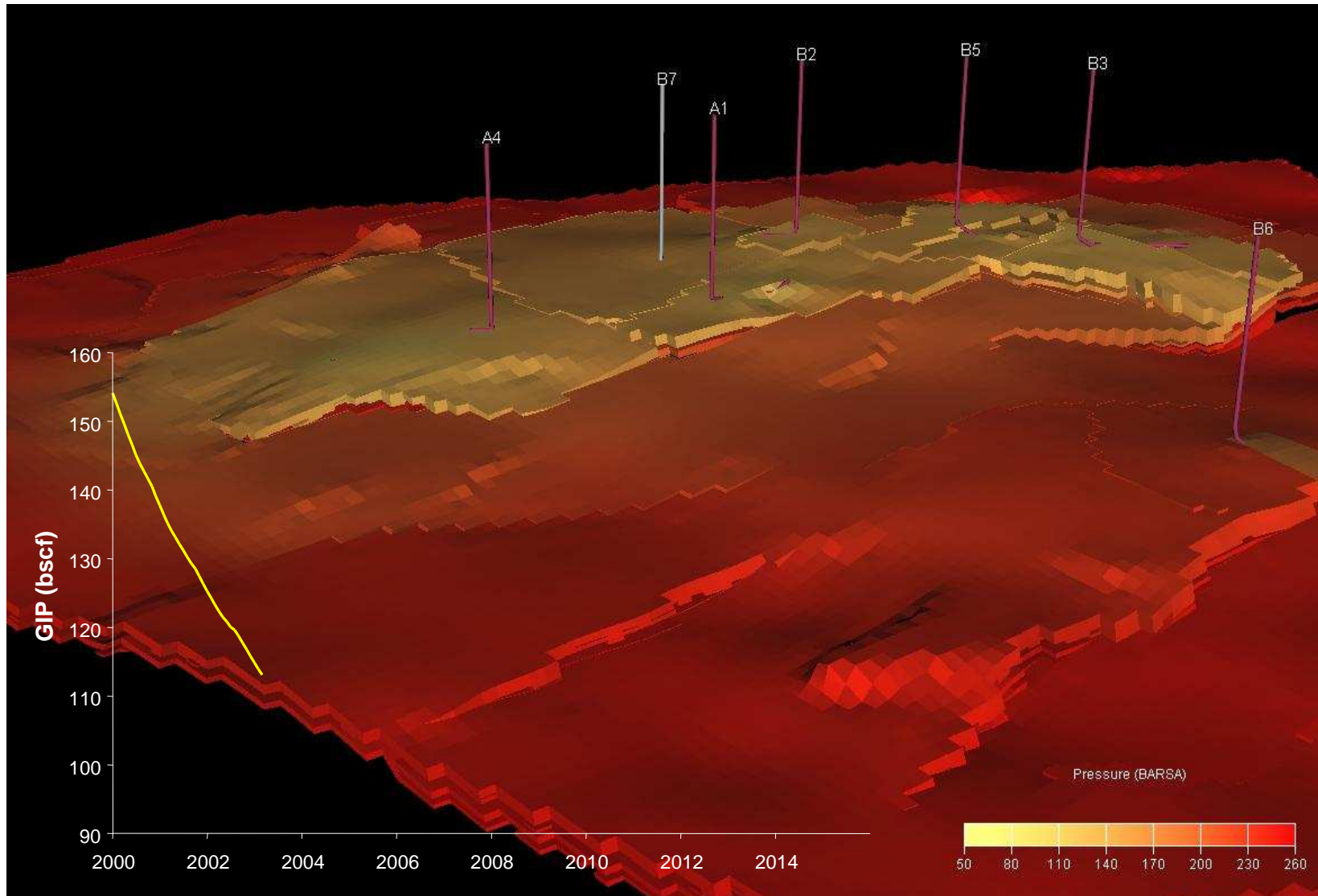
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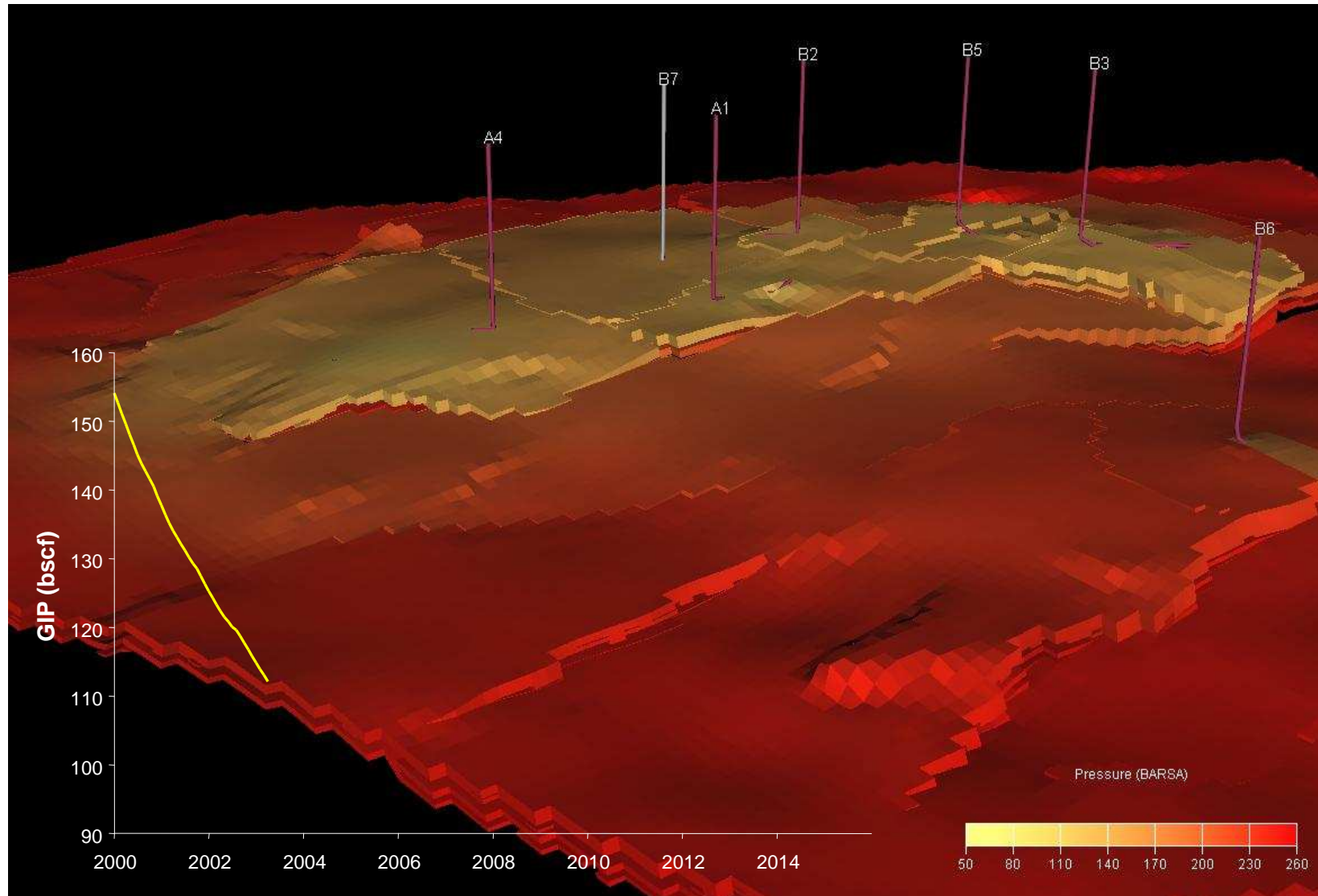
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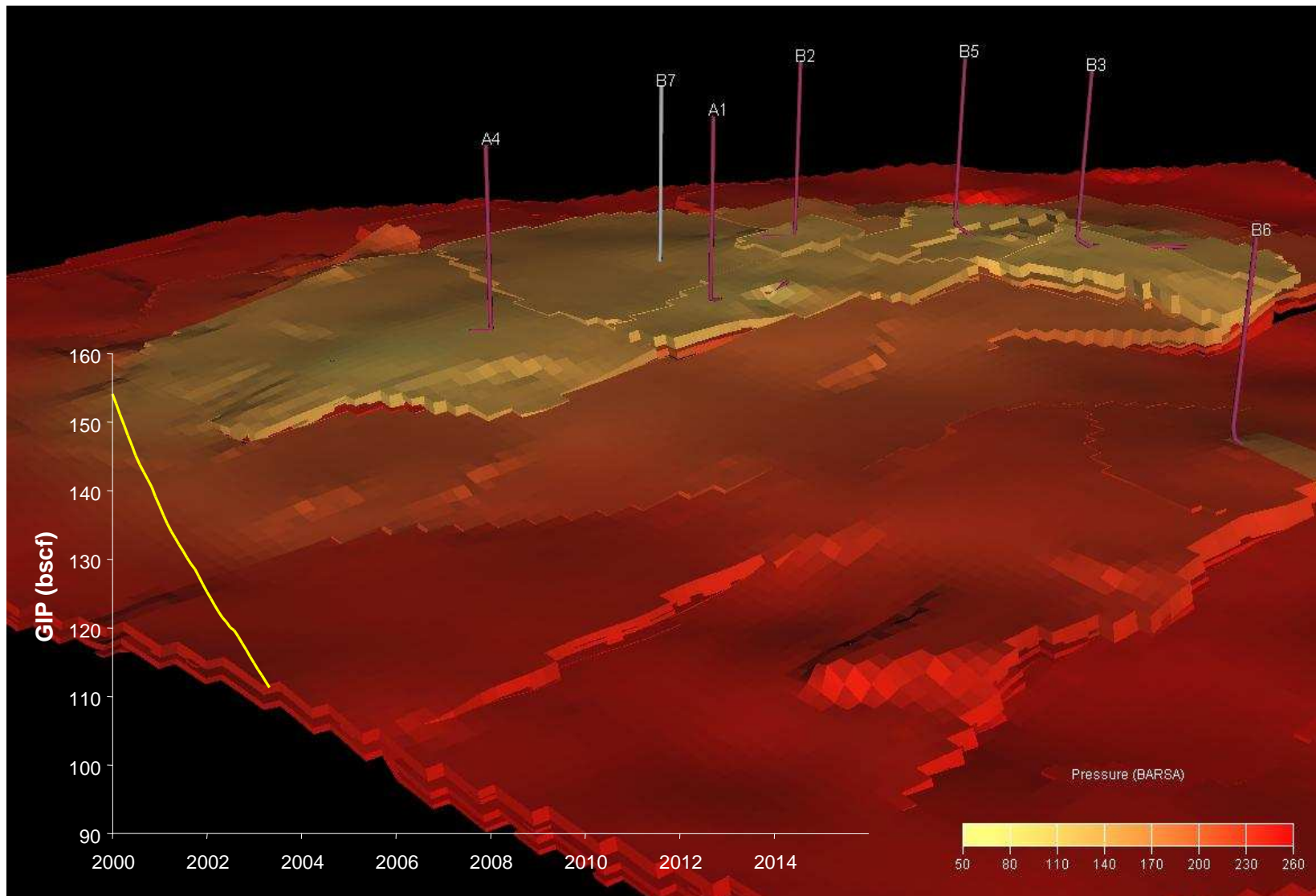
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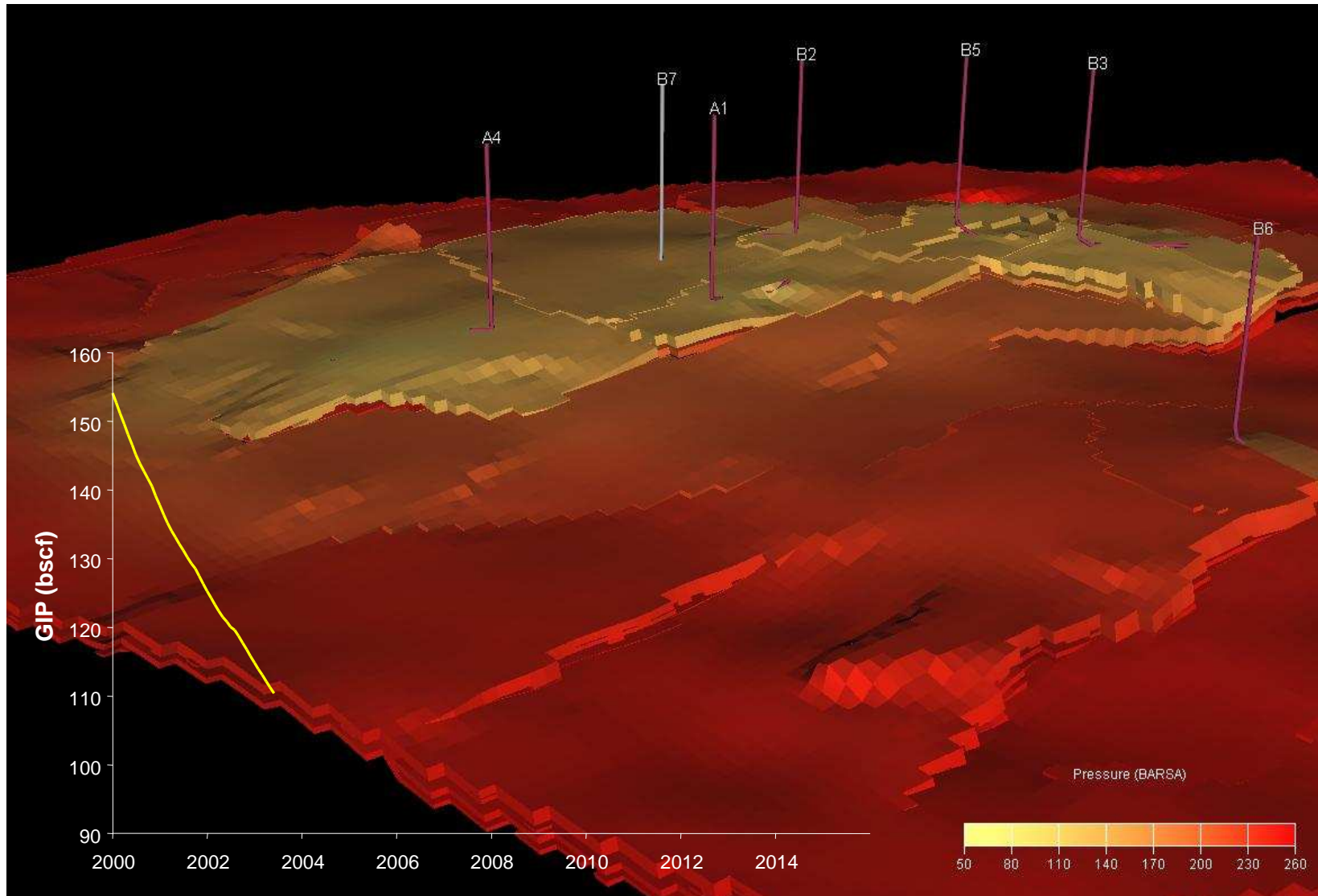
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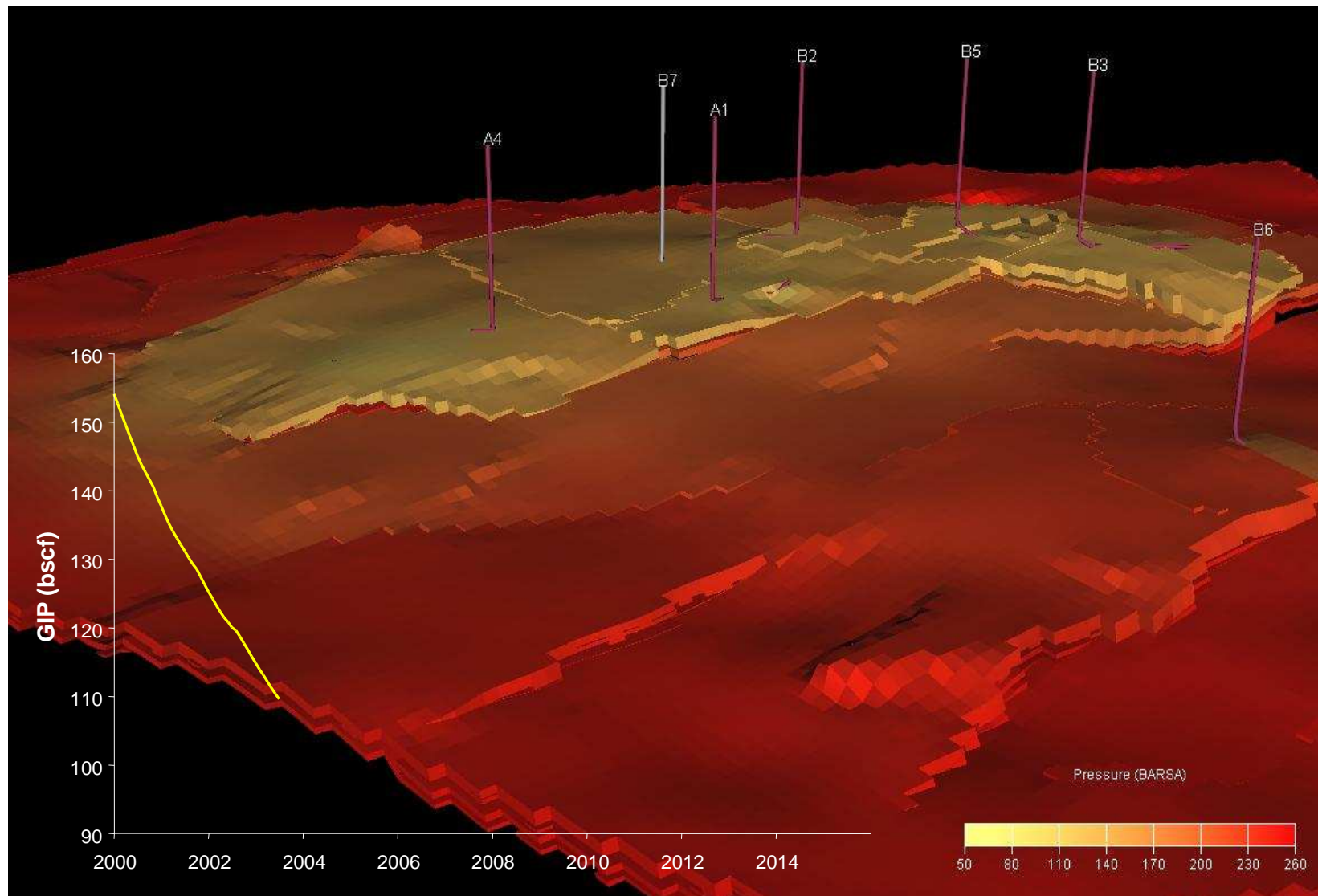
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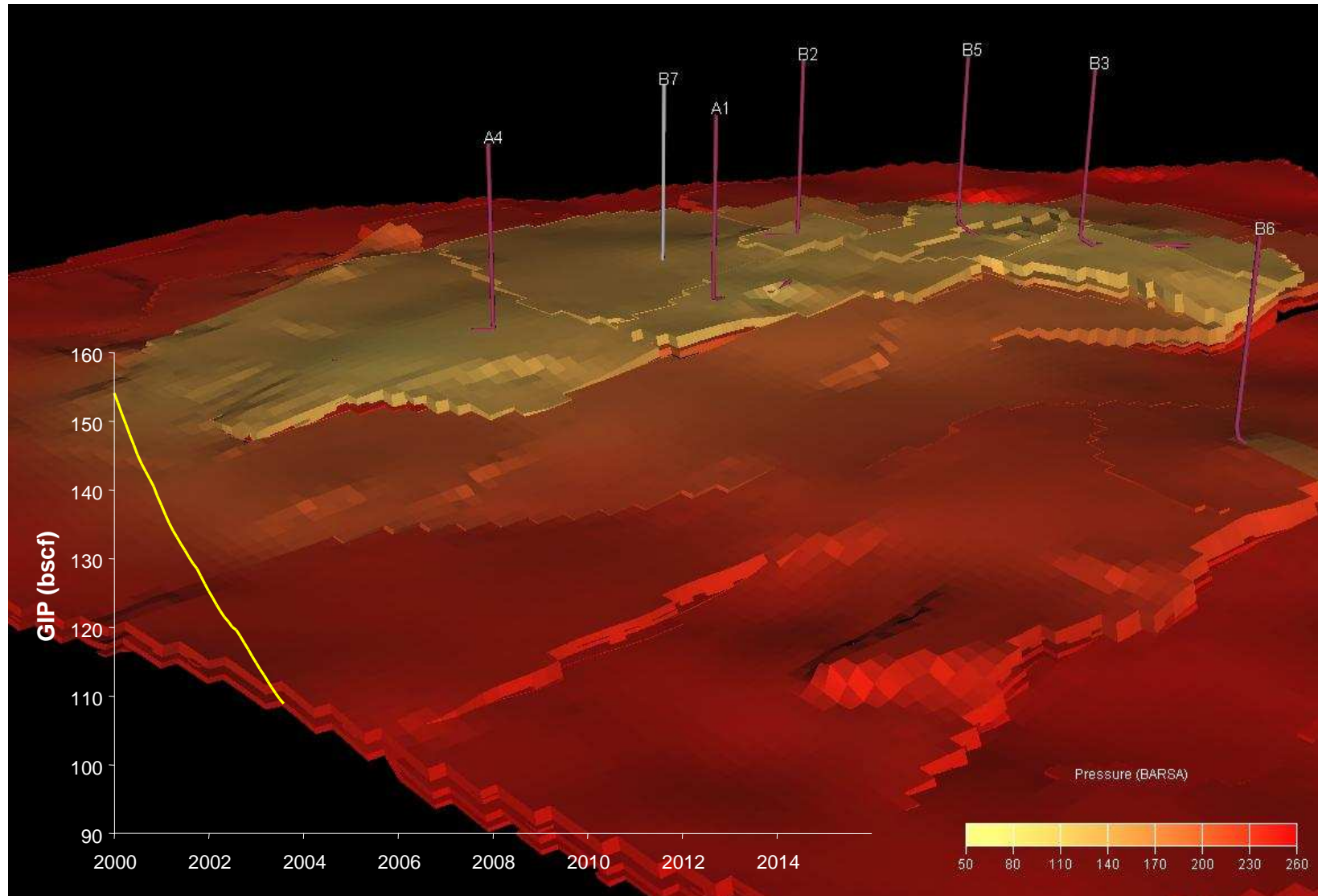
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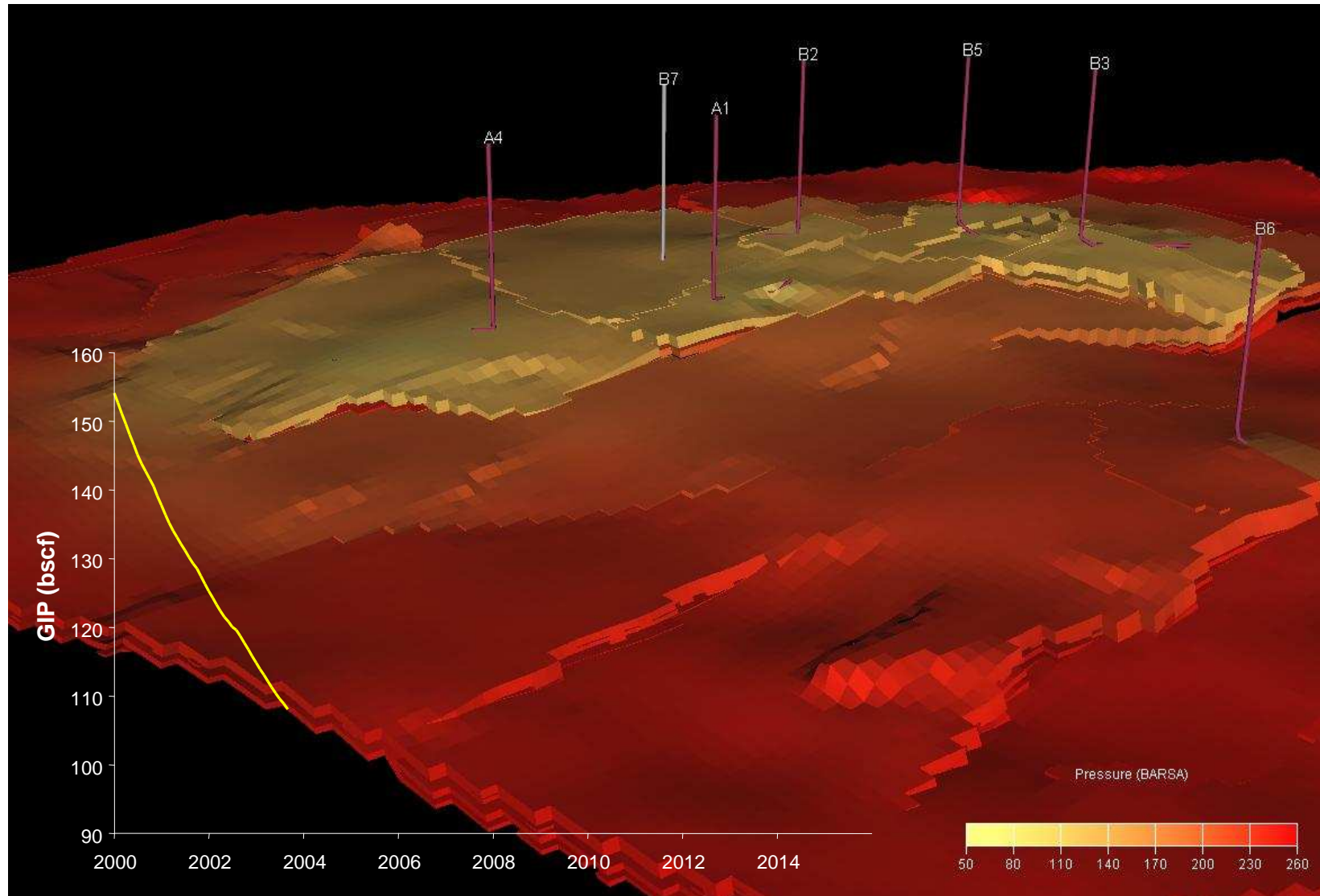
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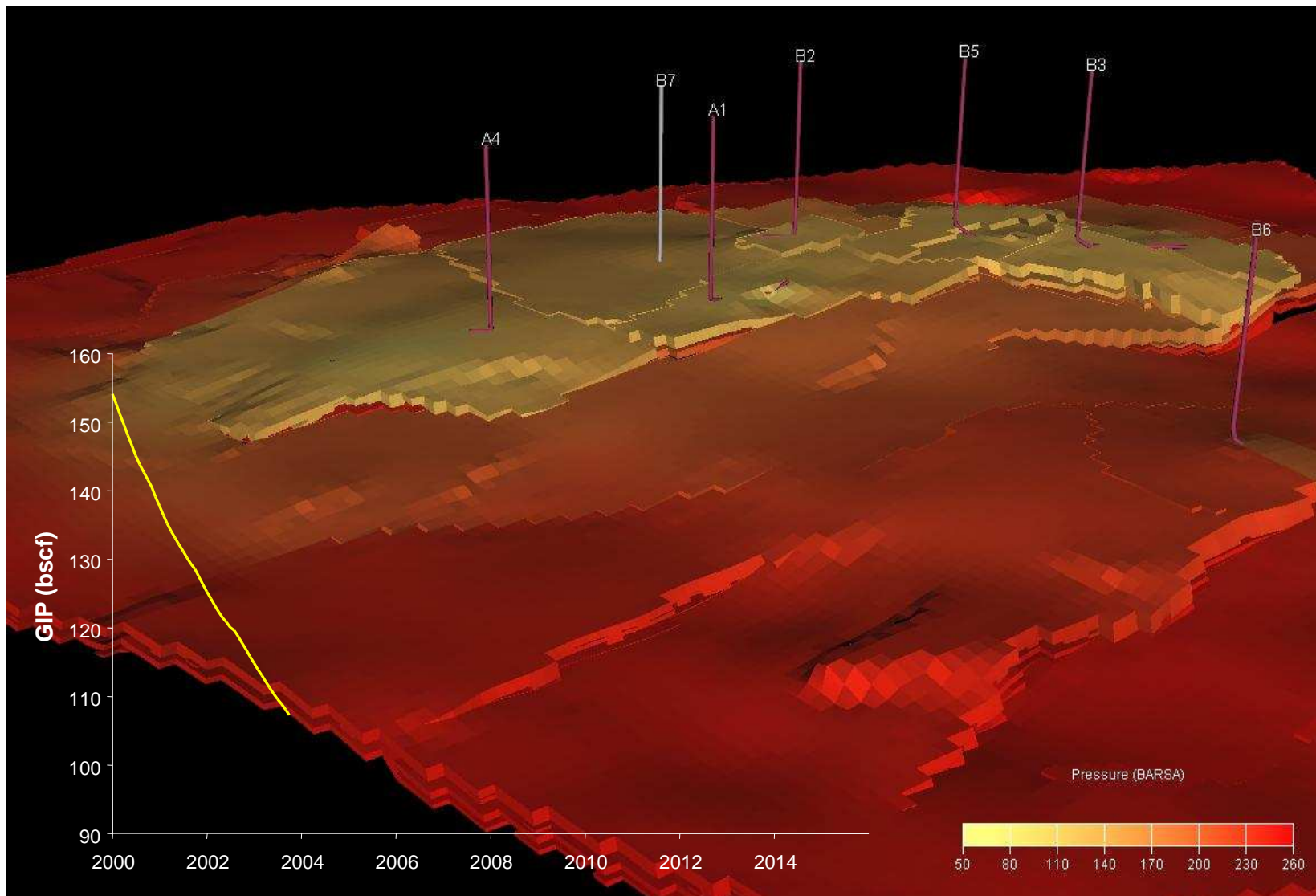
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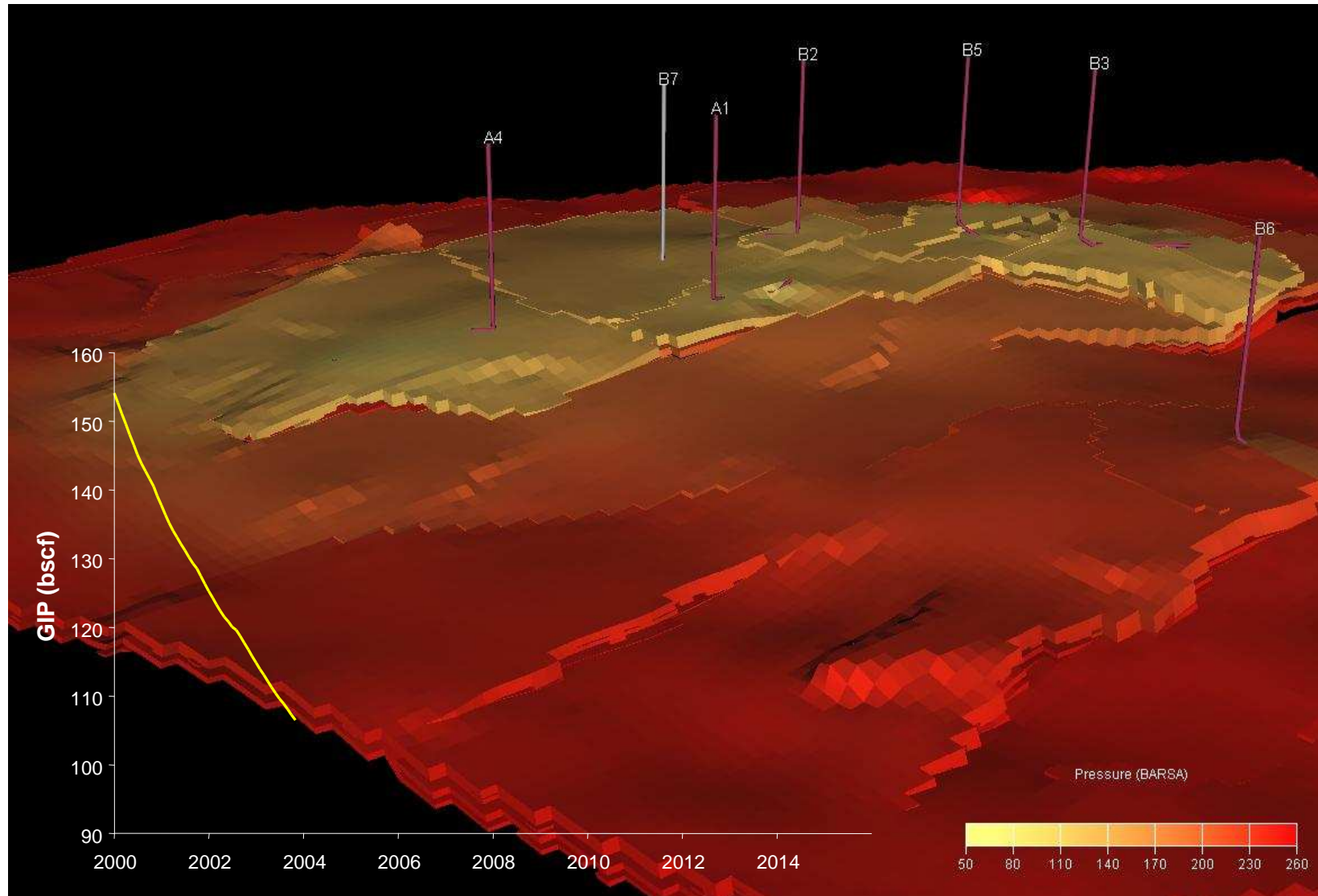
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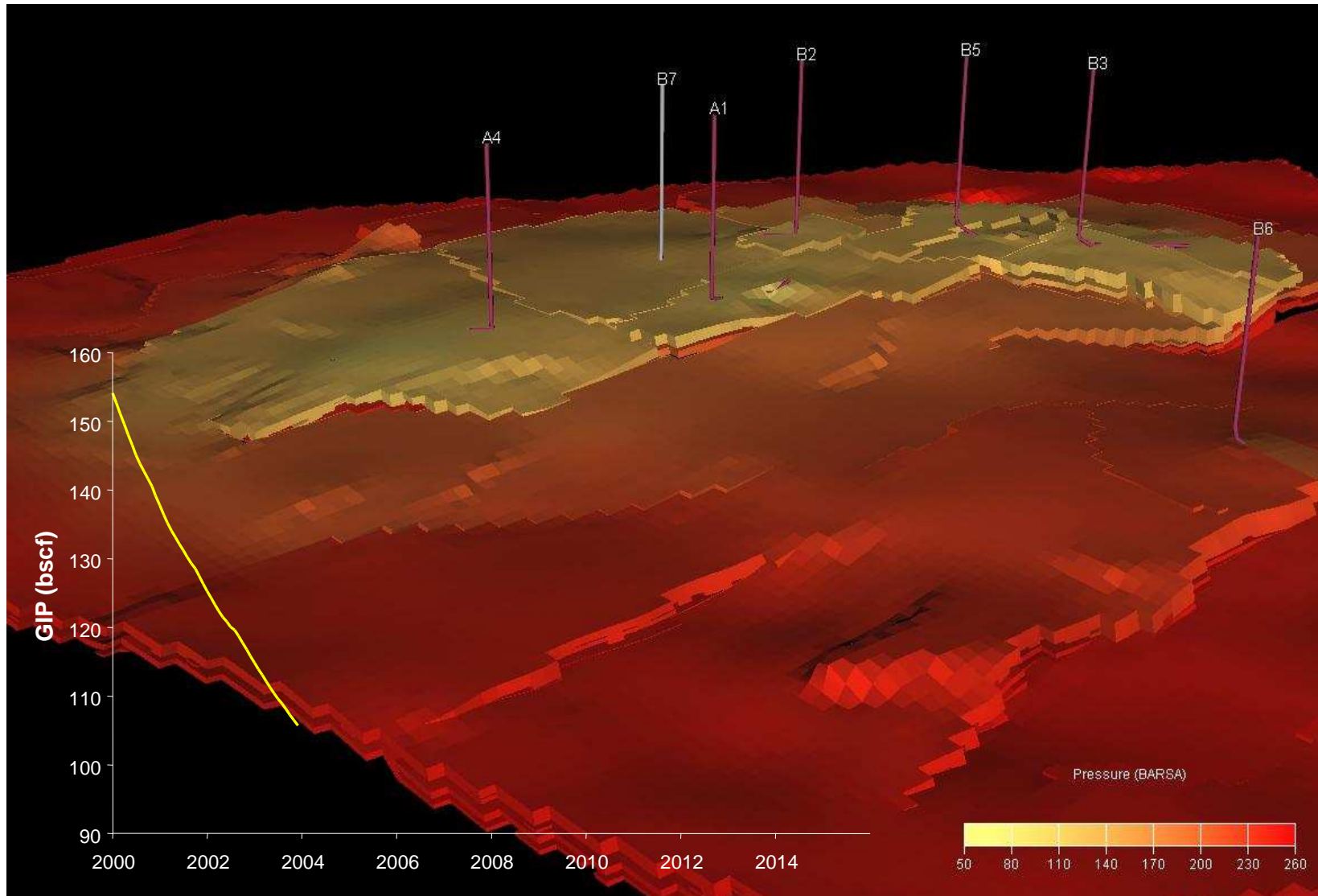
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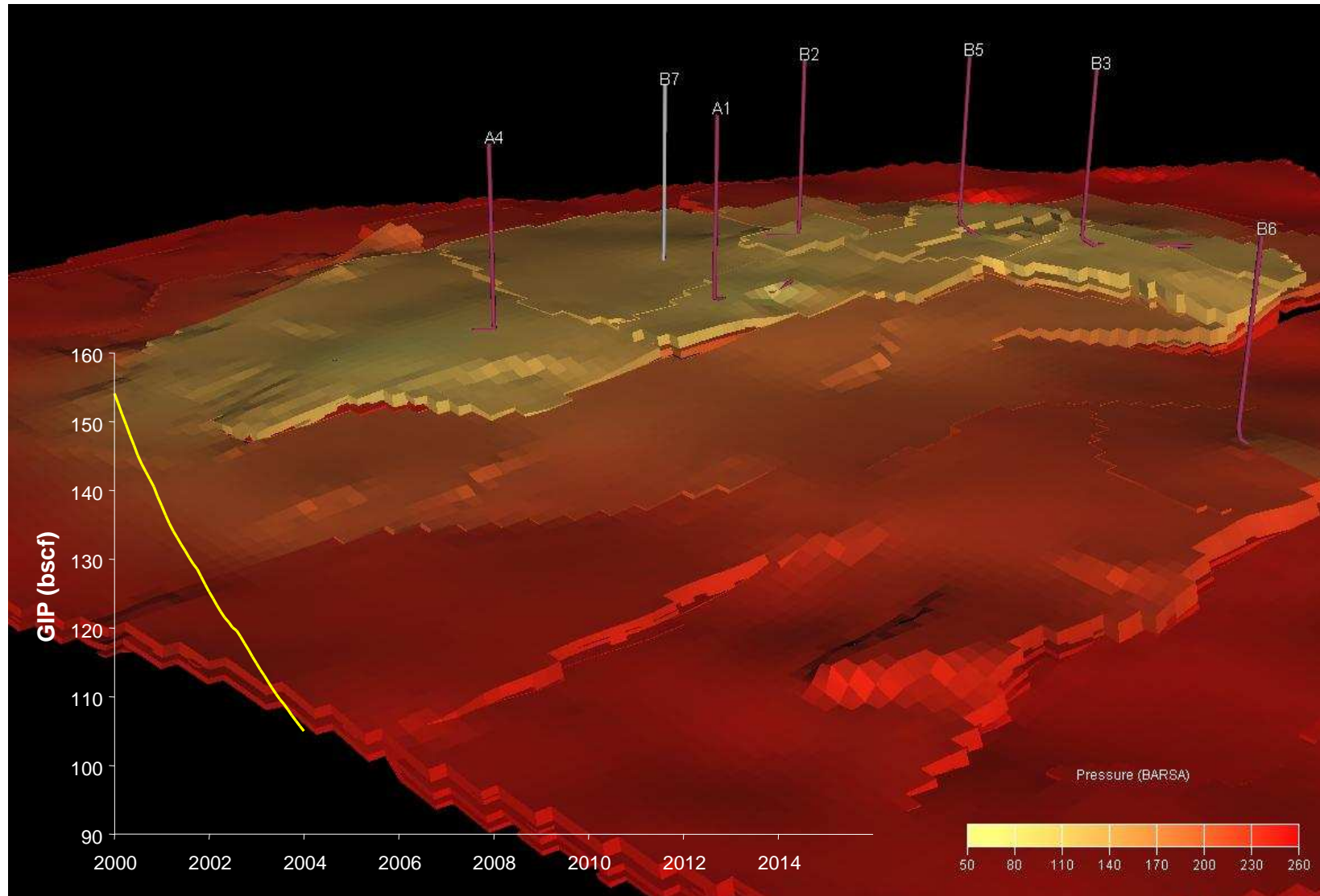
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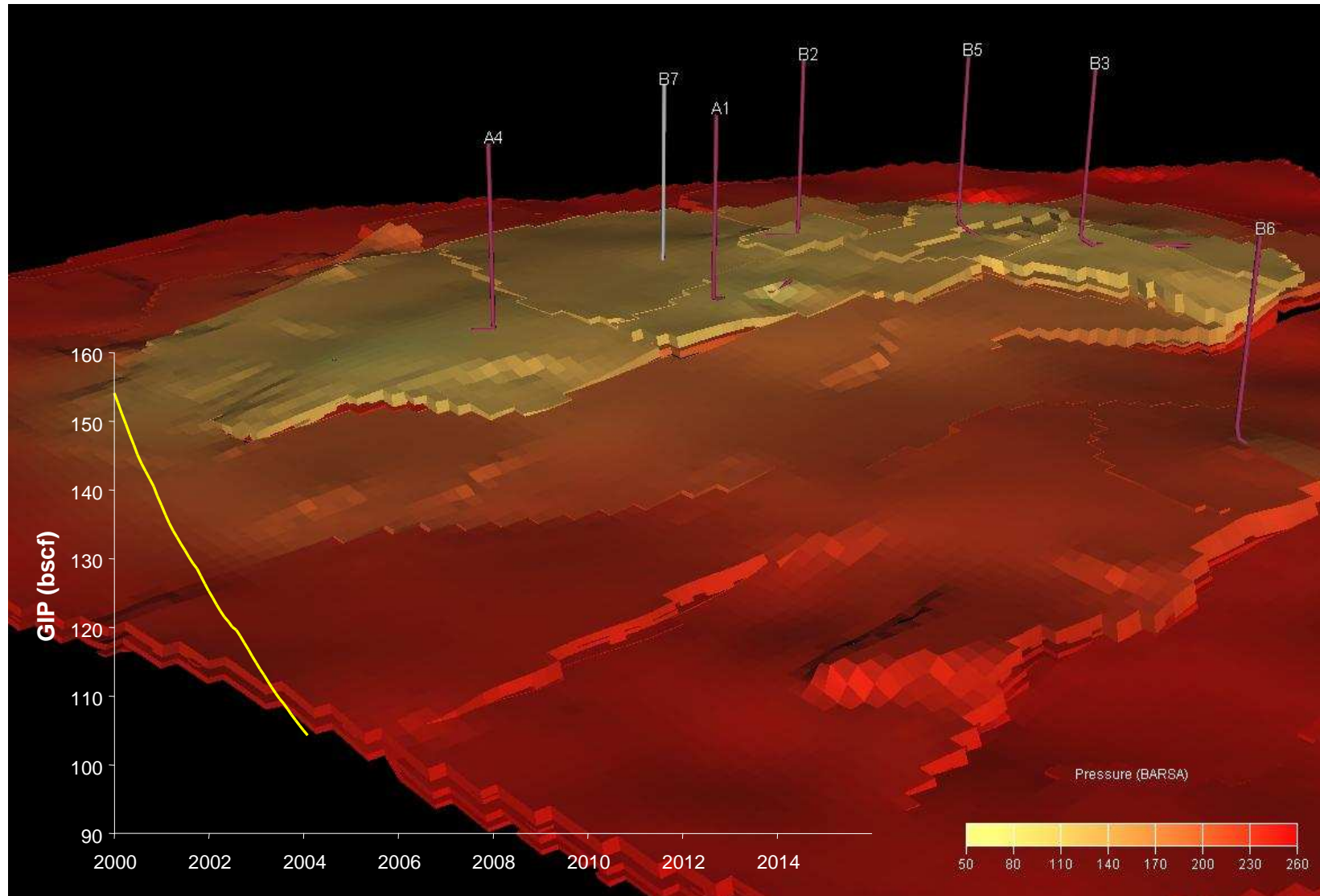
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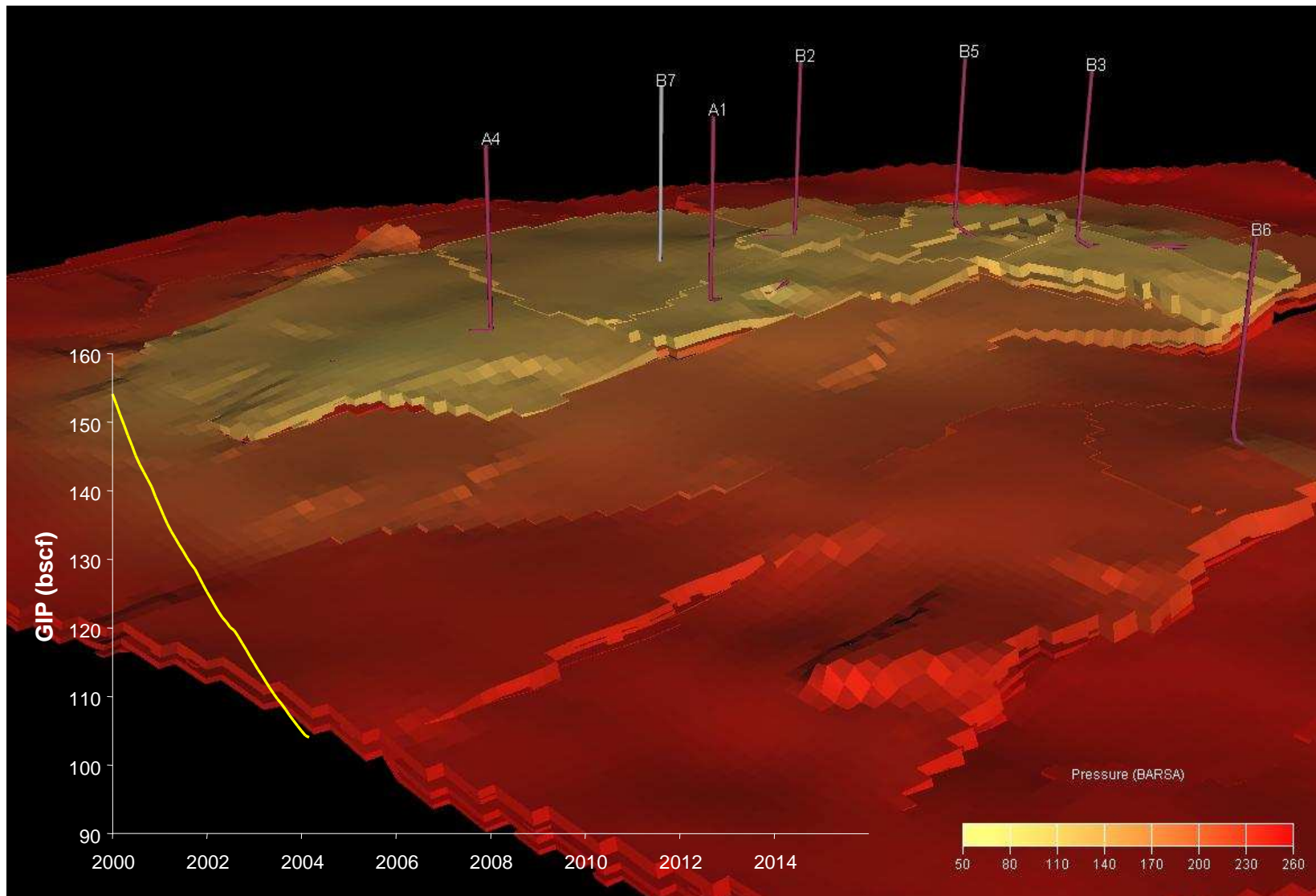
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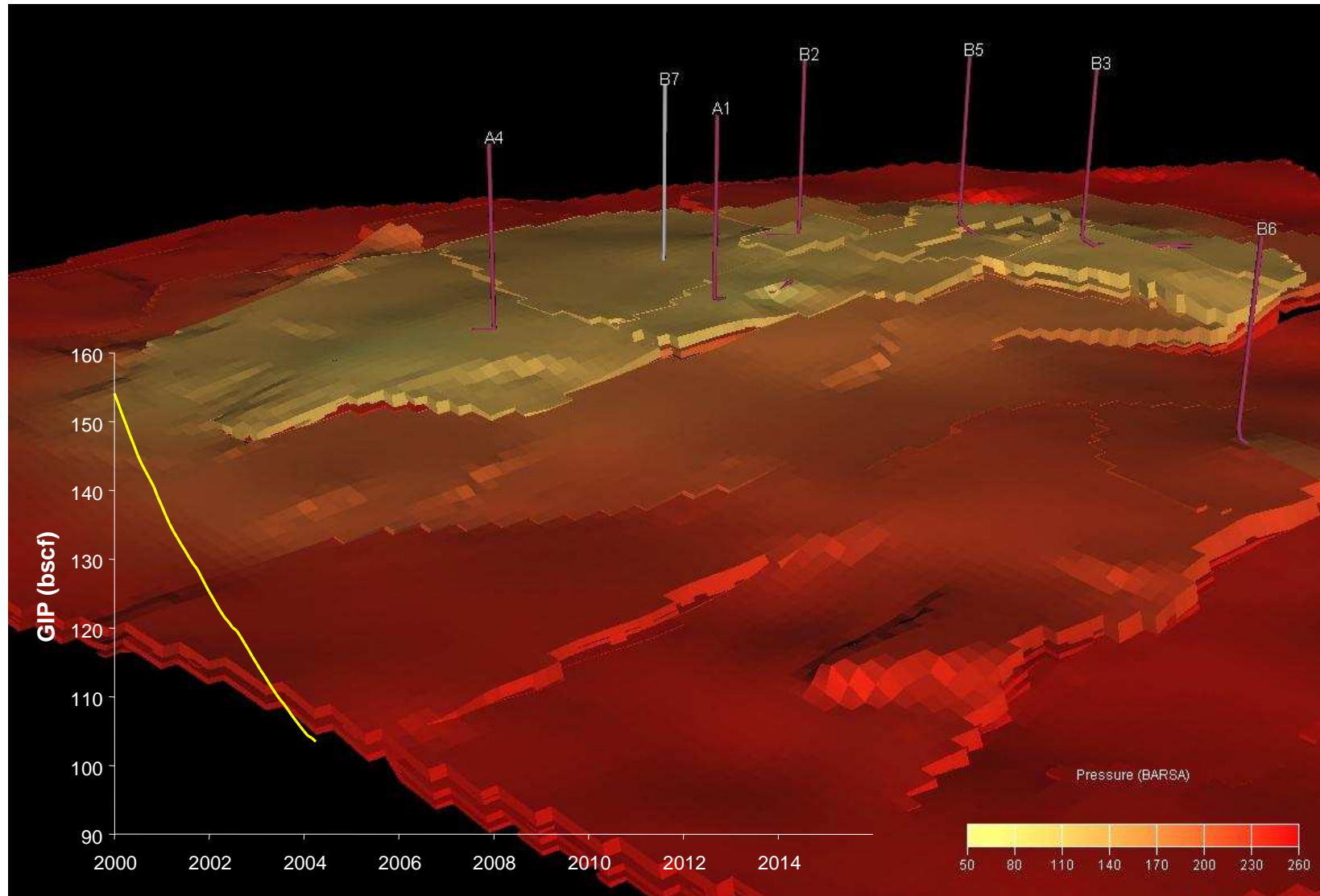
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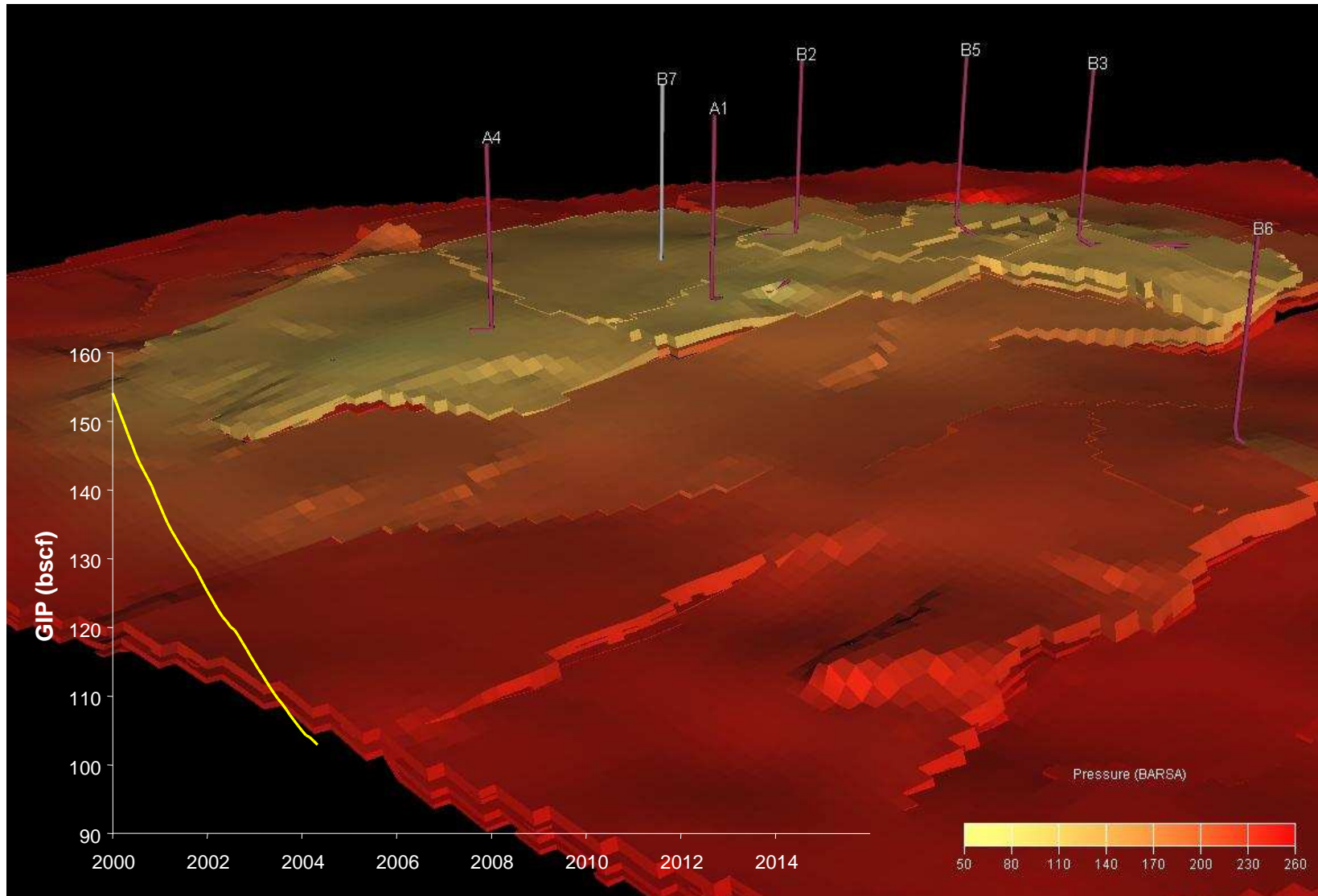
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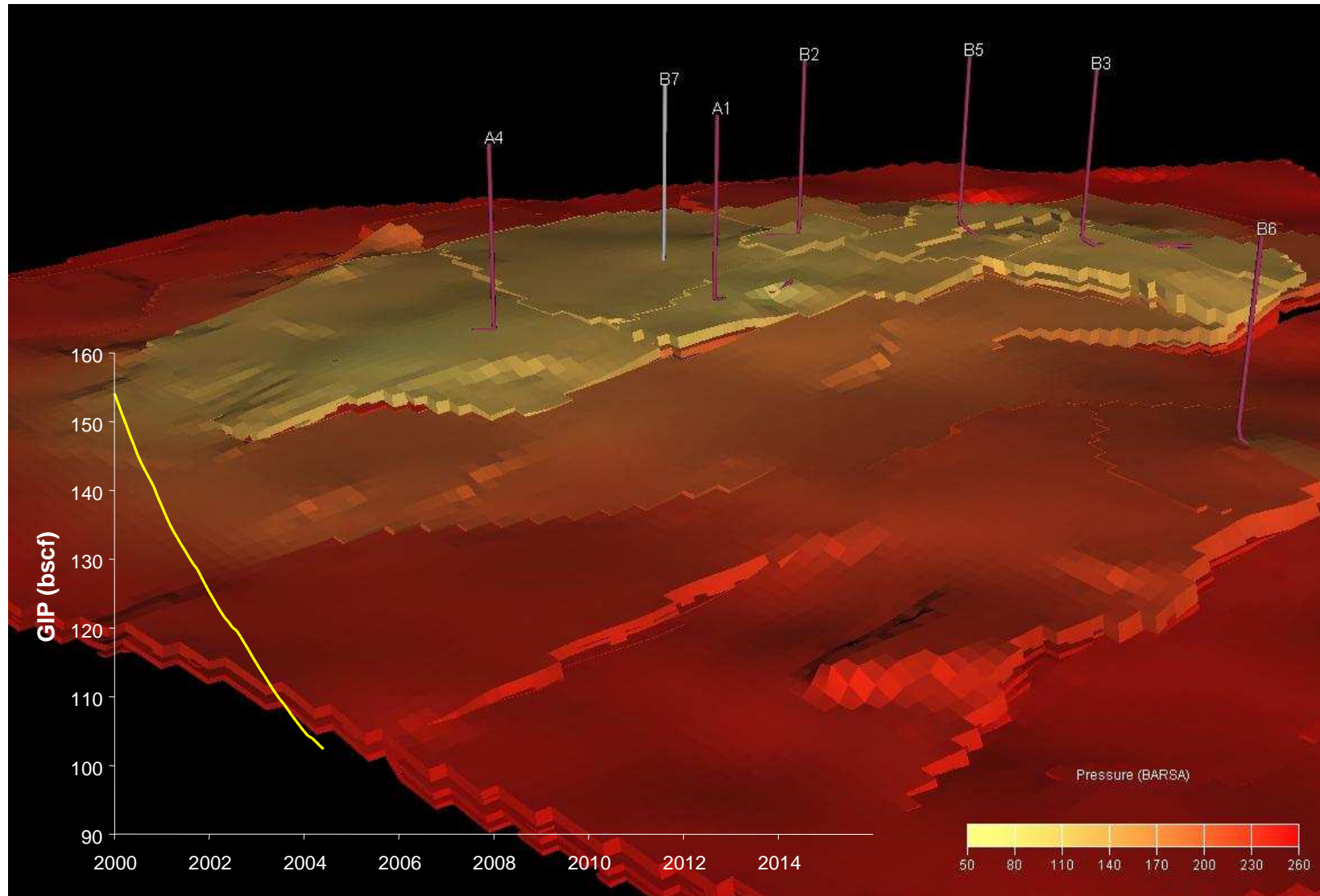
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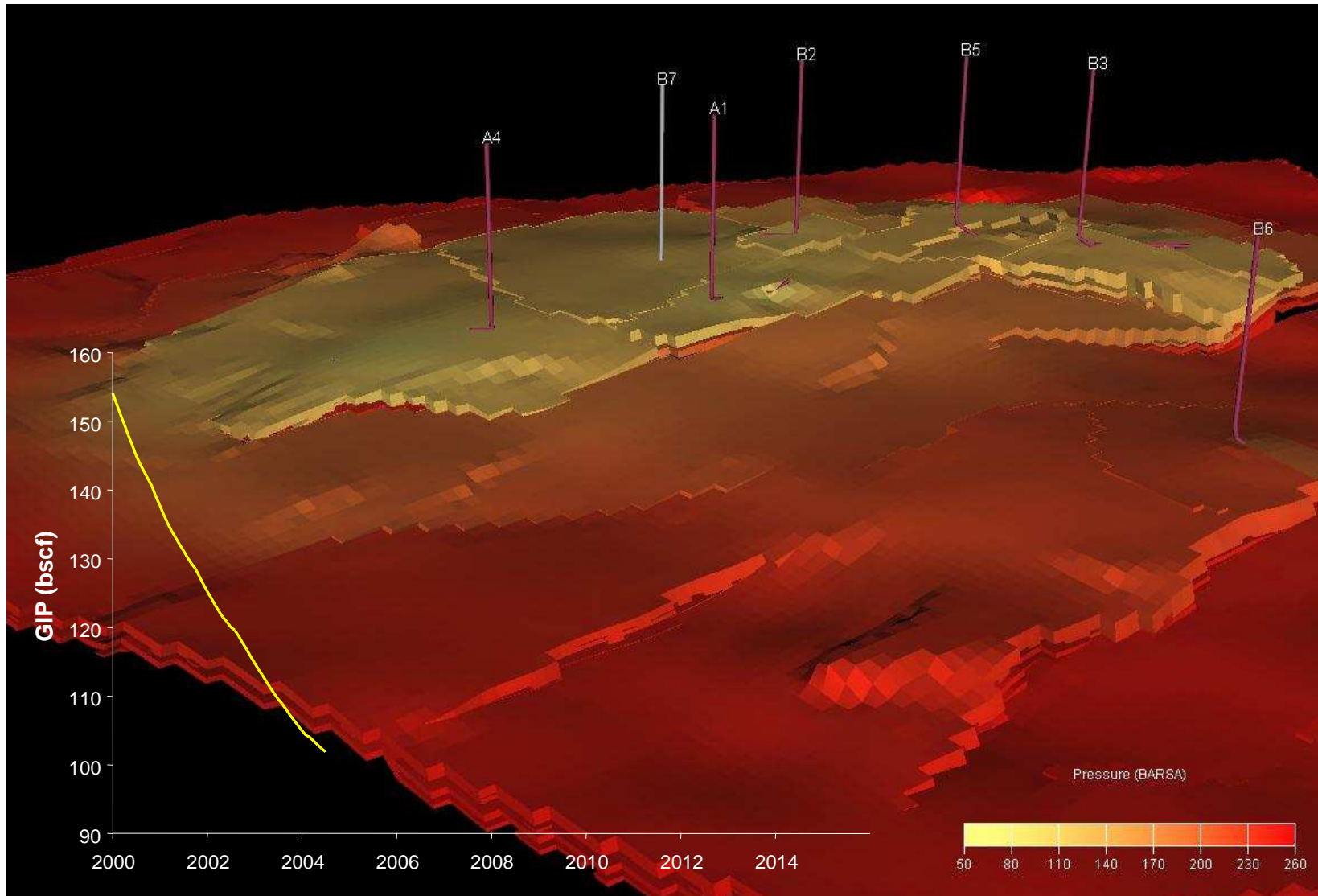
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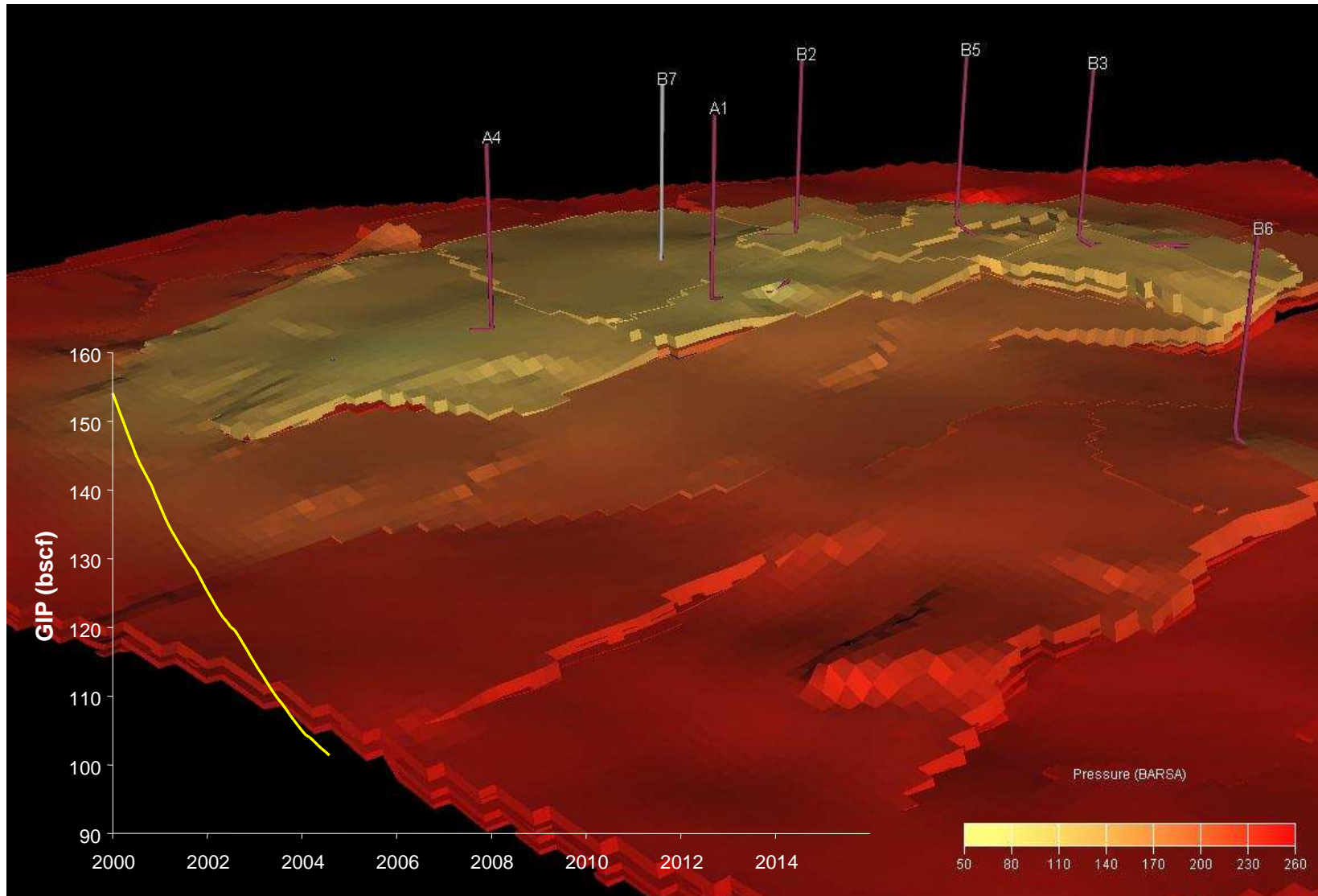
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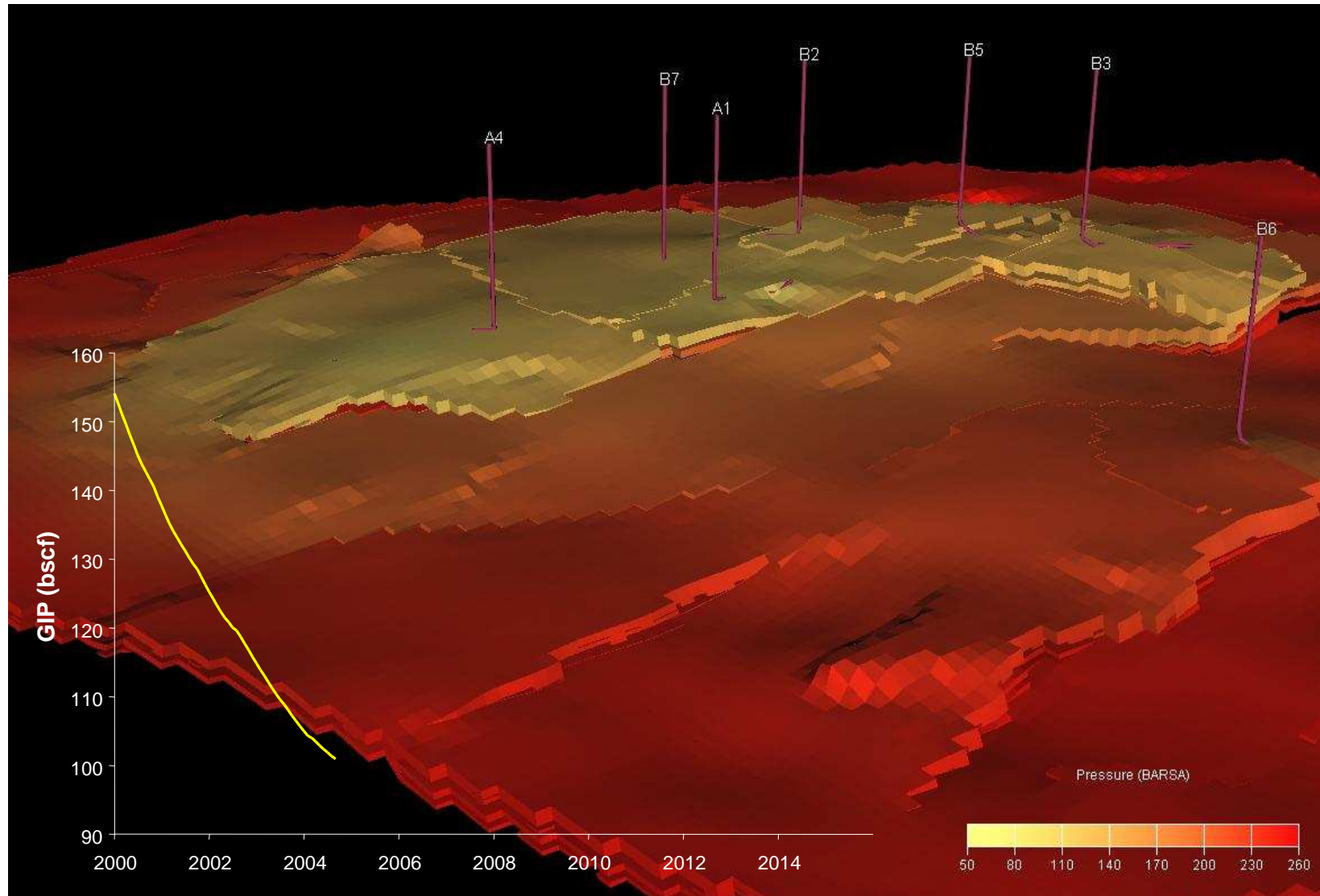
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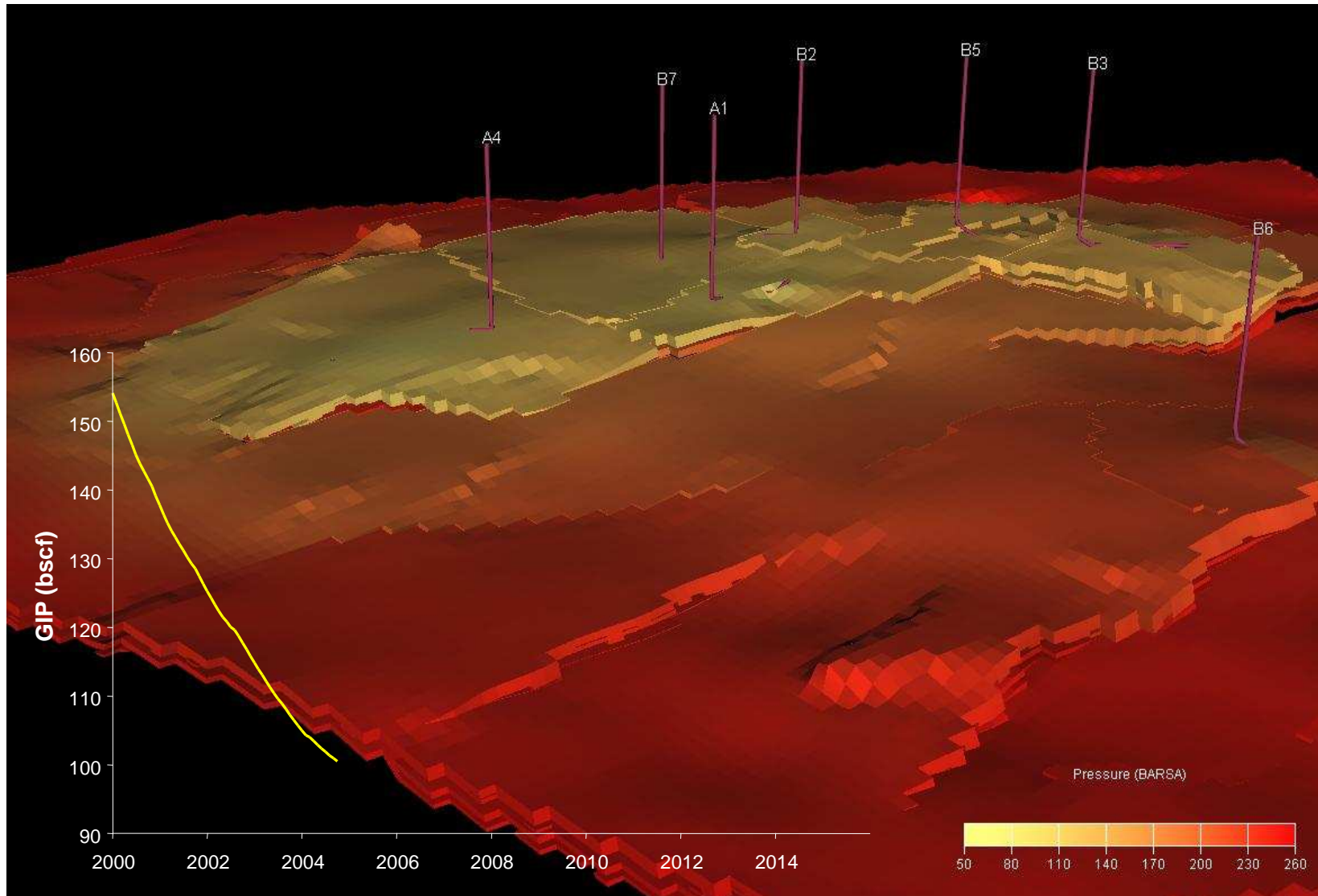
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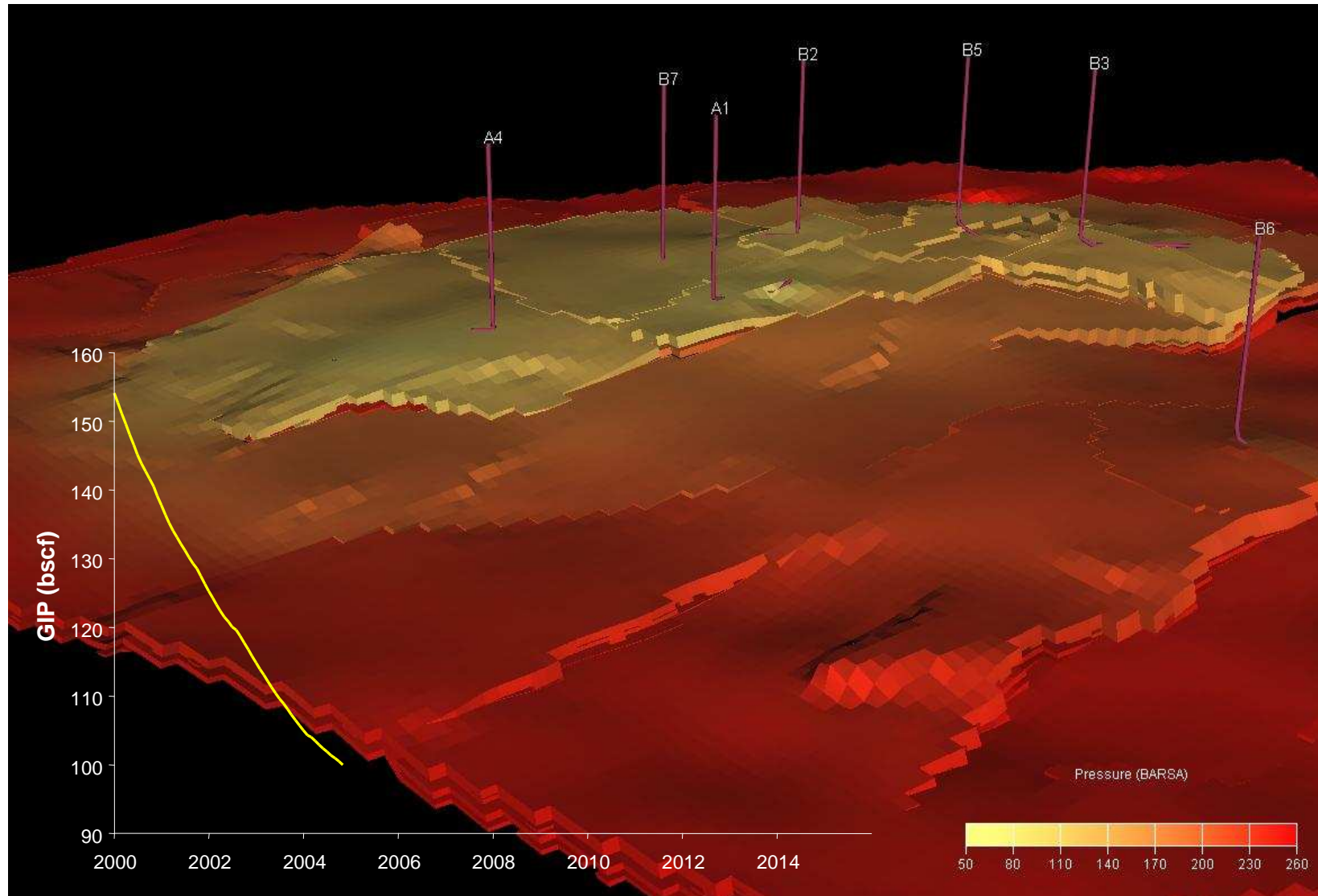
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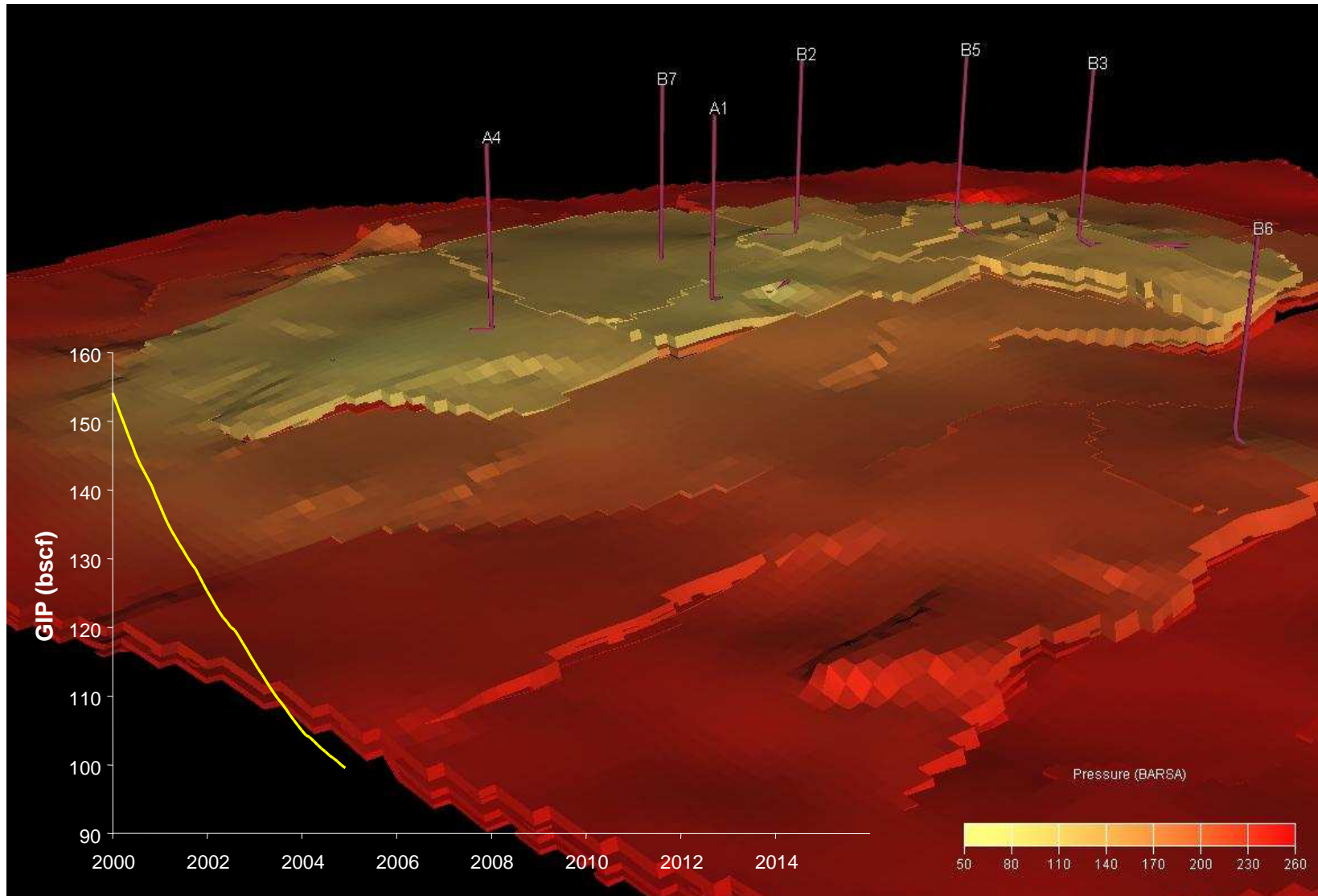
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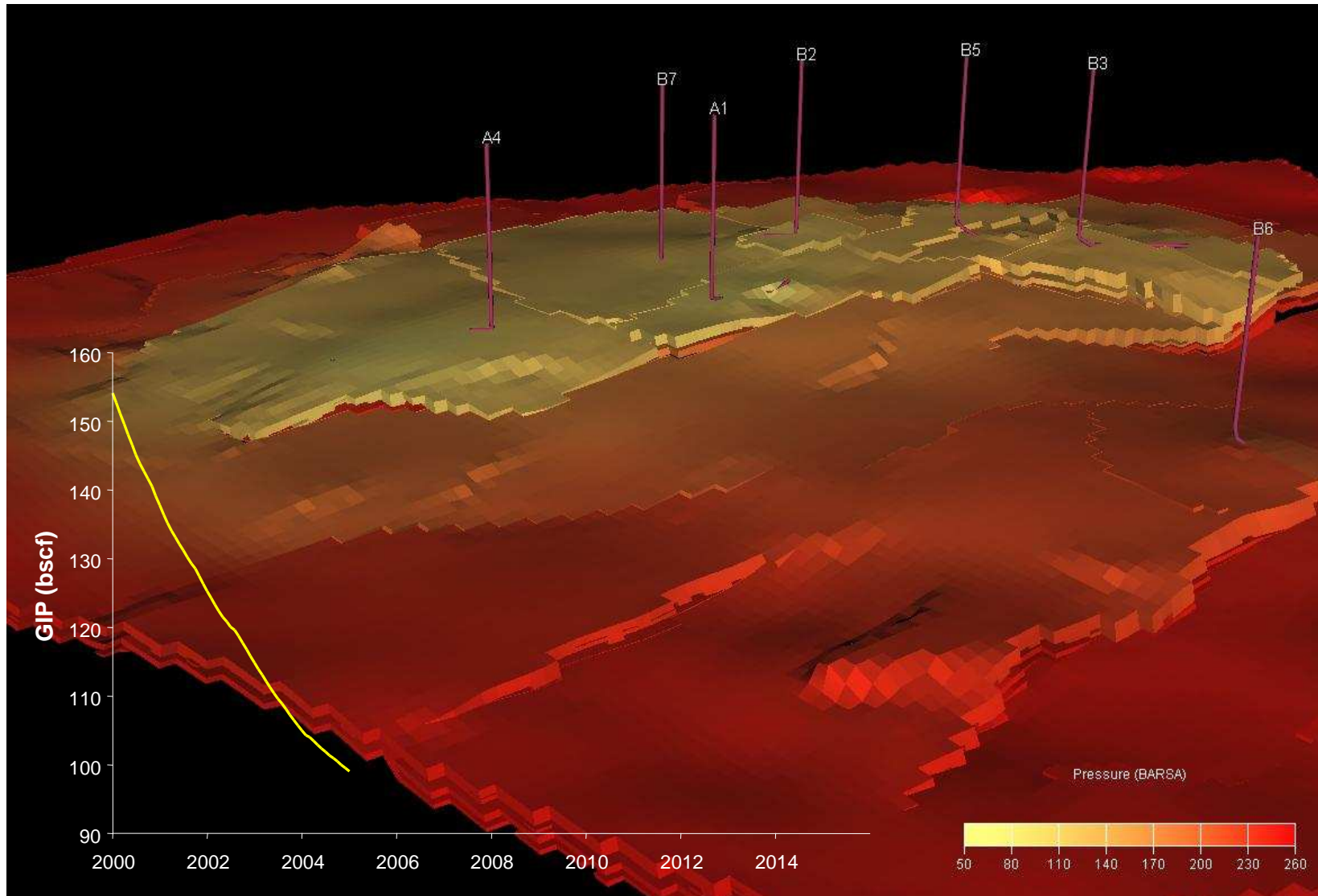
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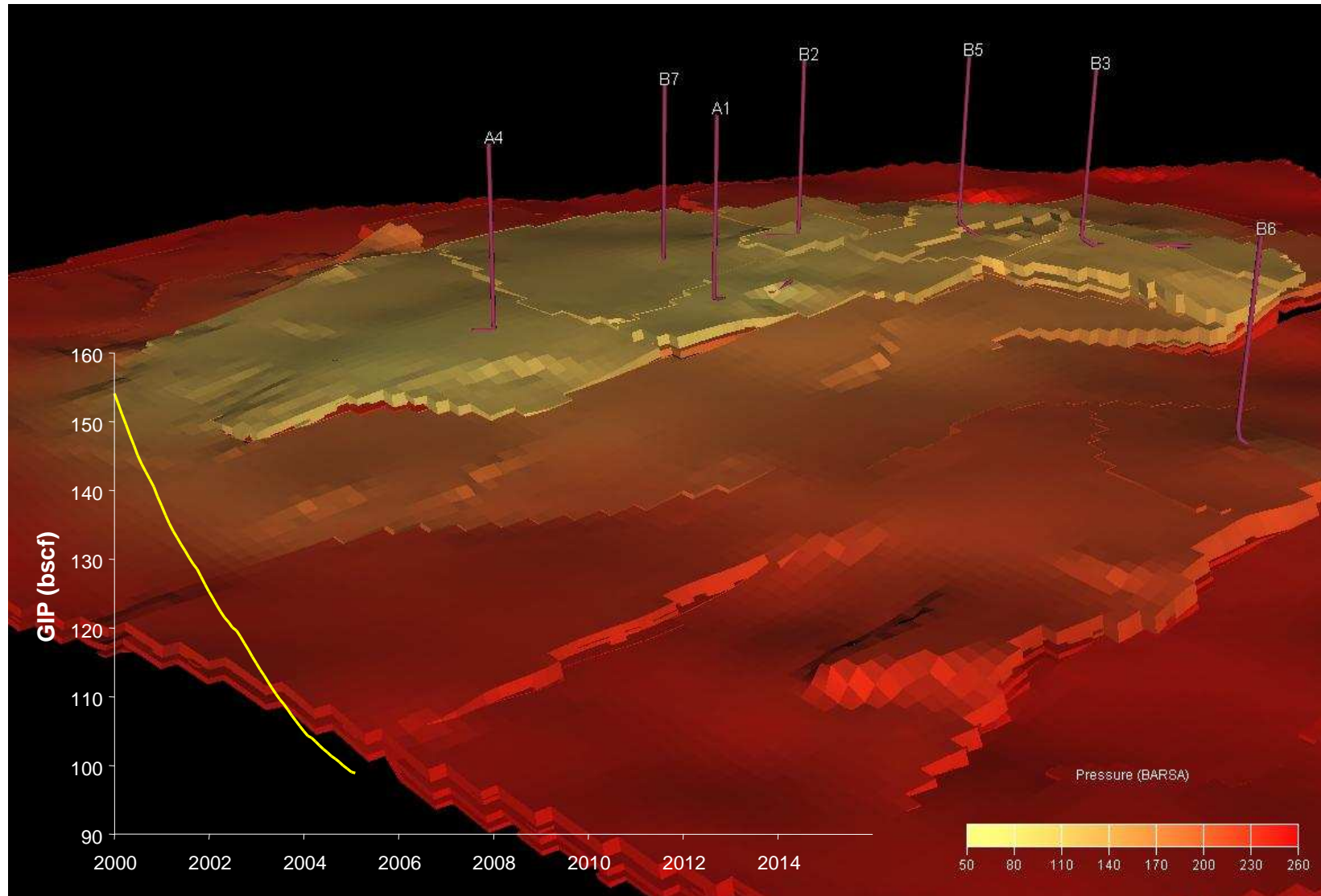
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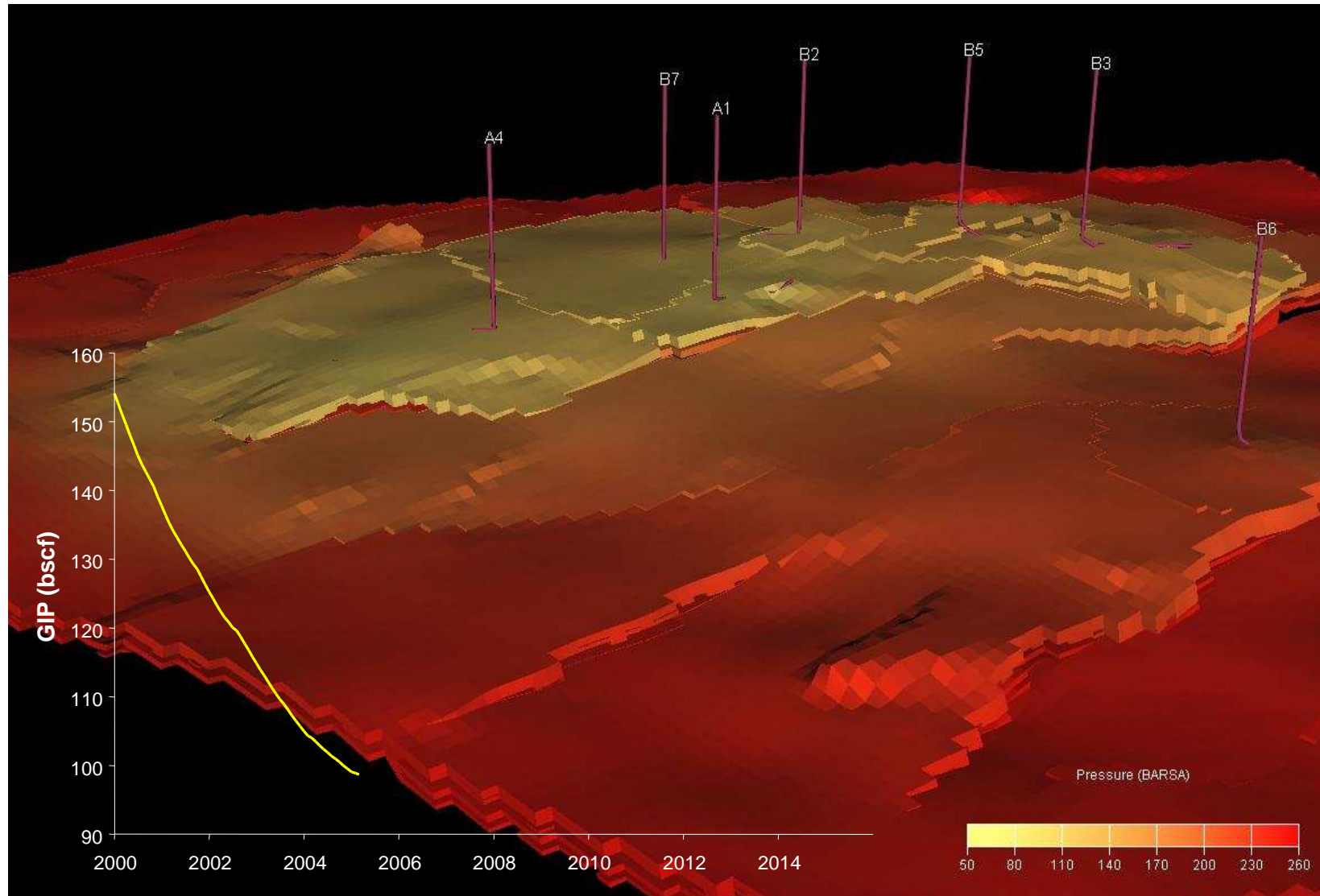
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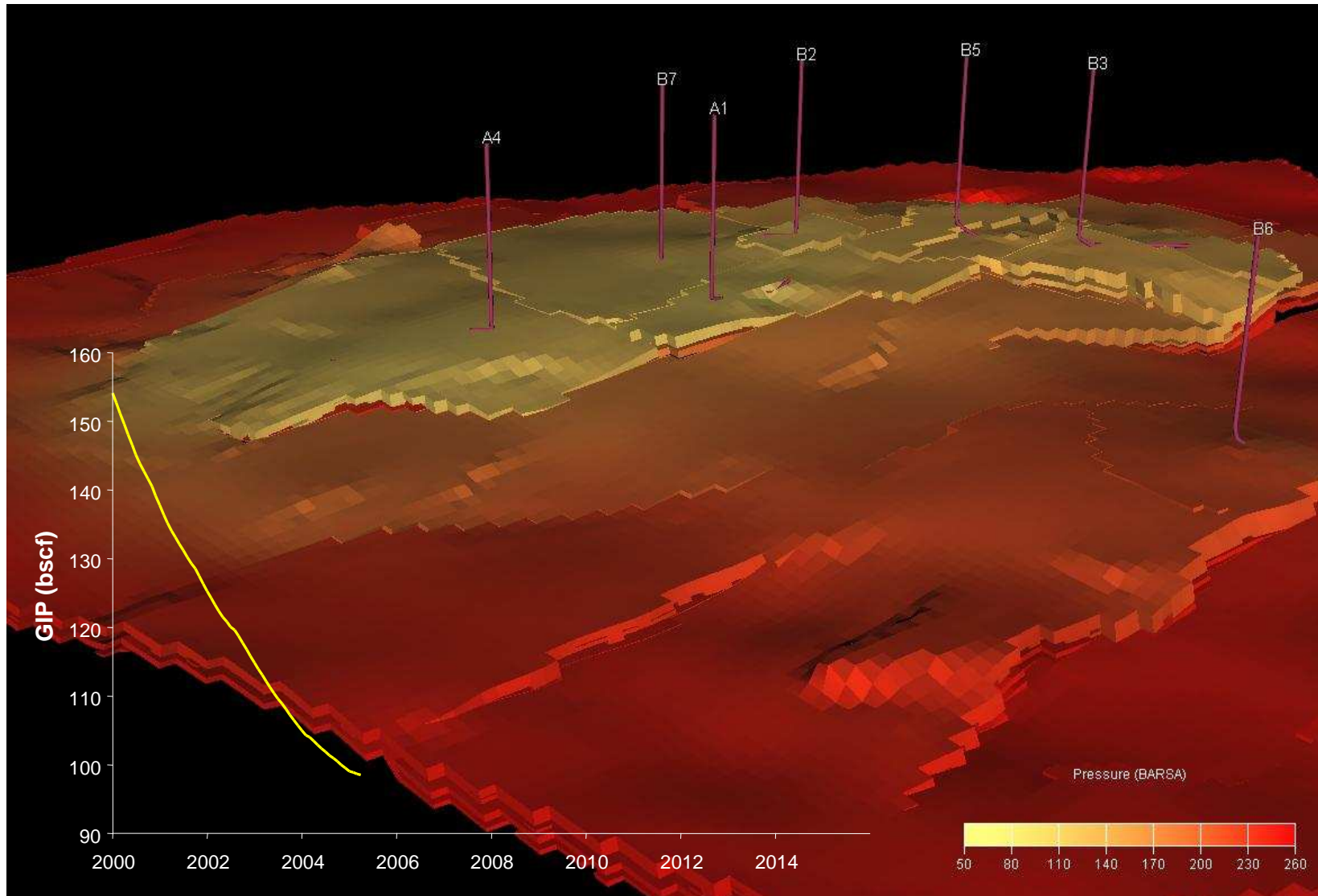
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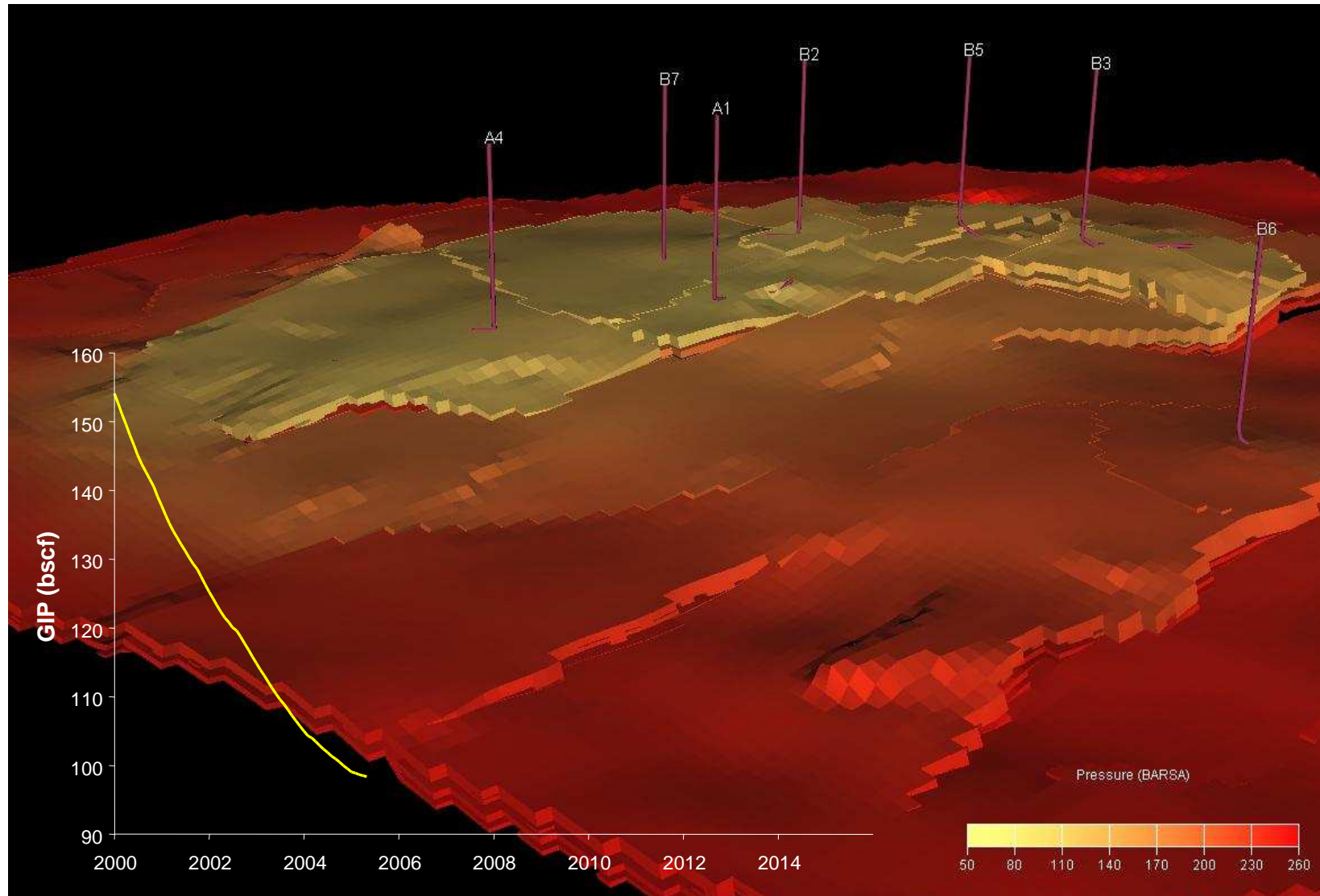
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



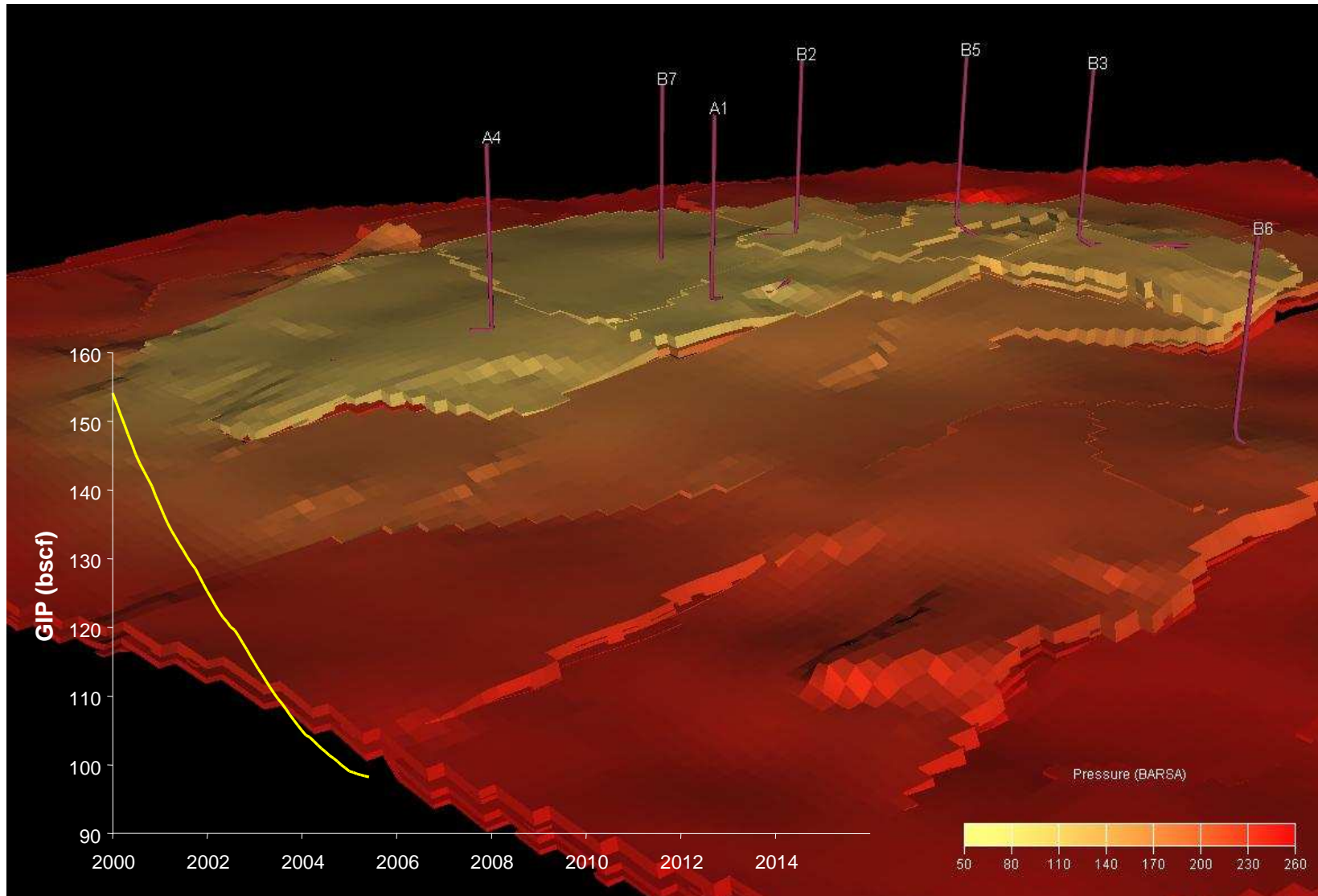
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



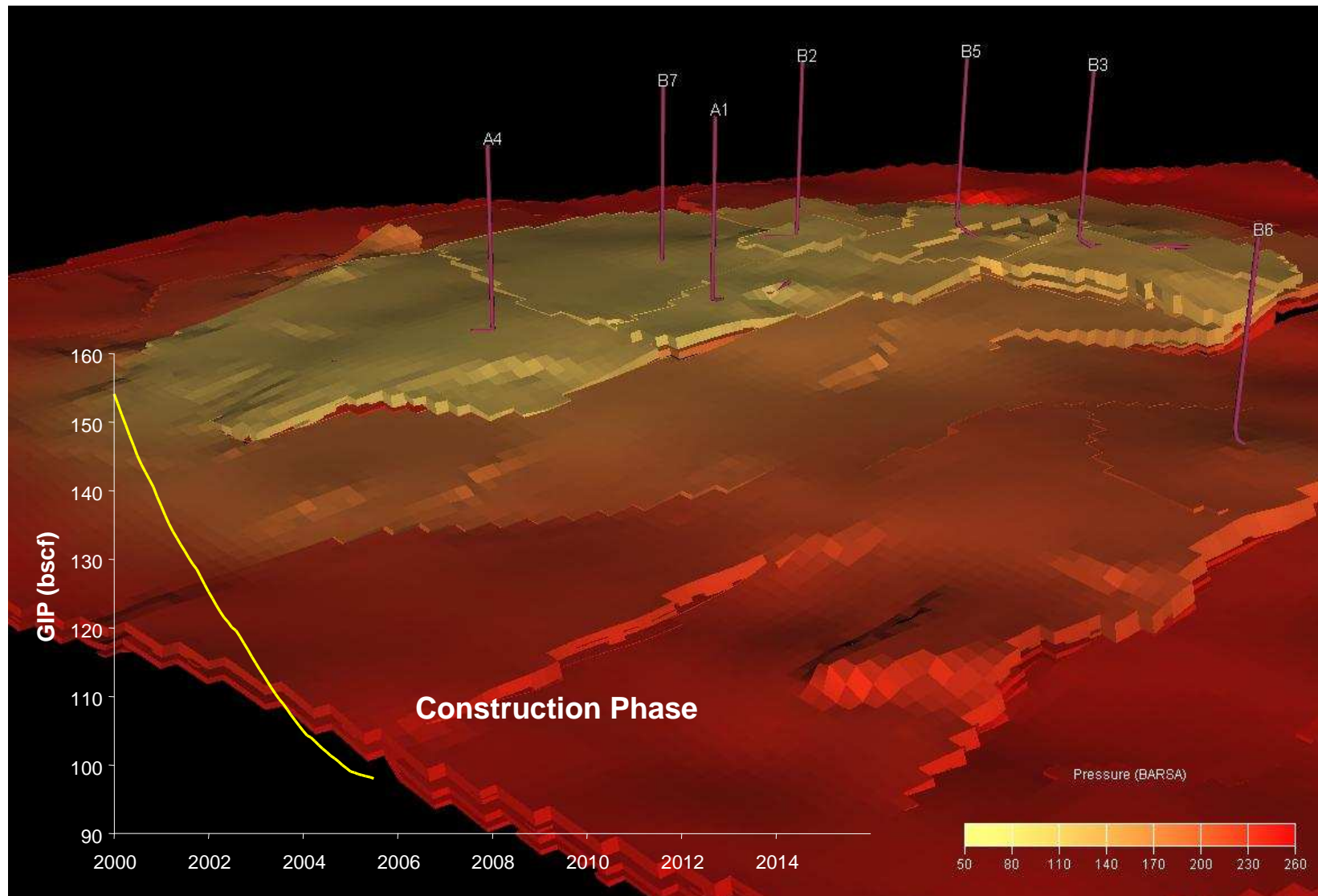
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



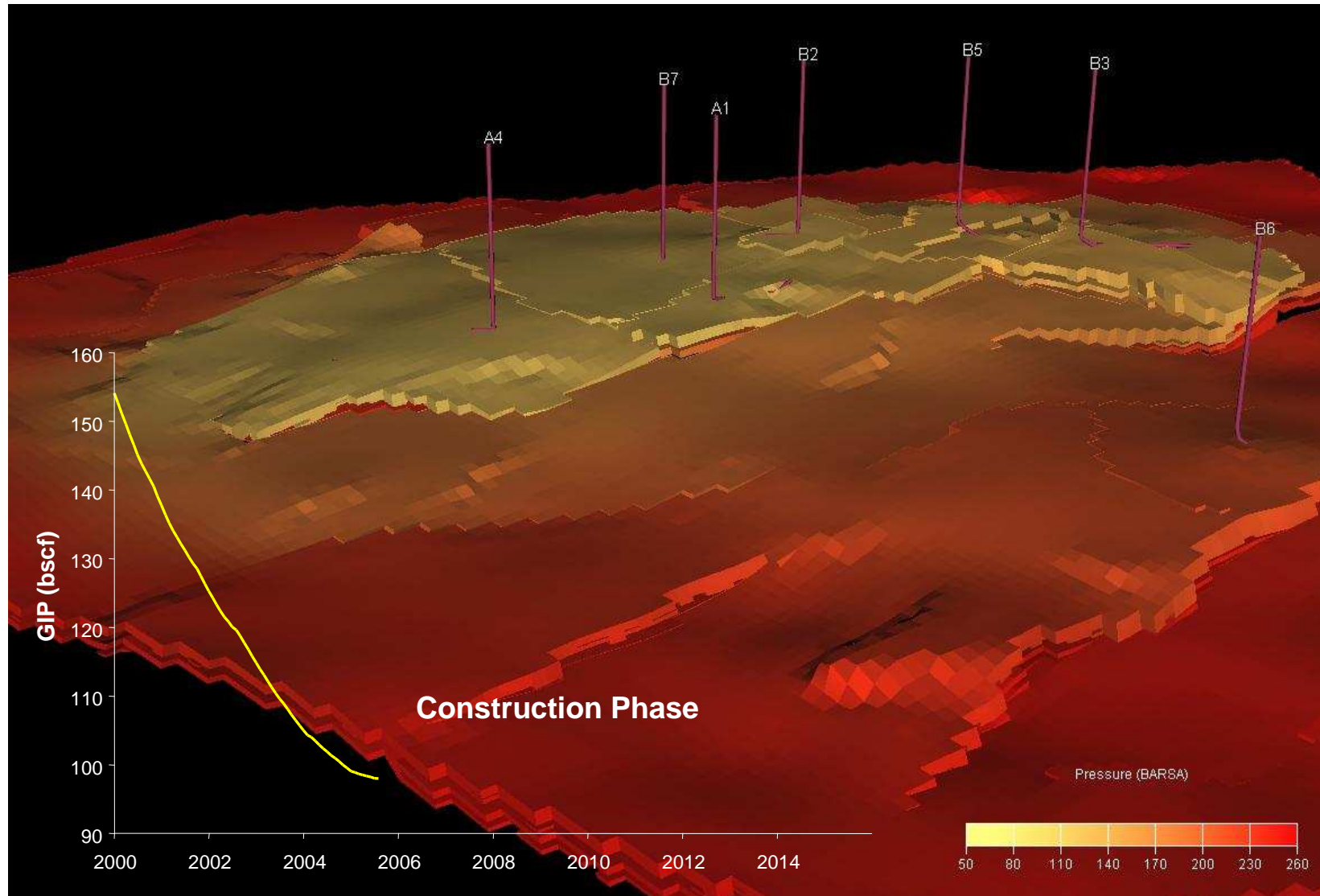
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



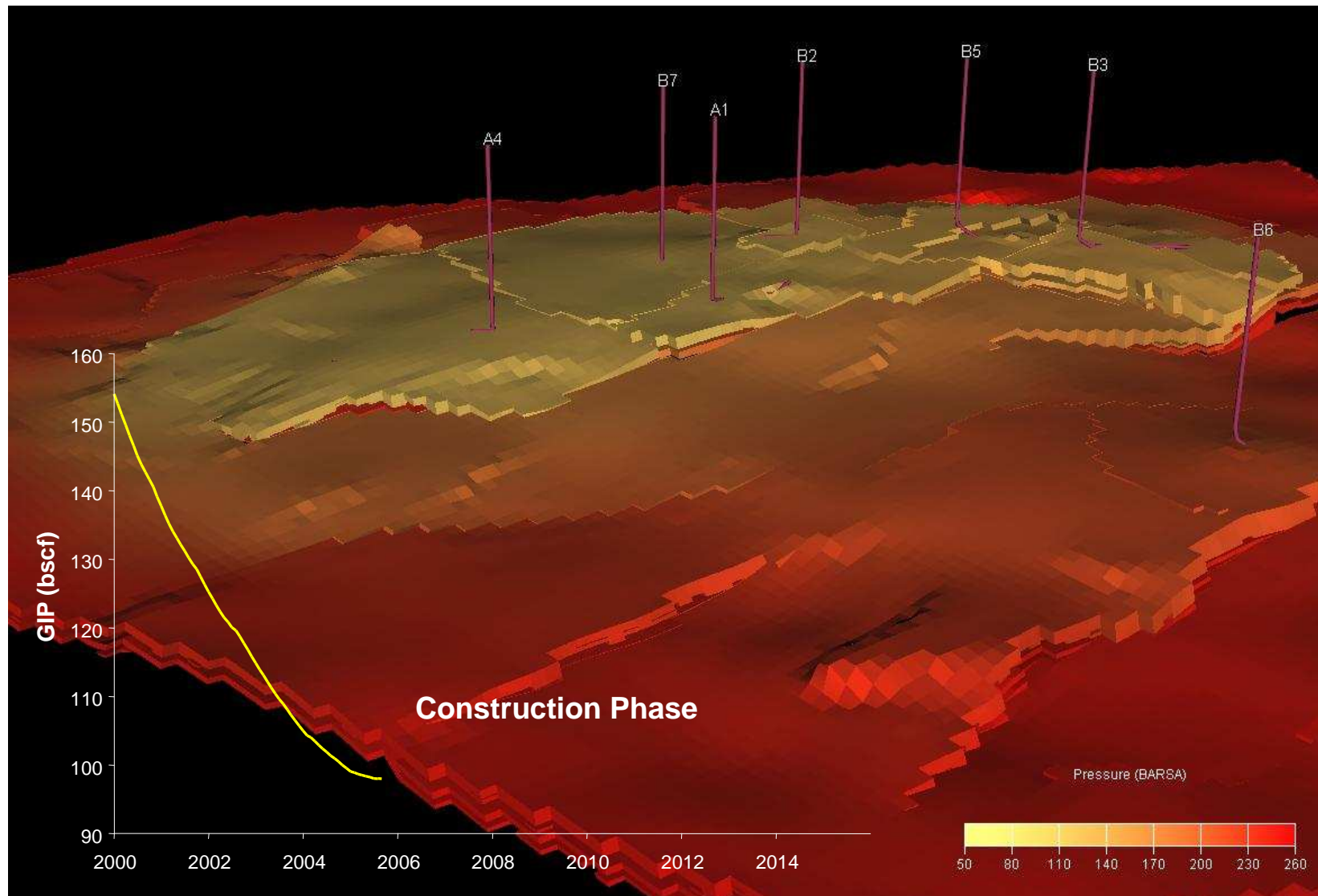
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



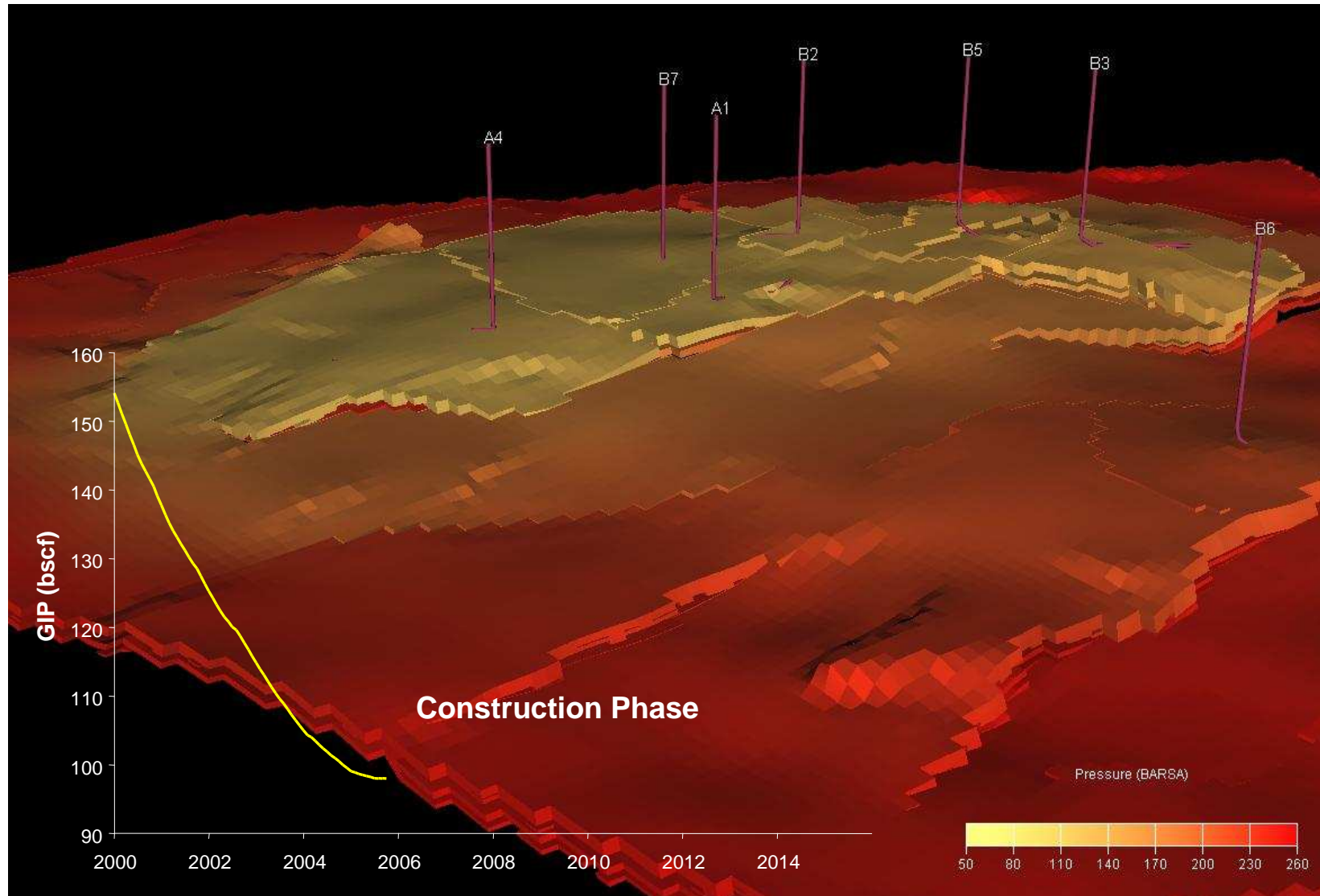
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



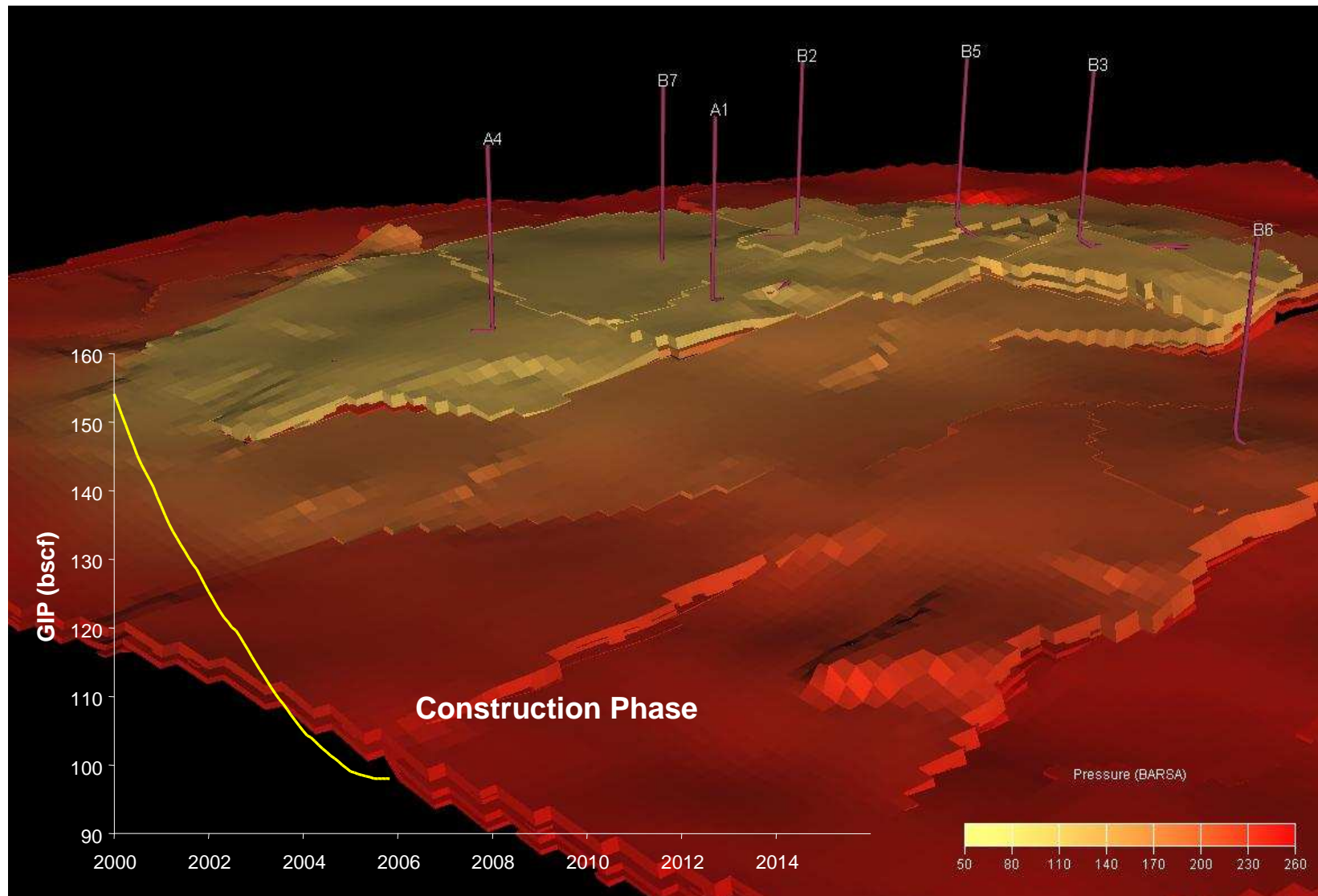
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



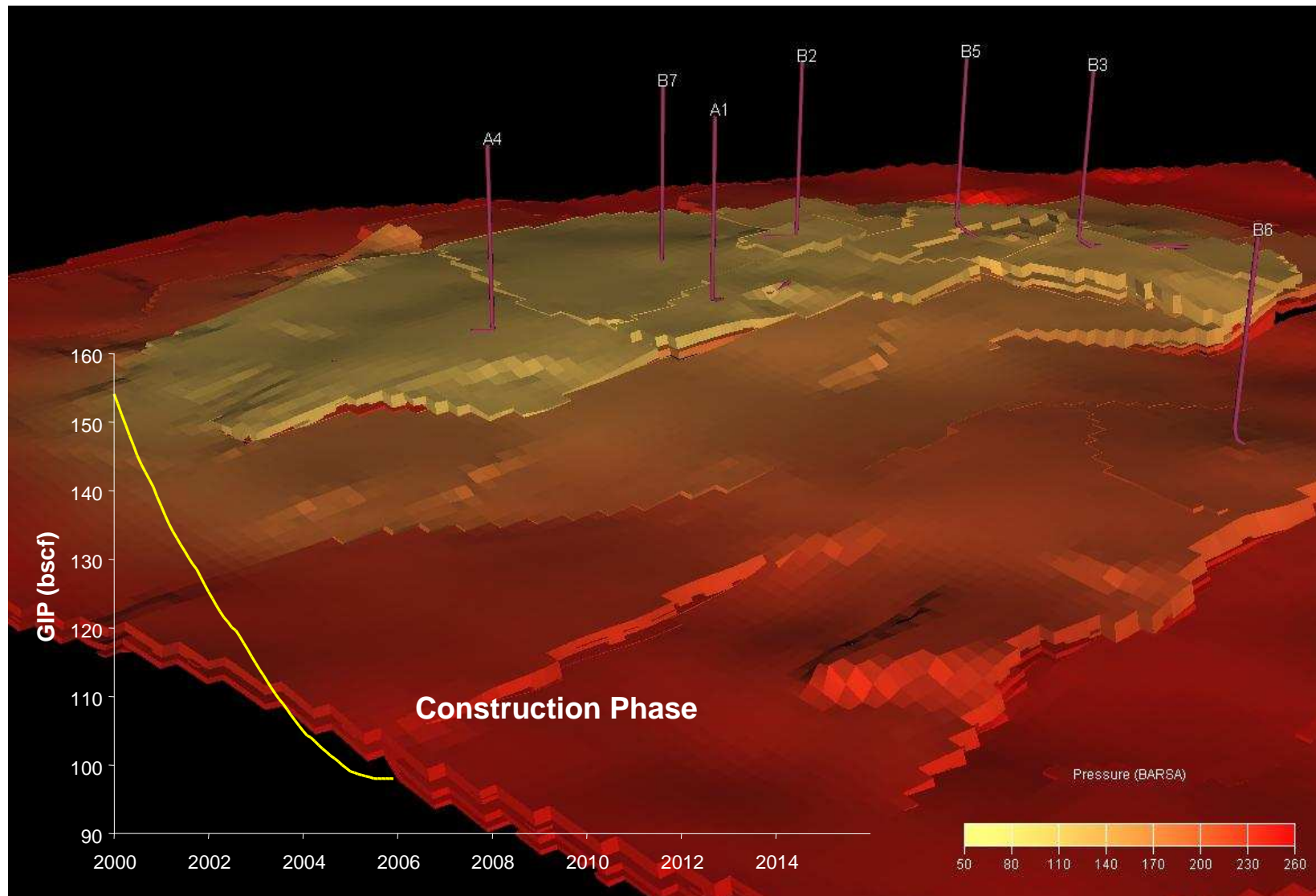
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



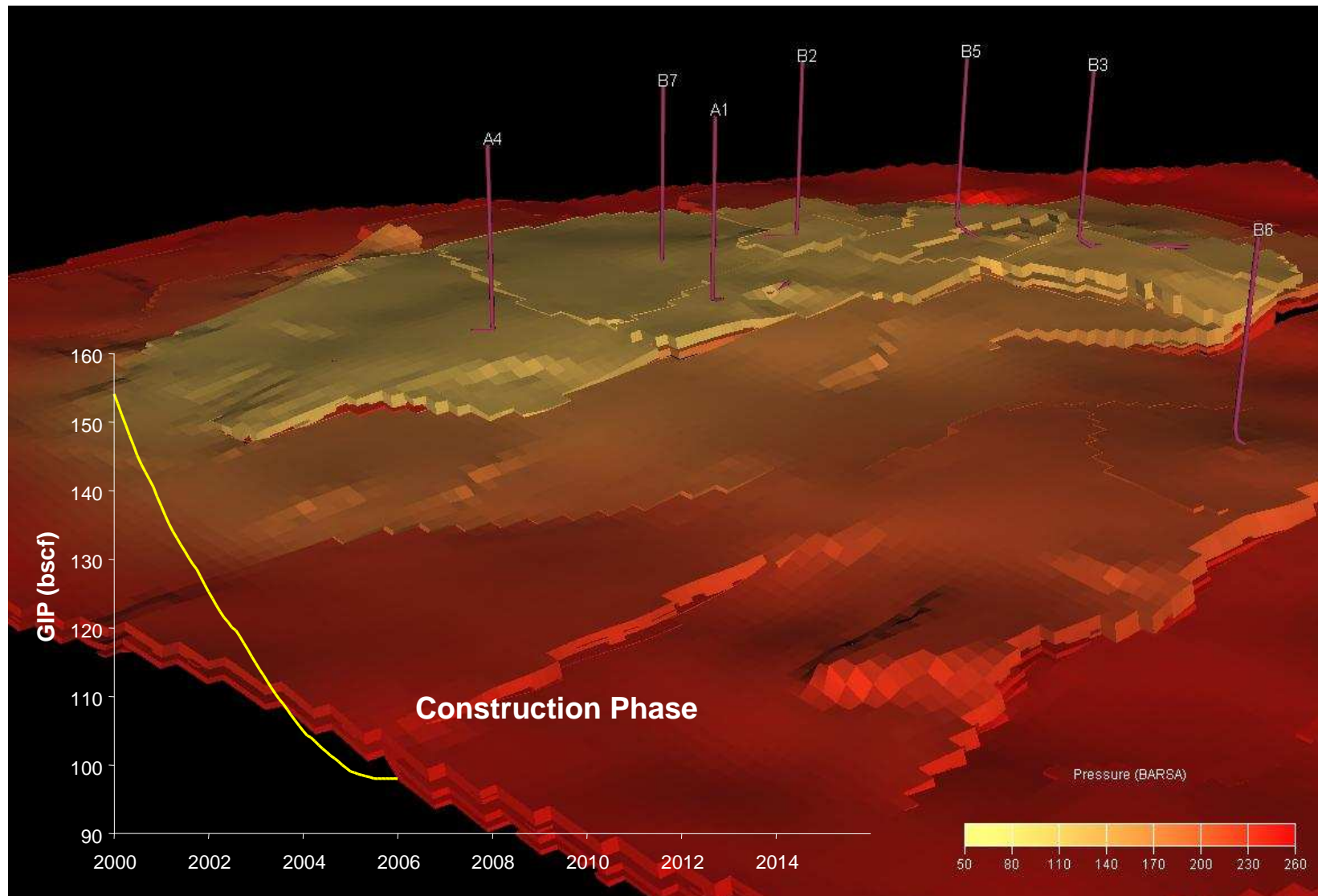
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



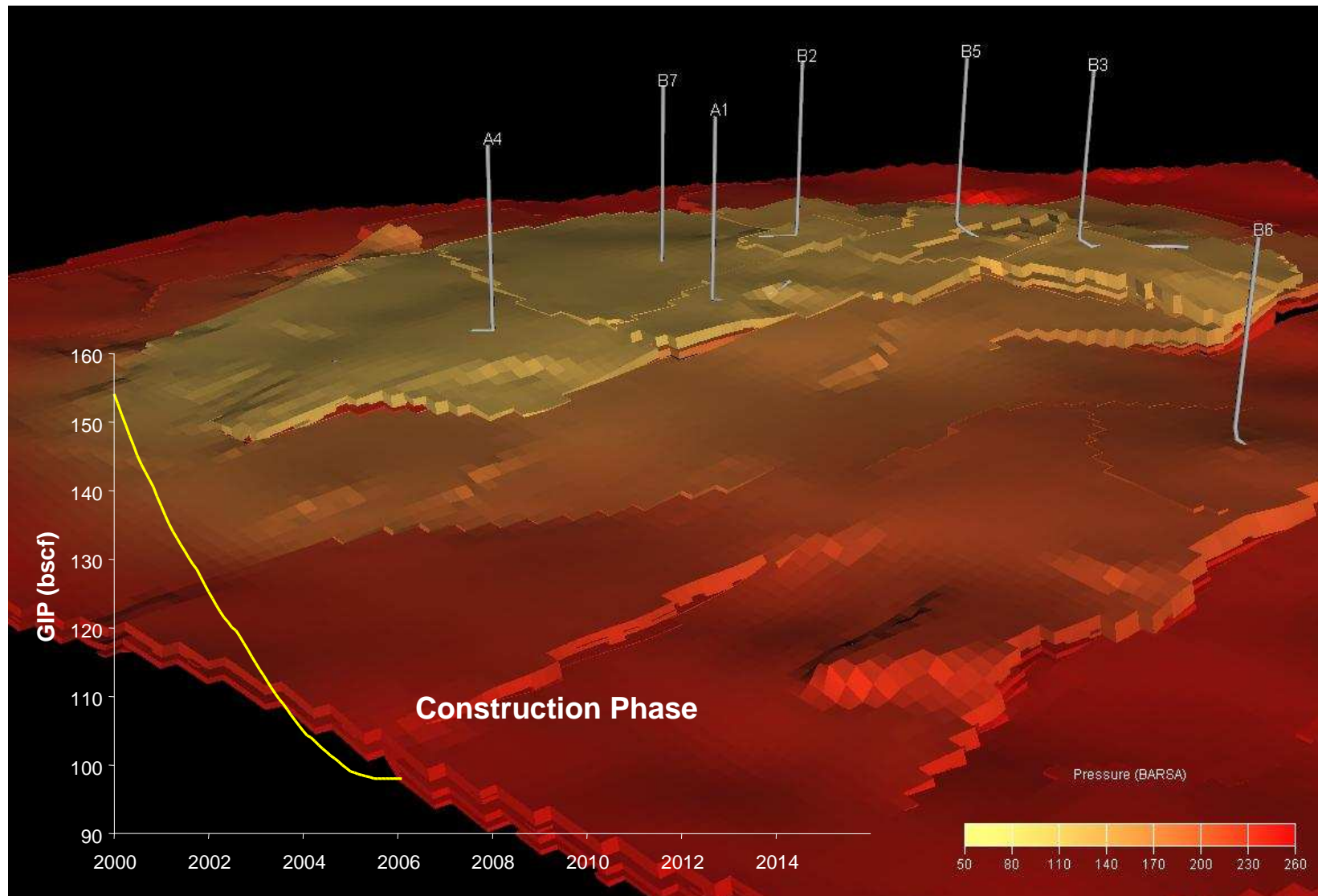
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



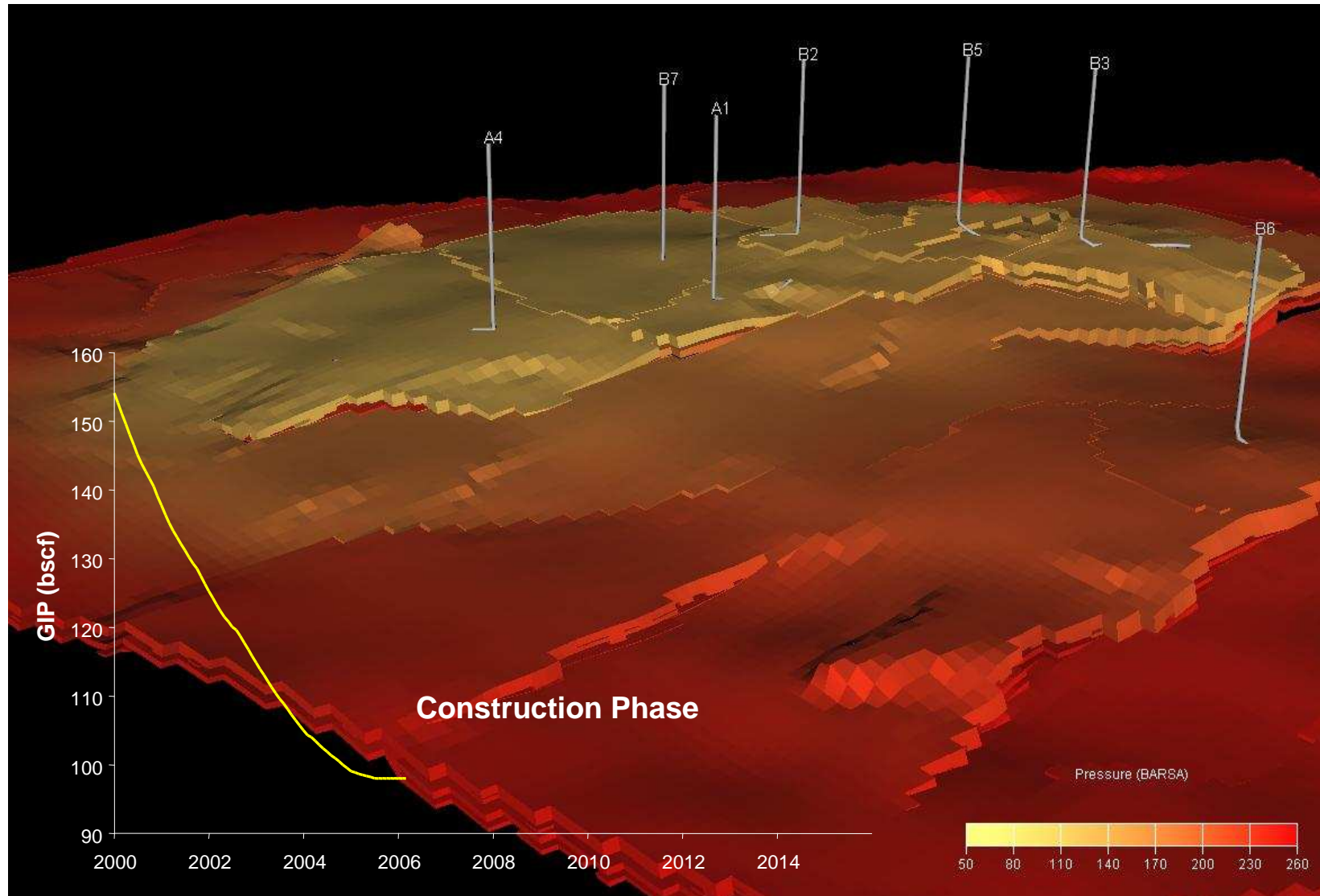
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



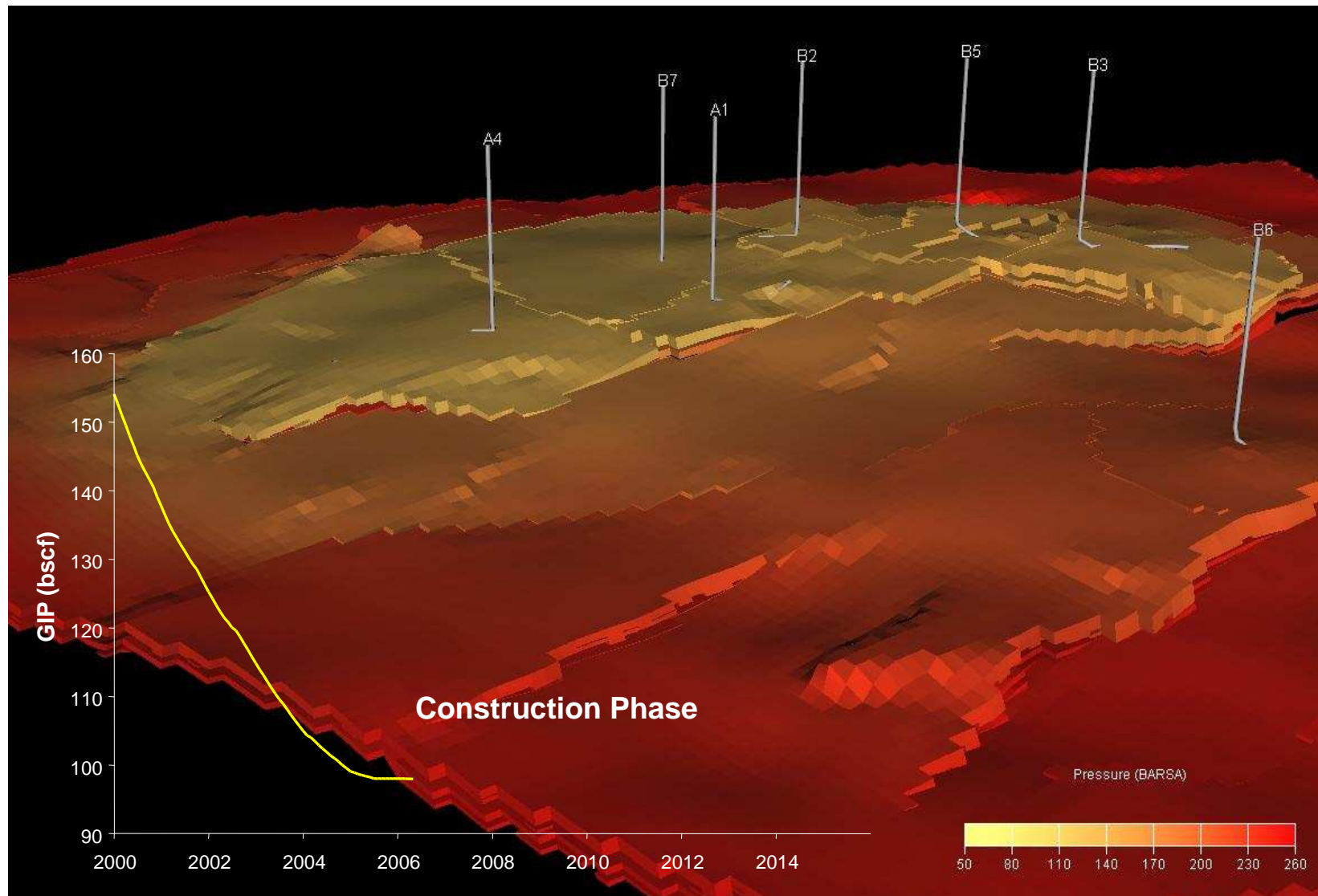
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Dynamic Reservoir Simulation



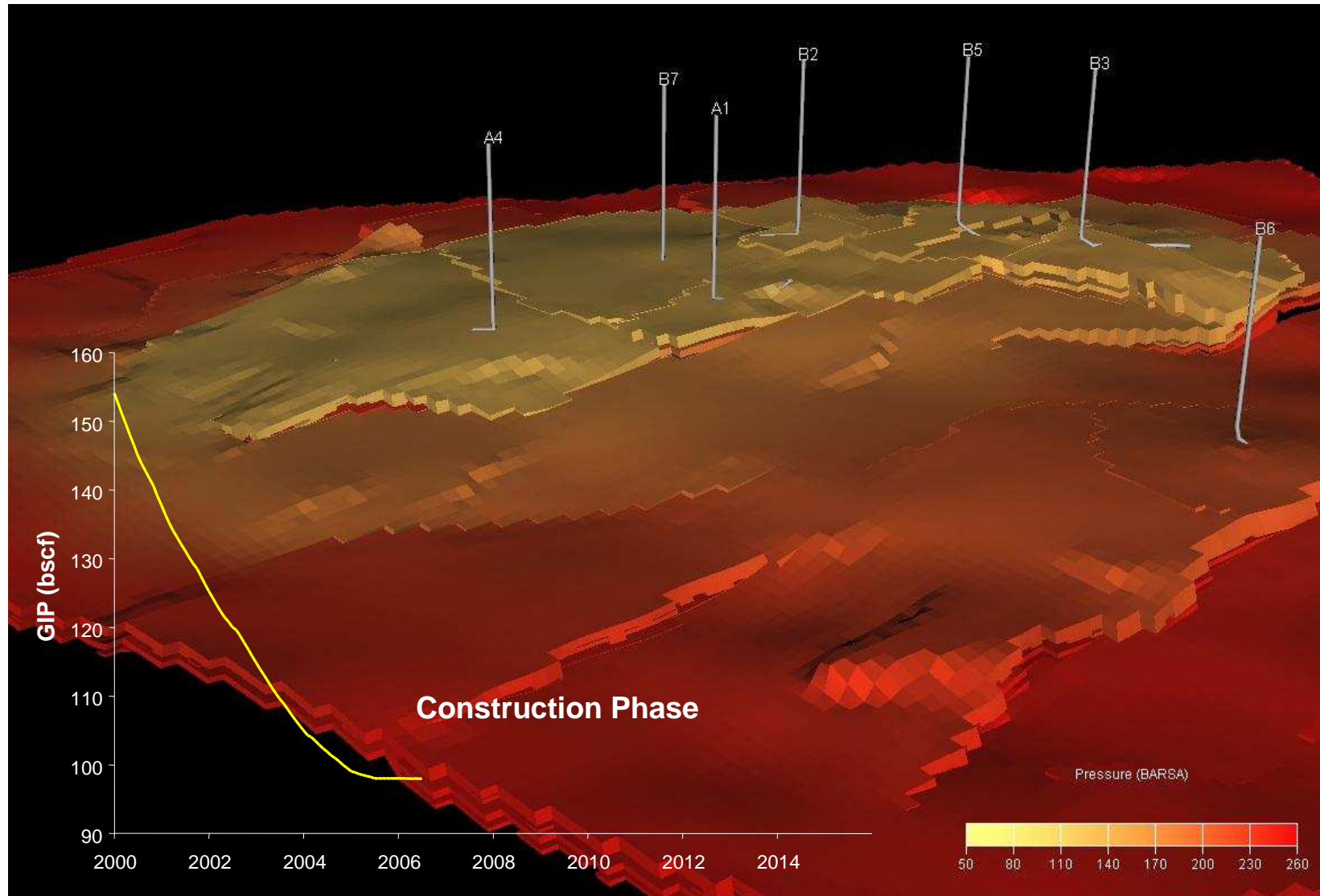
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Dynamic Reservoir Simulation



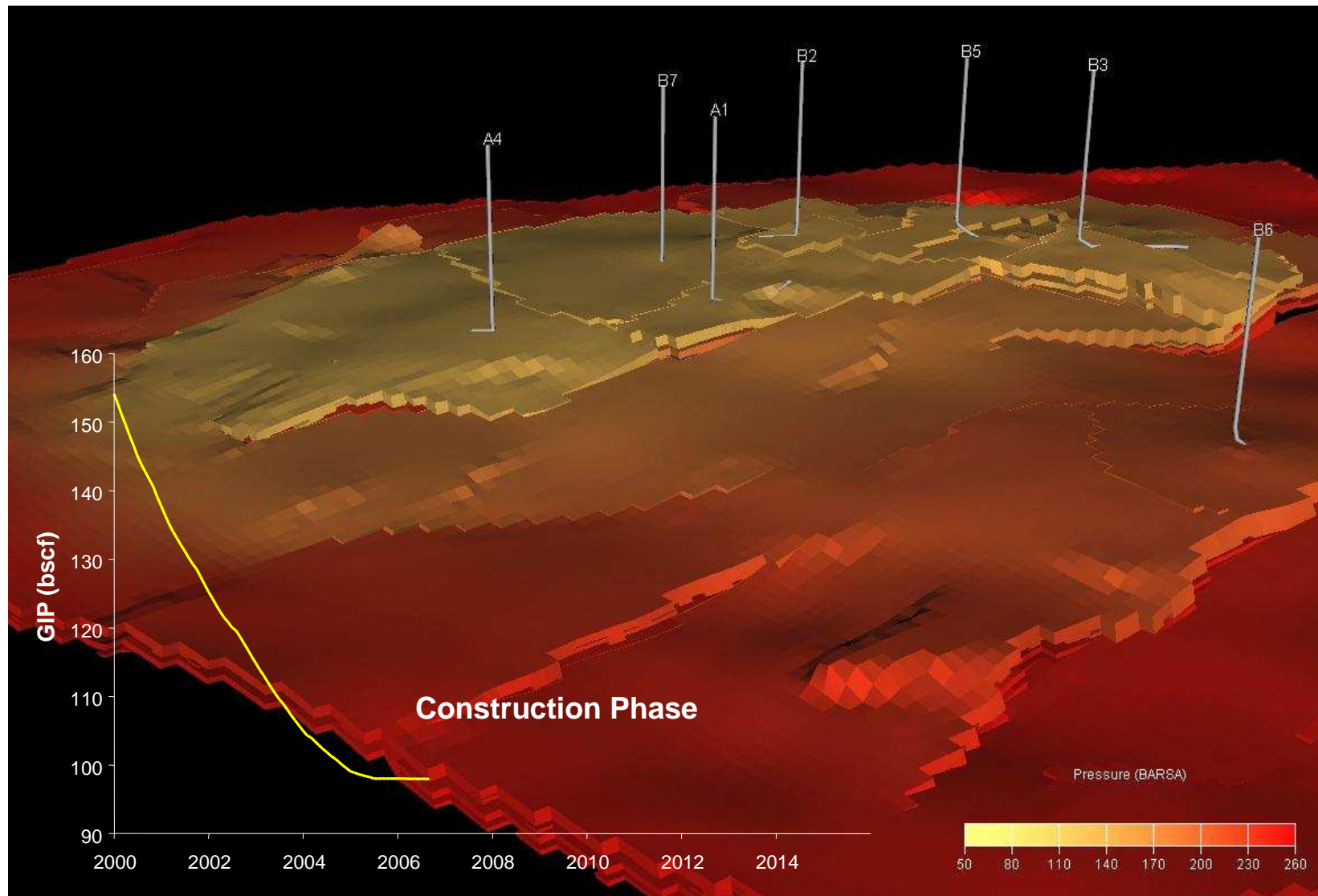
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



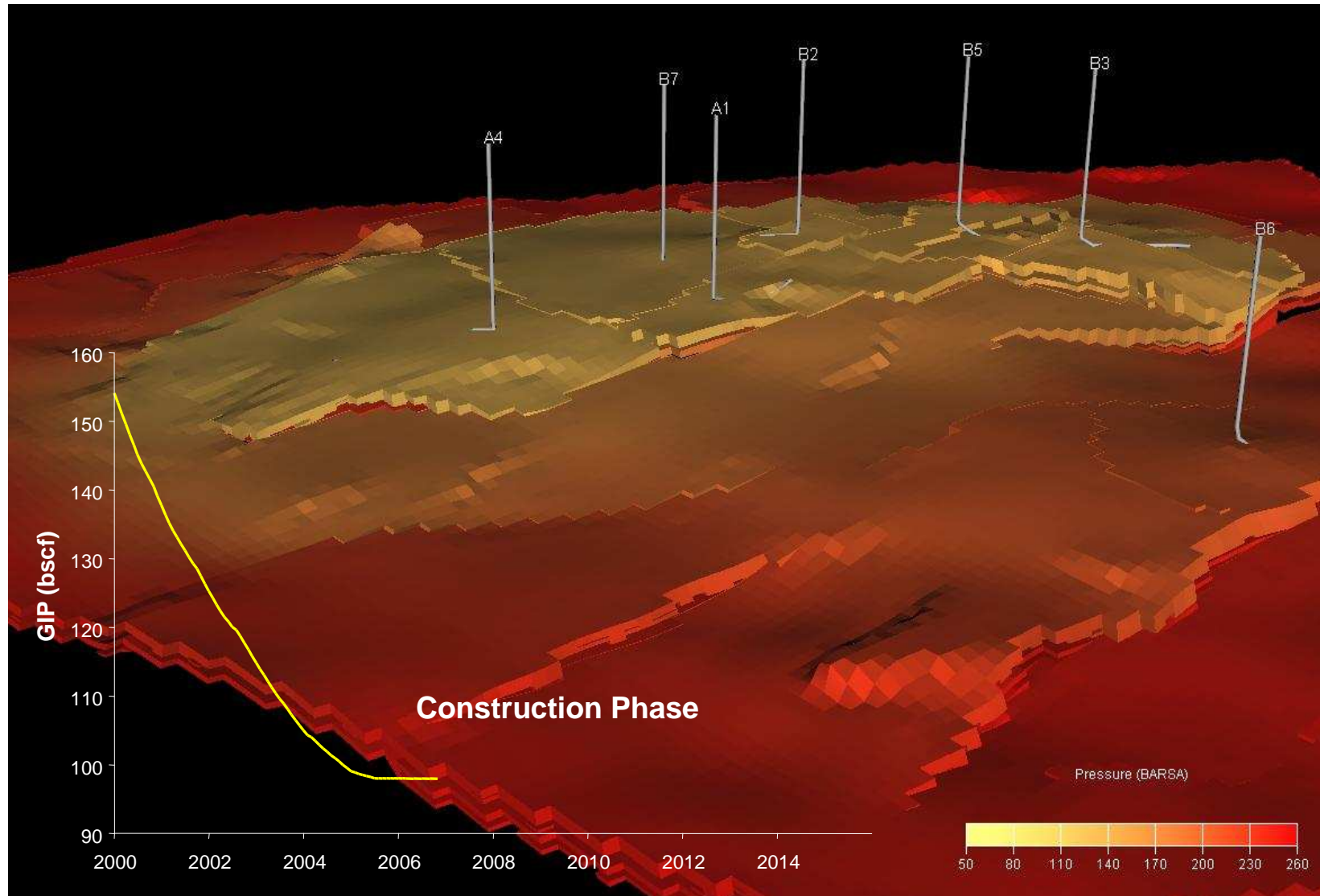
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Dynamic Reservoir Simulation



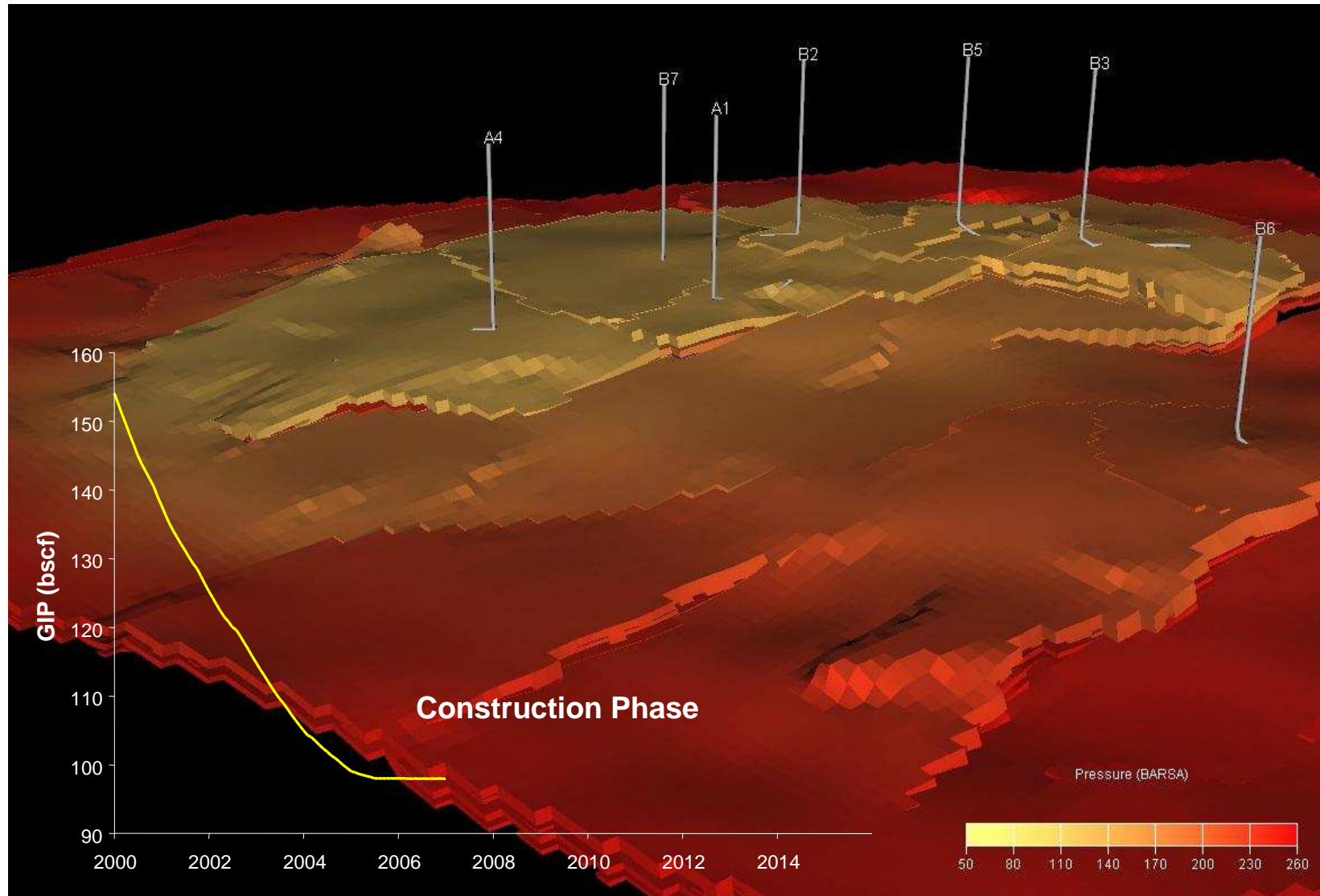
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Dynamic Reservoir Simulation



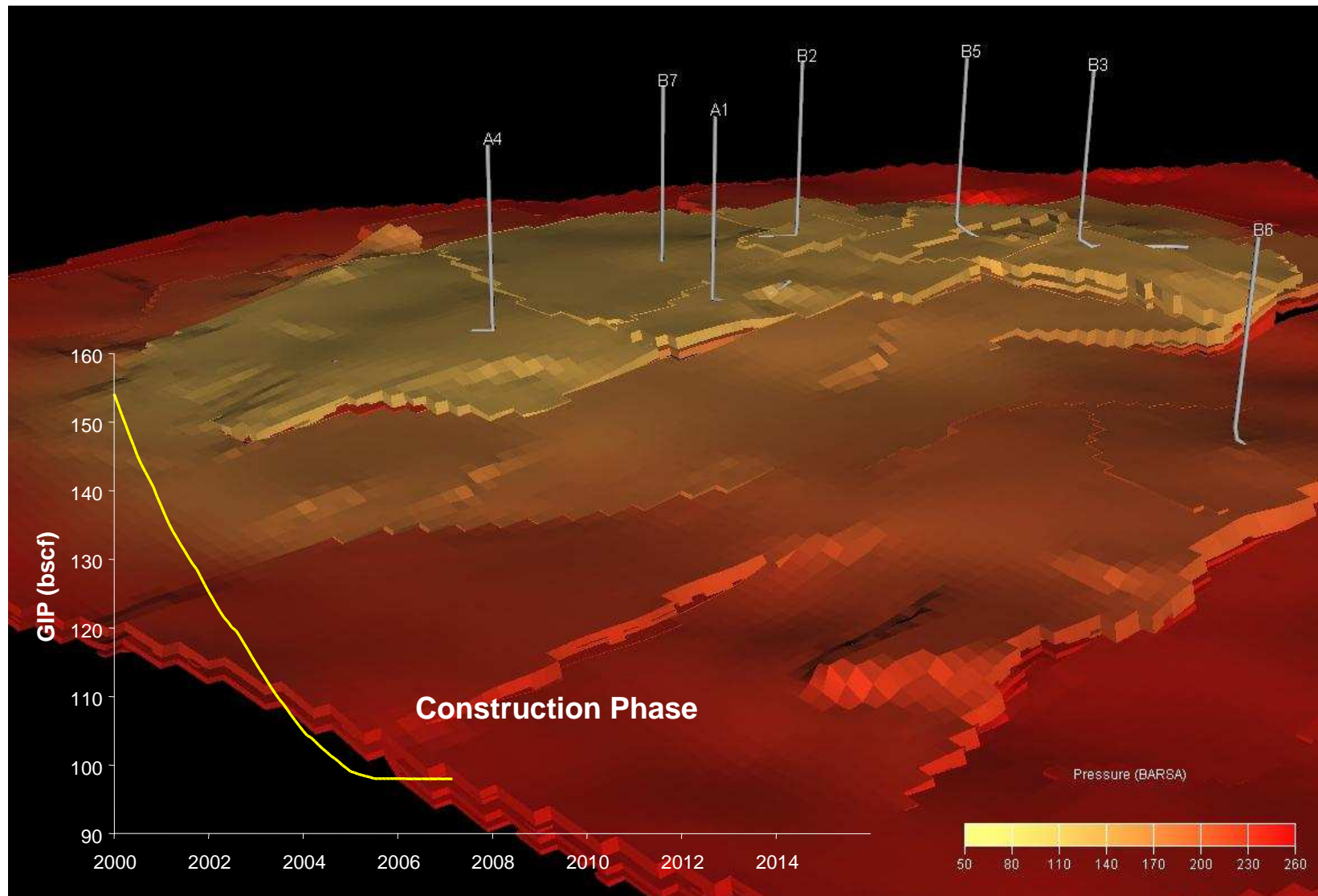
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Dynamic Reservoir Simulation



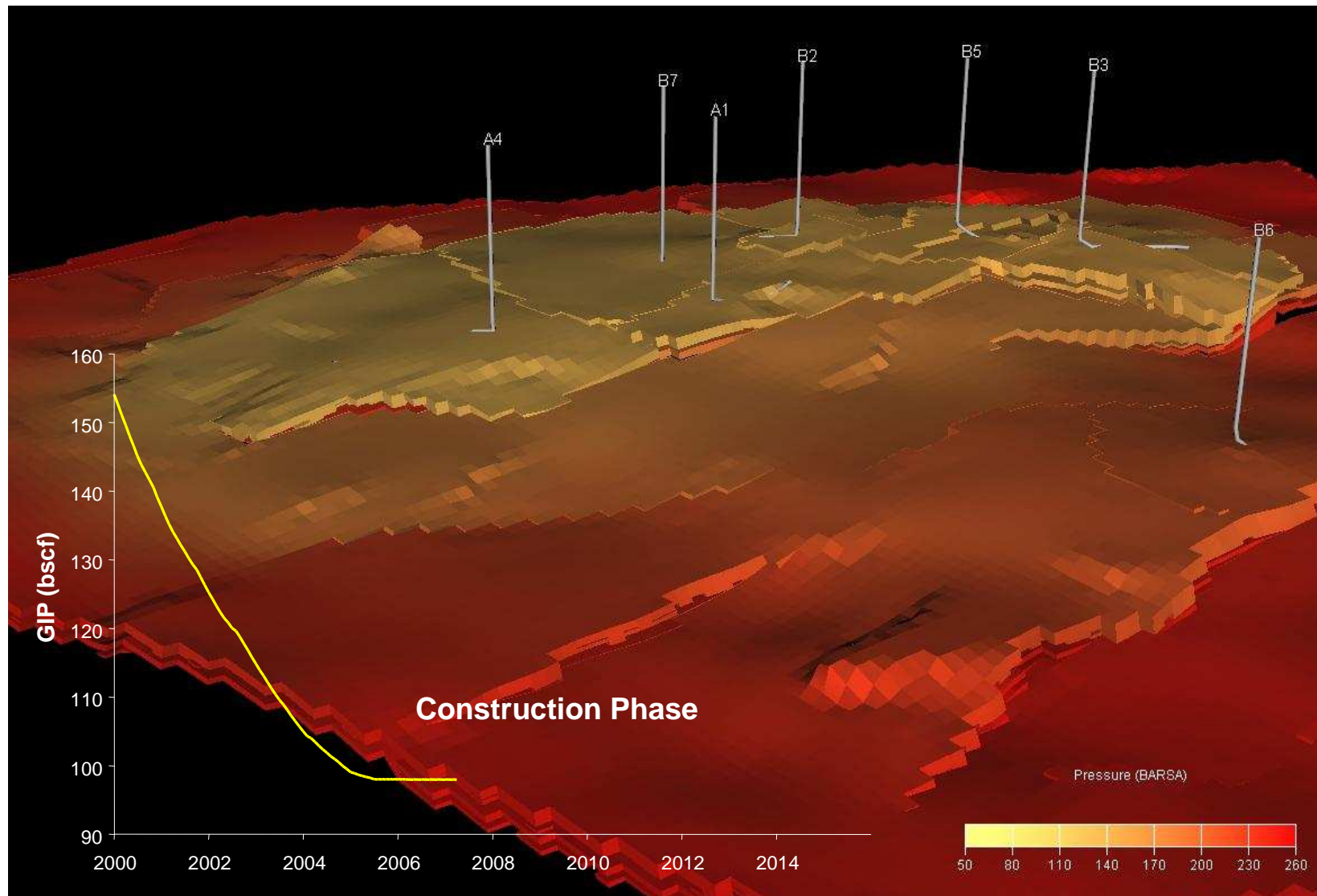
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Dynamic Reservoir Simulation



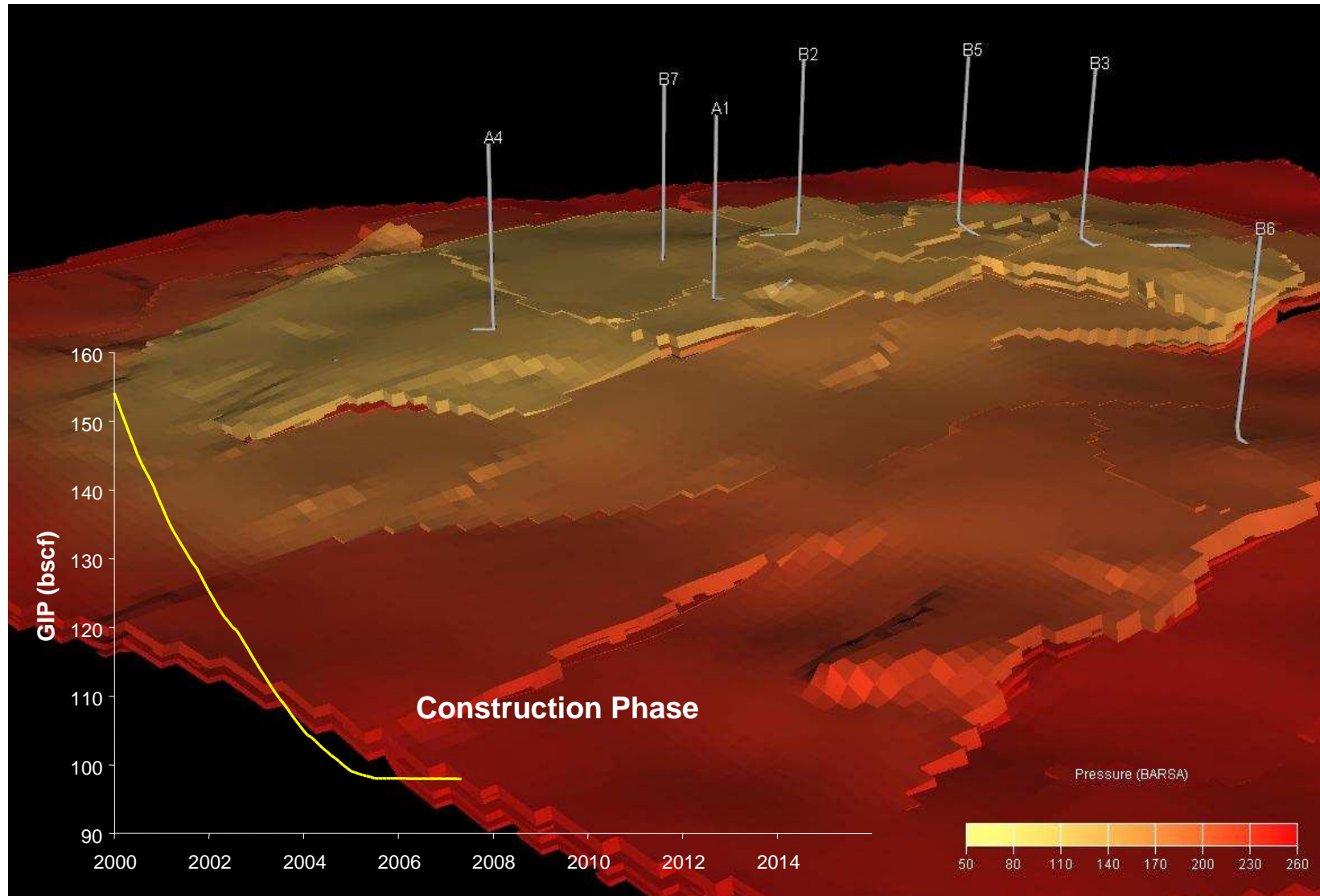
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Dynamic Reservoir Simulation



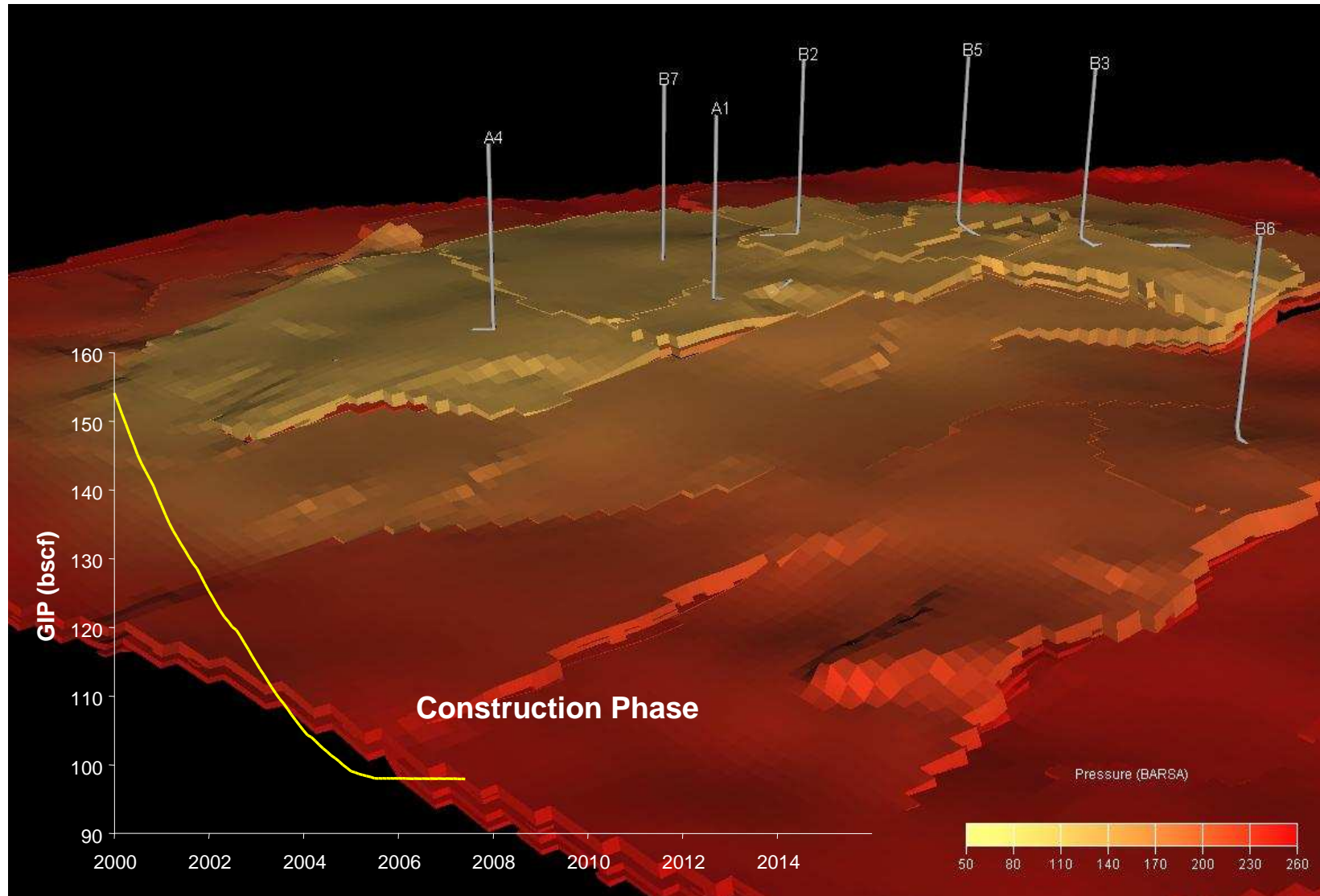
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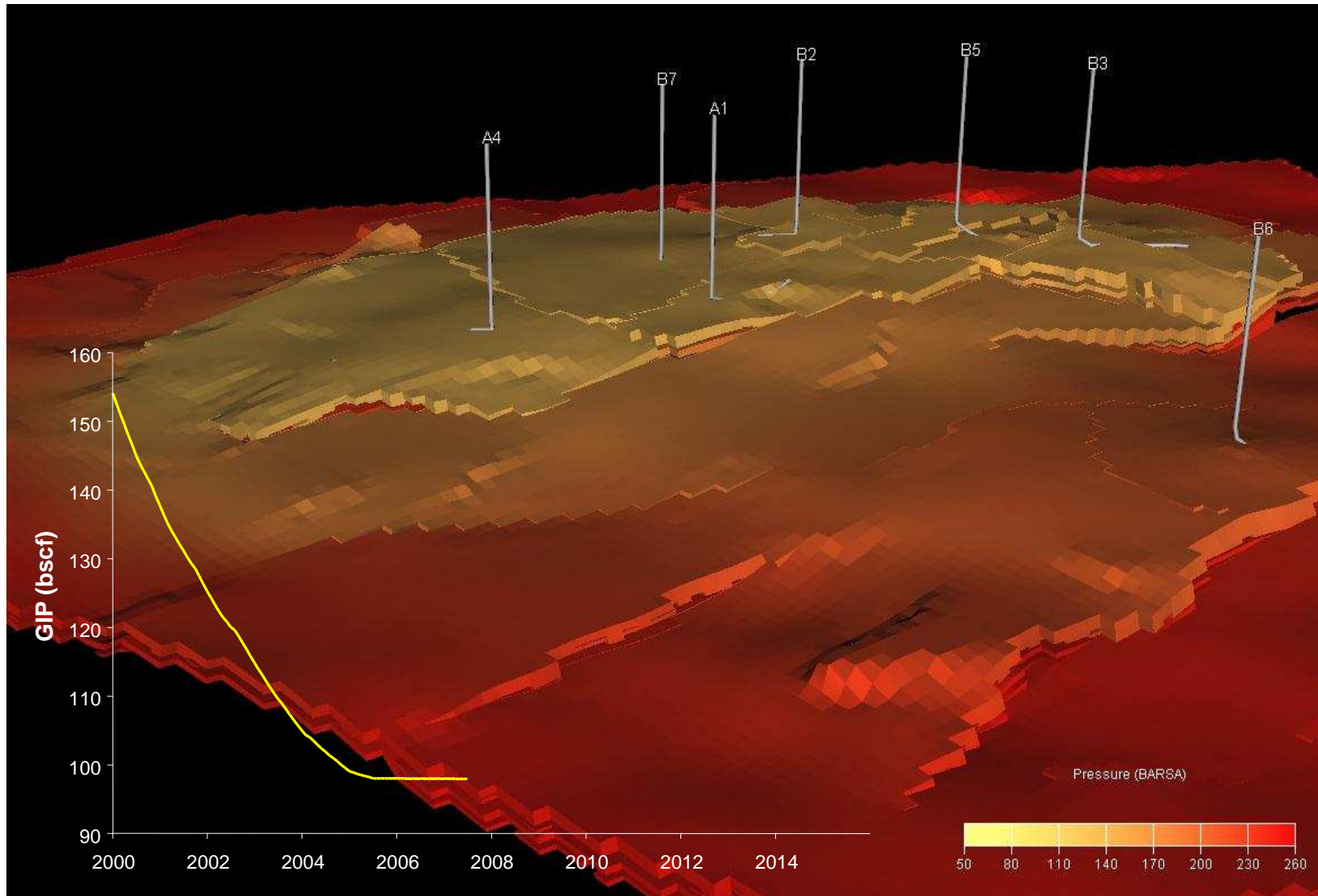
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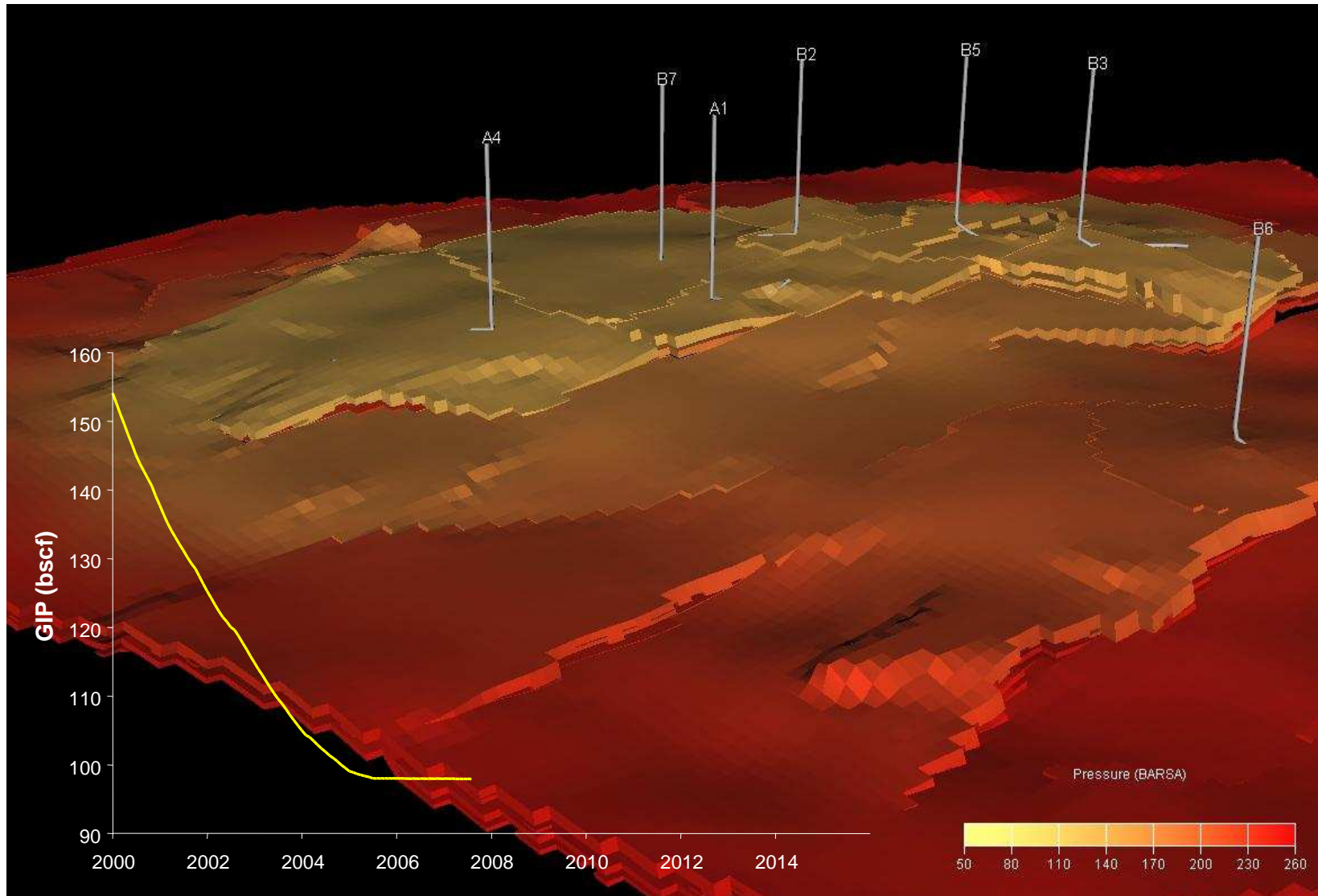
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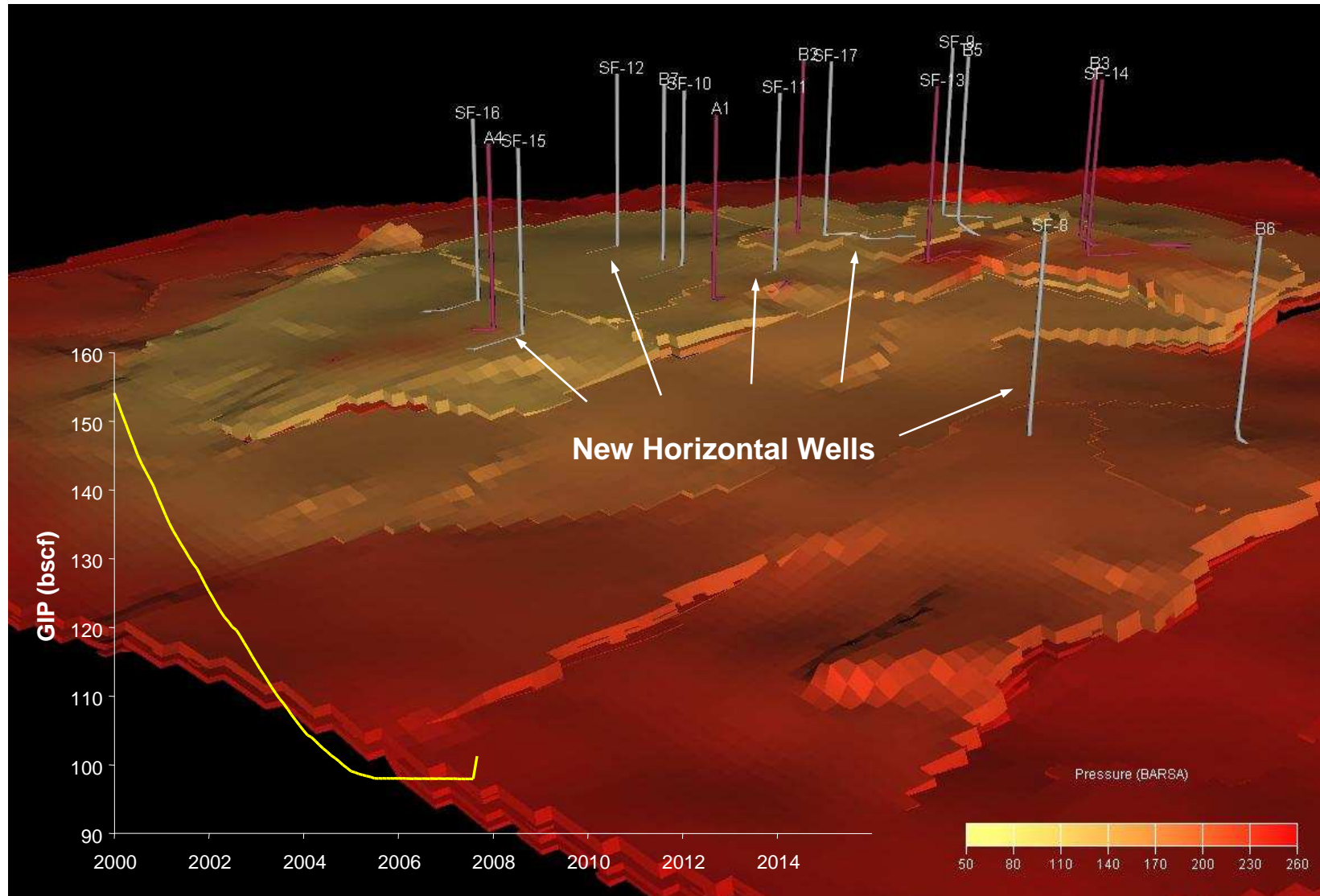
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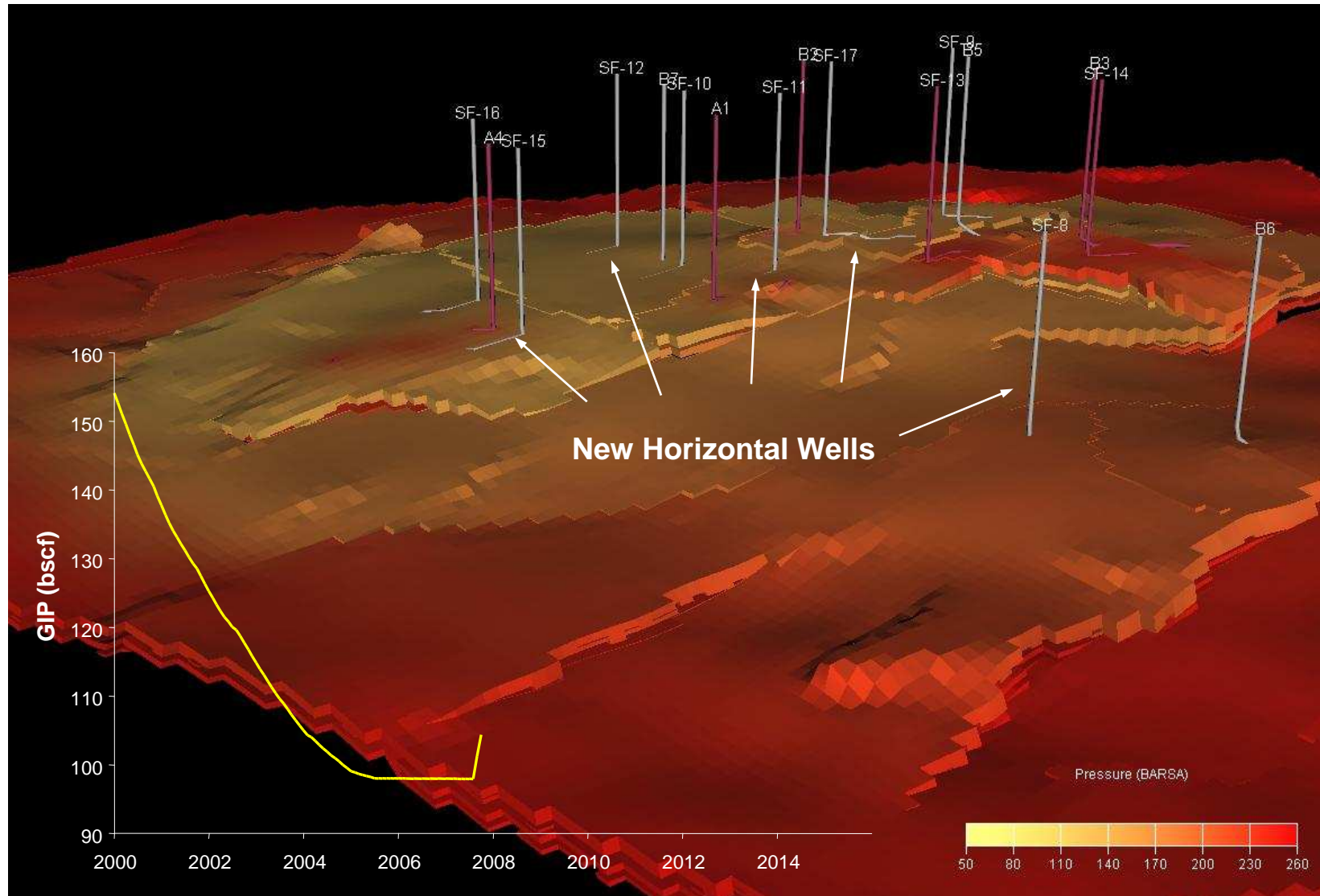
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Dynamic Reservoir Simulation



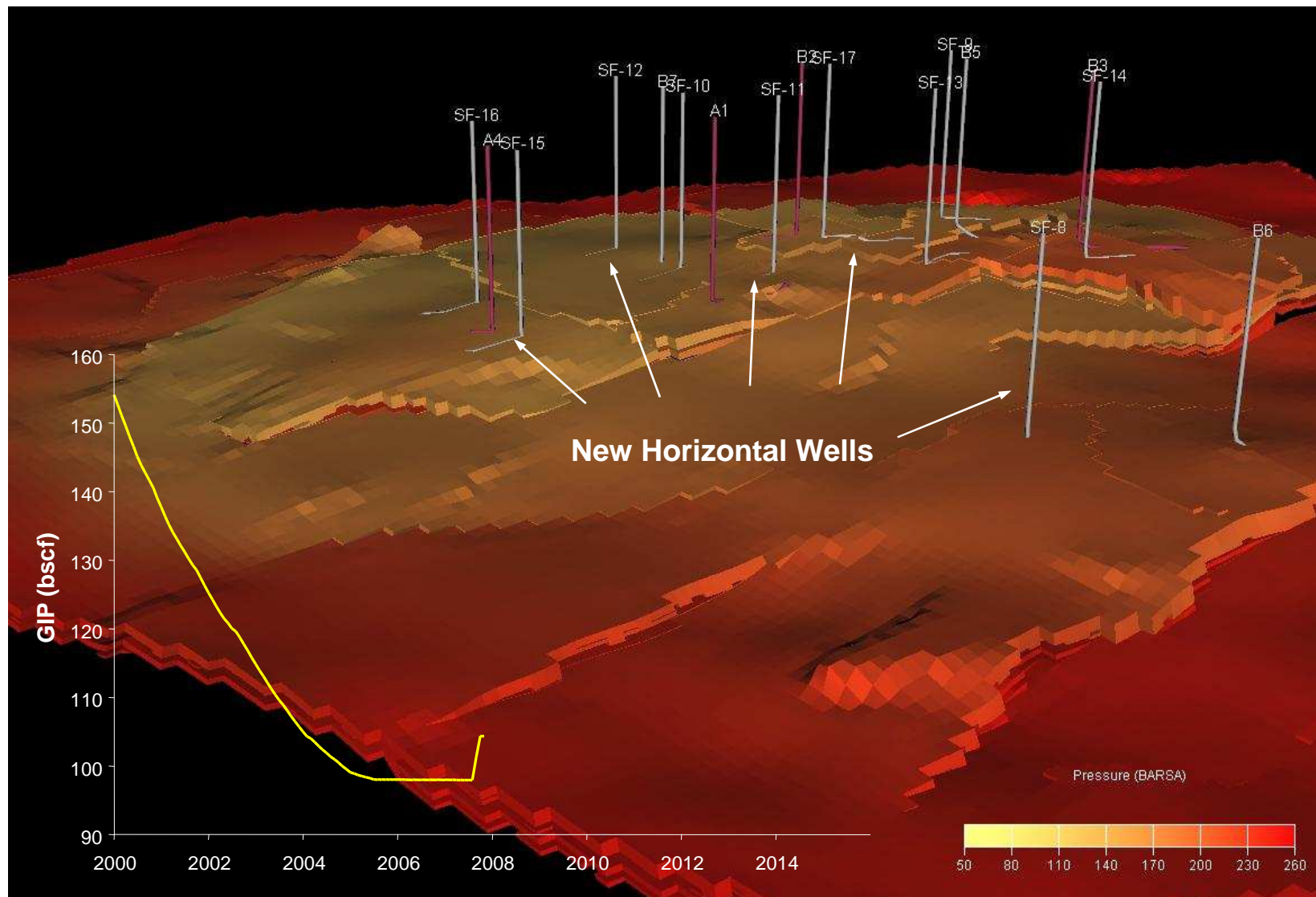
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



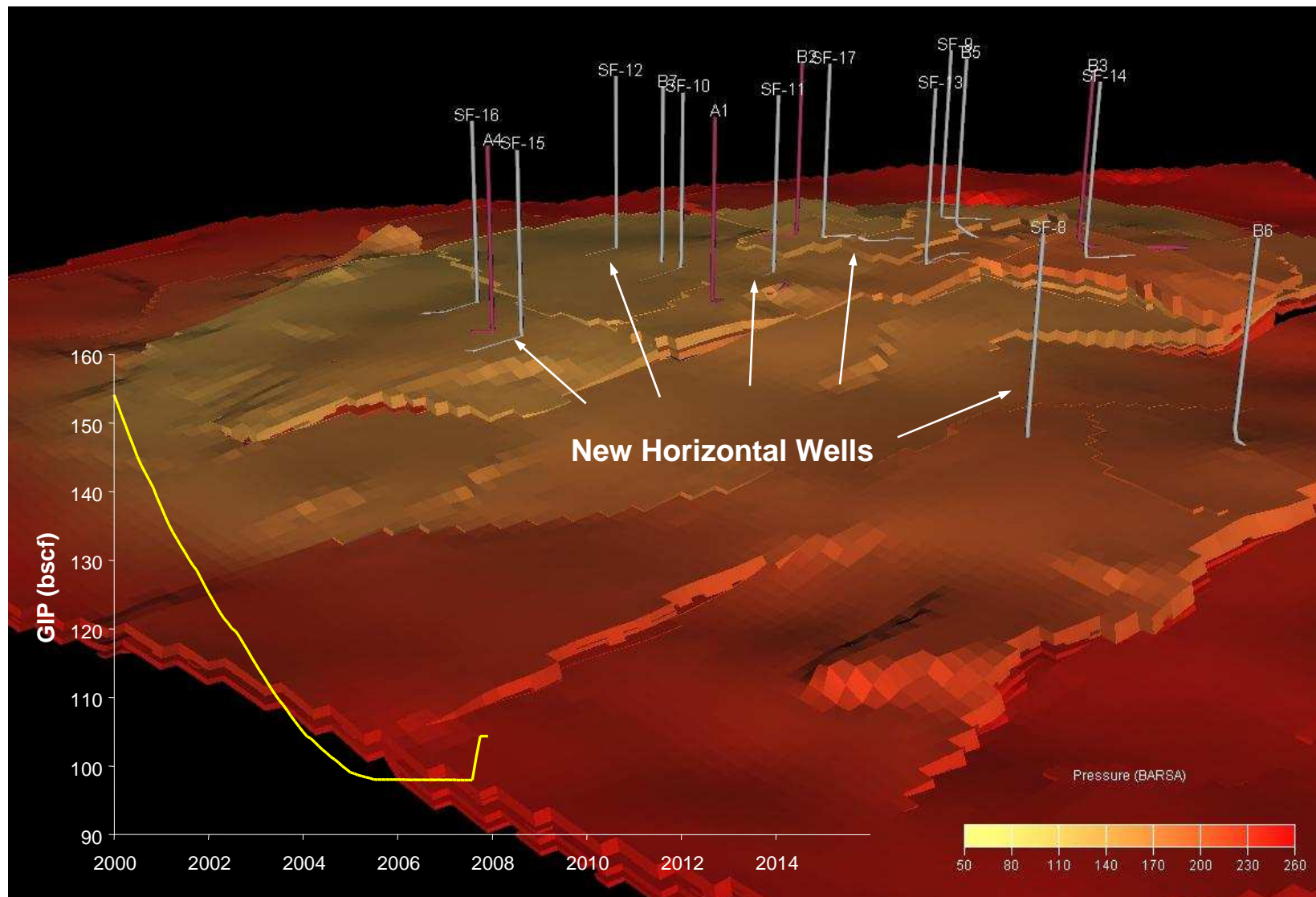
Saltfleetby Gas Storage Project

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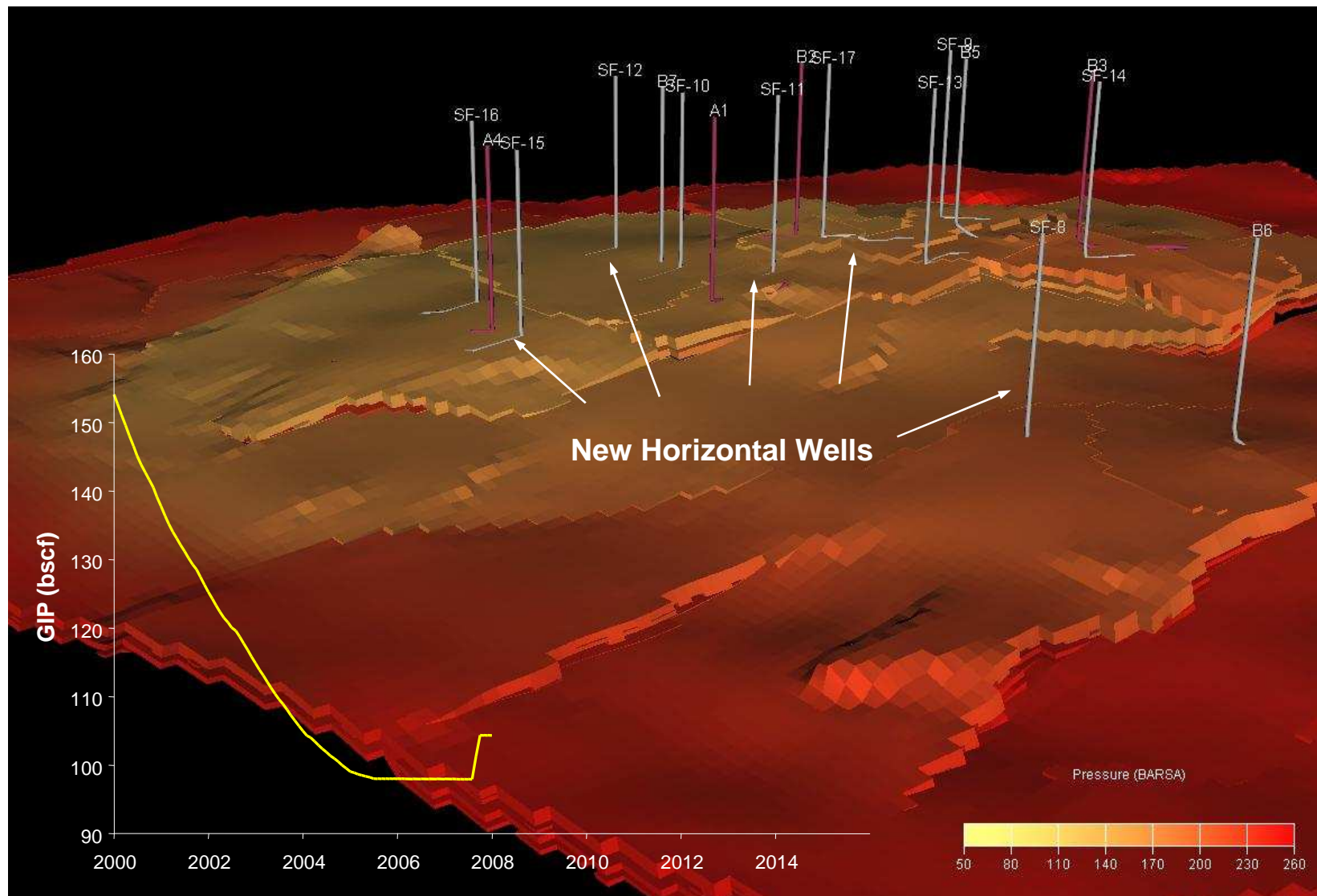
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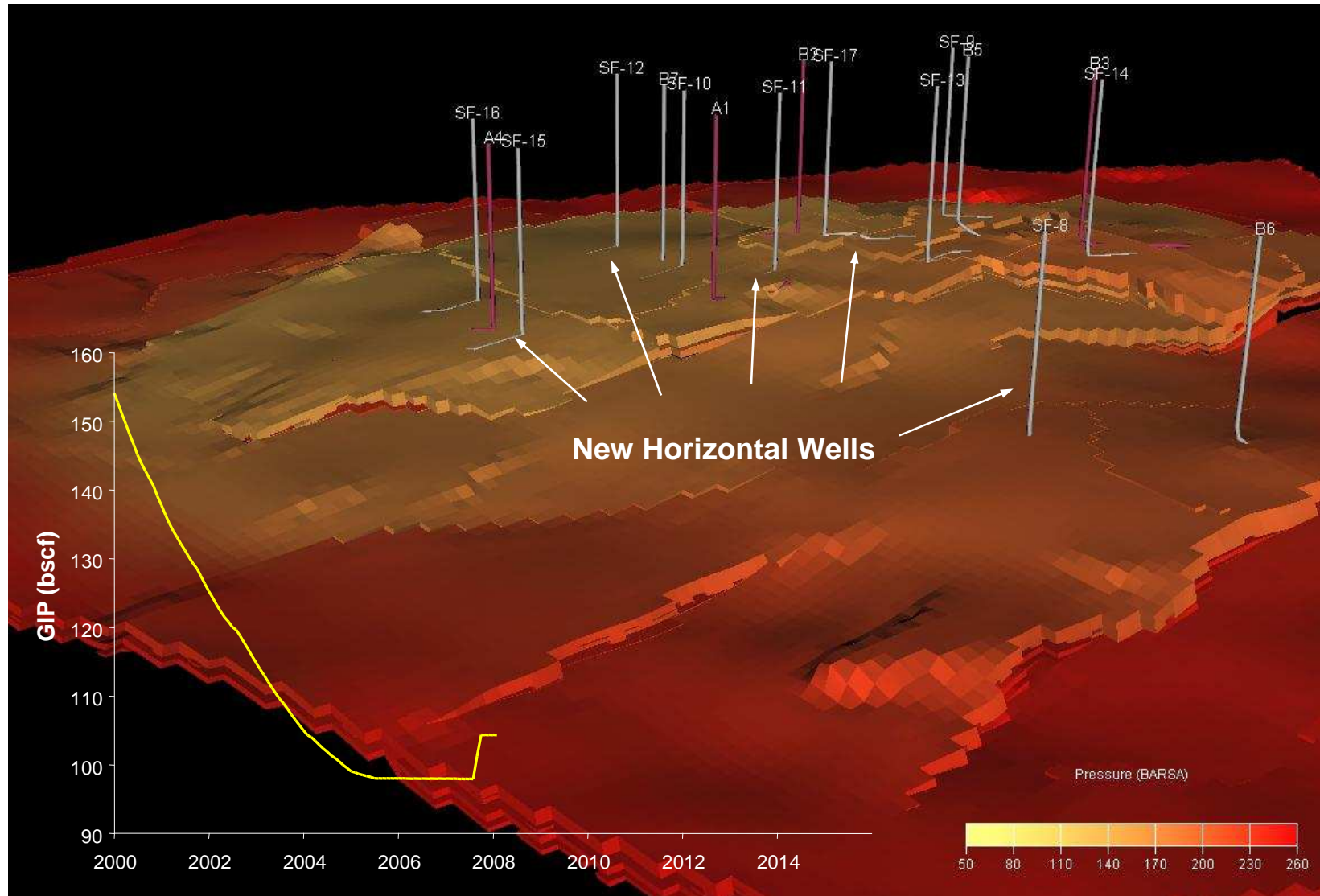
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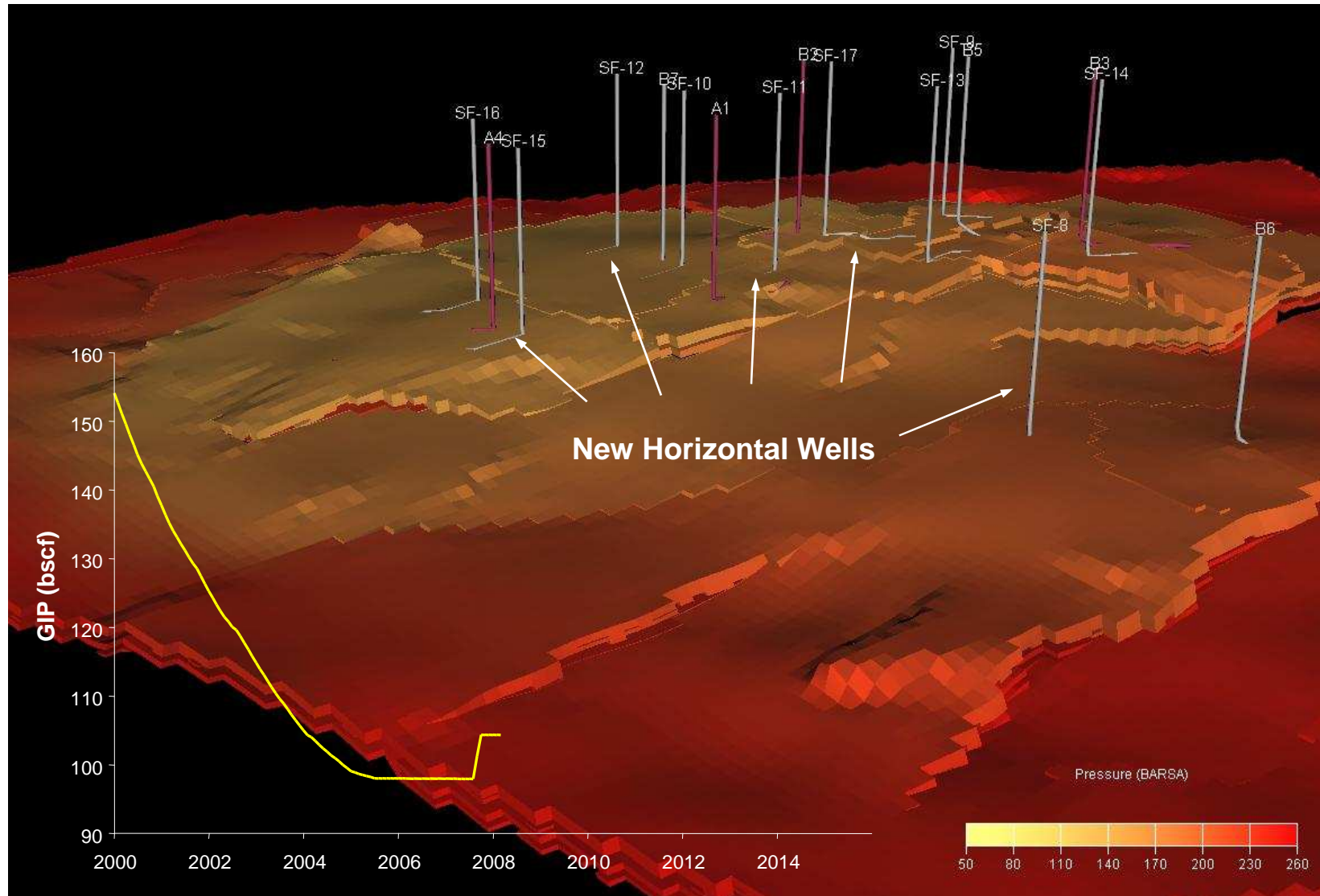
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



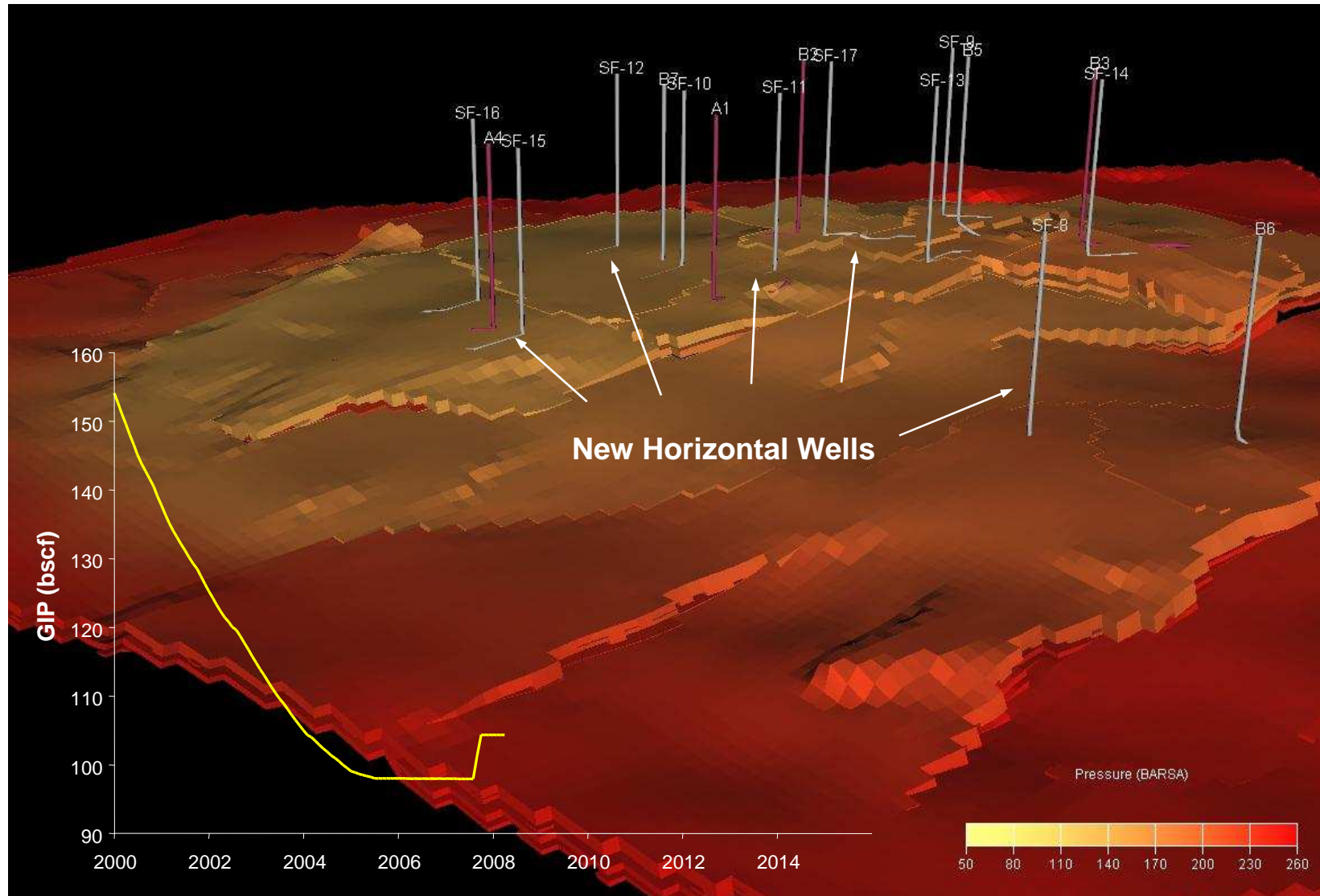
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



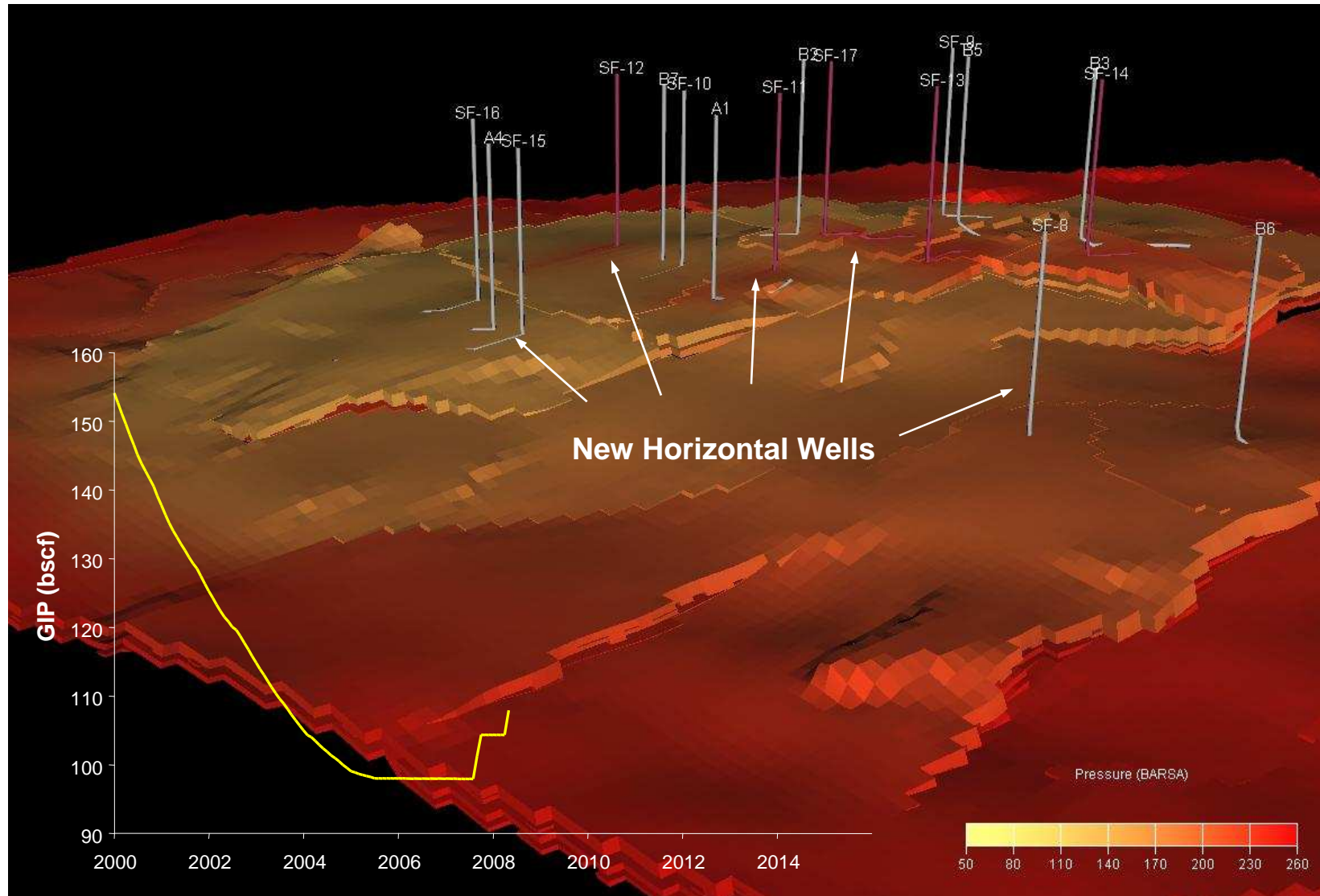
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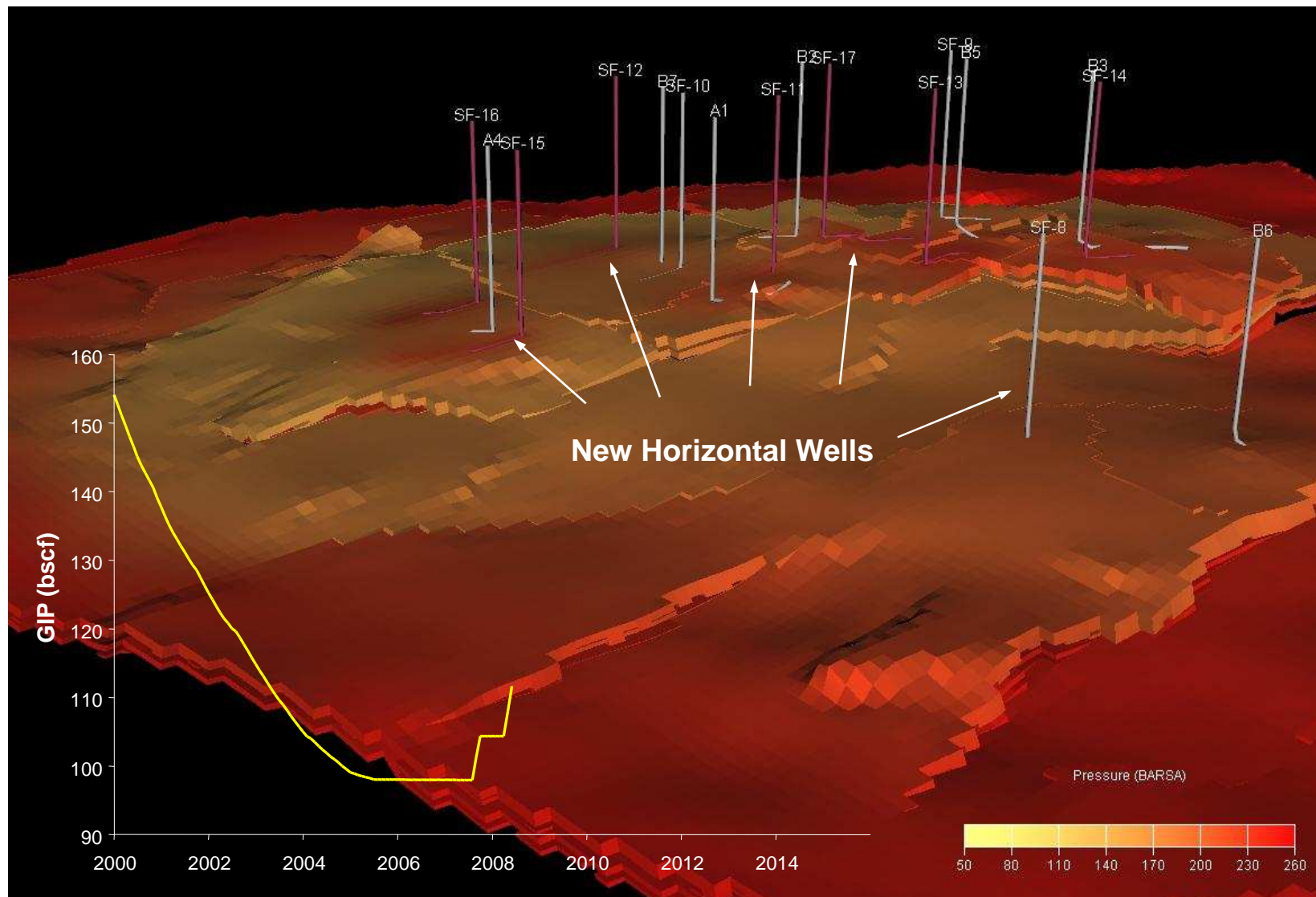
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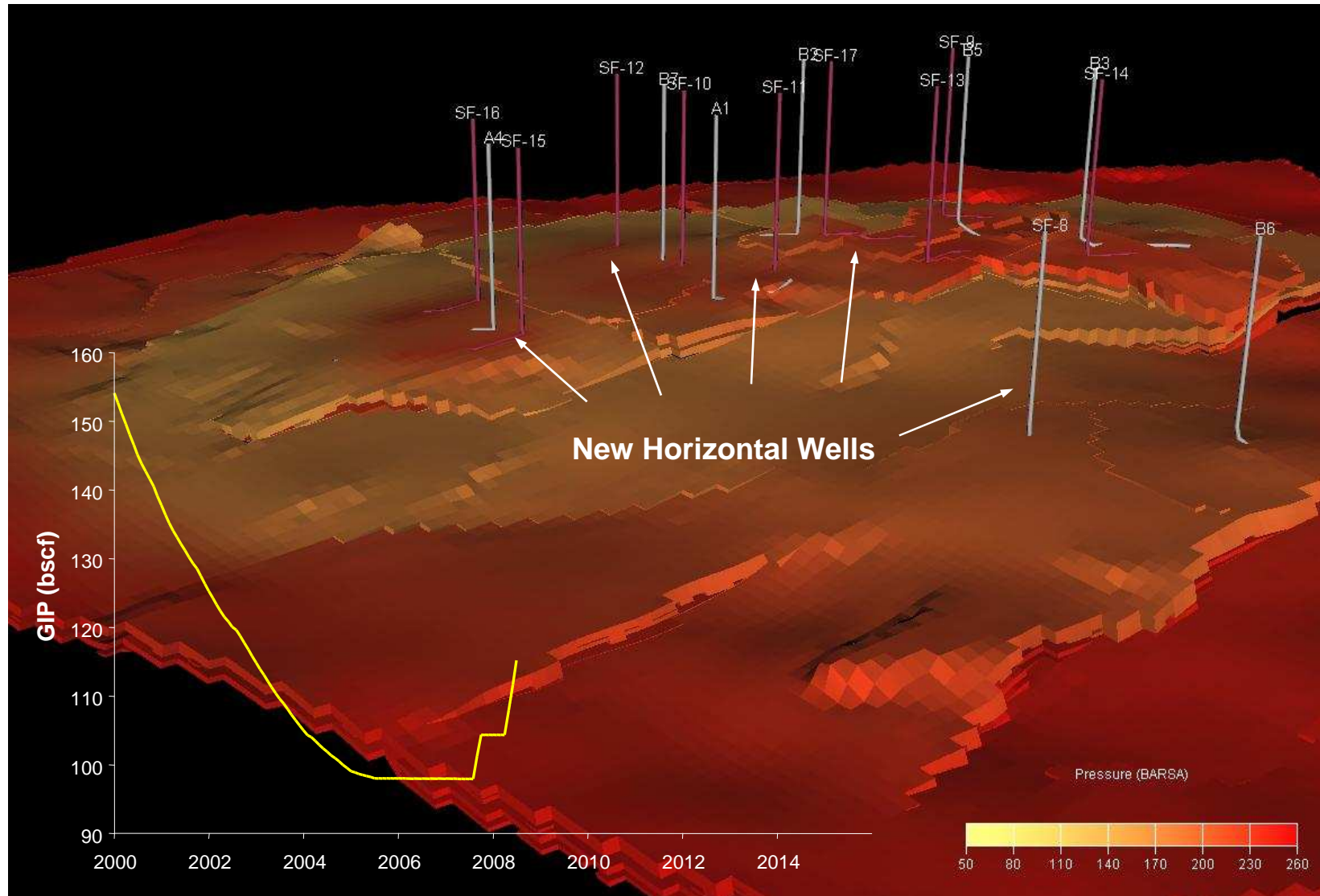
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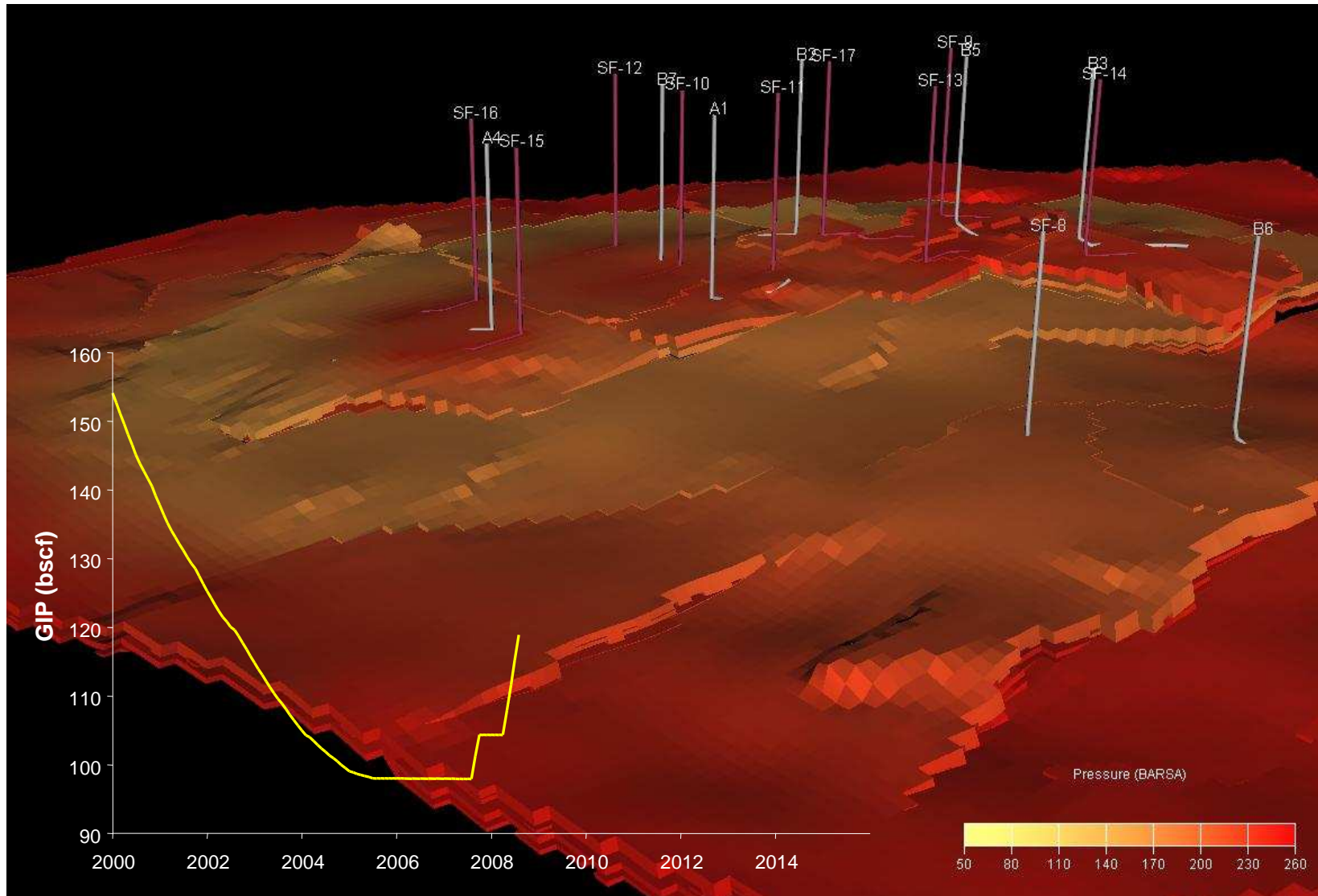
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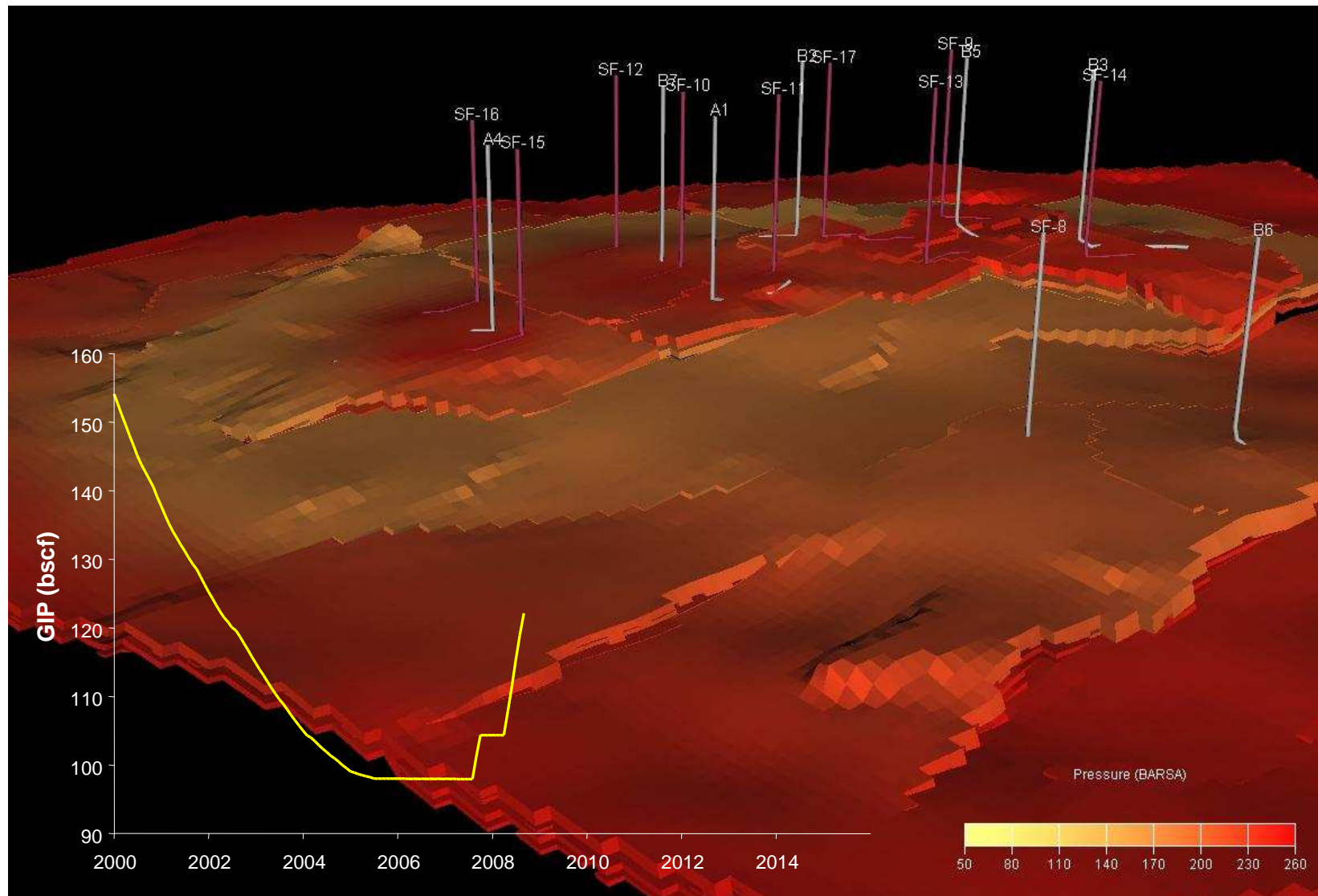
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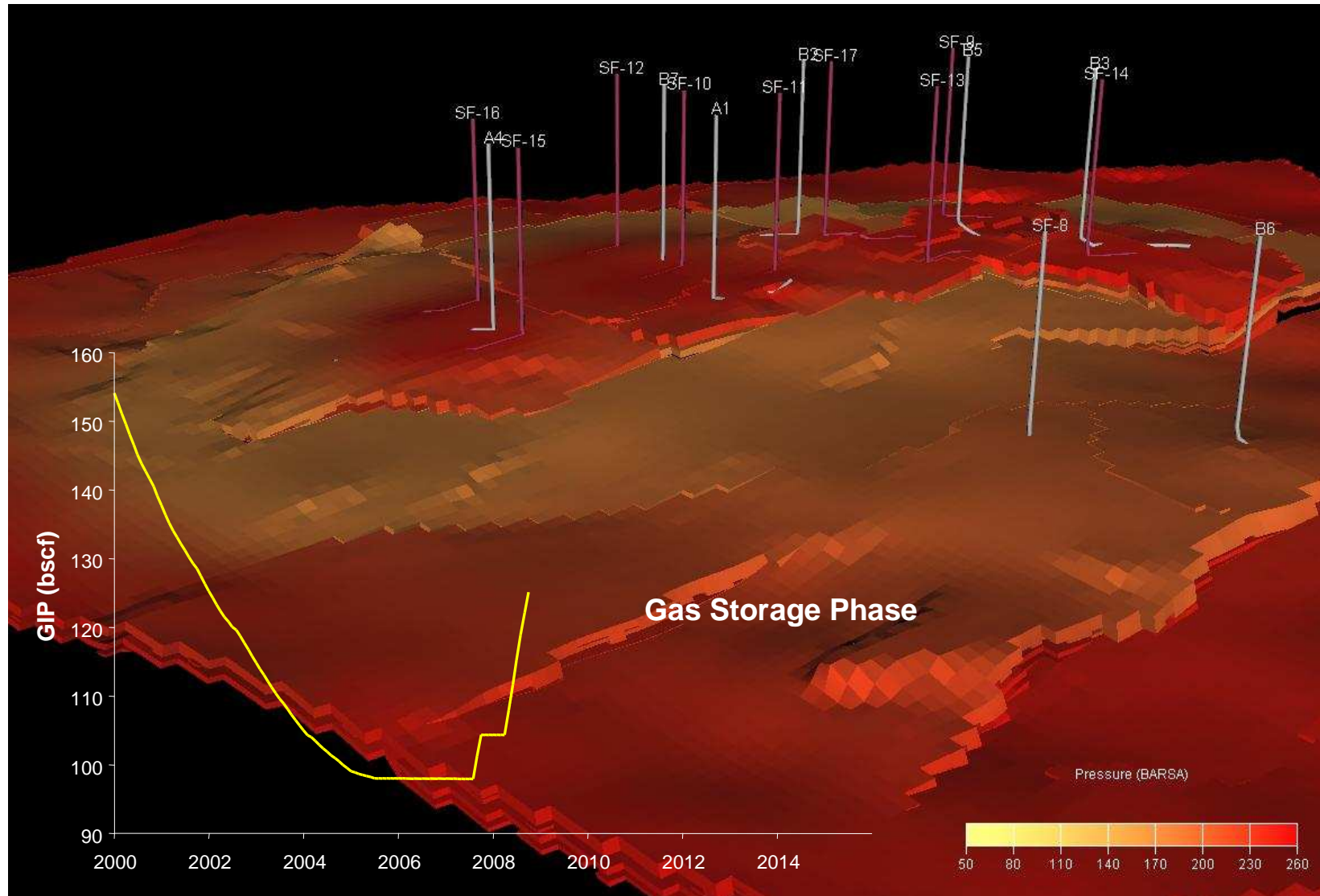
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Dynamic Reservoir Simulation



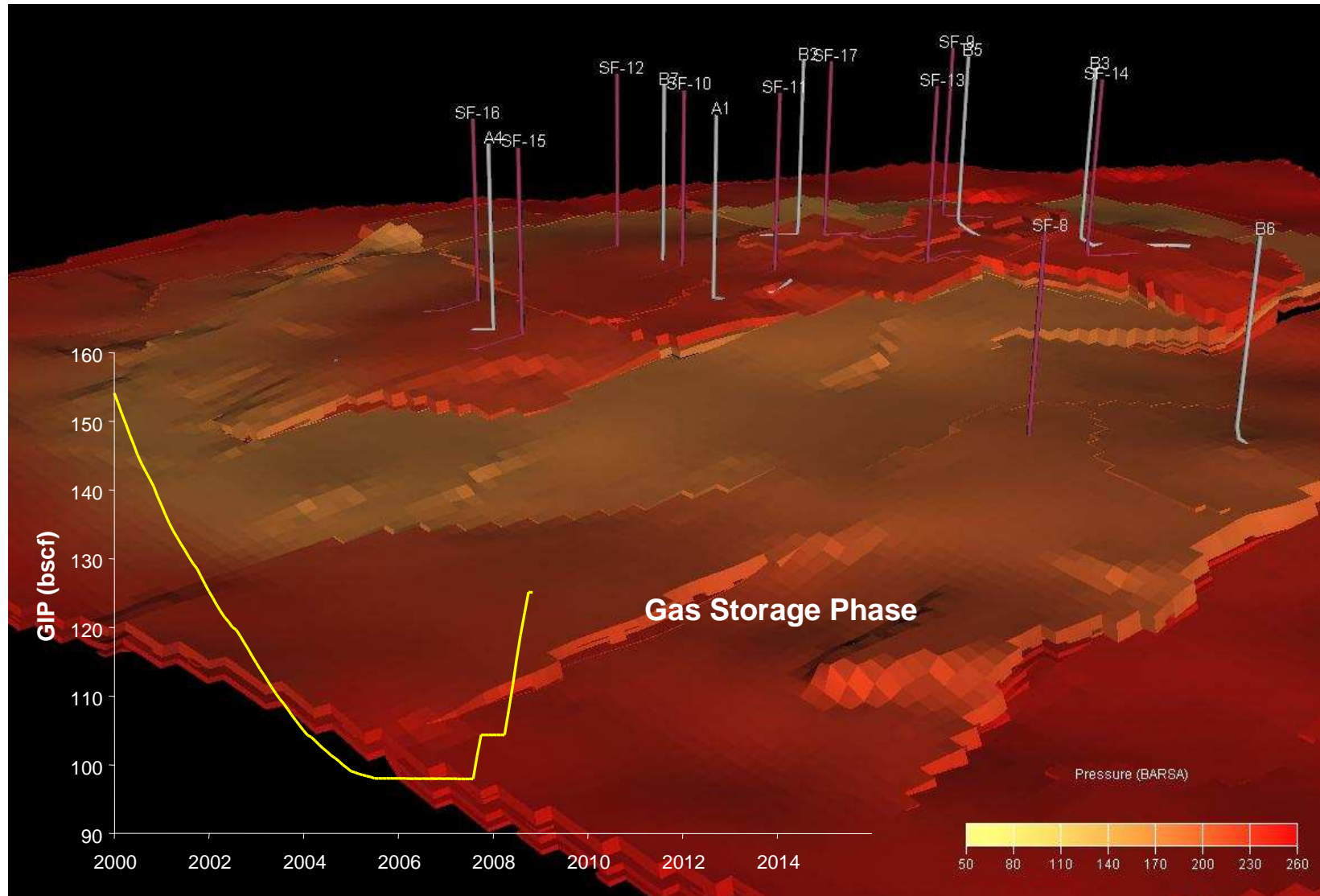
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Dynamic Reservoir Simulation



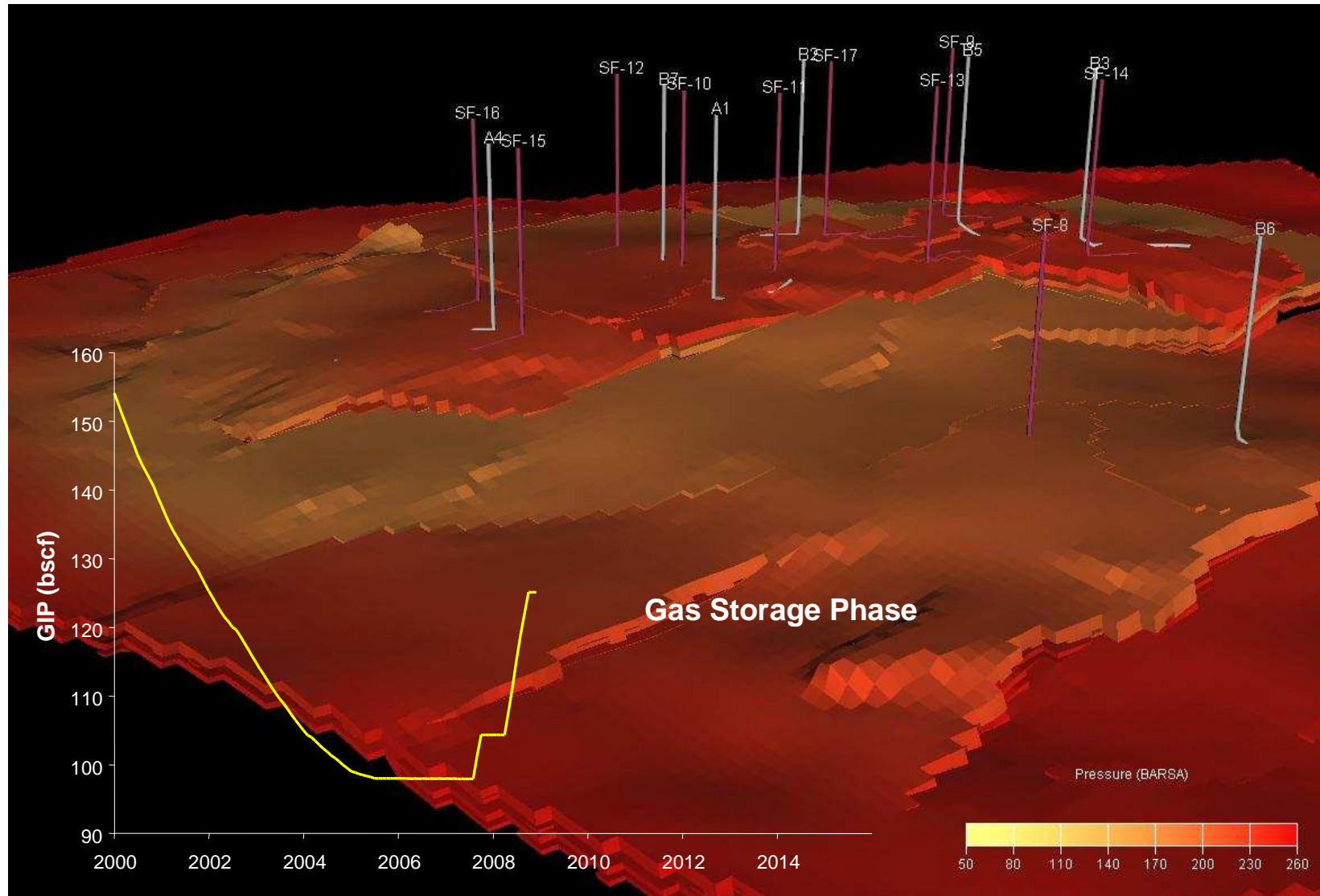
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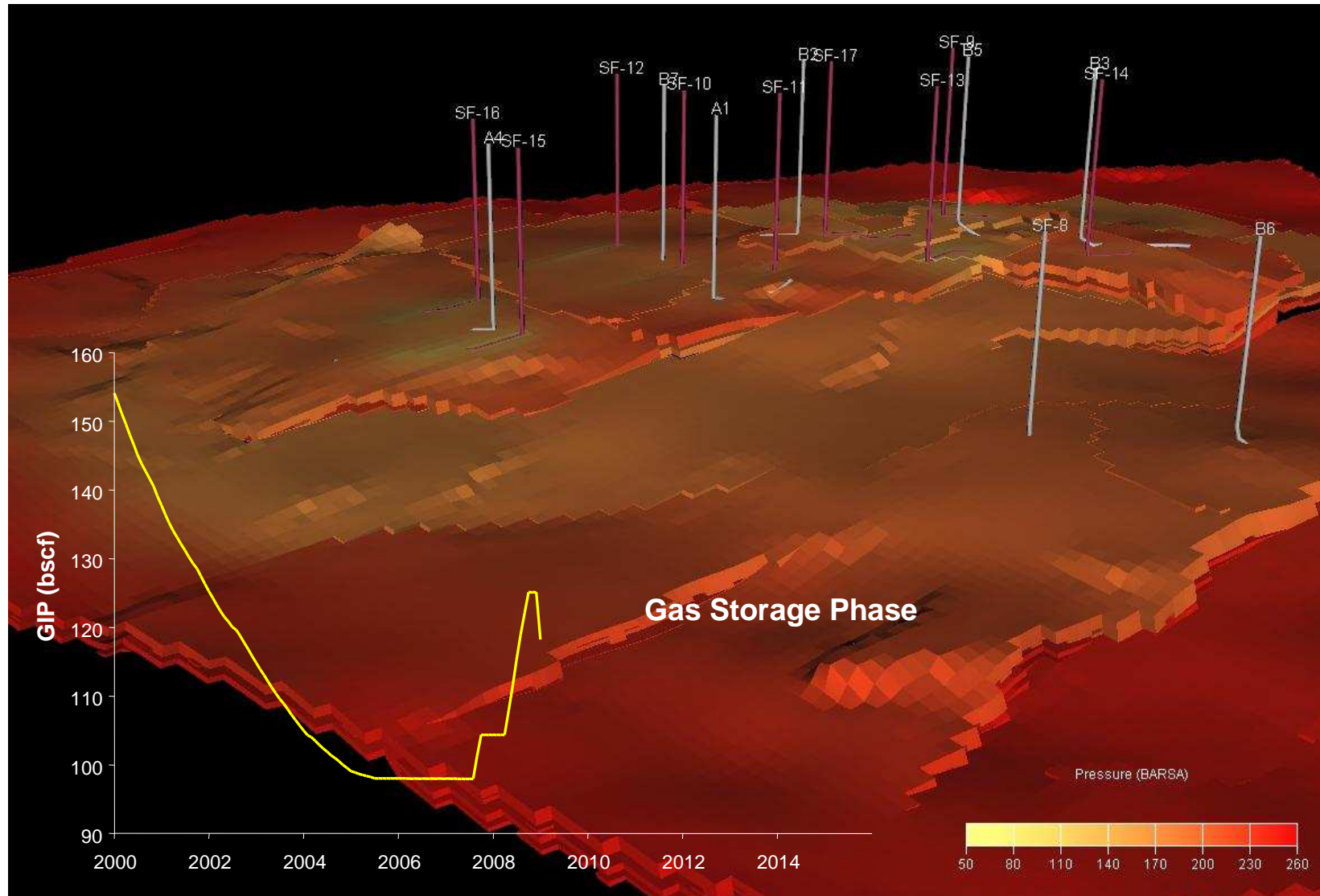
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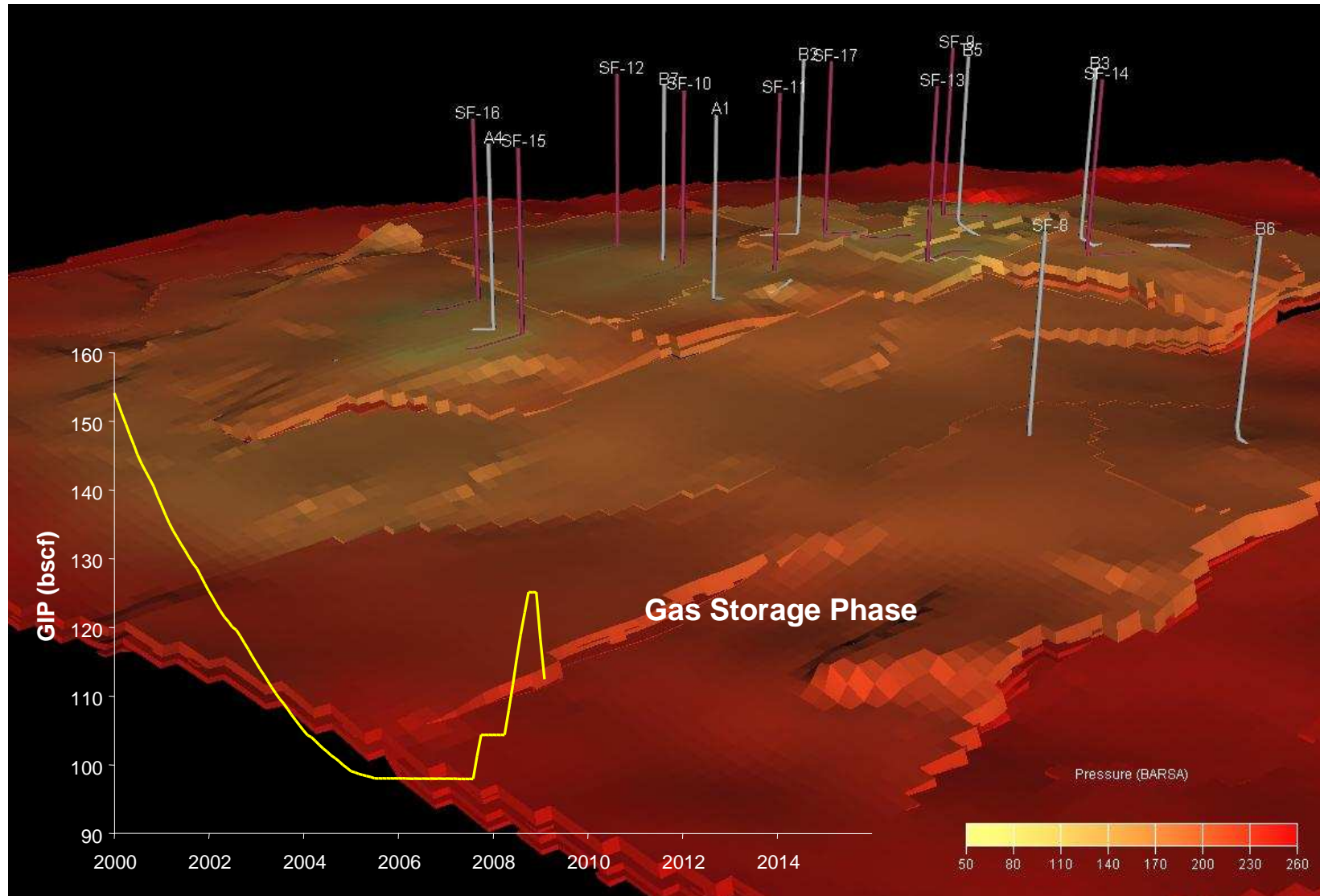
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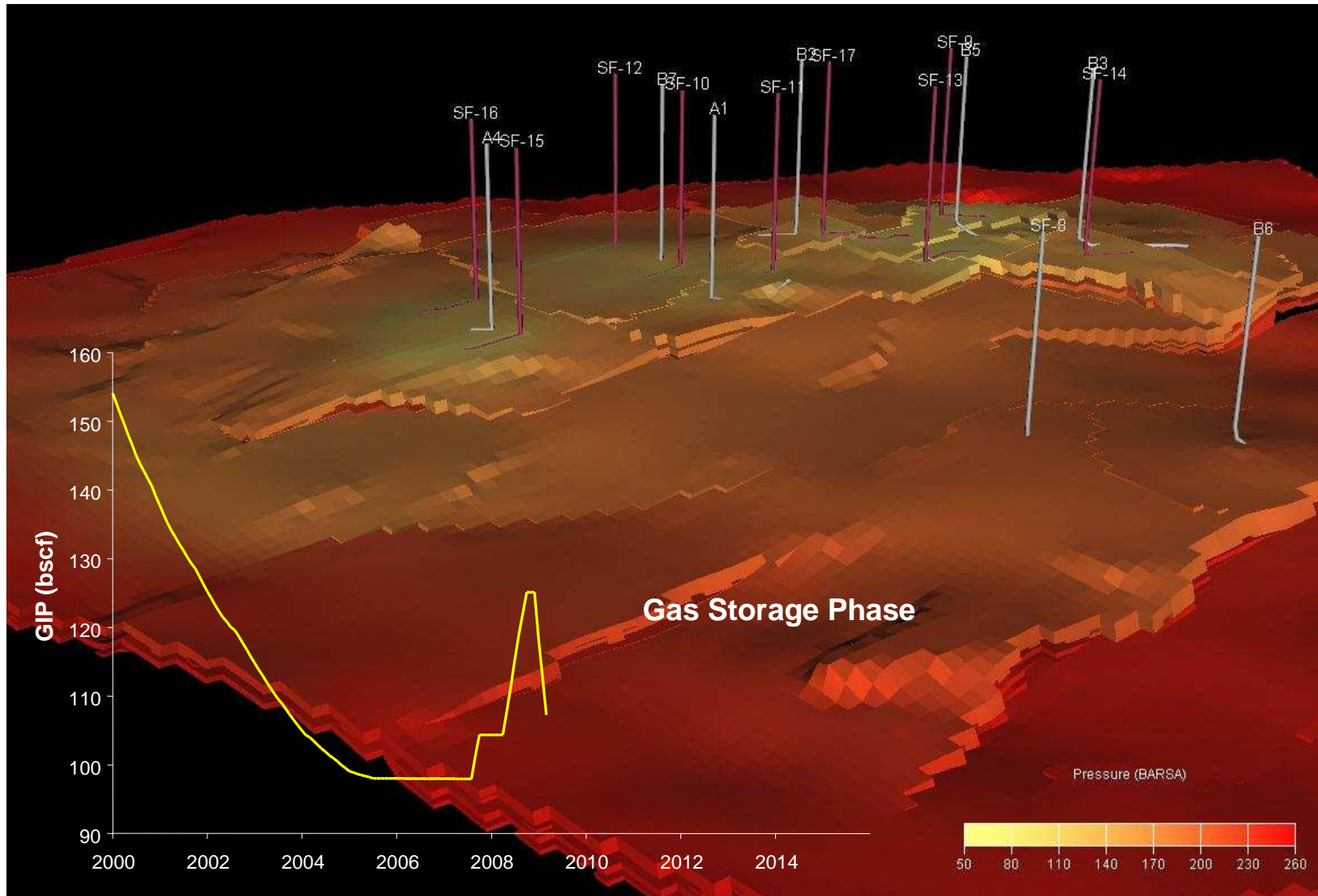
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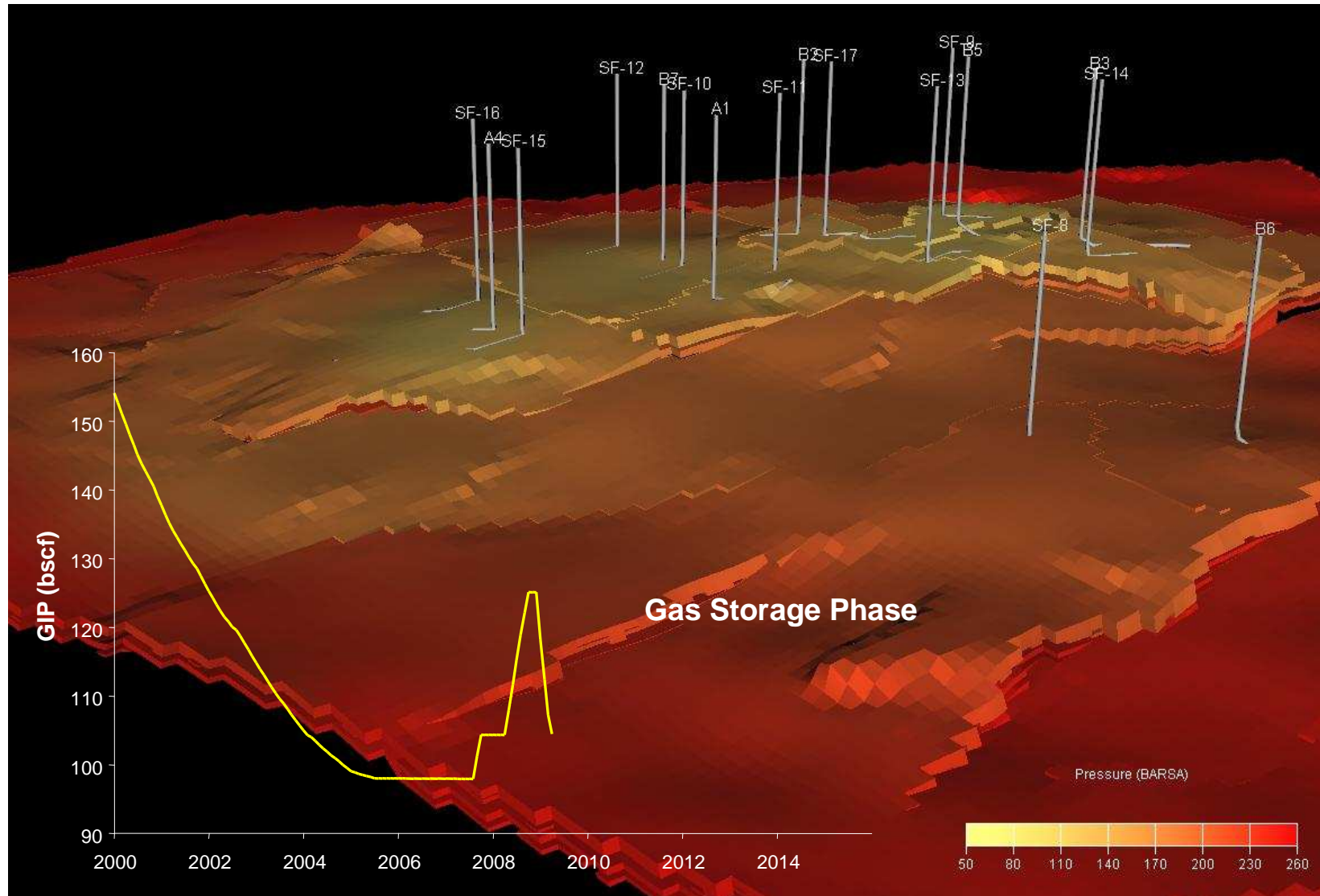
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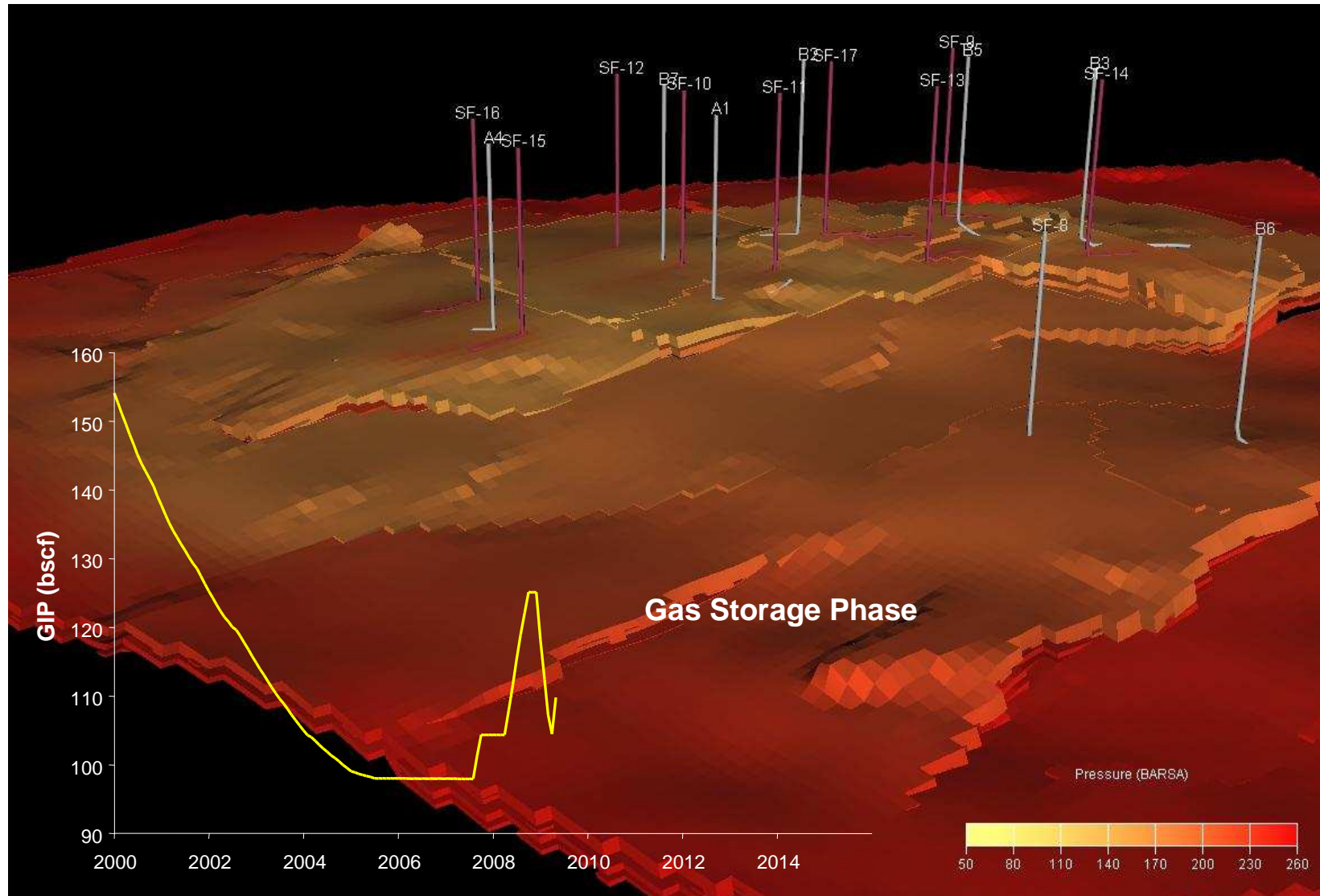
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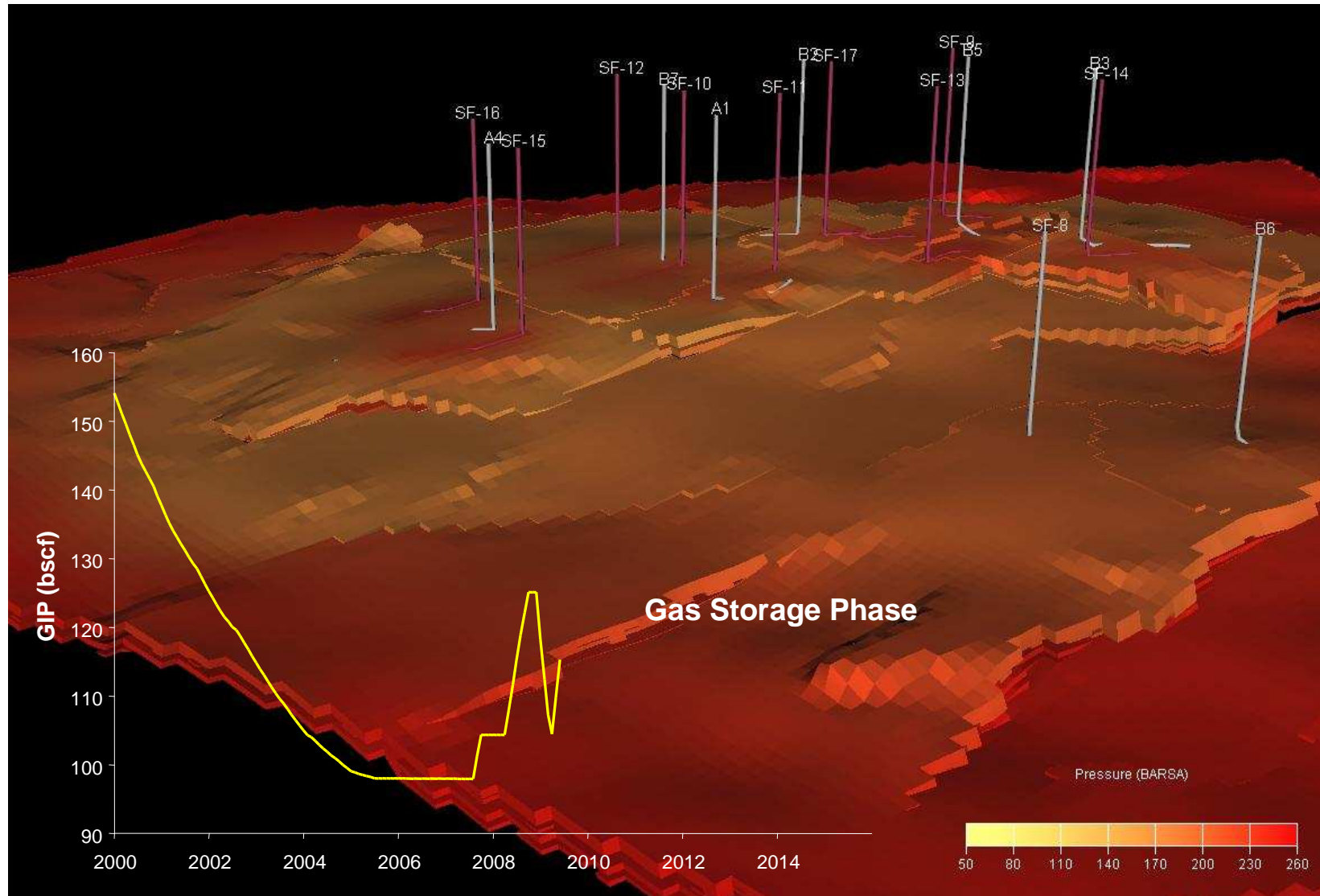
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Dynamic Reservoir Simulation



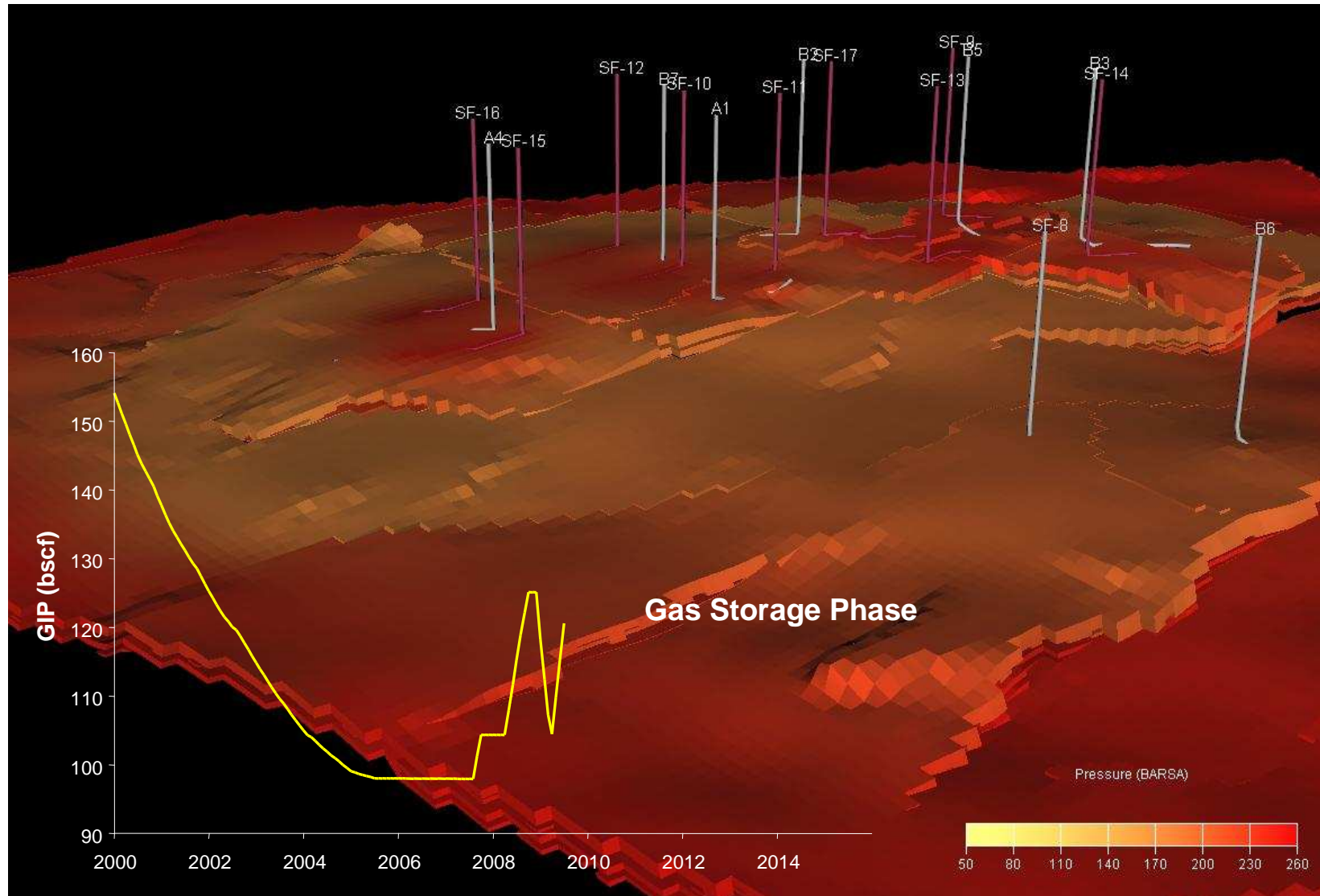
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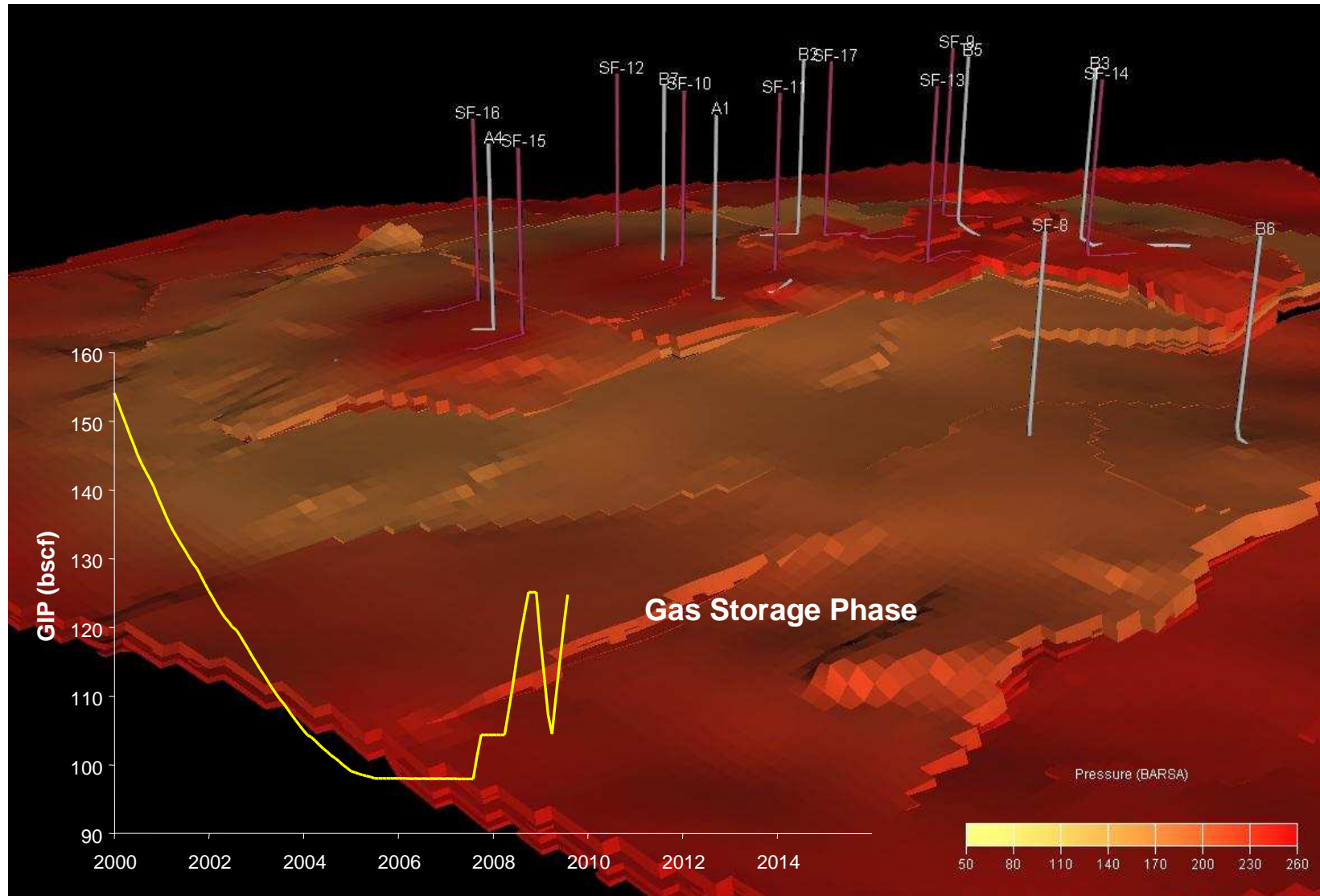
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Dynamic Reservoir Simulation



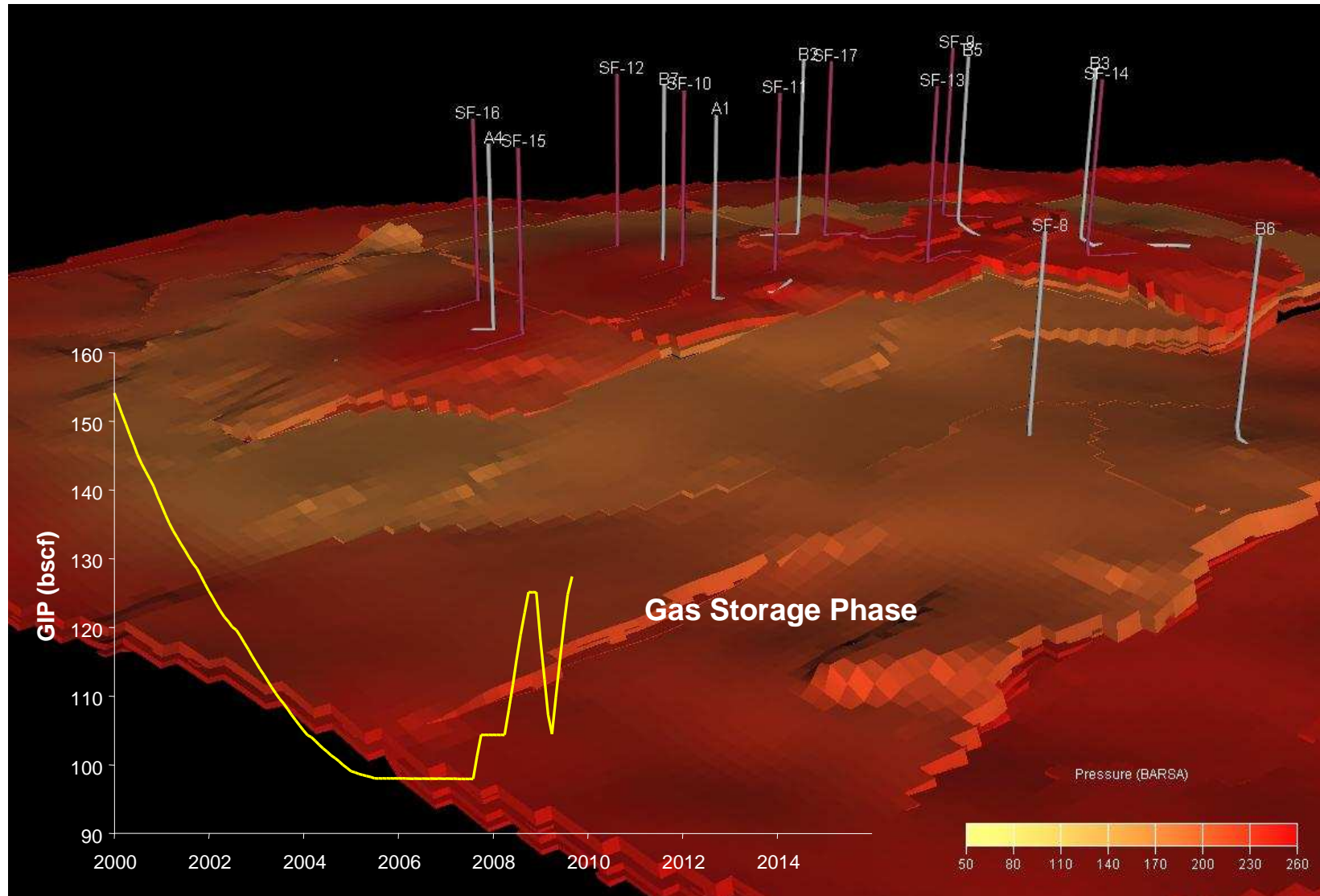
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Dynamic Reservoir Simulation



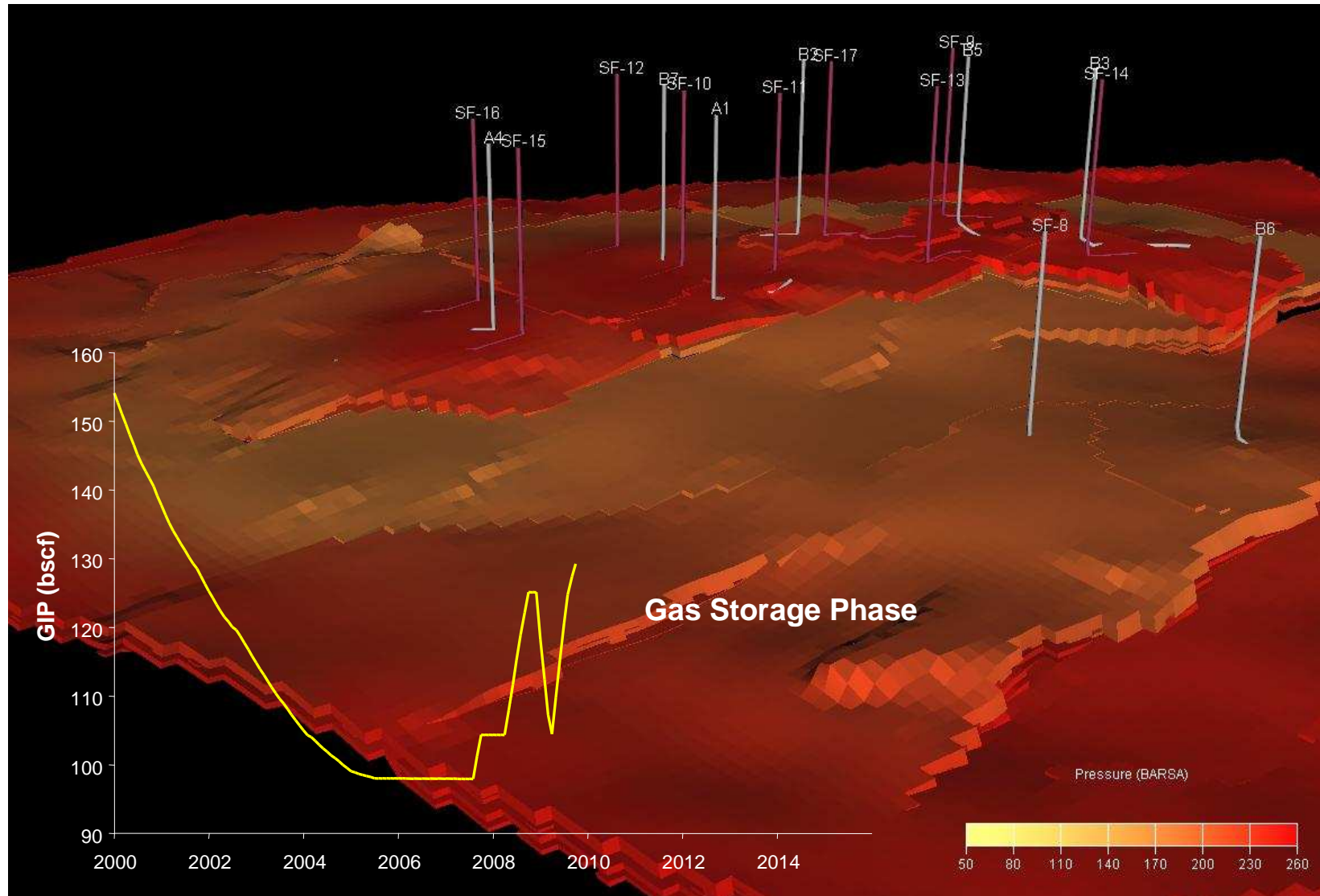
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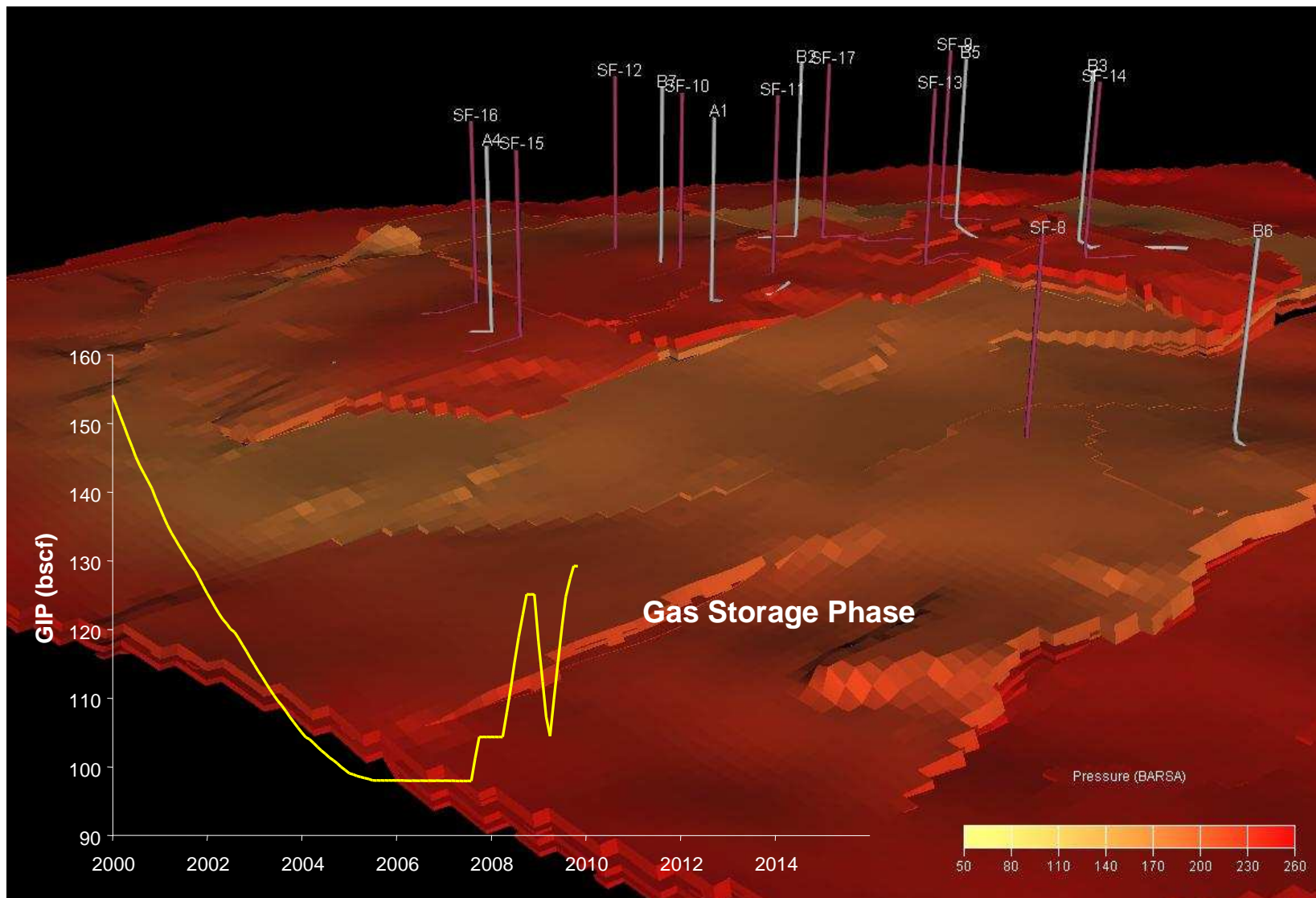
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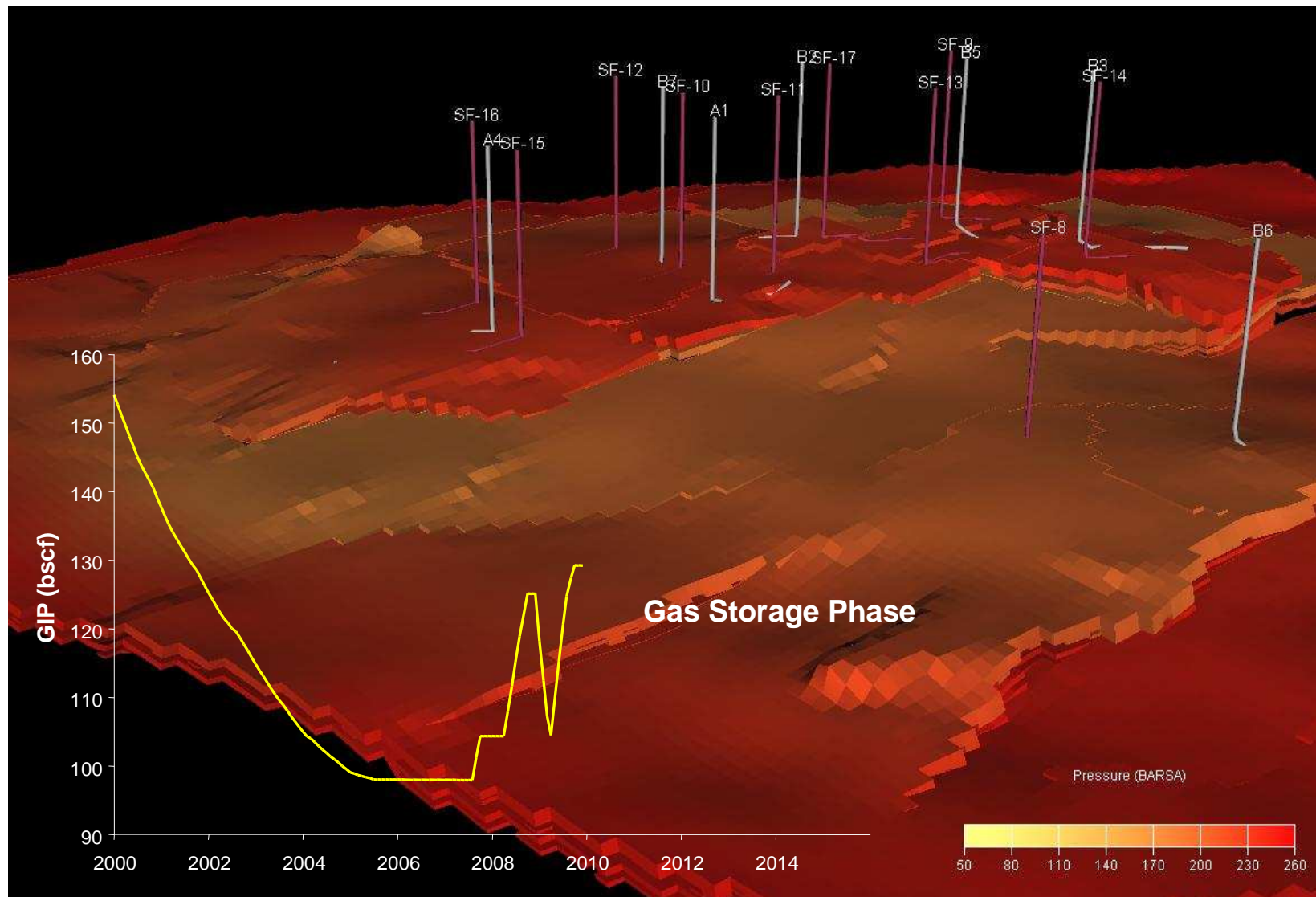
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Dynamic Reservoir Simulation



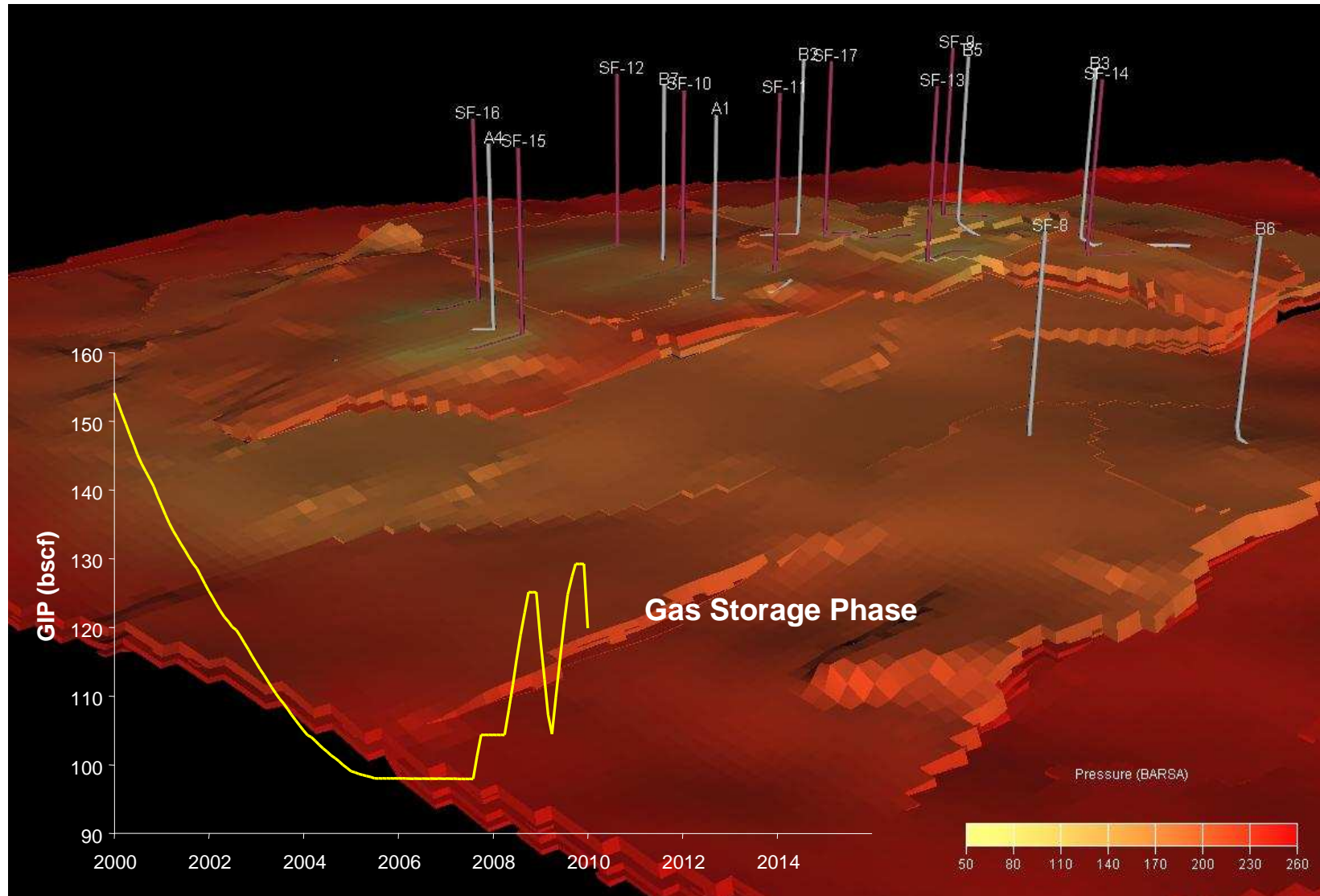
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



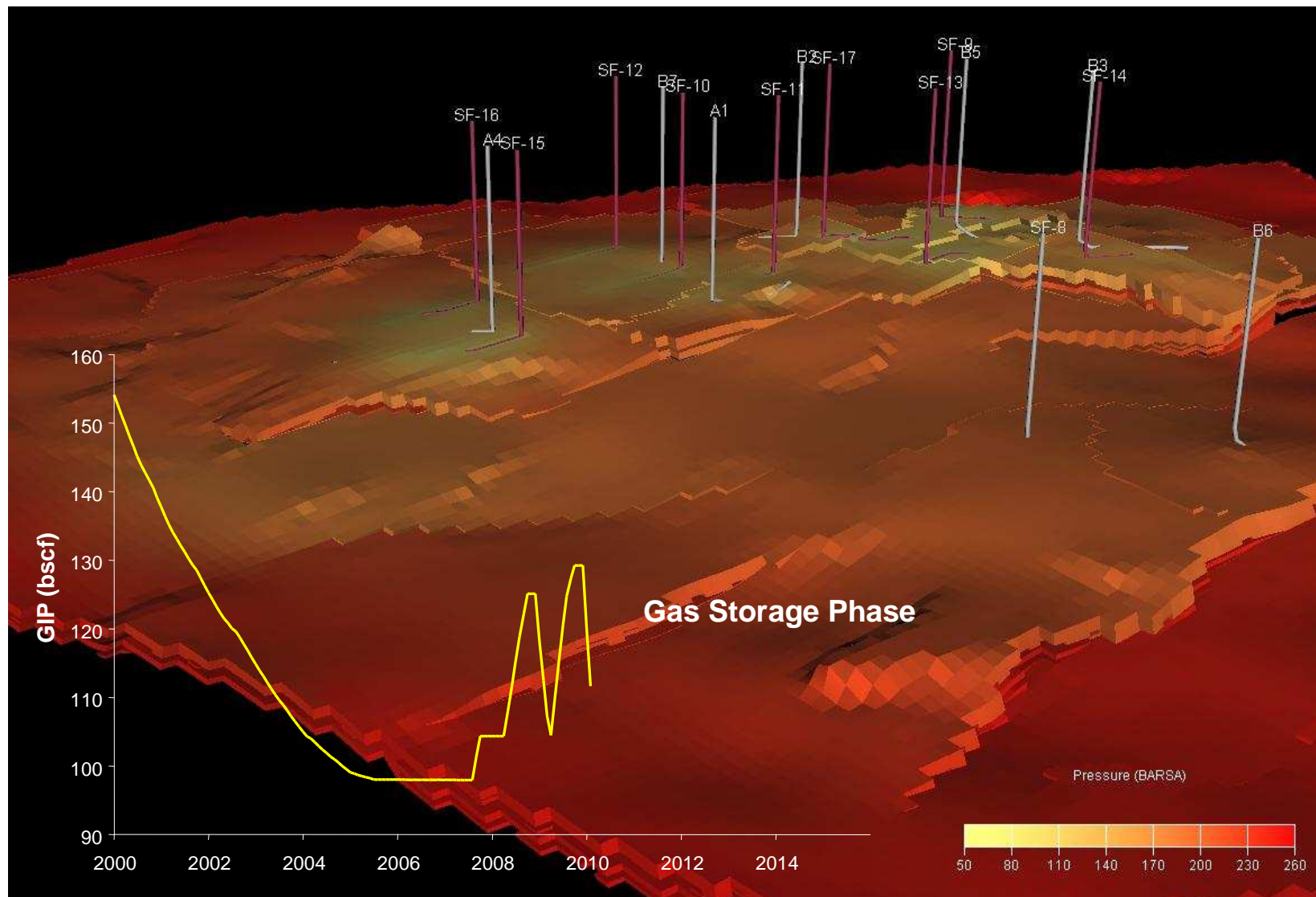
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



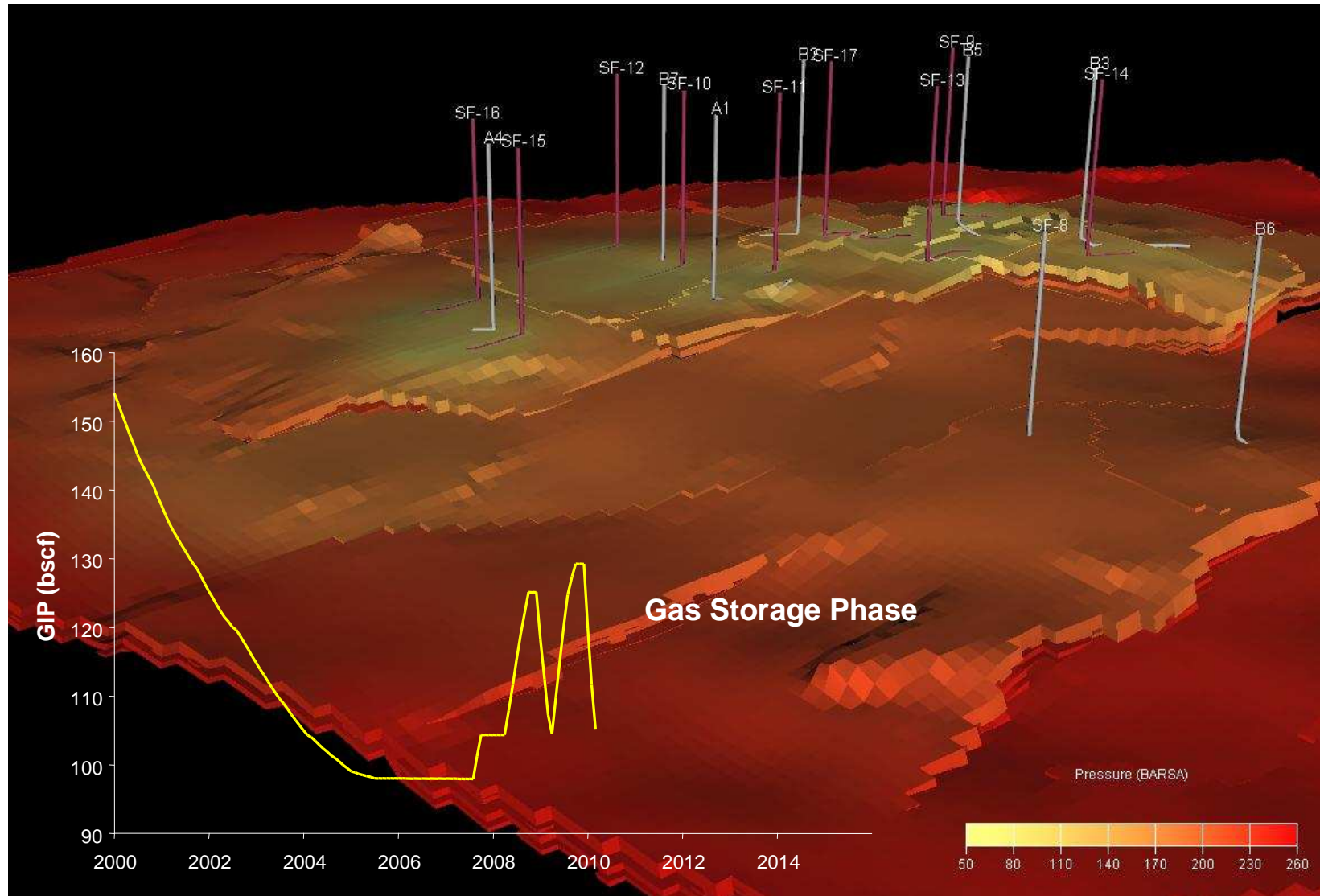
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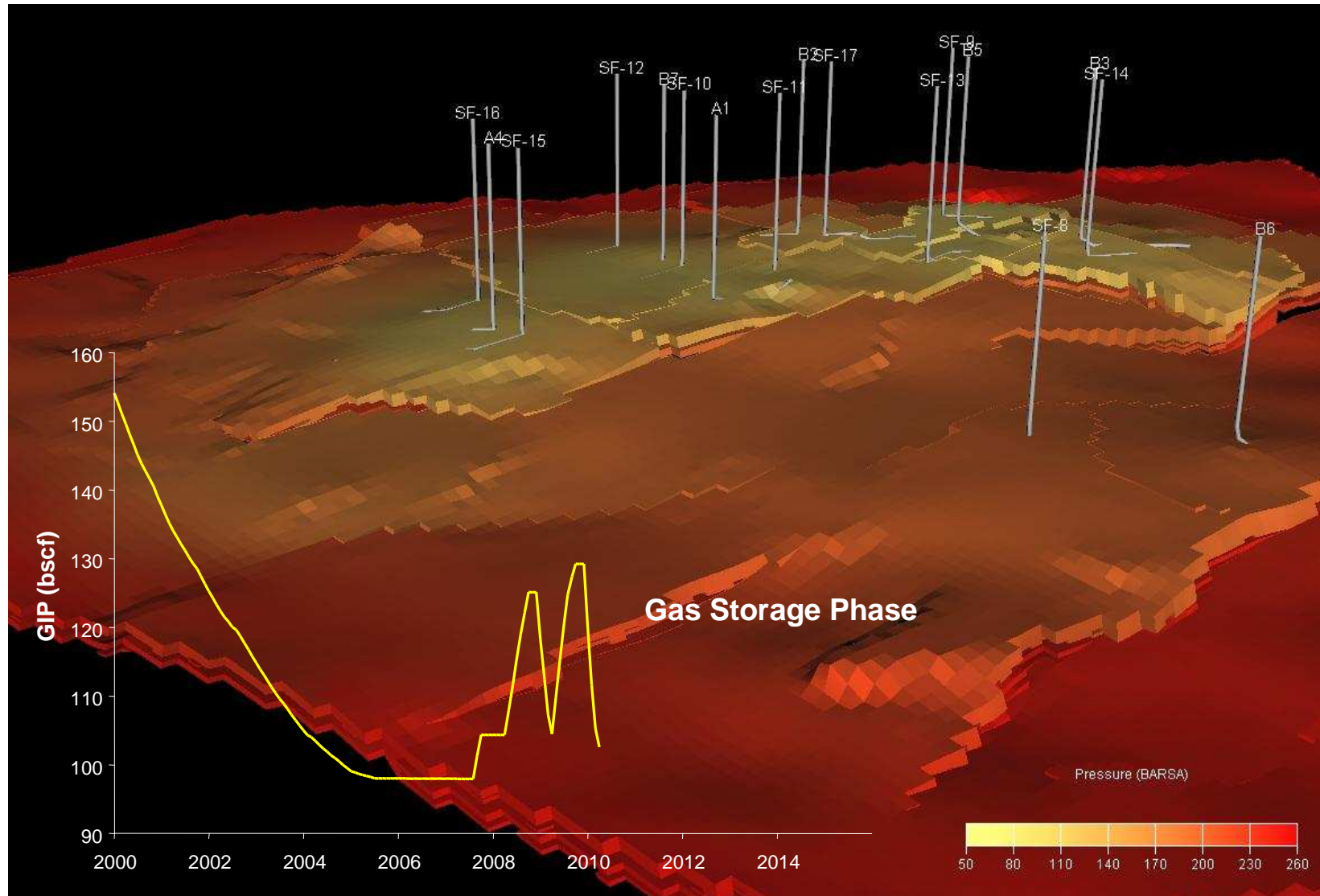
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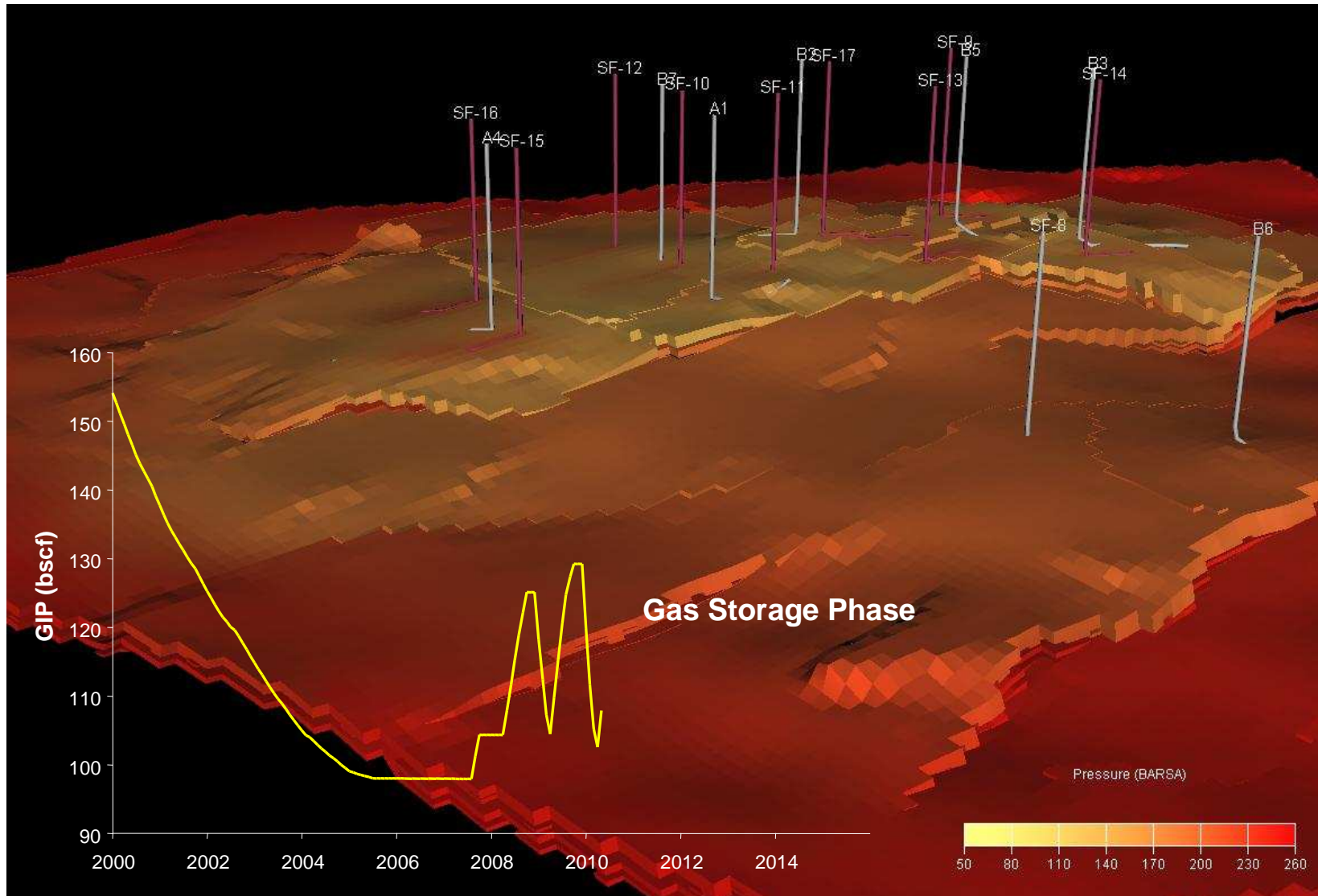
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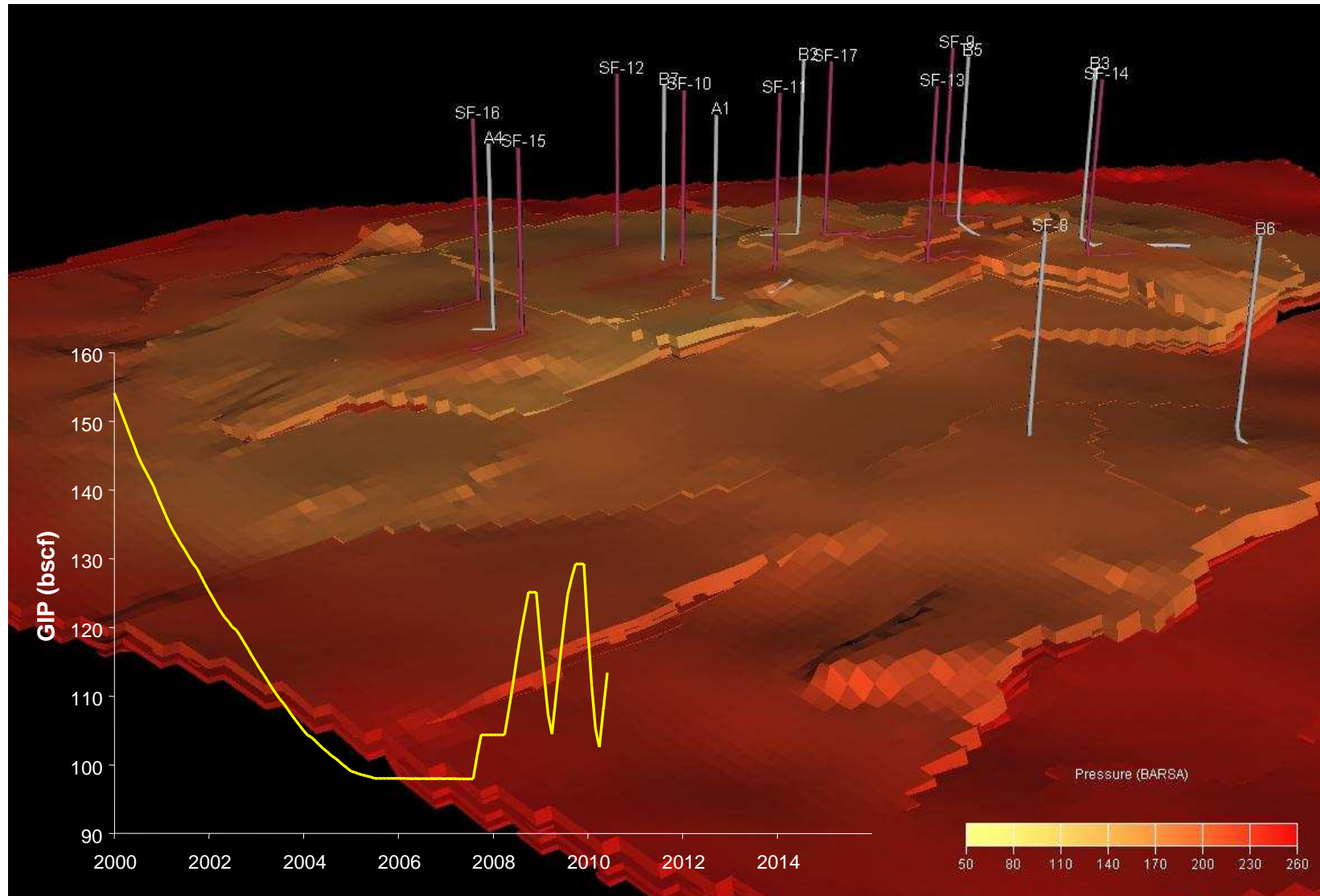
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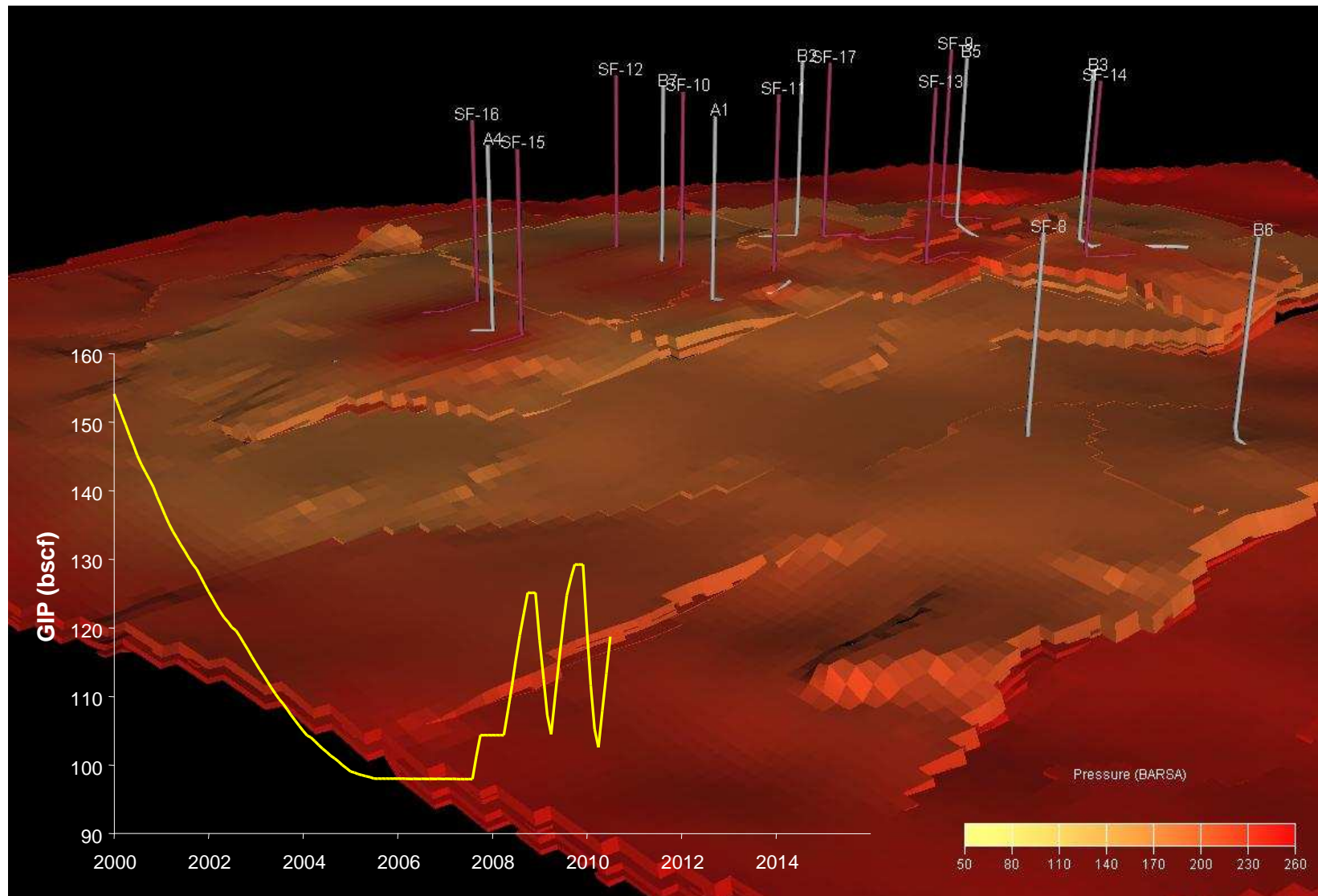
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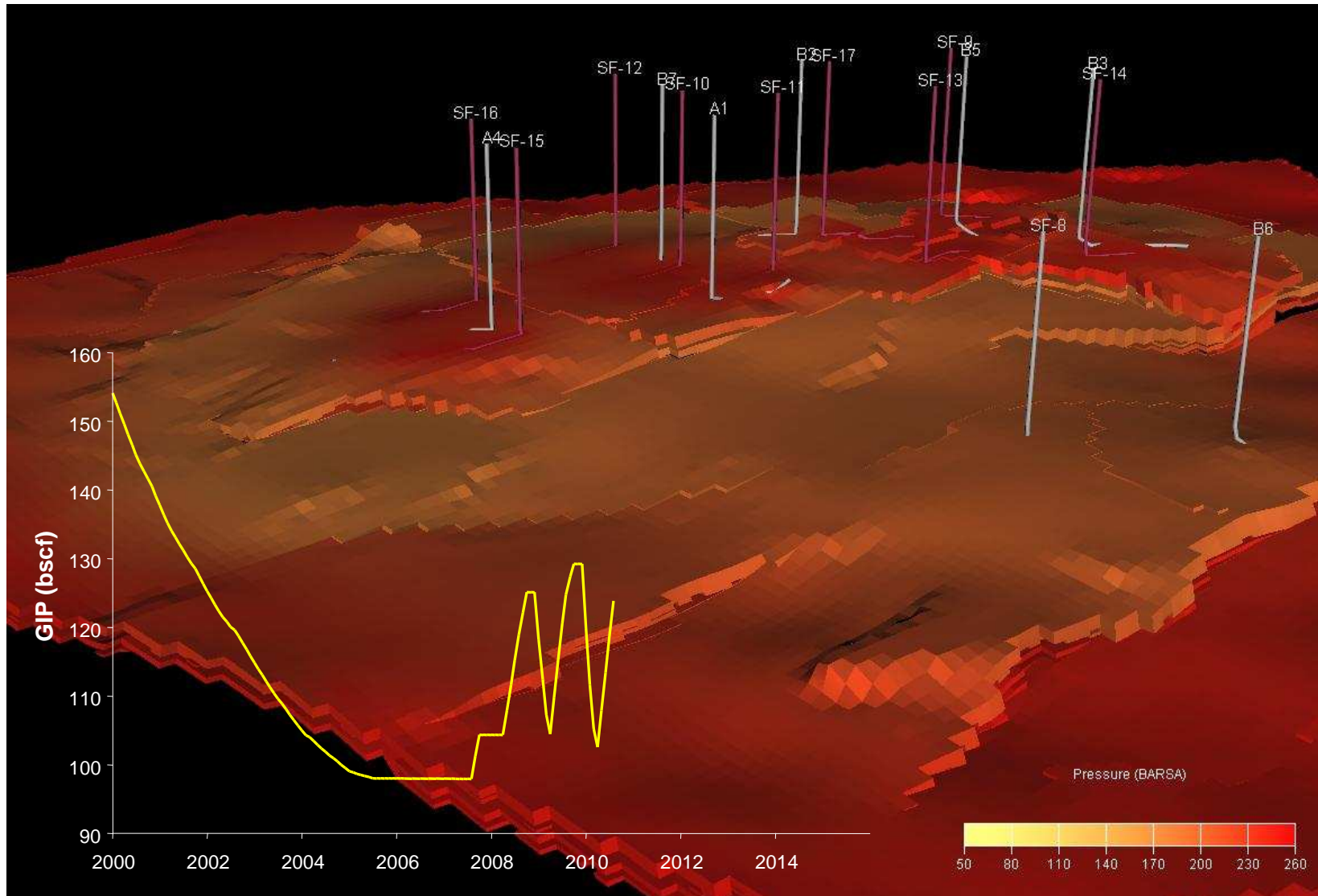
Saltfleetby Gas Storage Project

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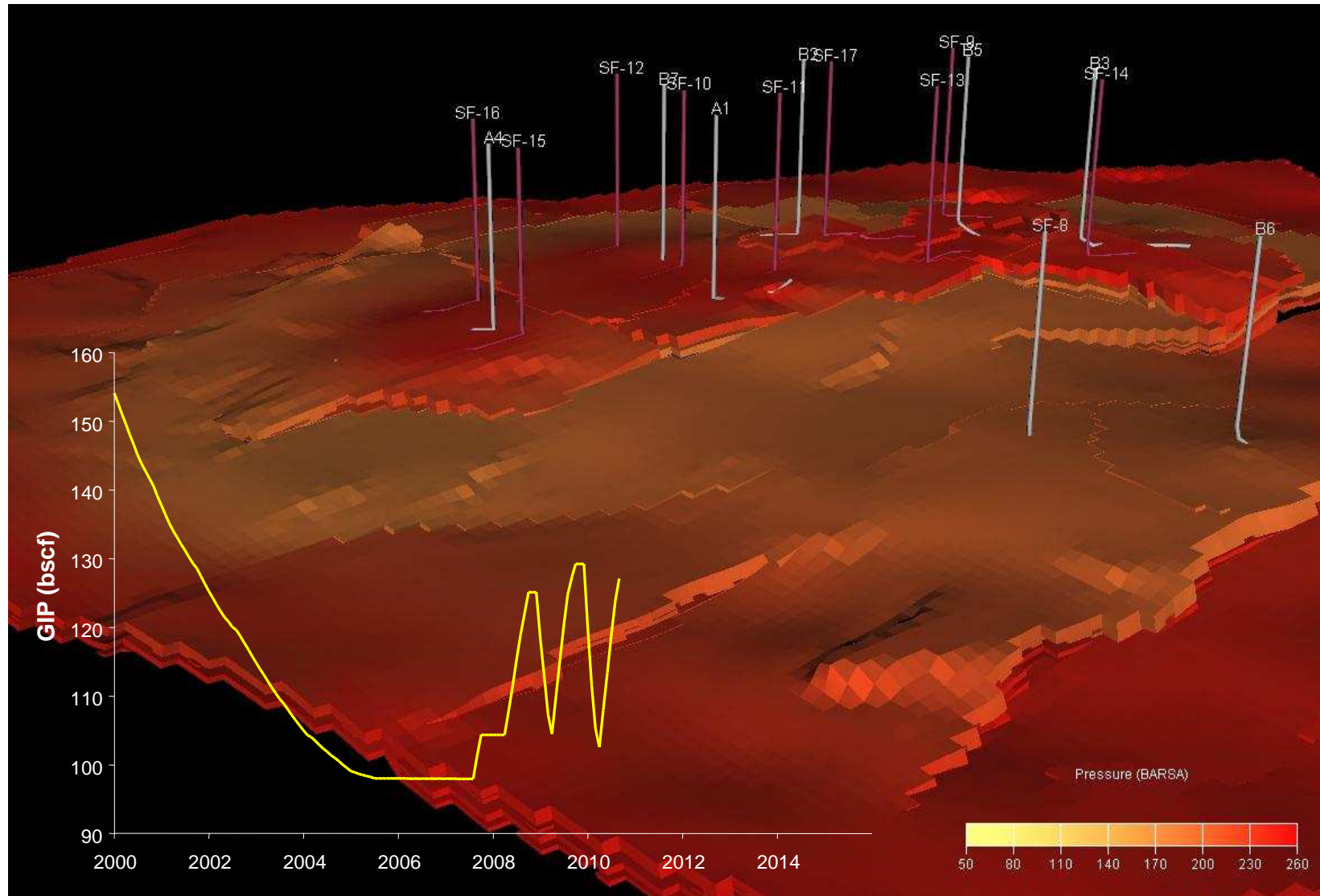
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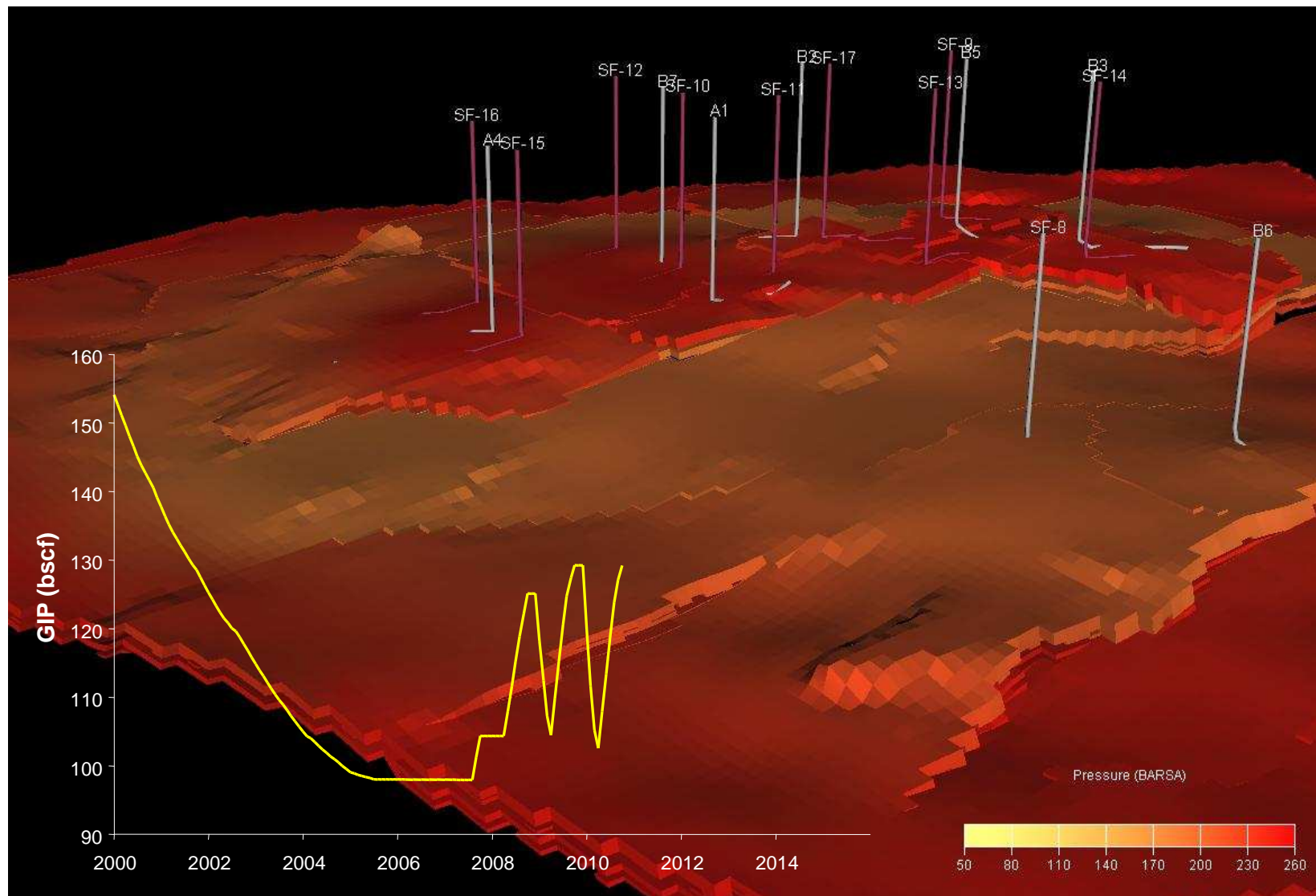
Saltfleetby Gas Storage Project

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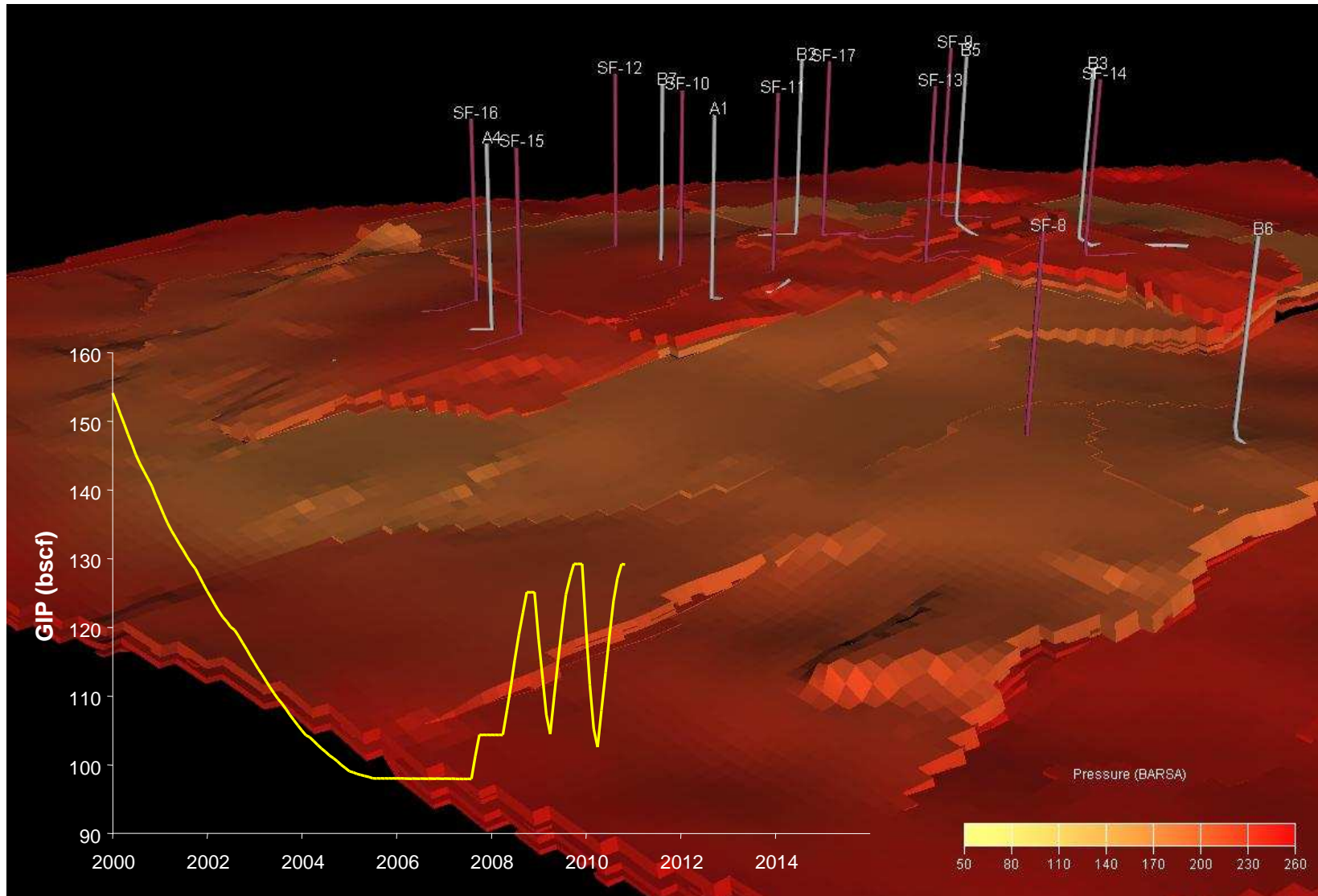
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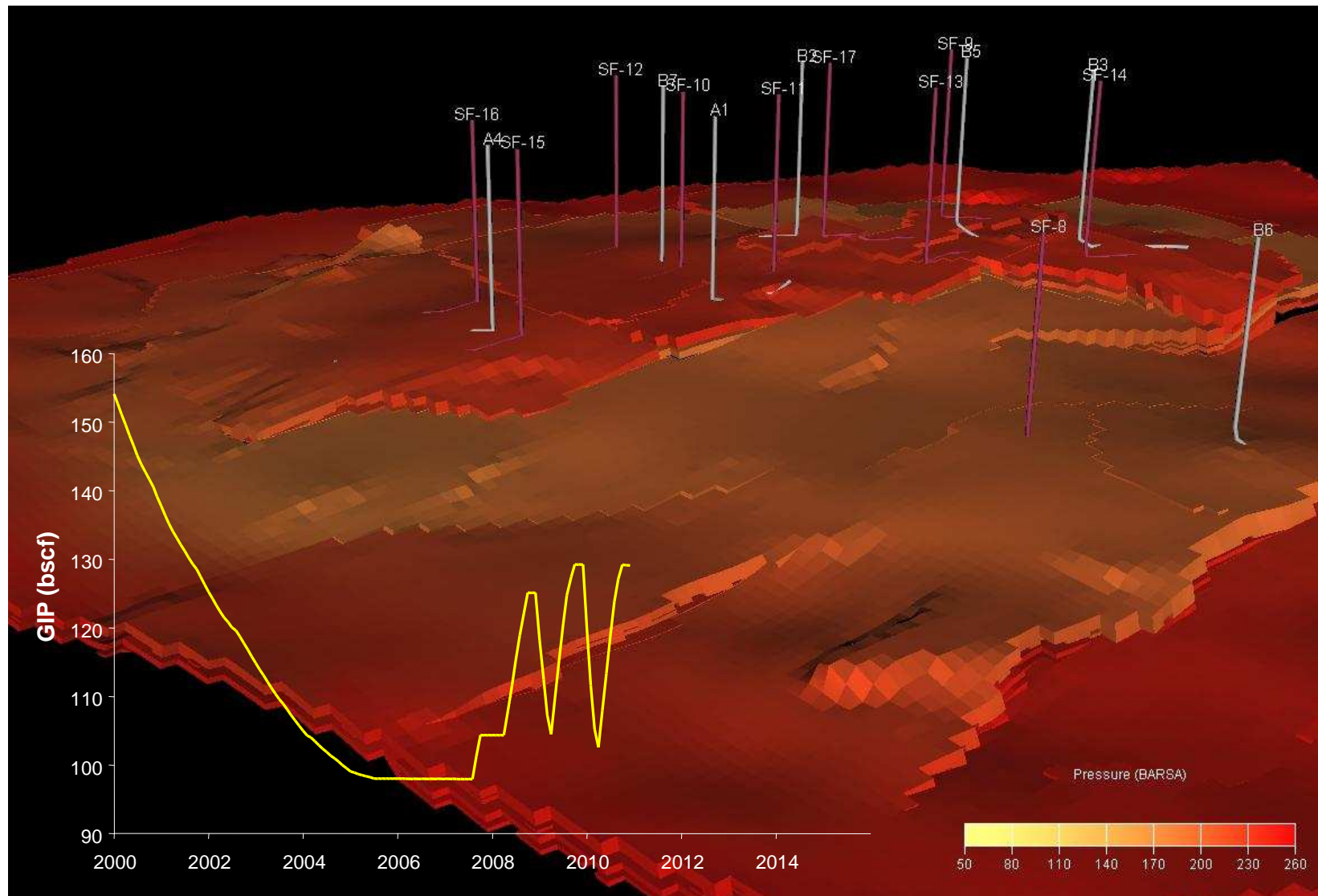
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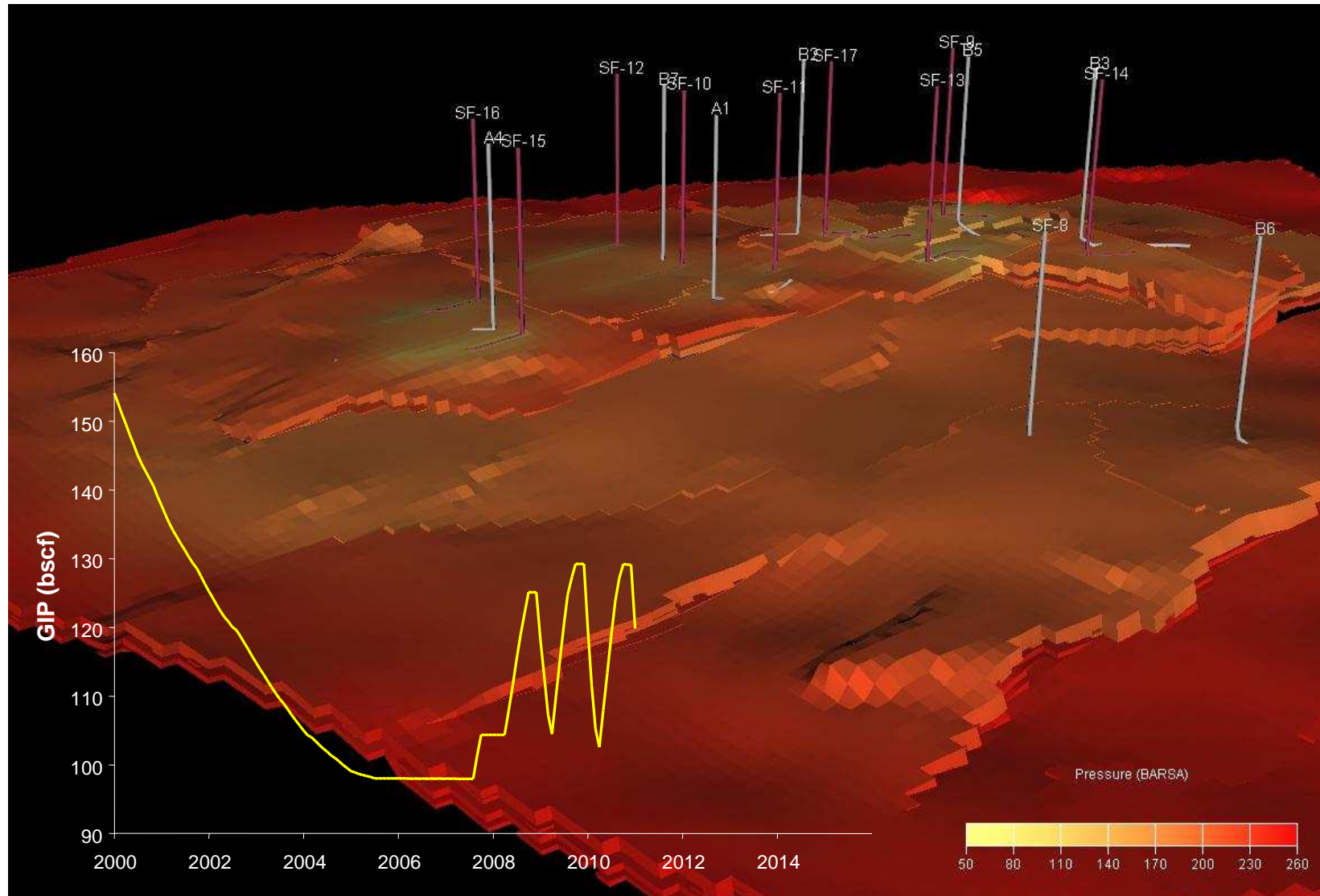
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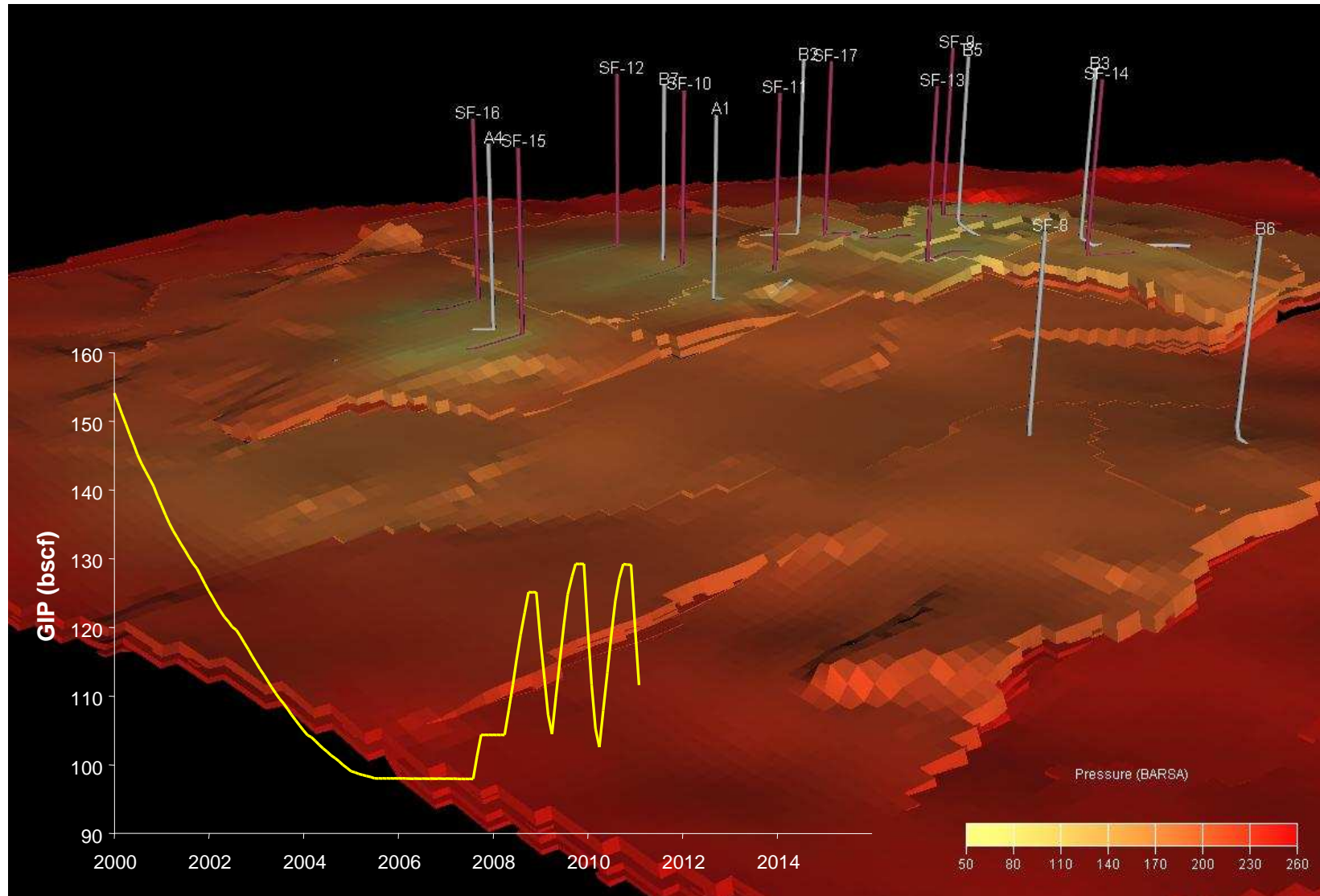
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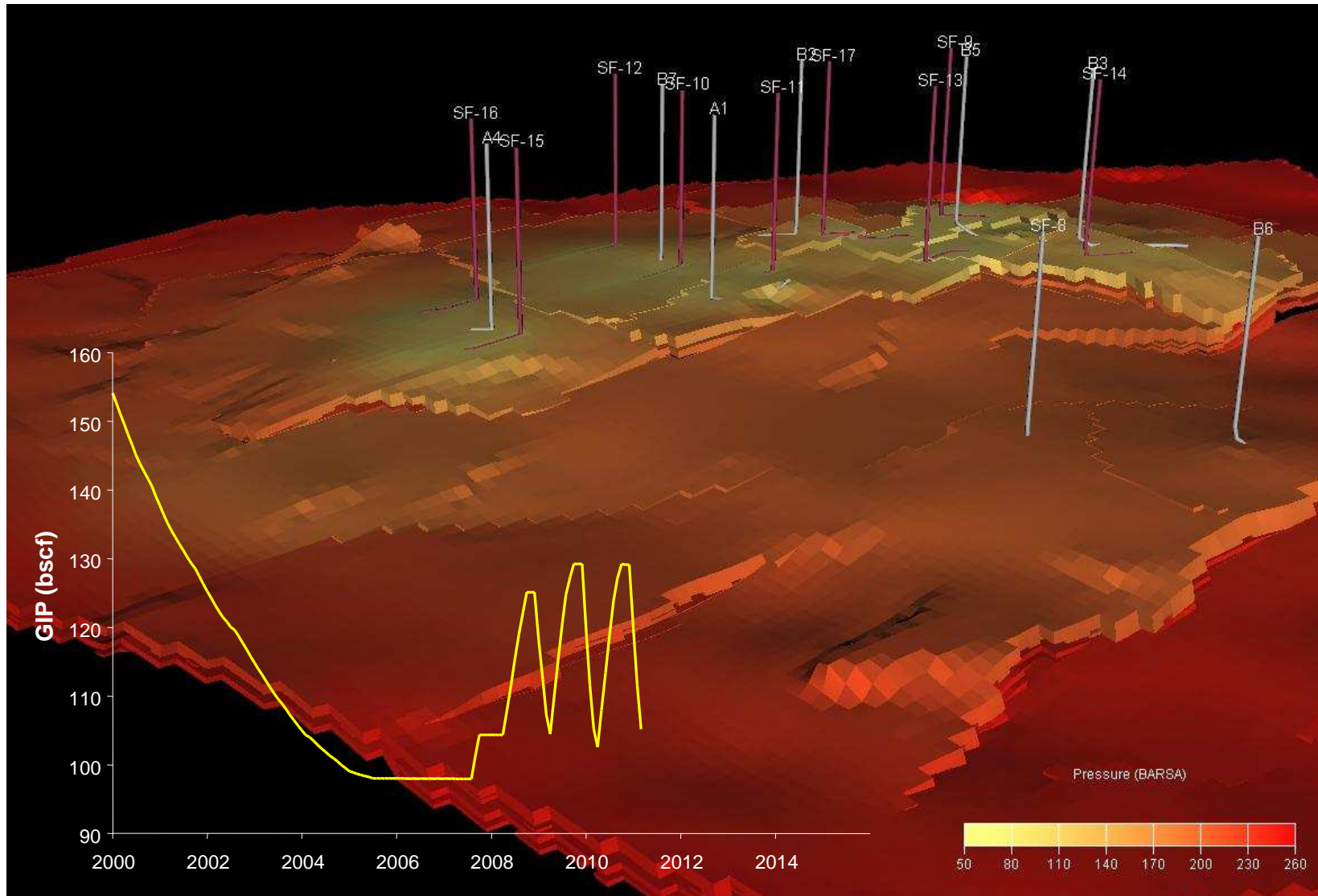
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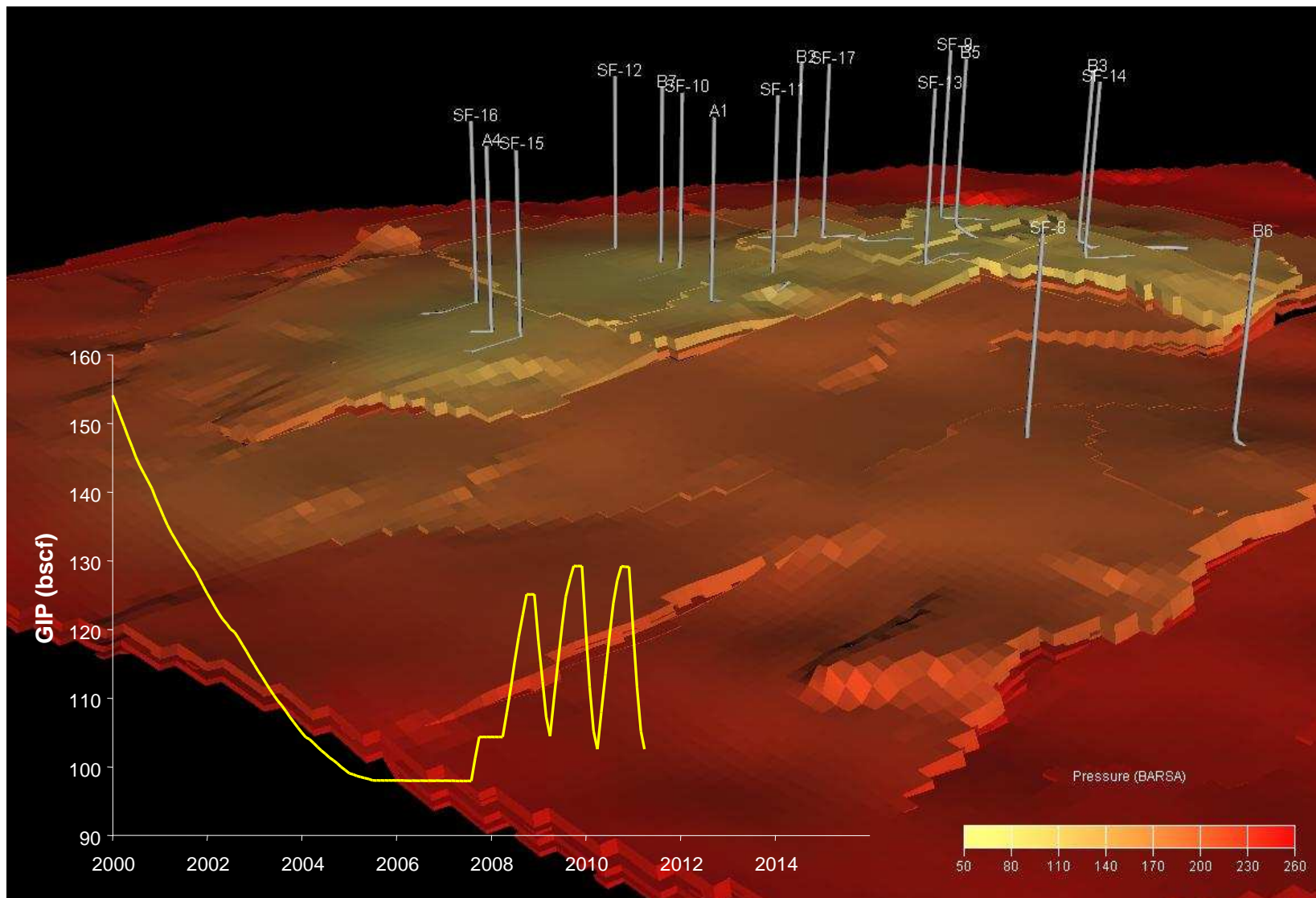
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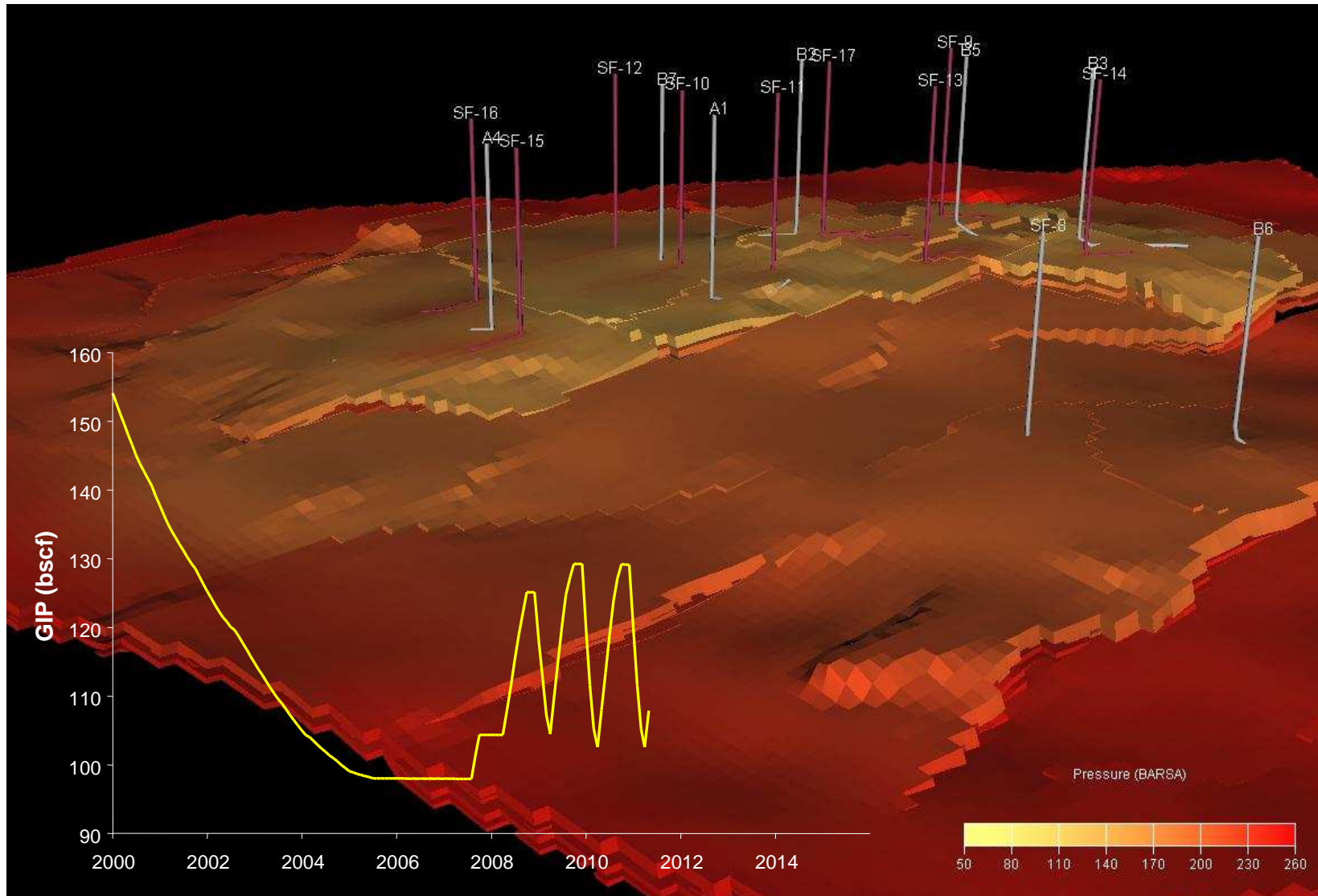
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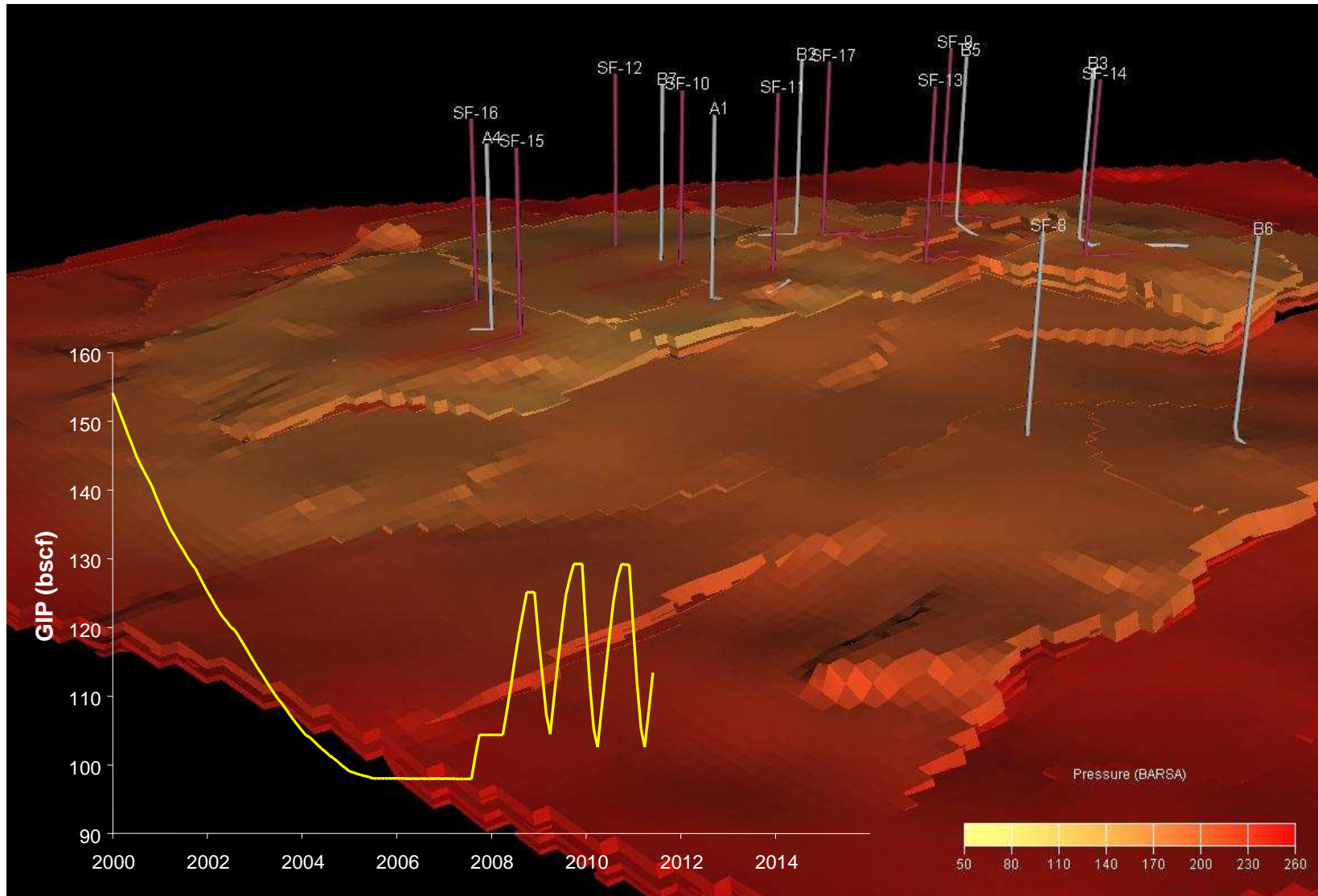
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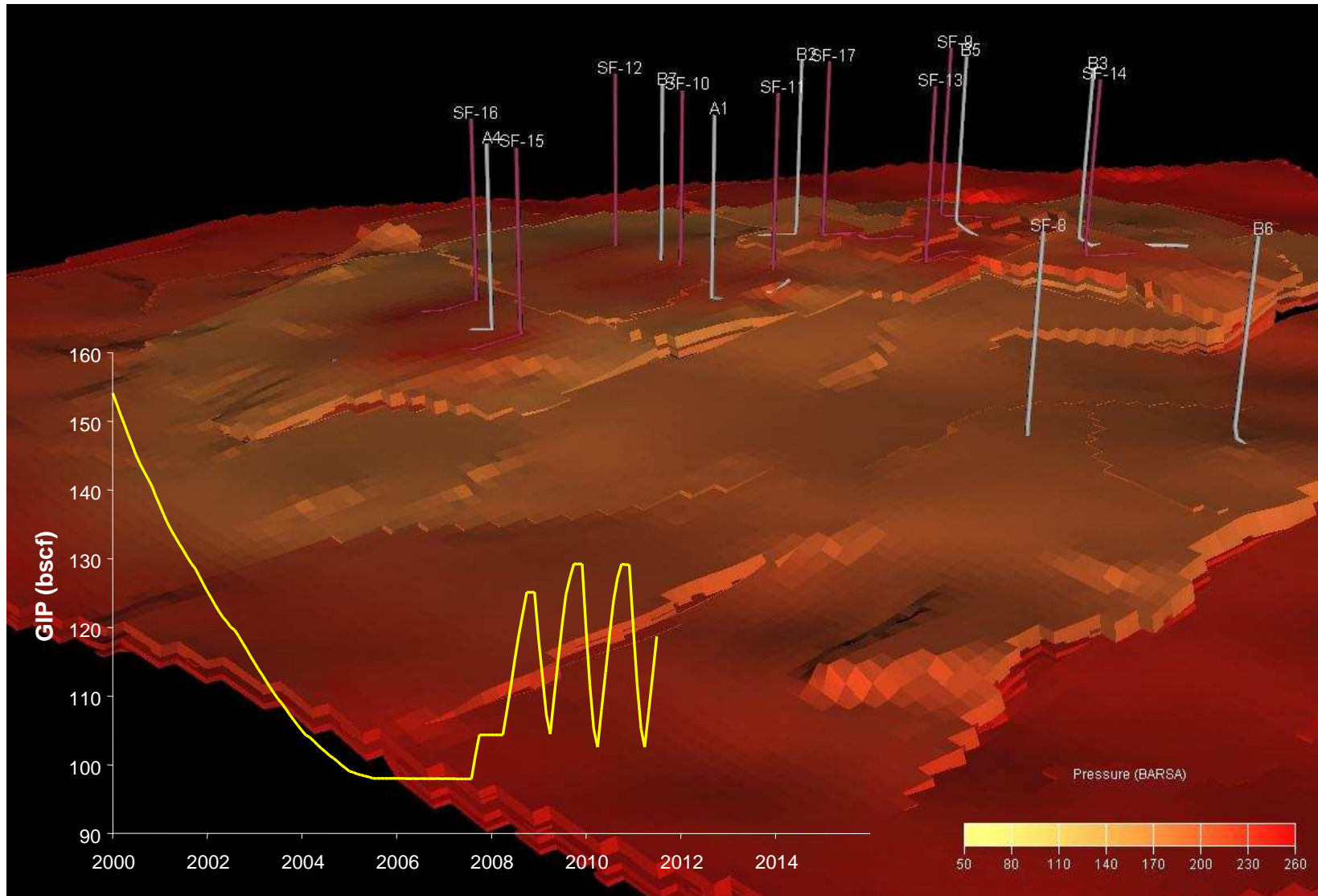
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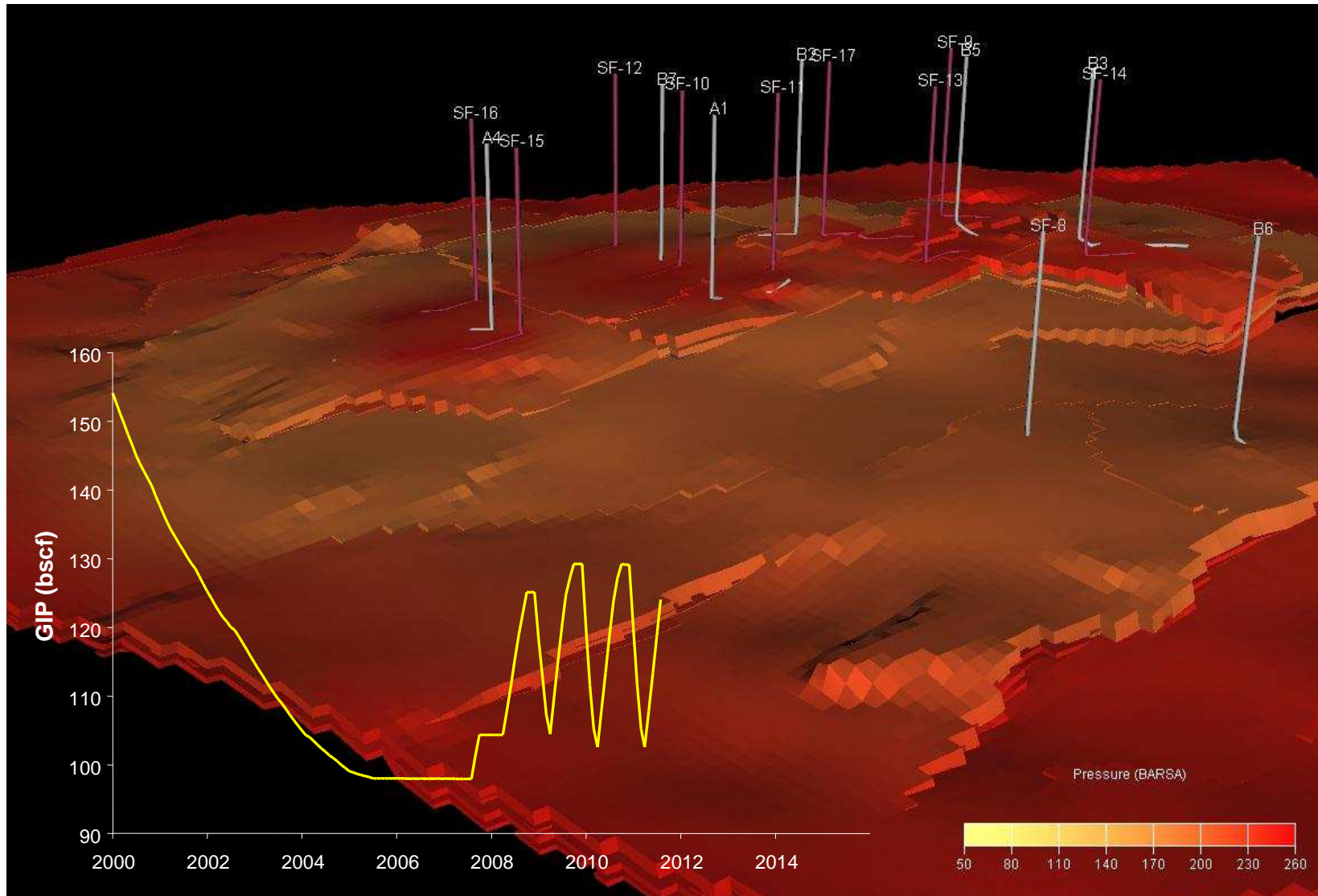
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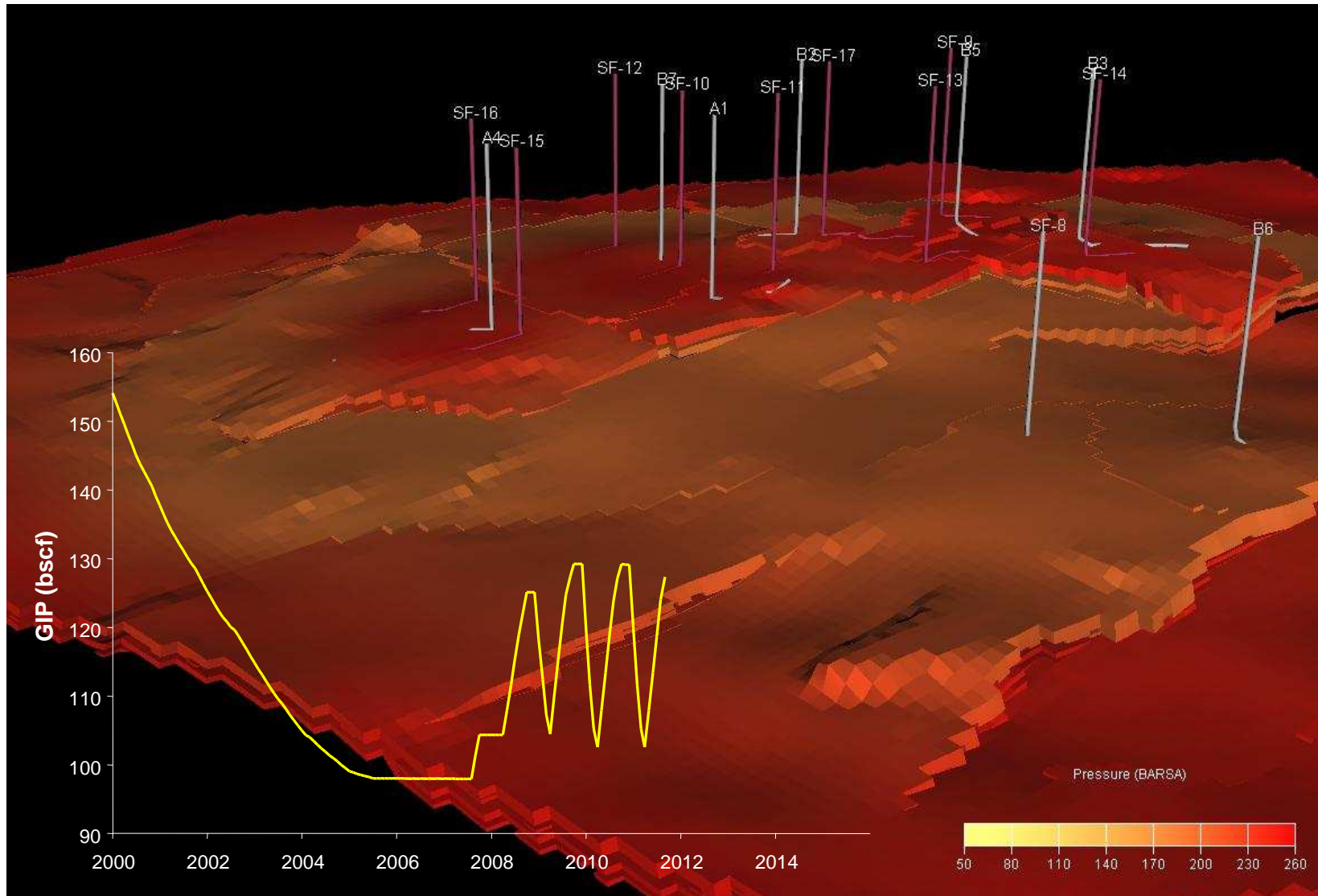
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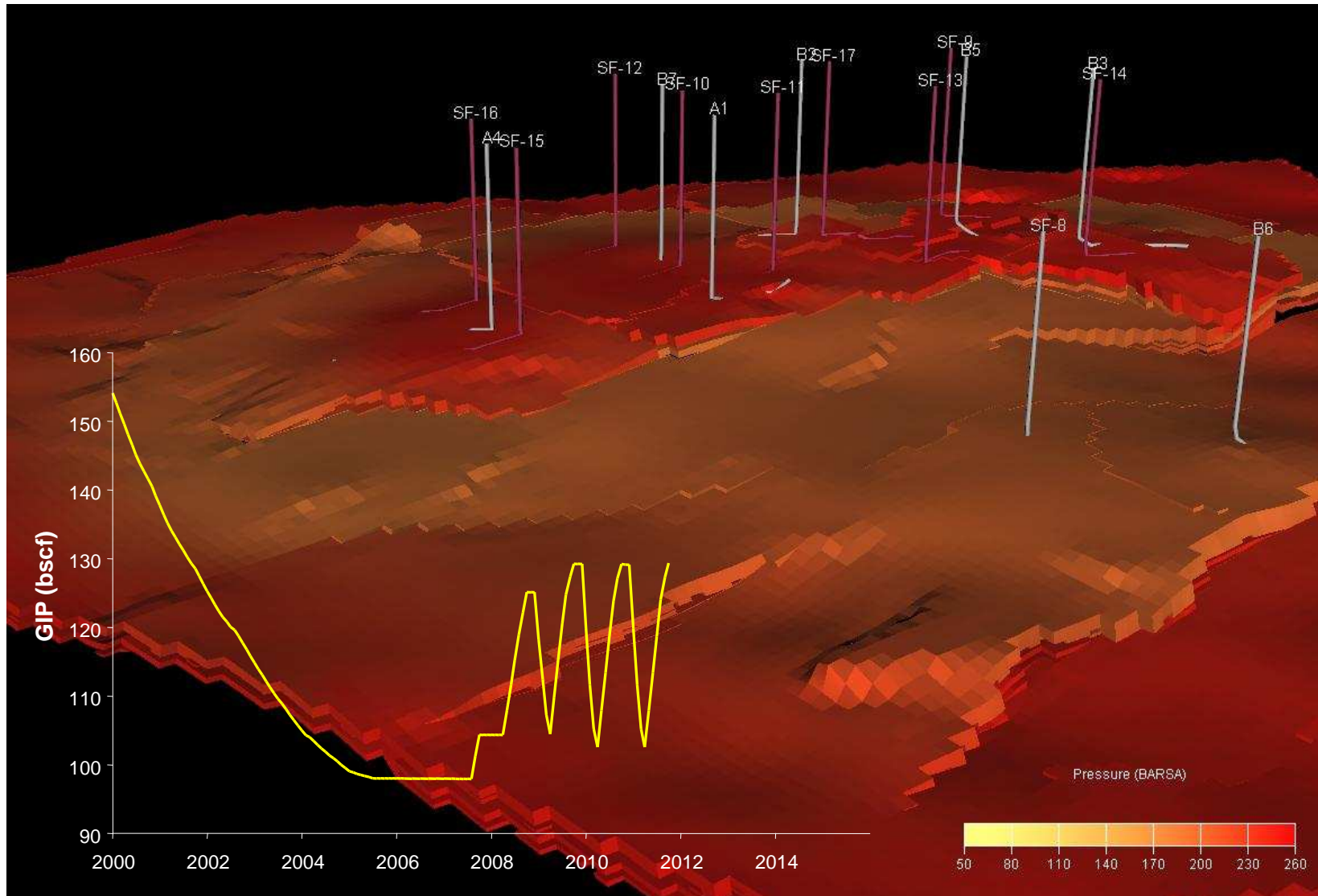
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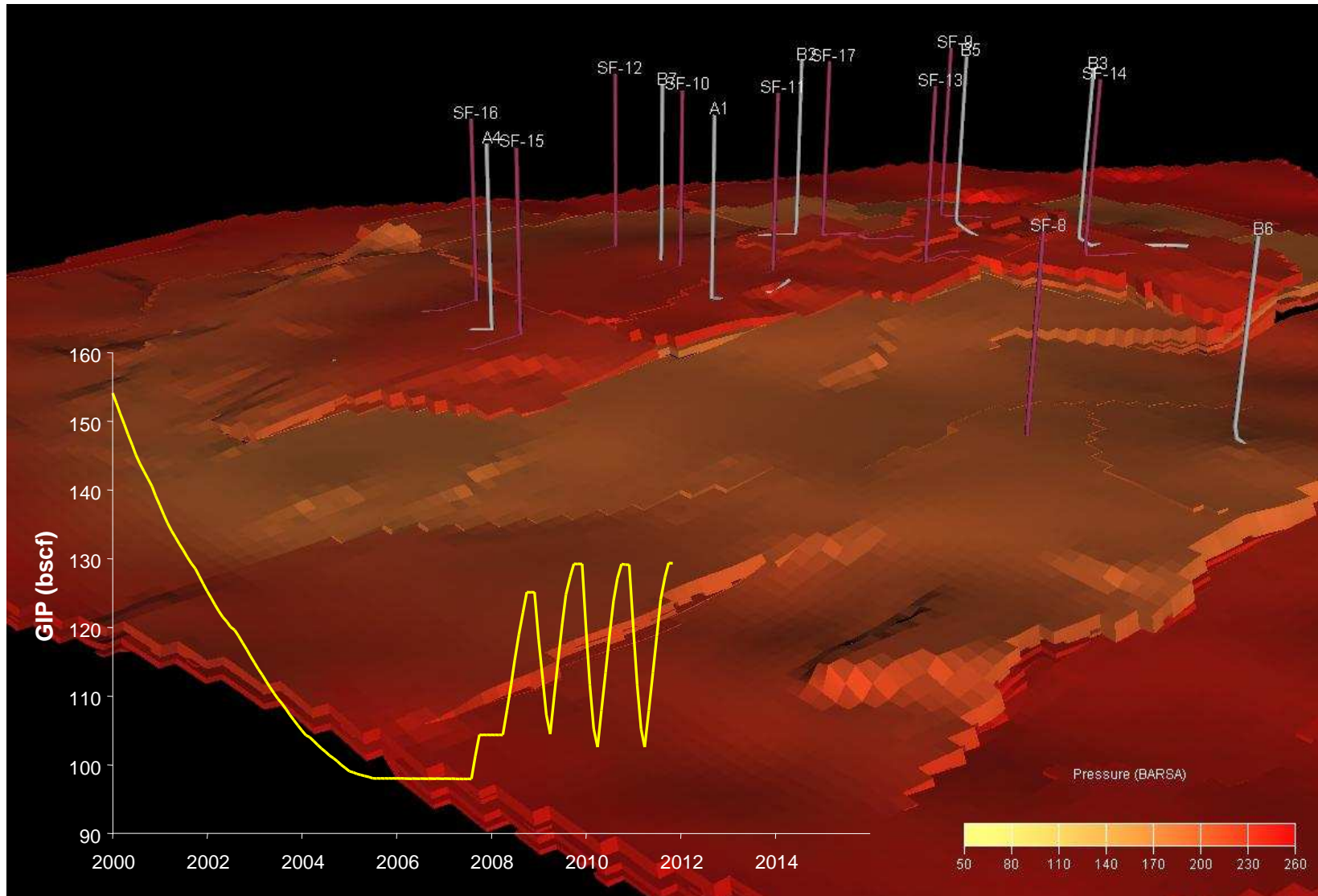
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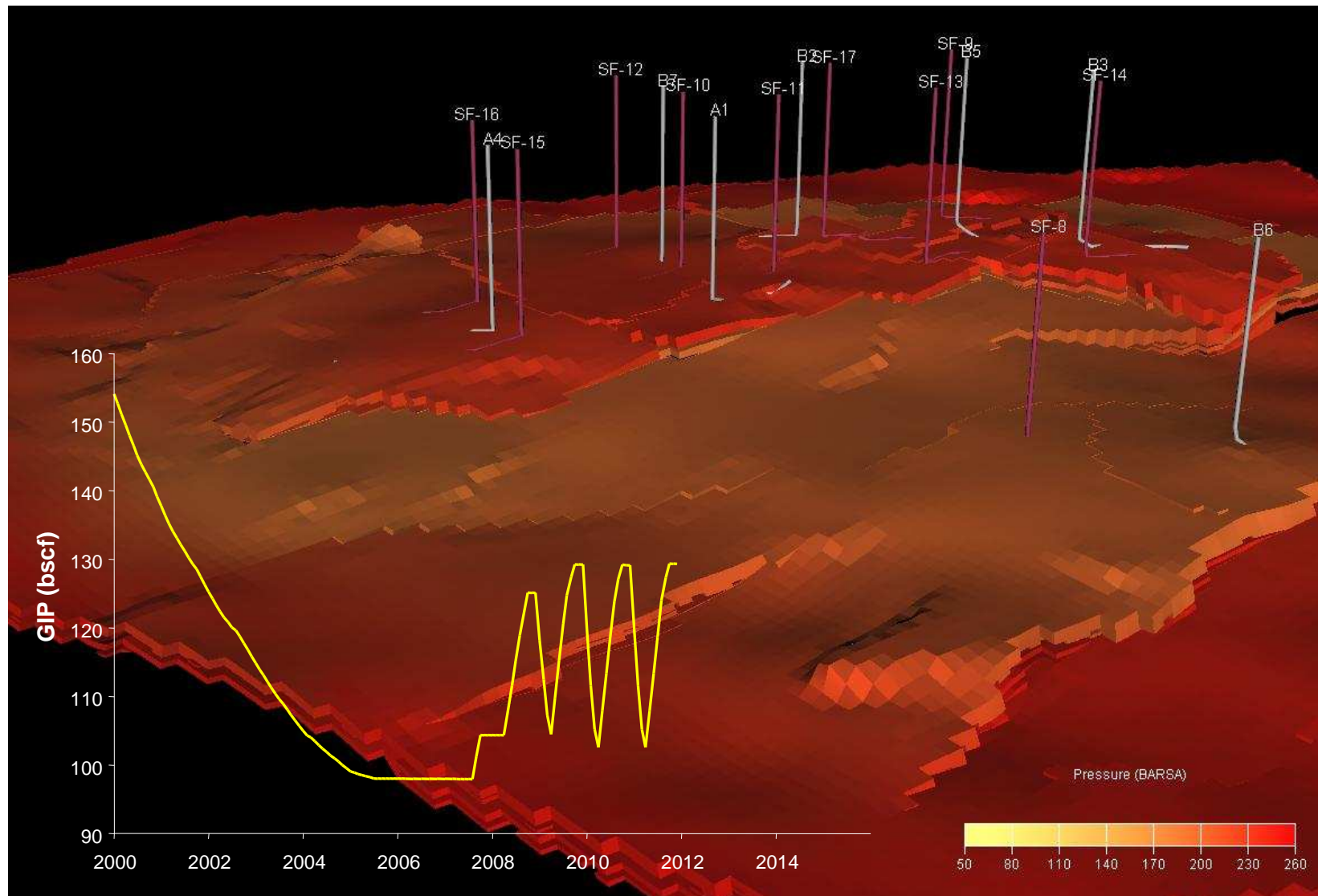
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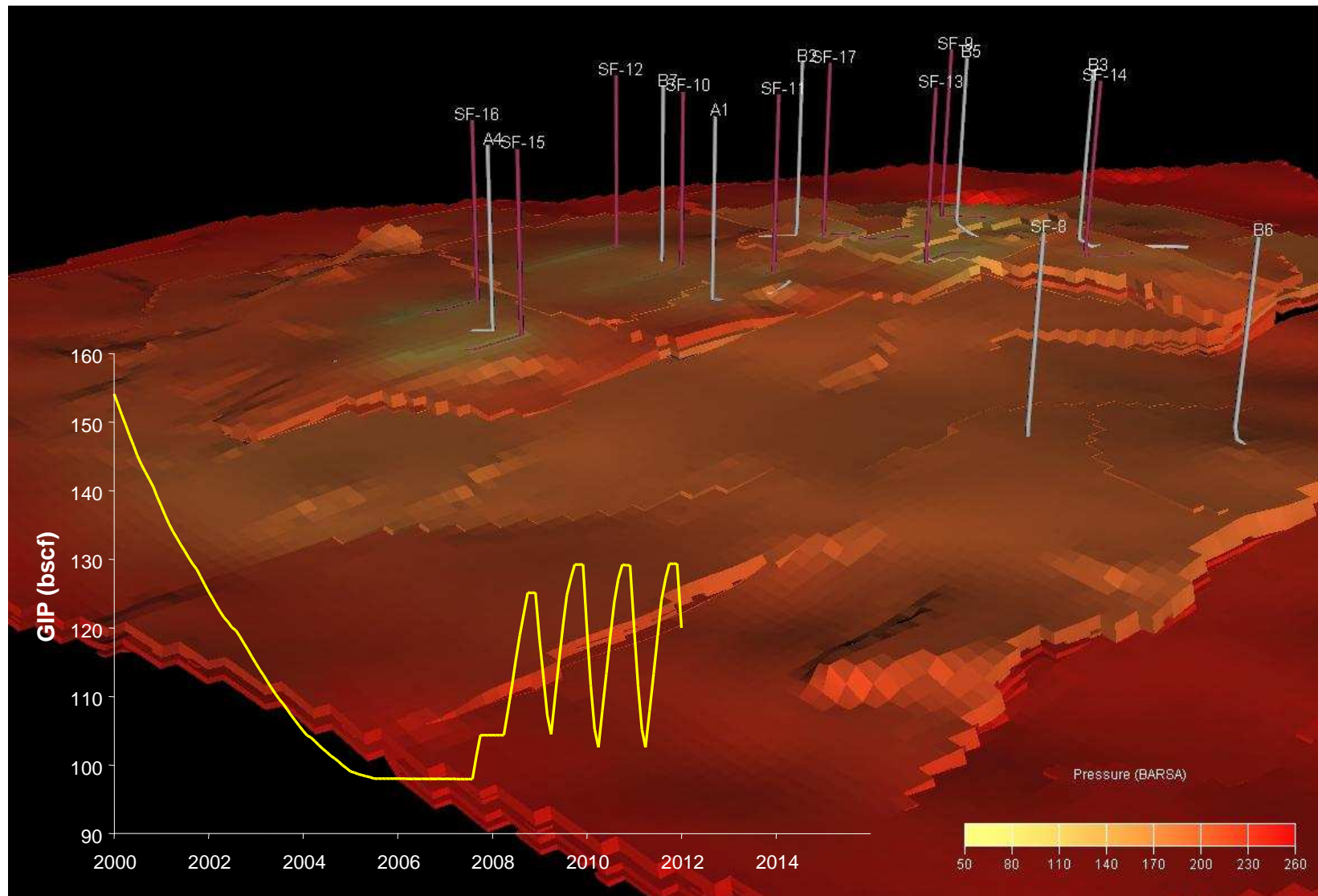
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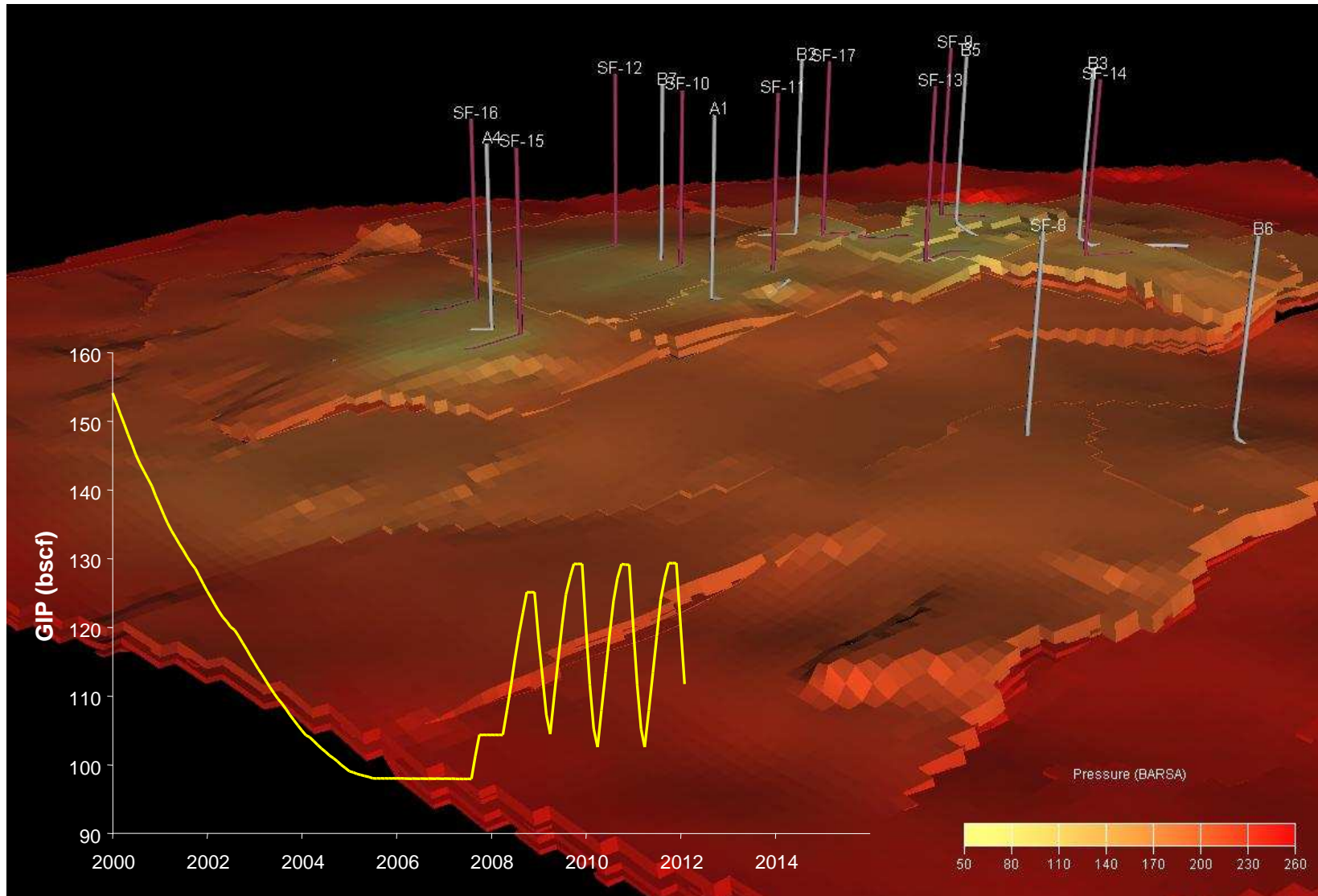
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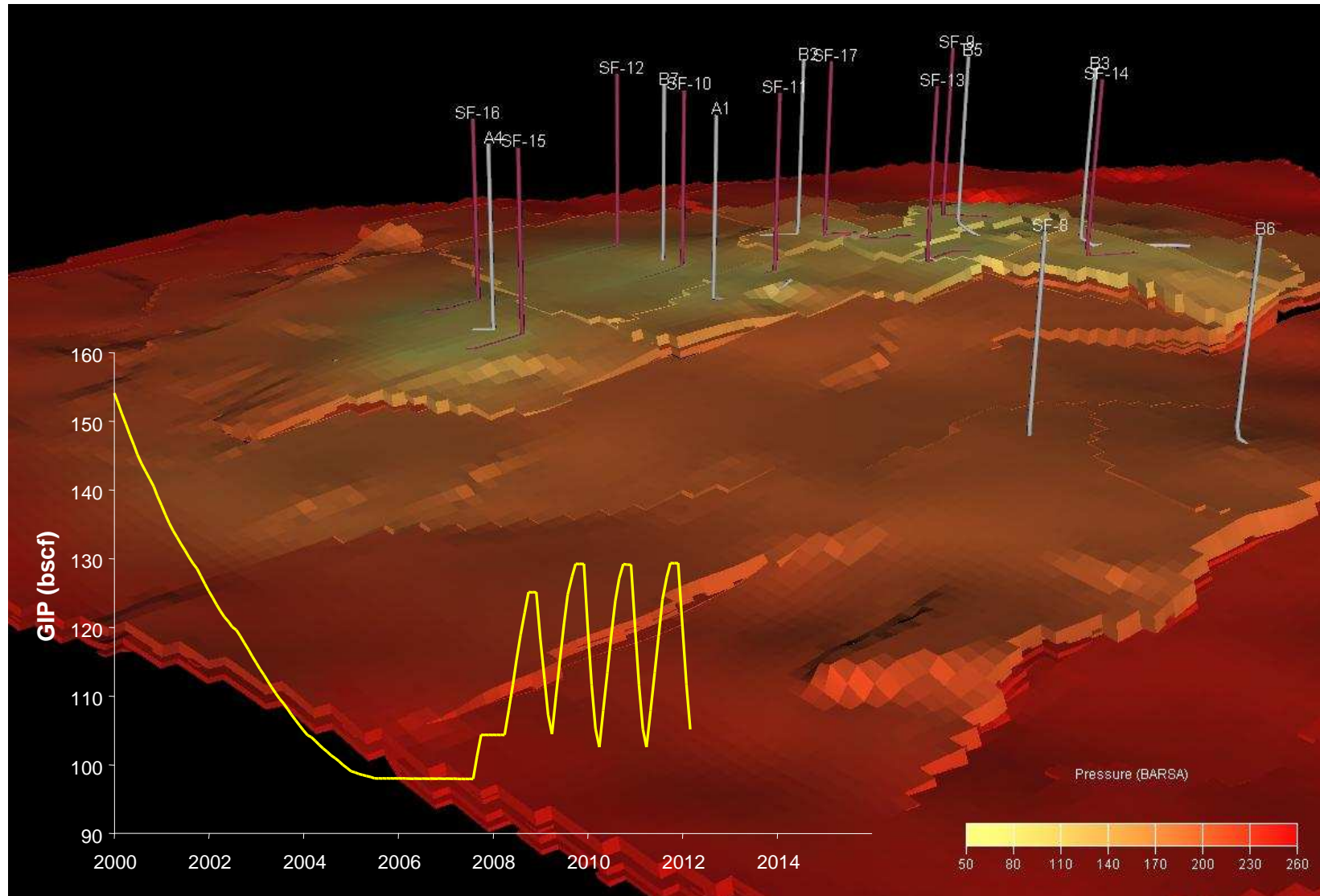
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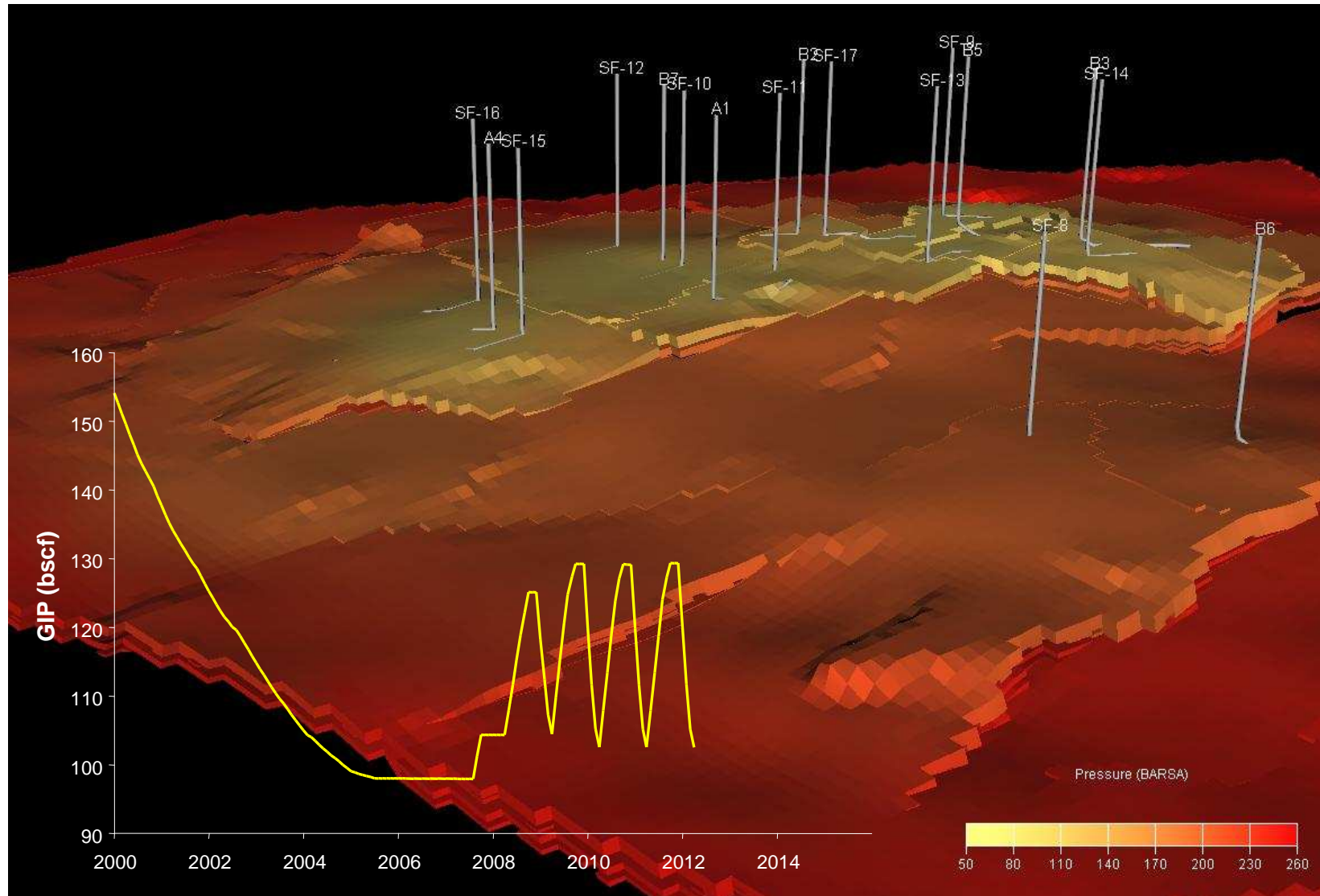
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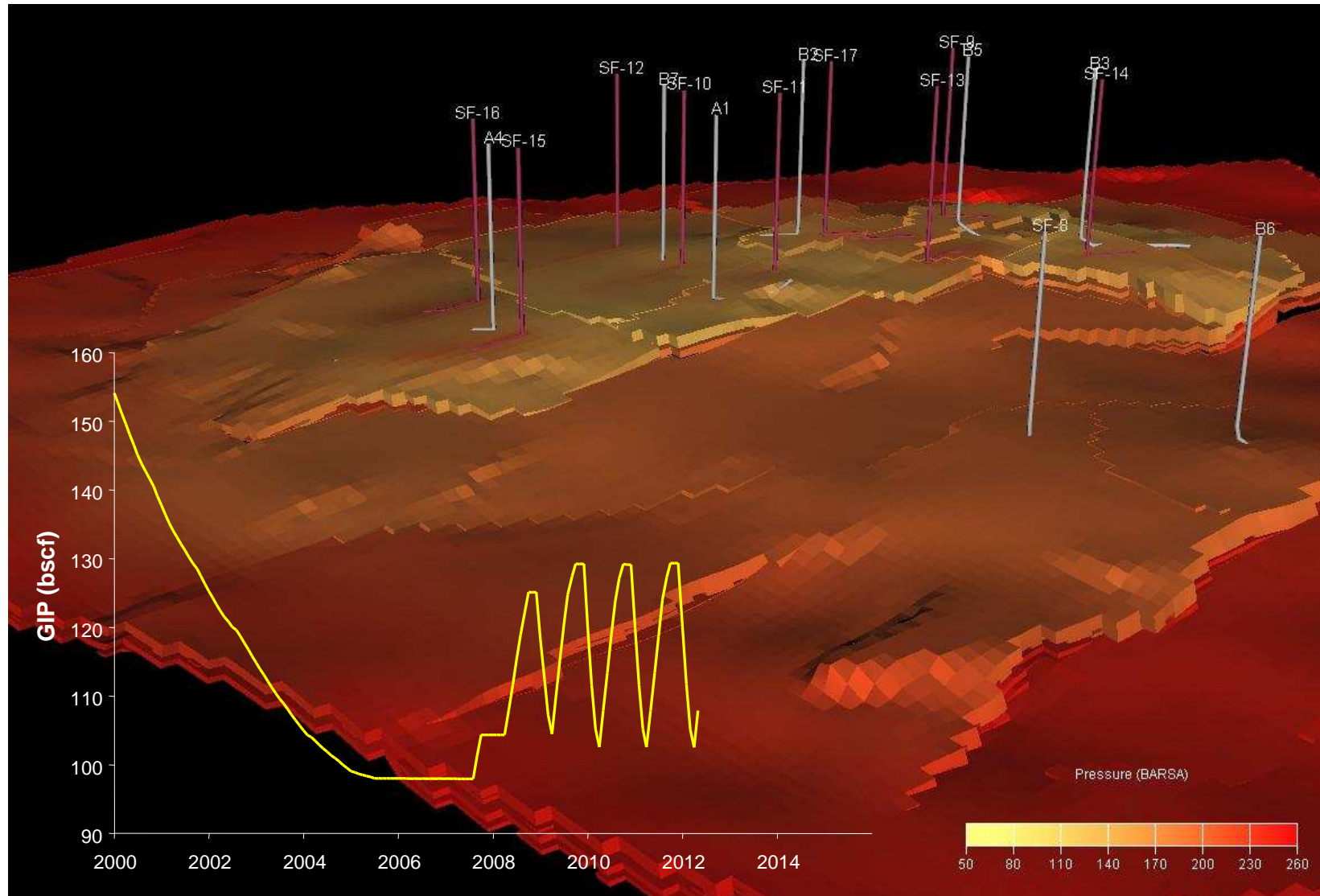
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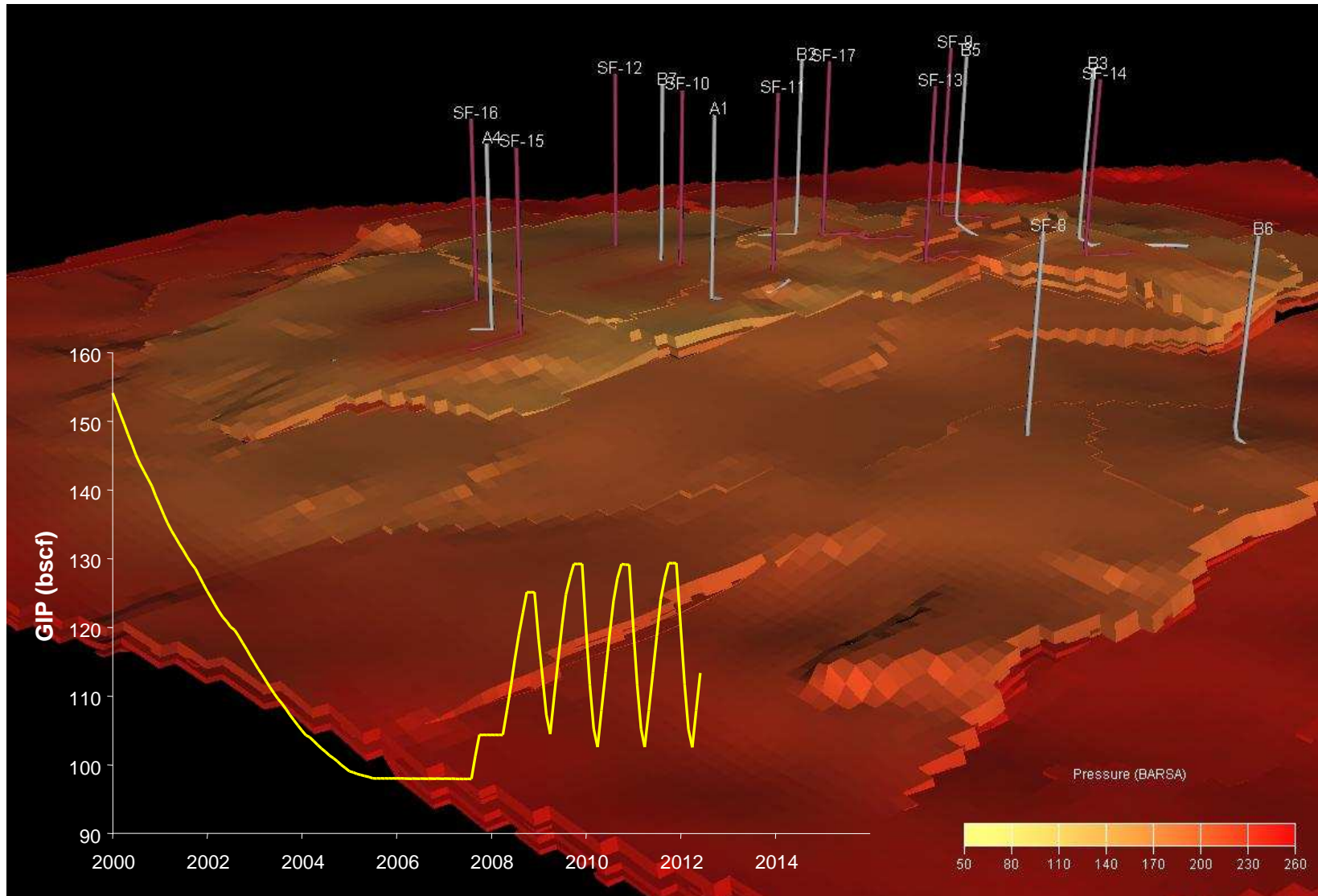
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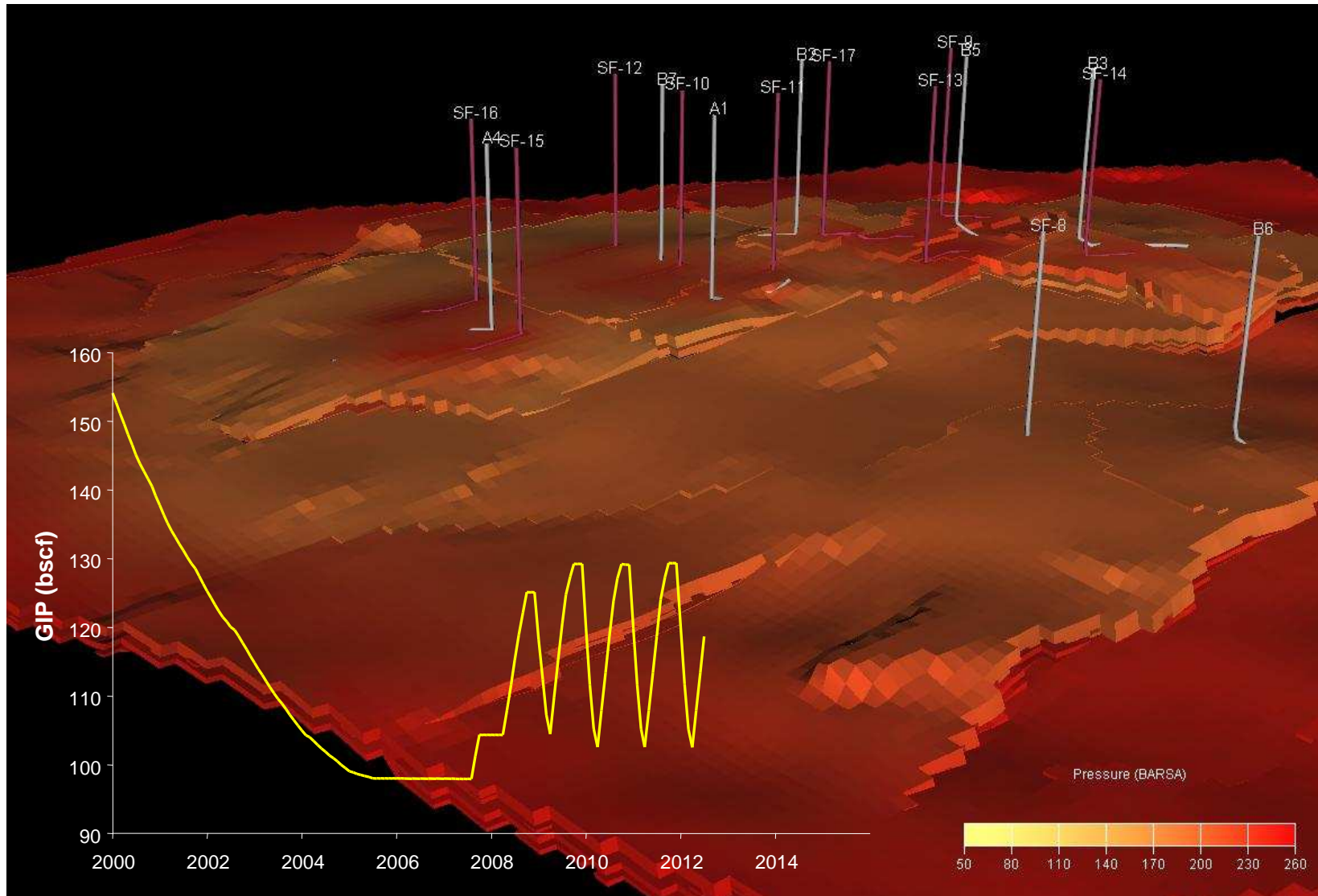
Saltfleetby Gas Storage Project

Dynamic Reservoir Simulation



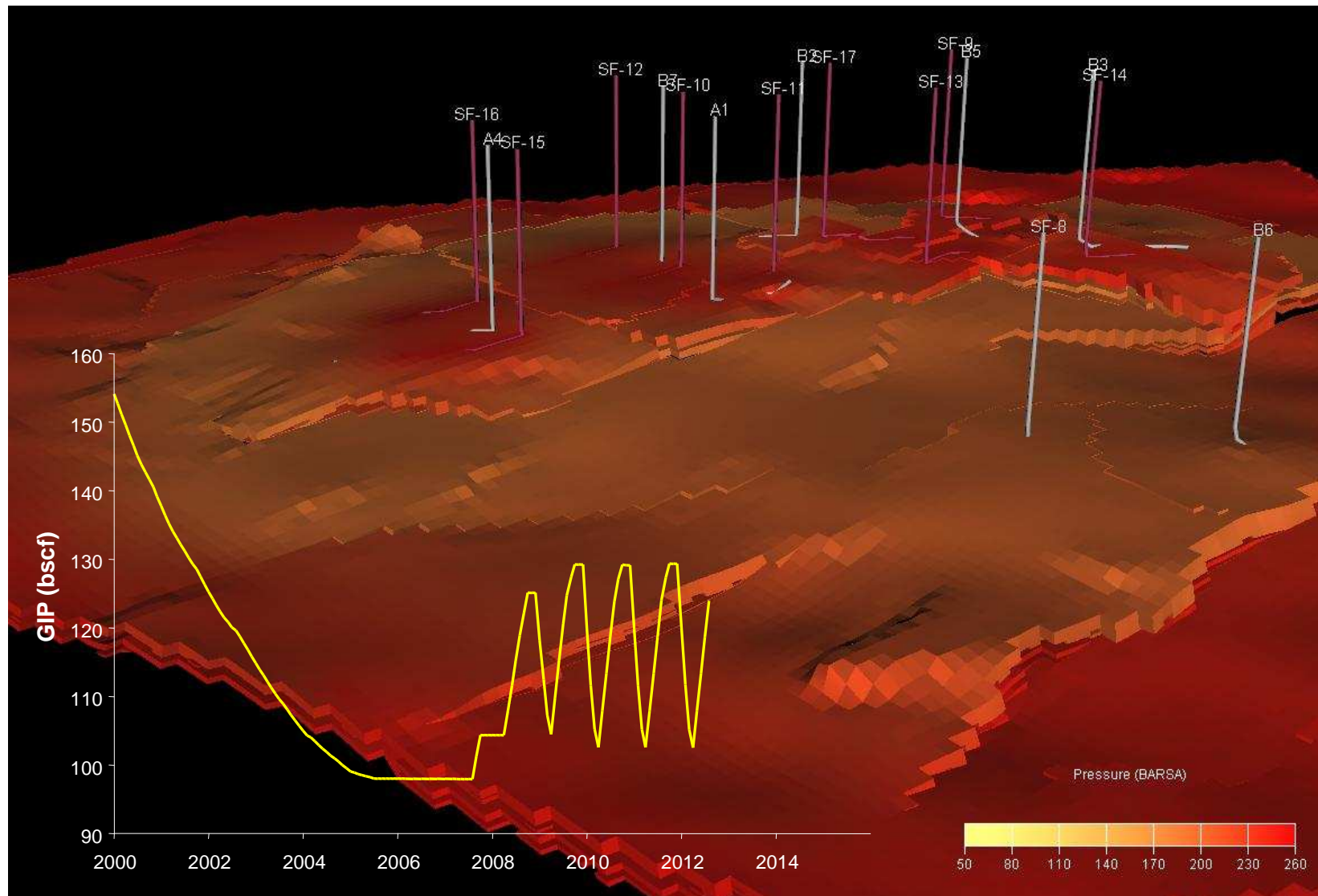
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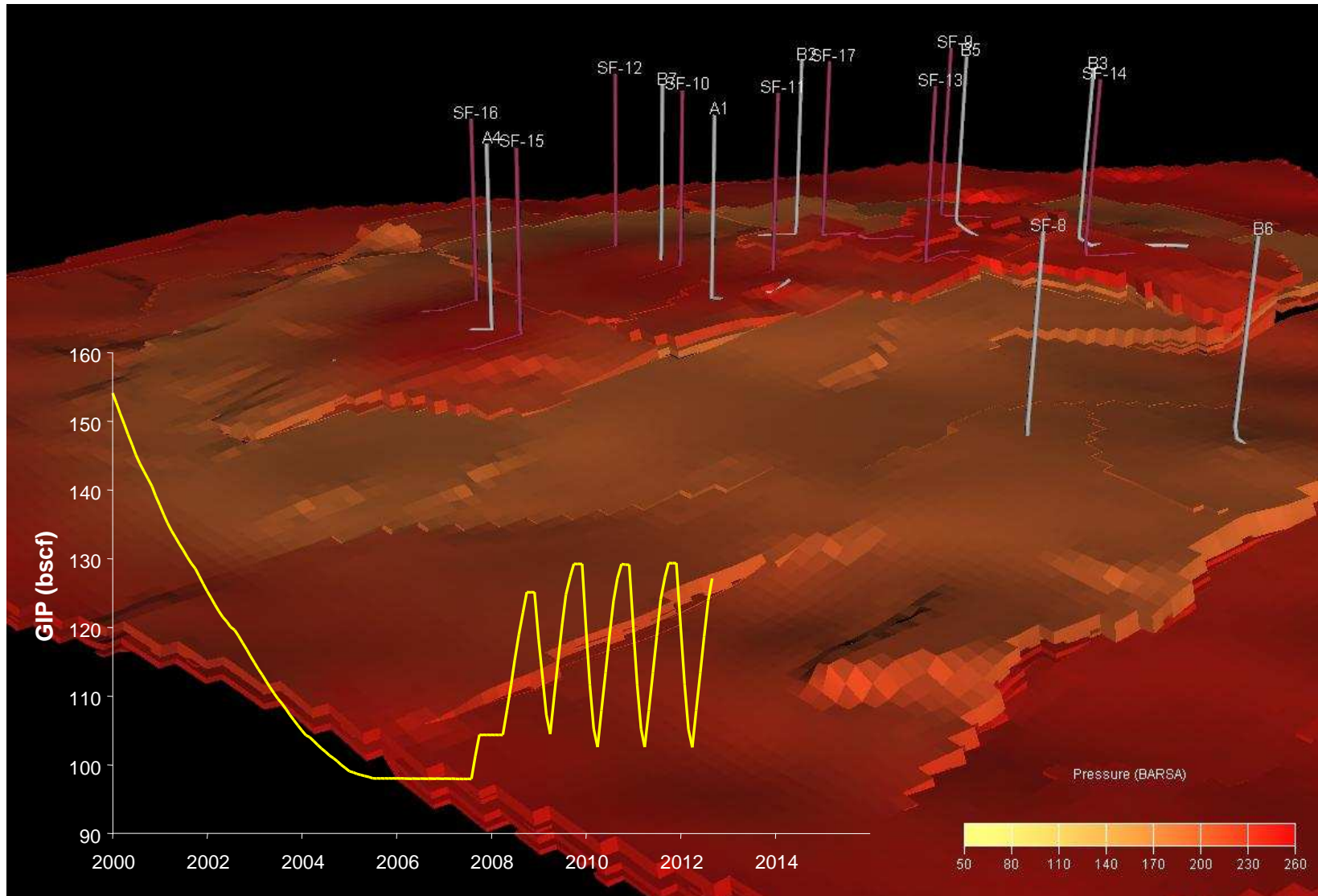
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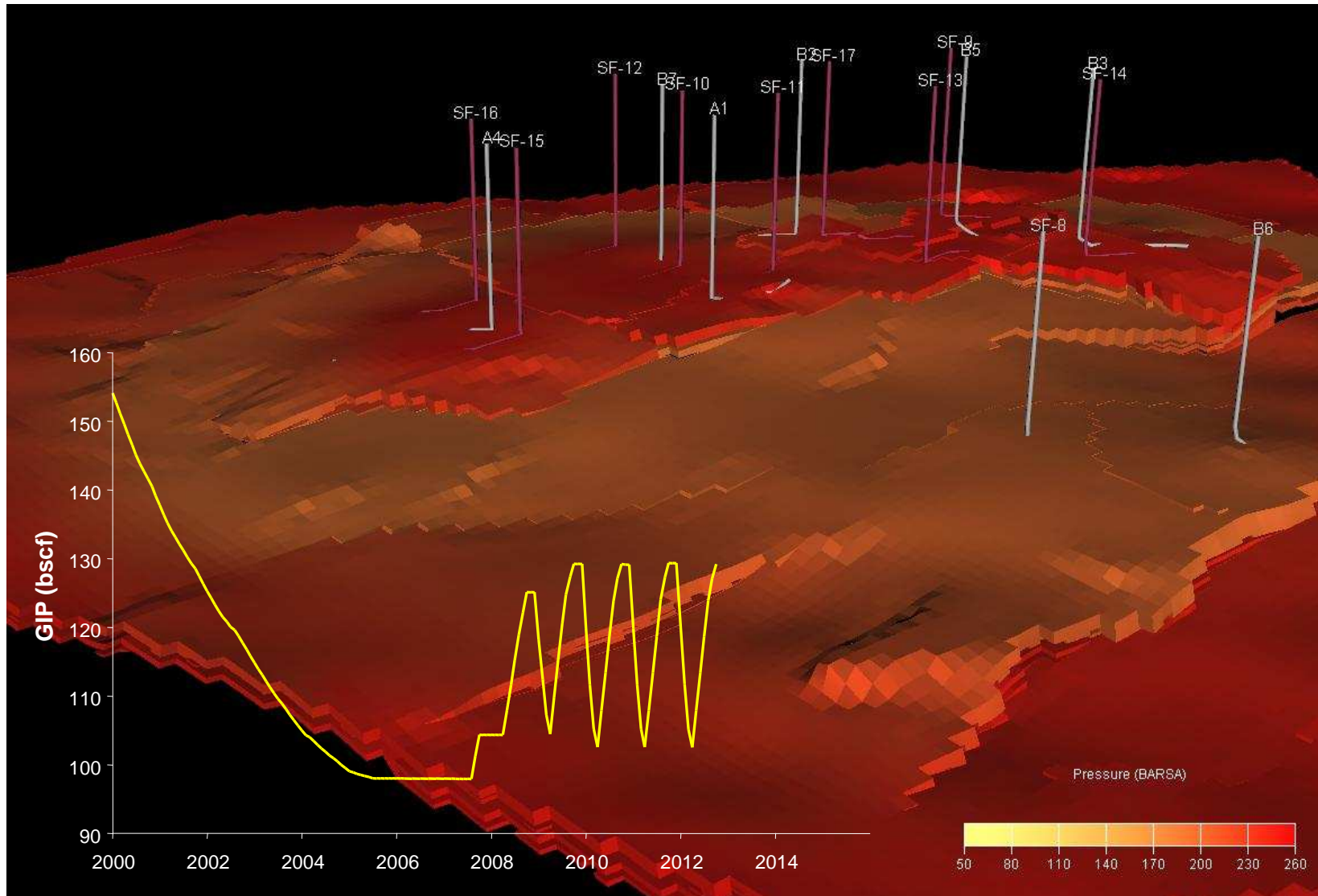
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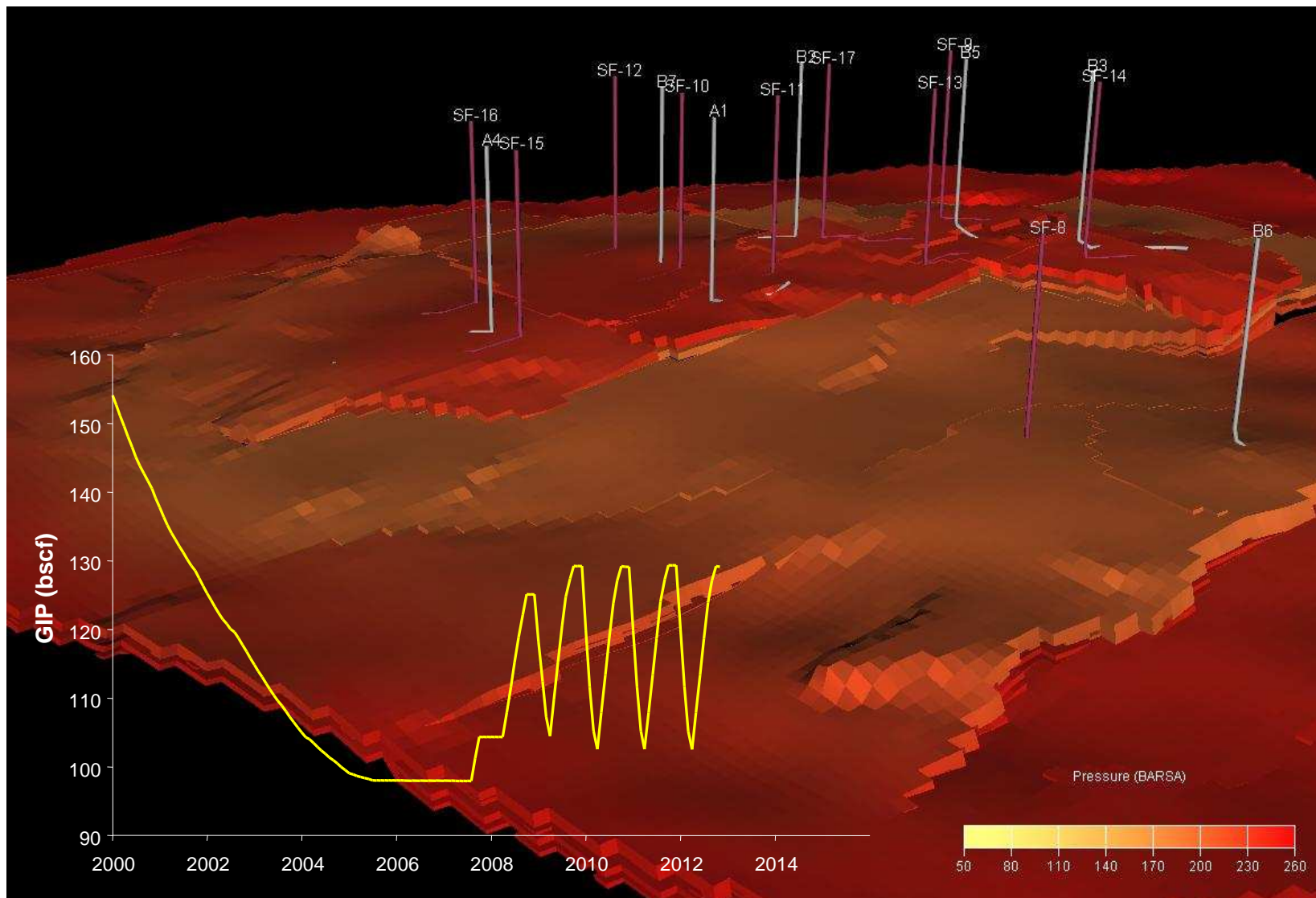
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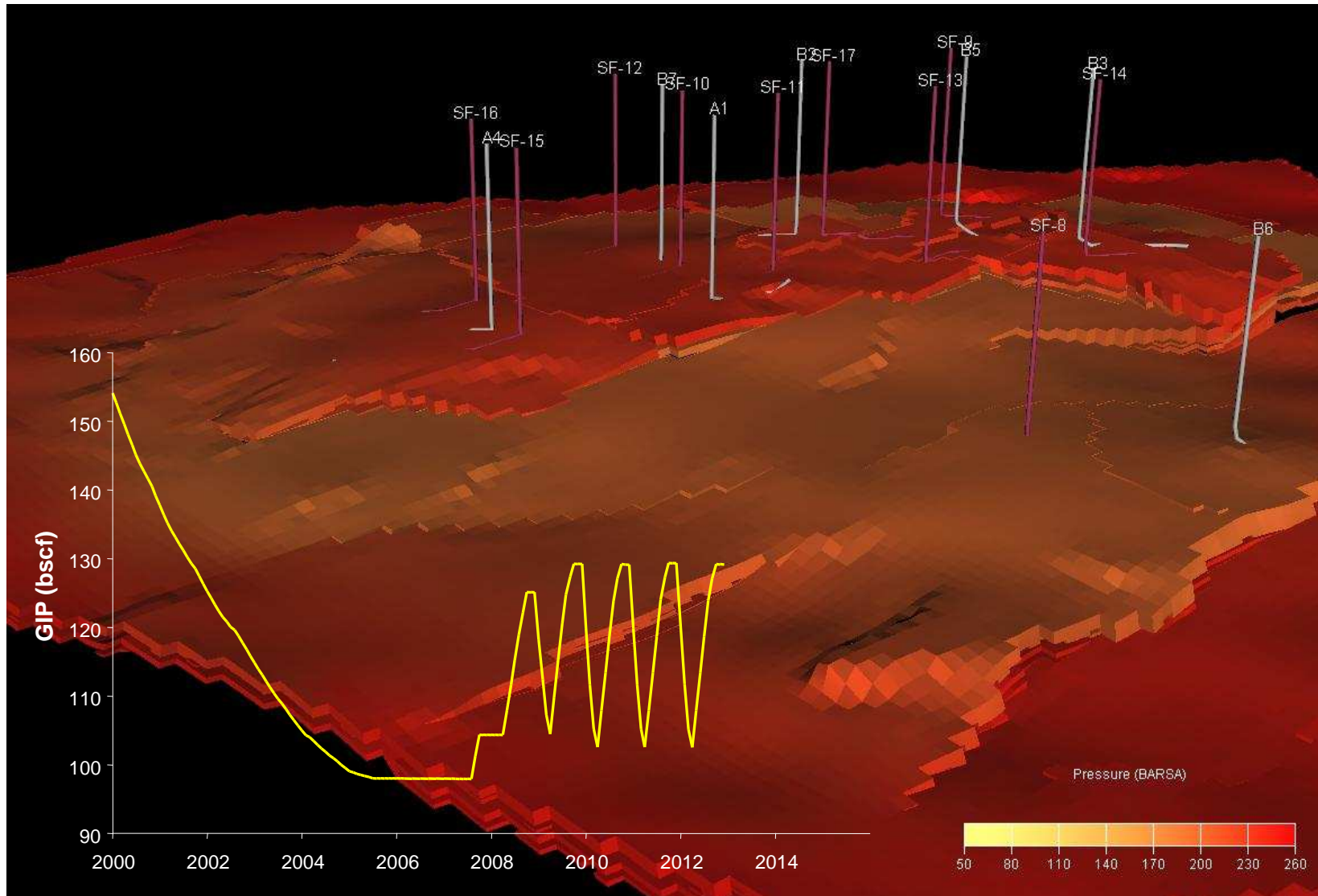
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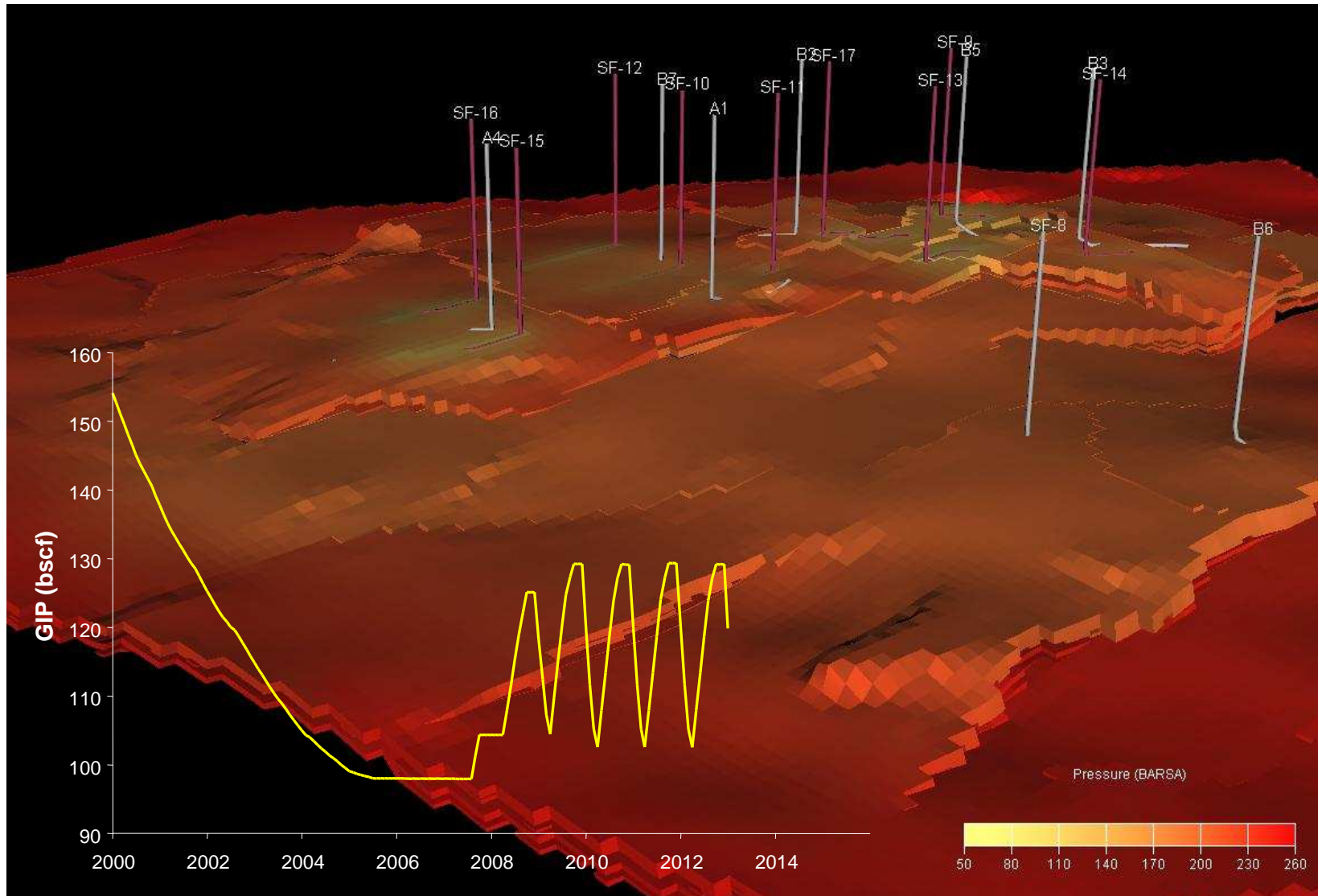
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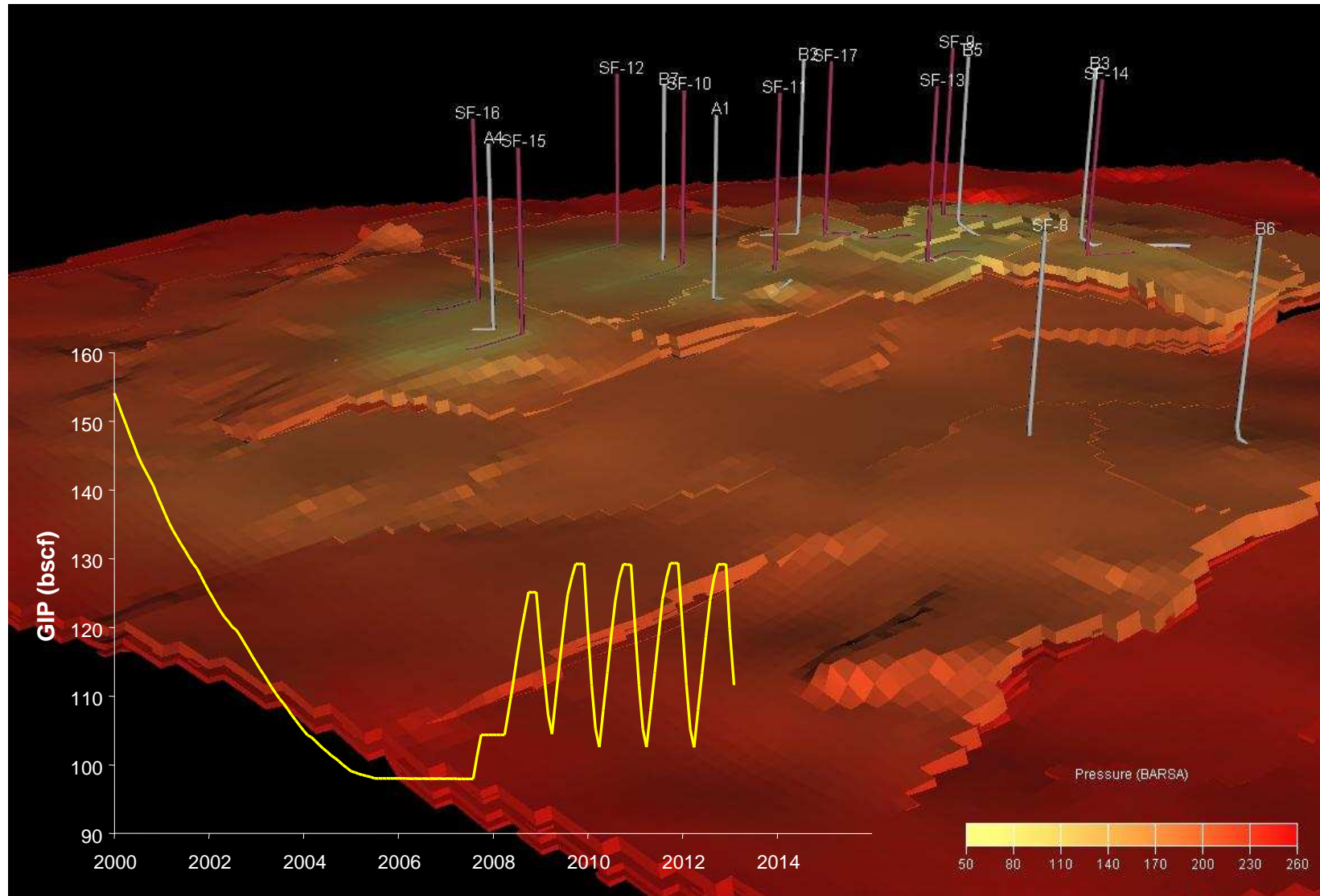
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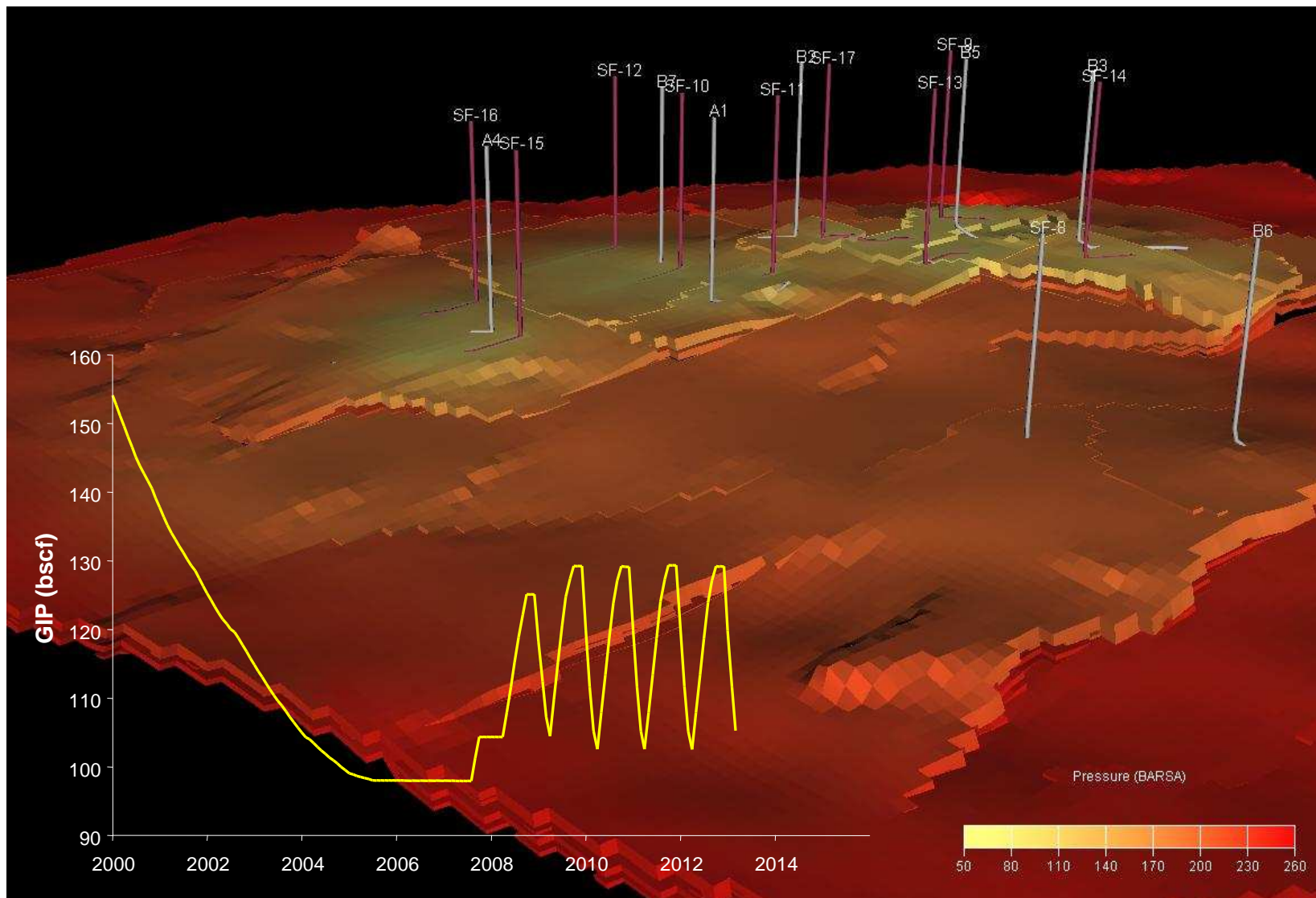
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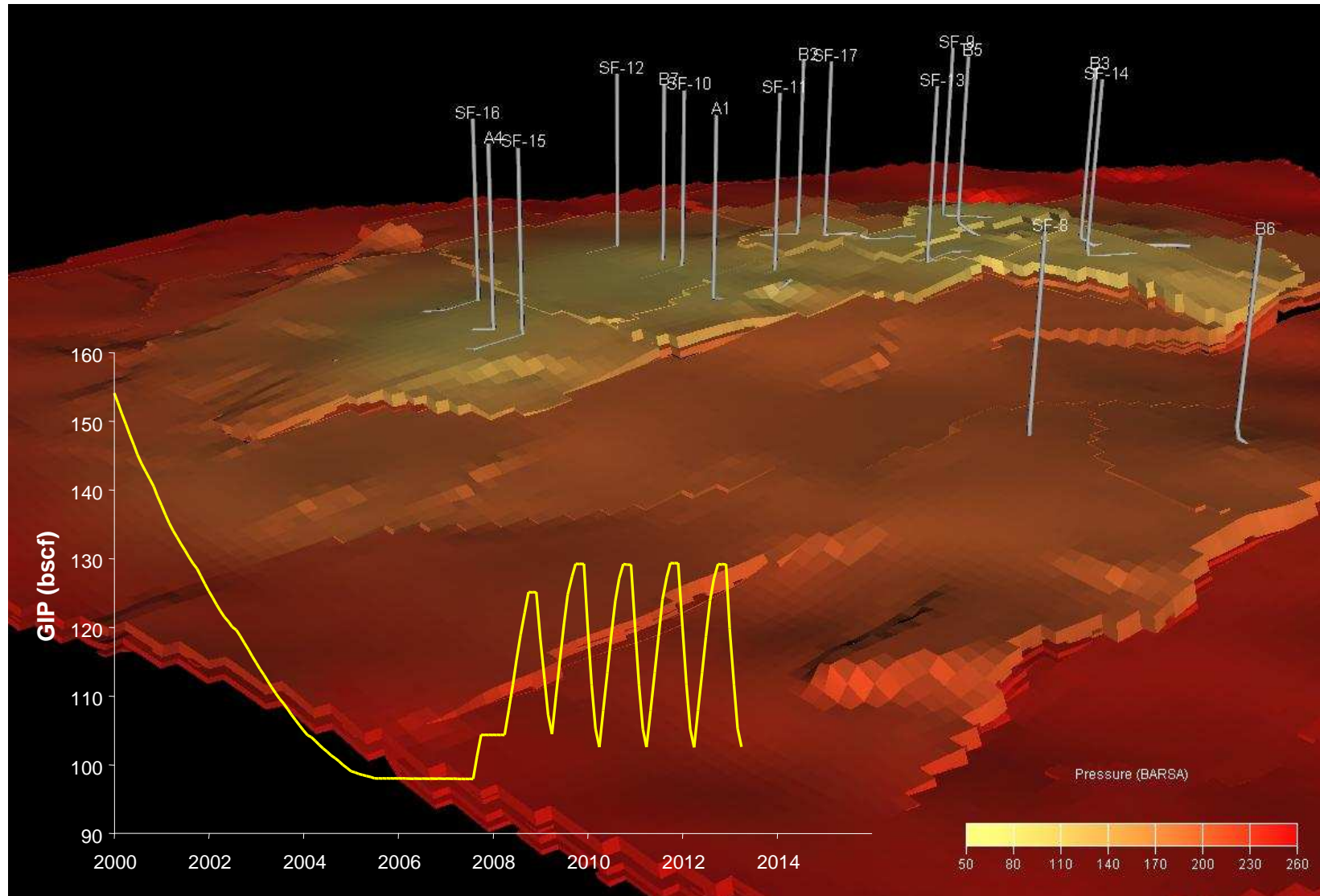
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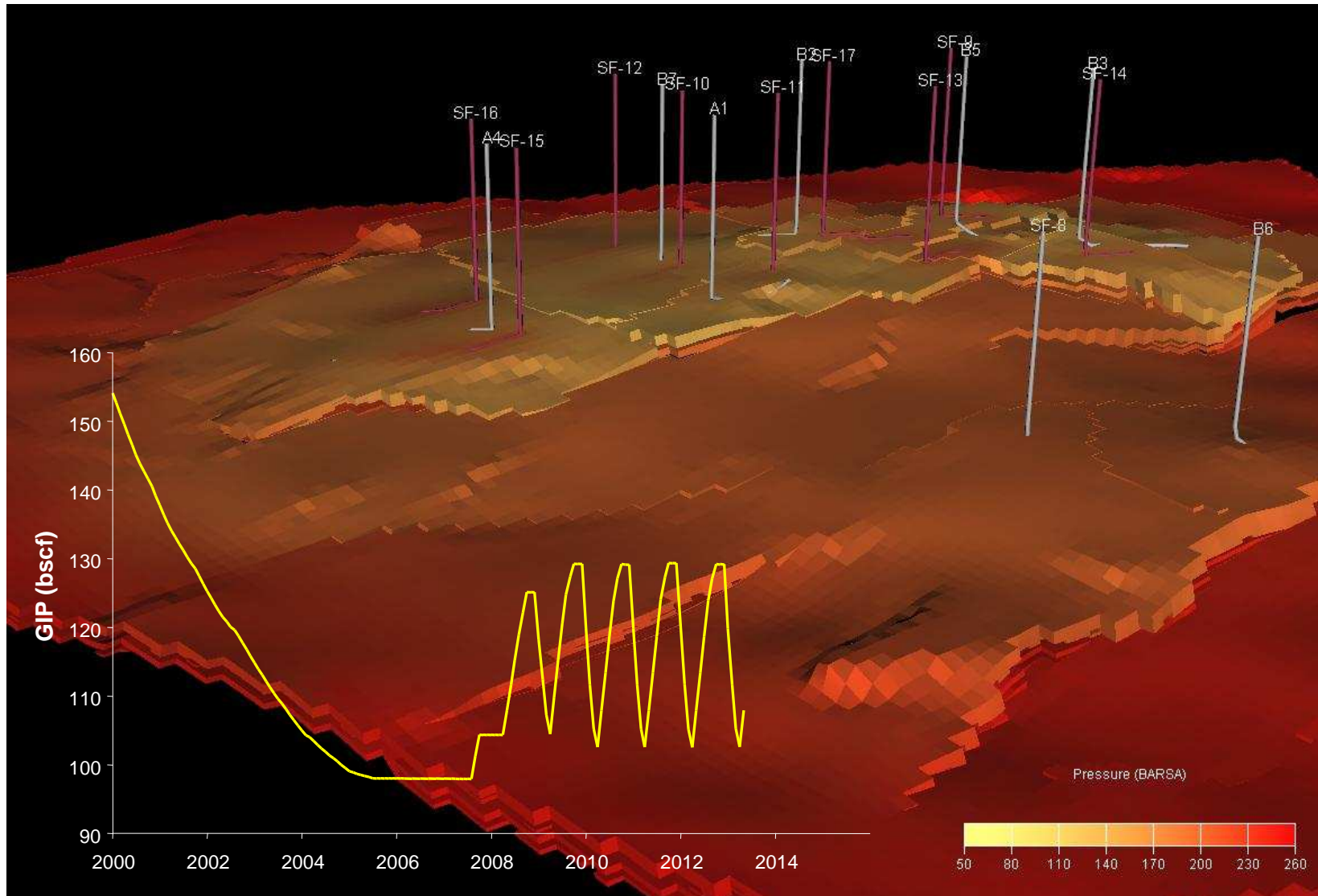
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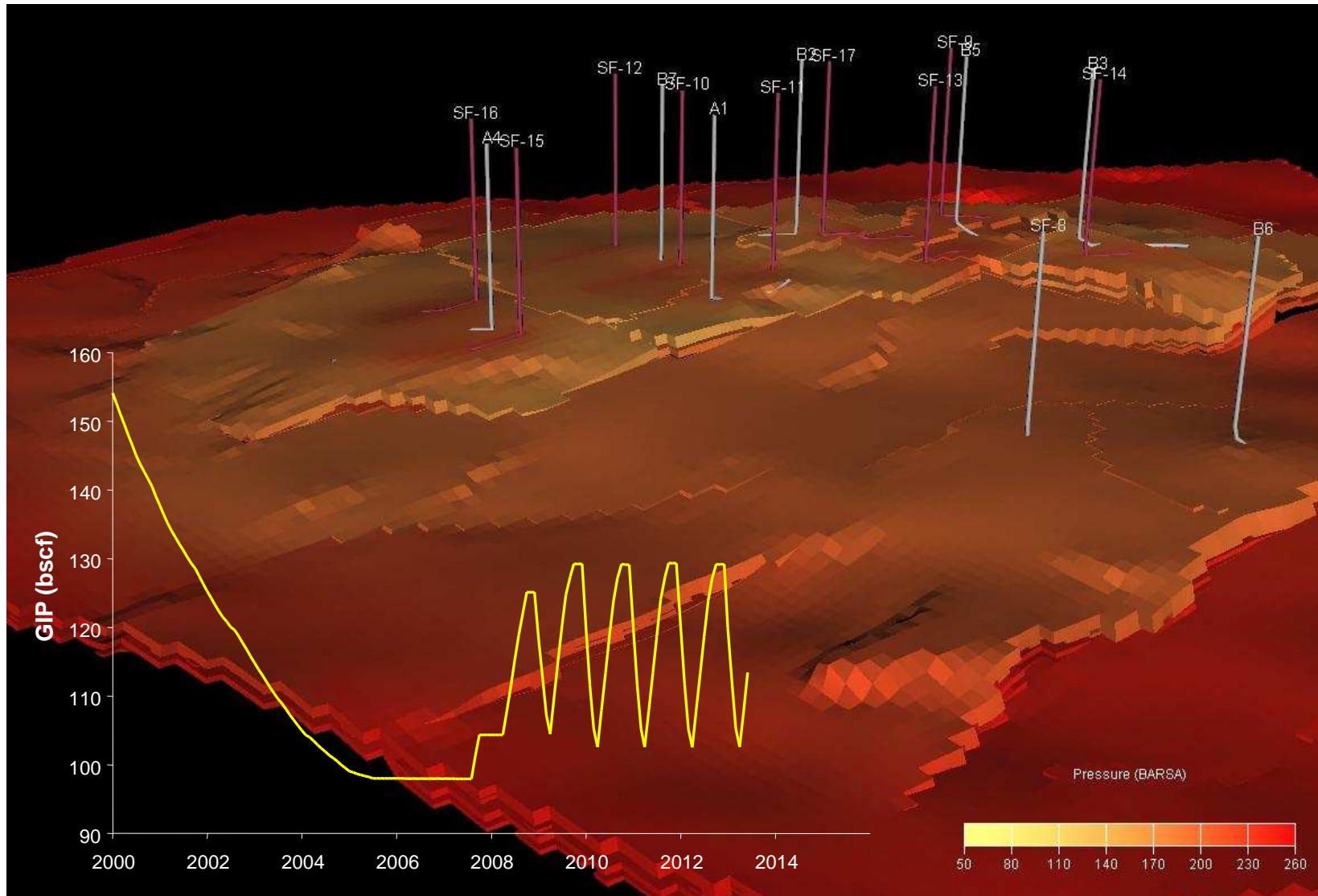
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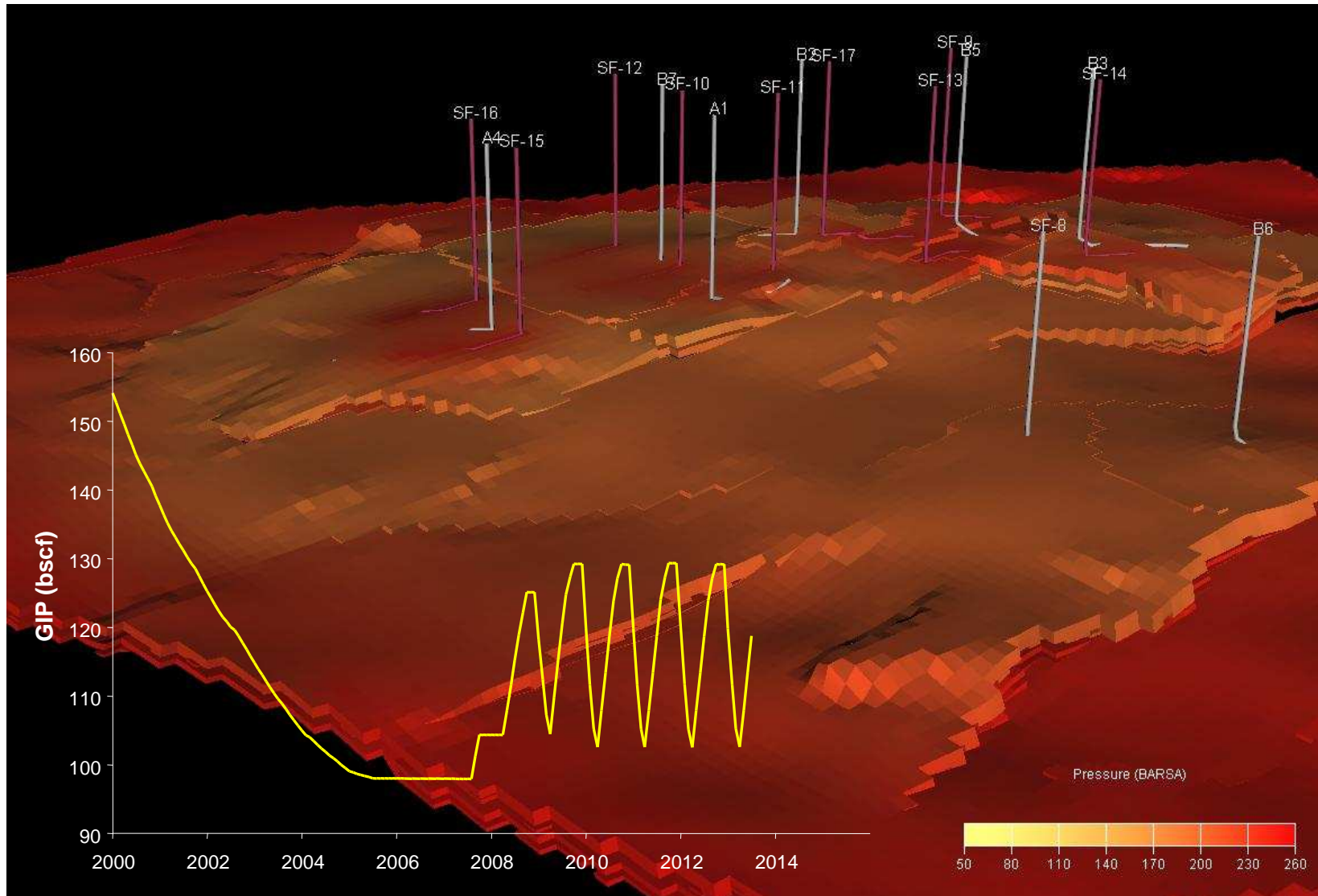
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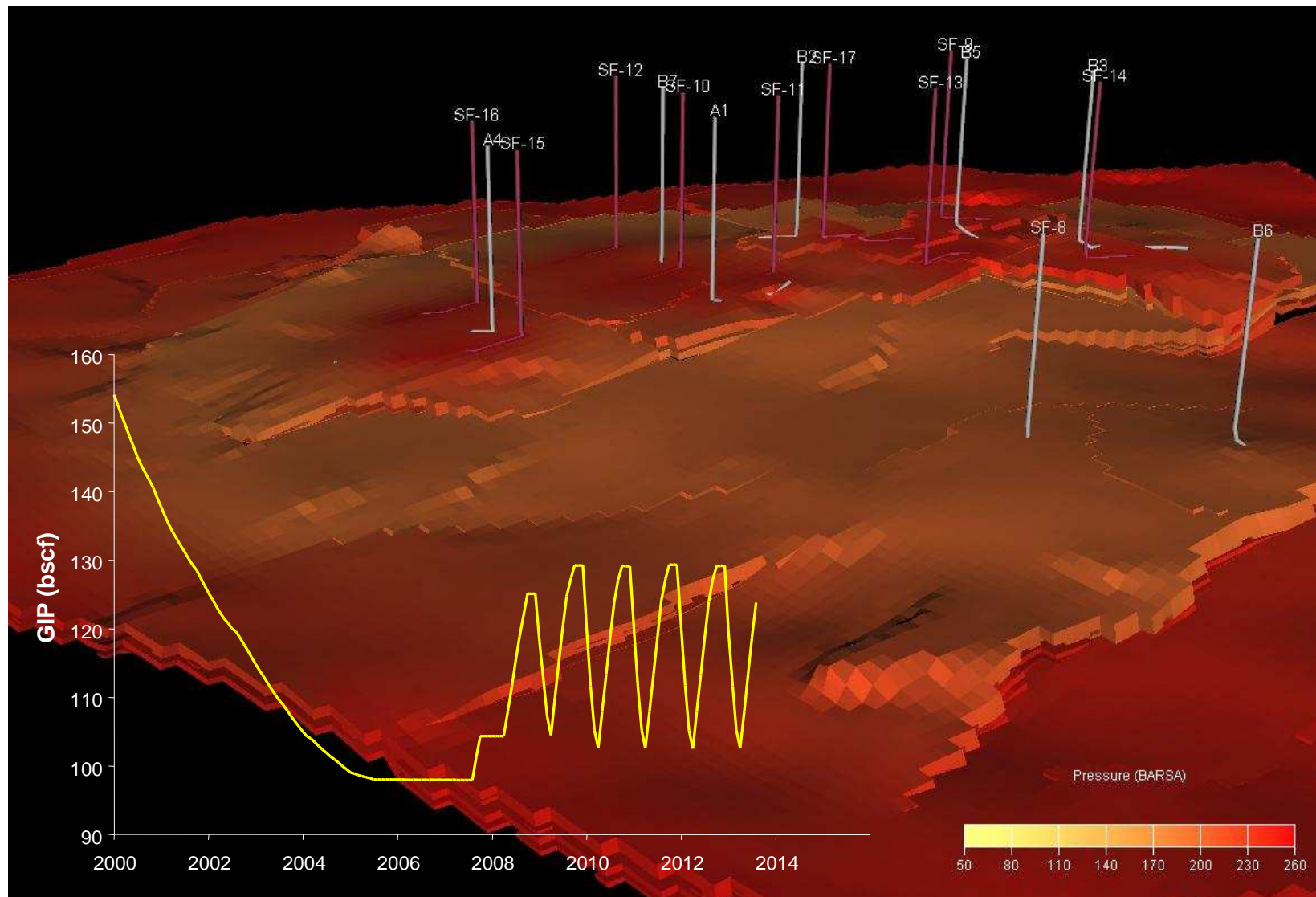
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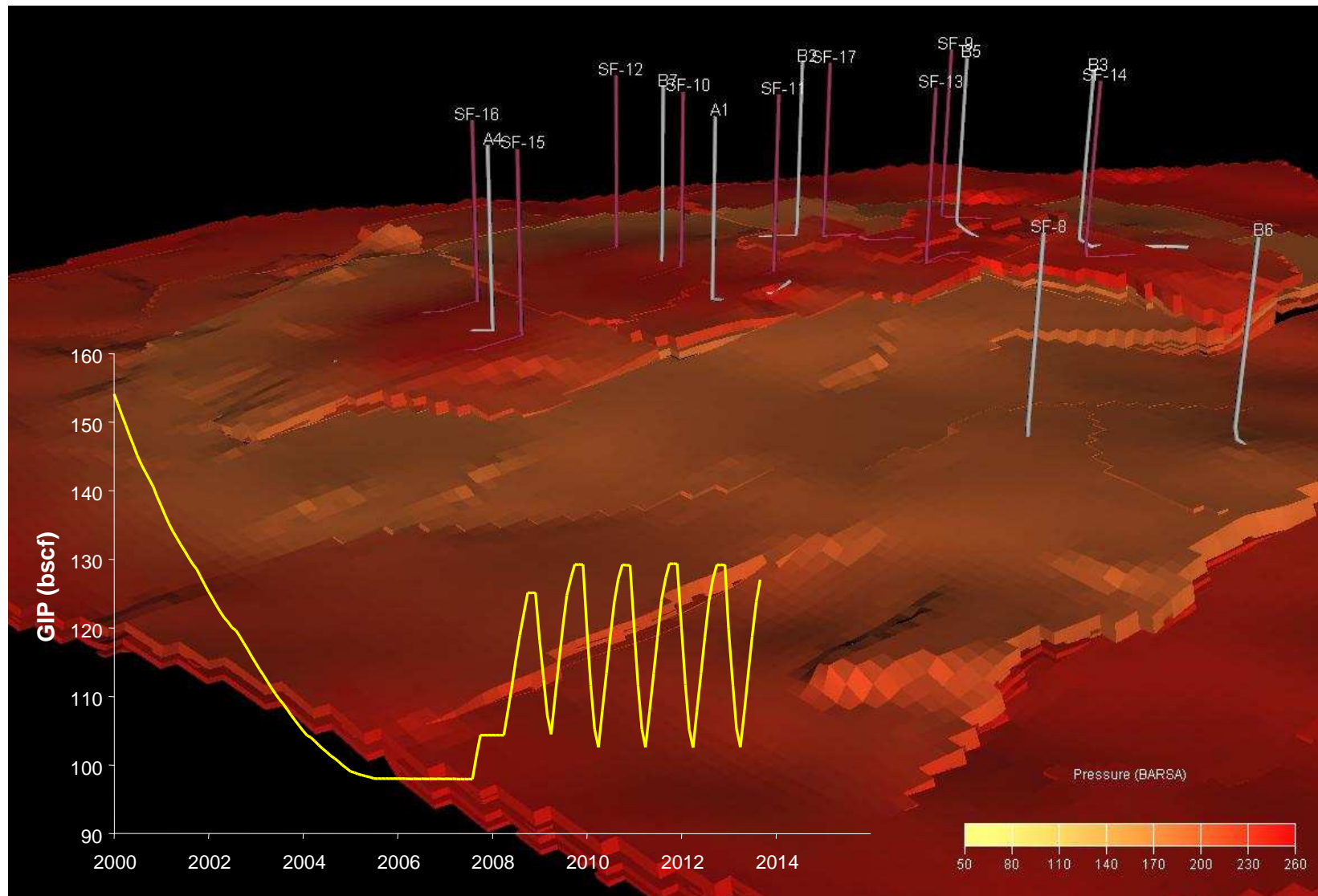
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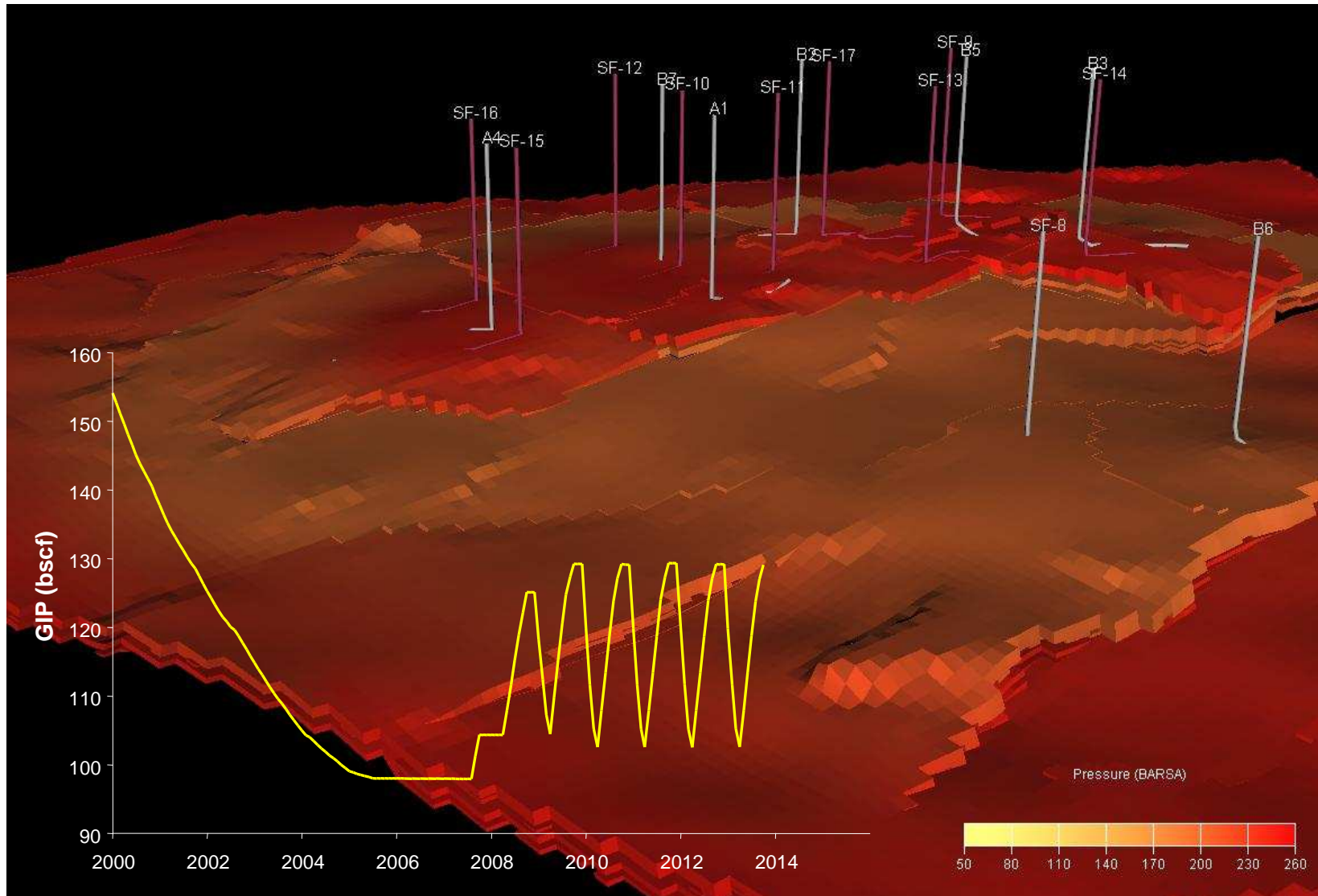
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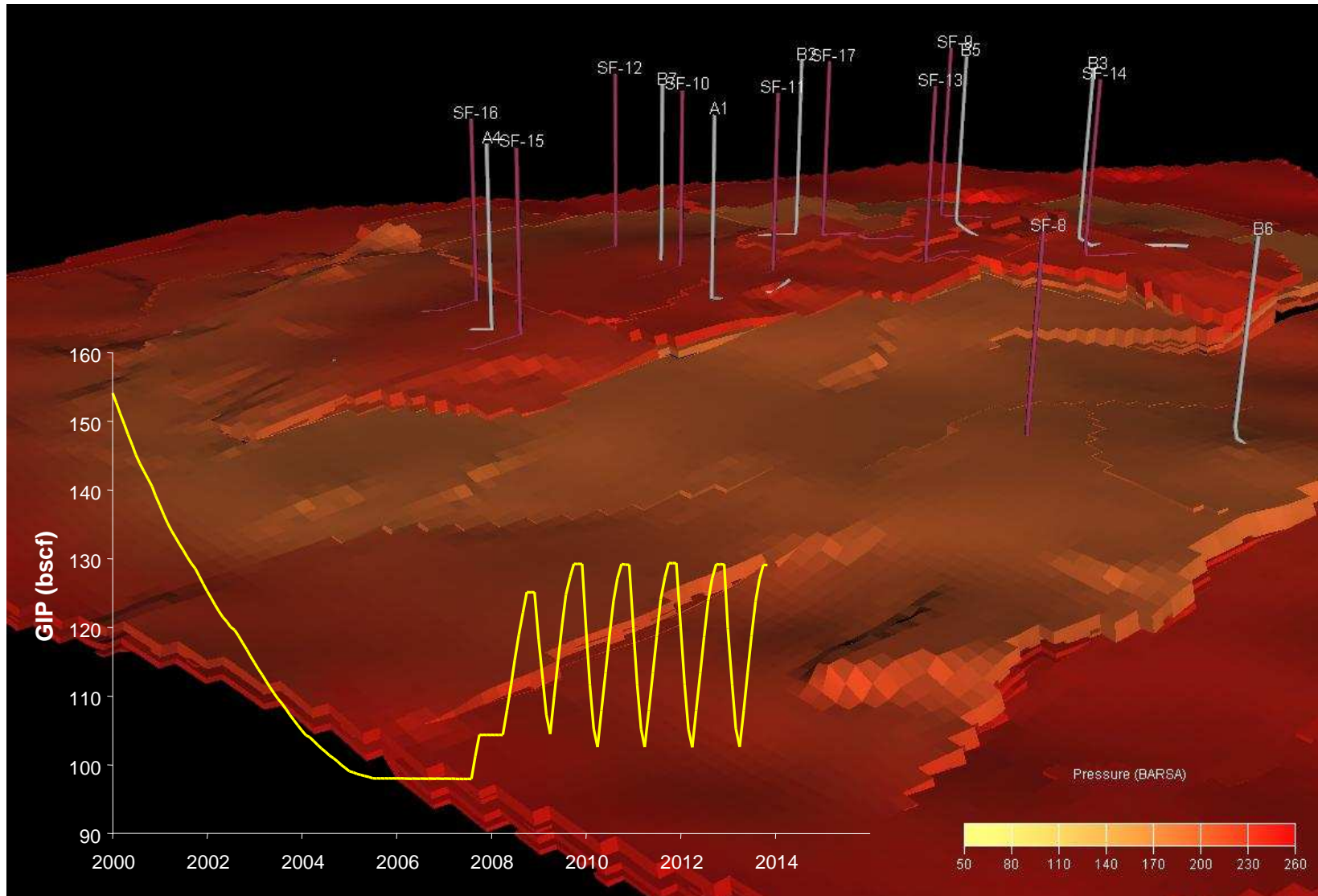
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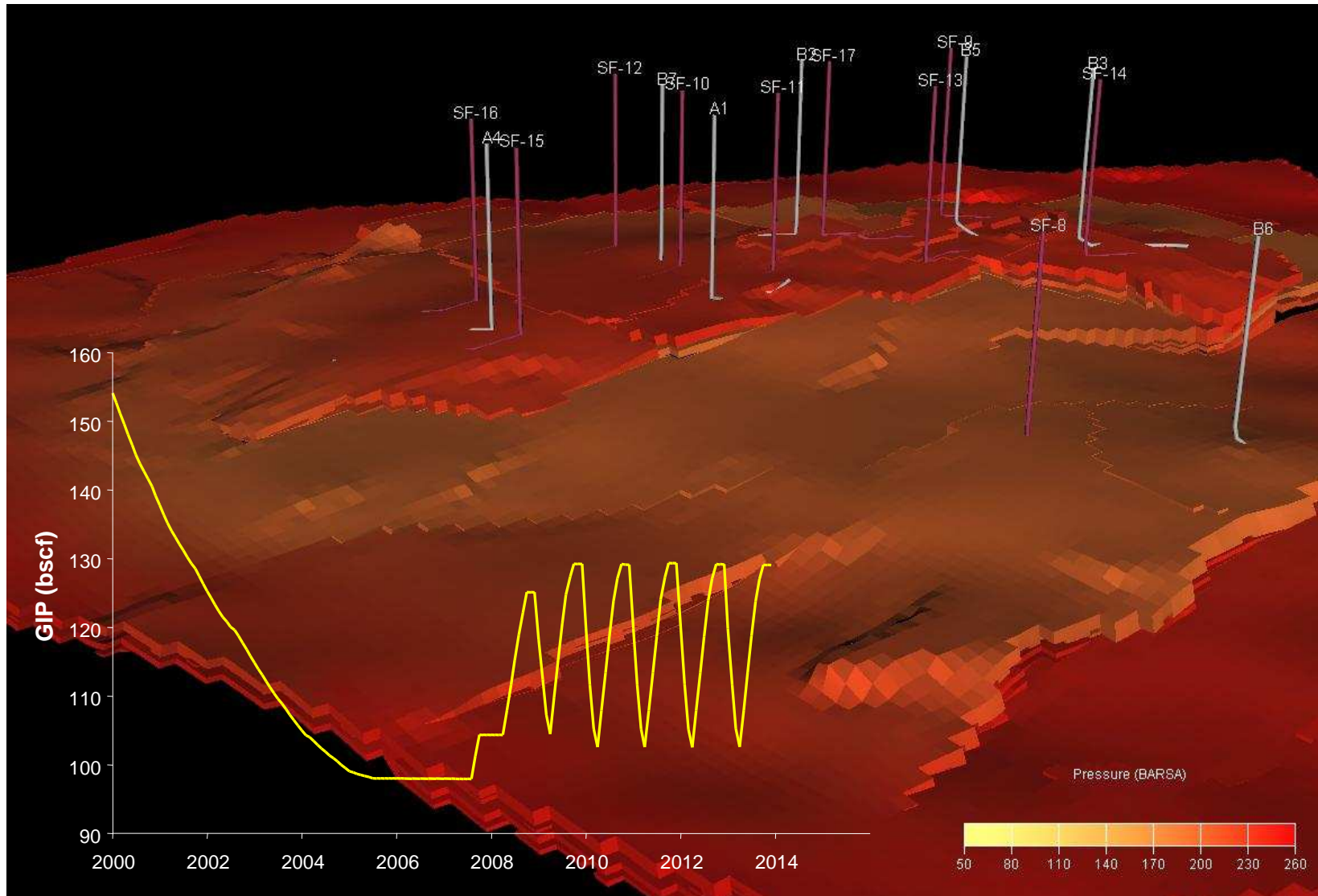
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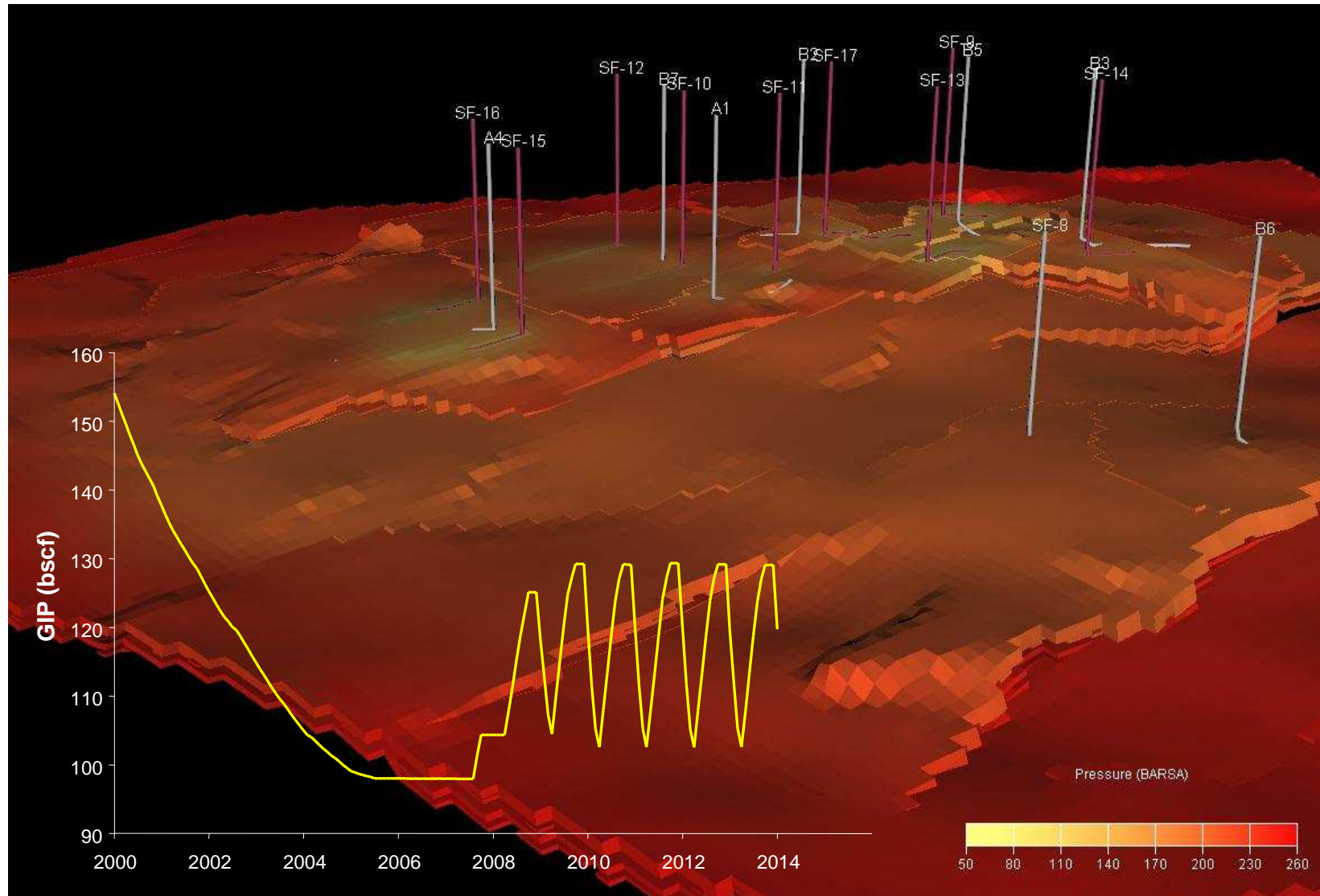
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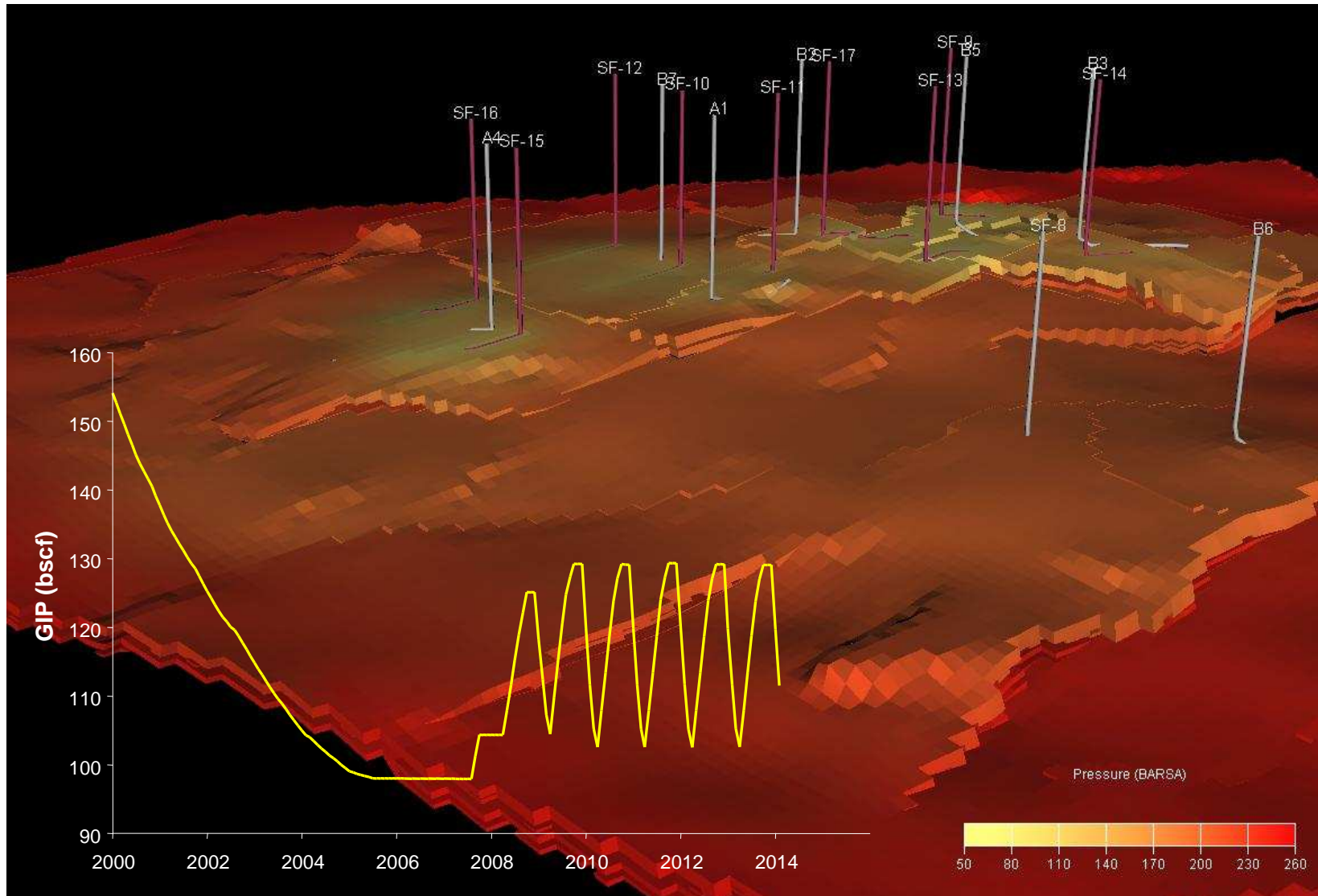
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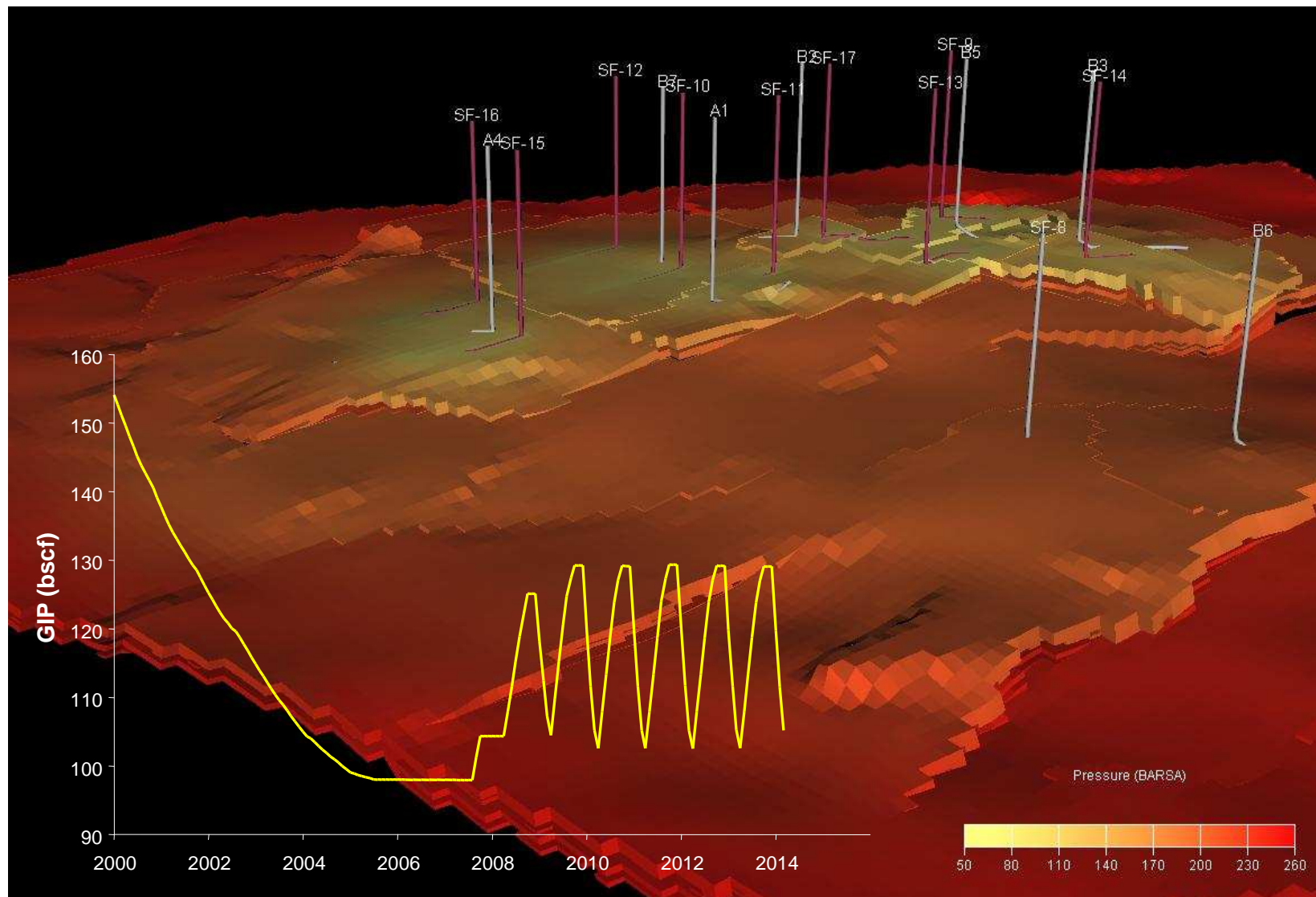
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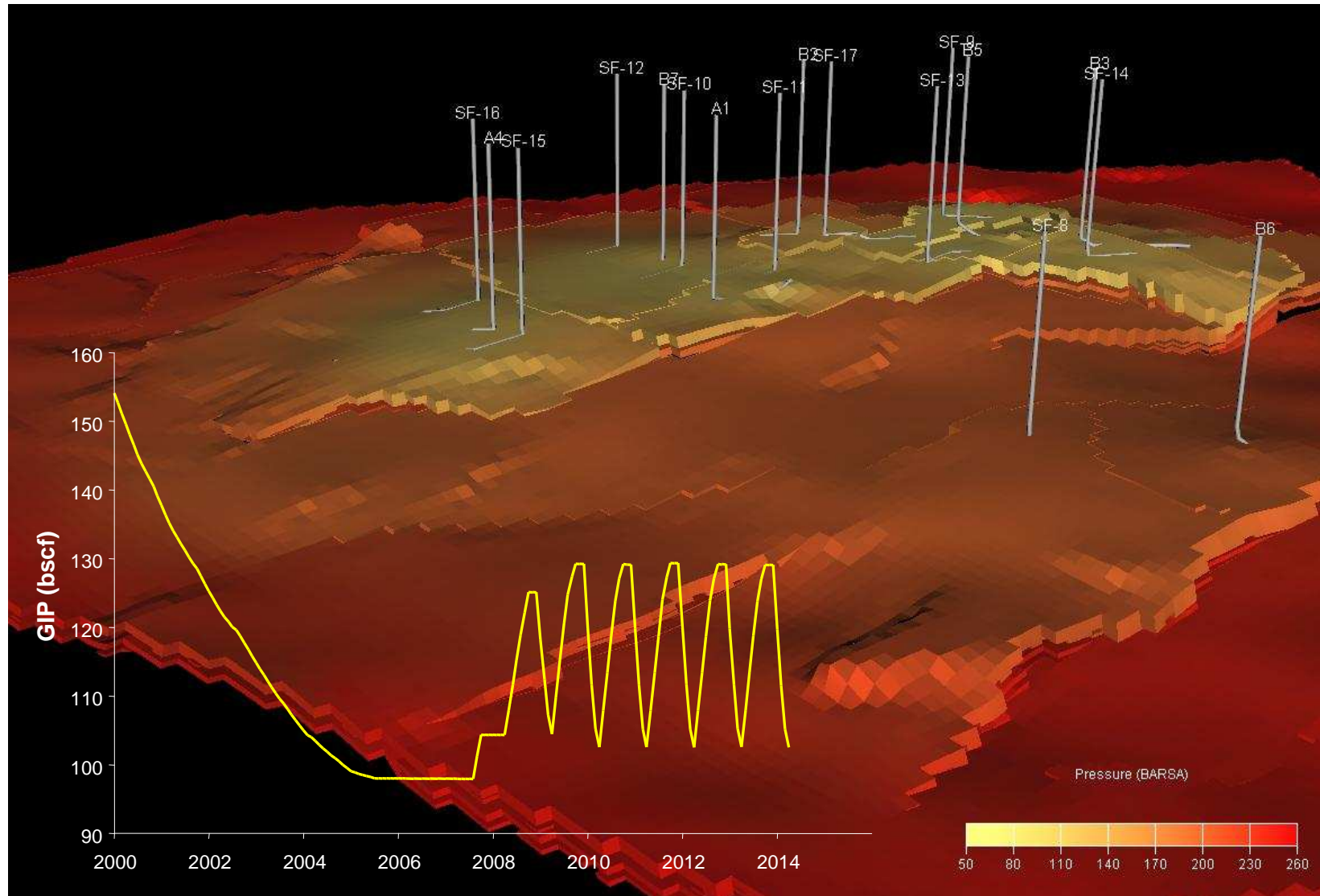
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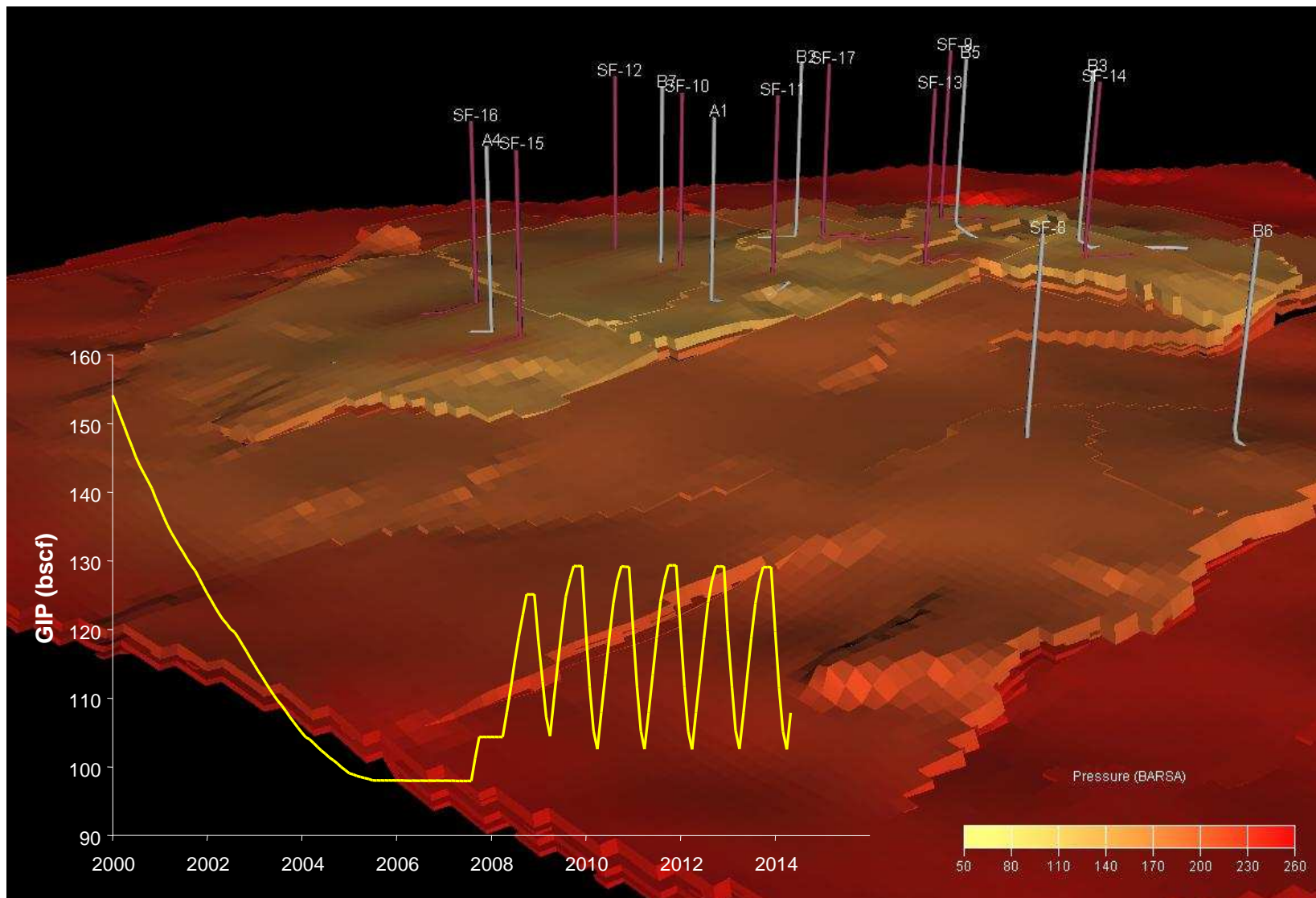
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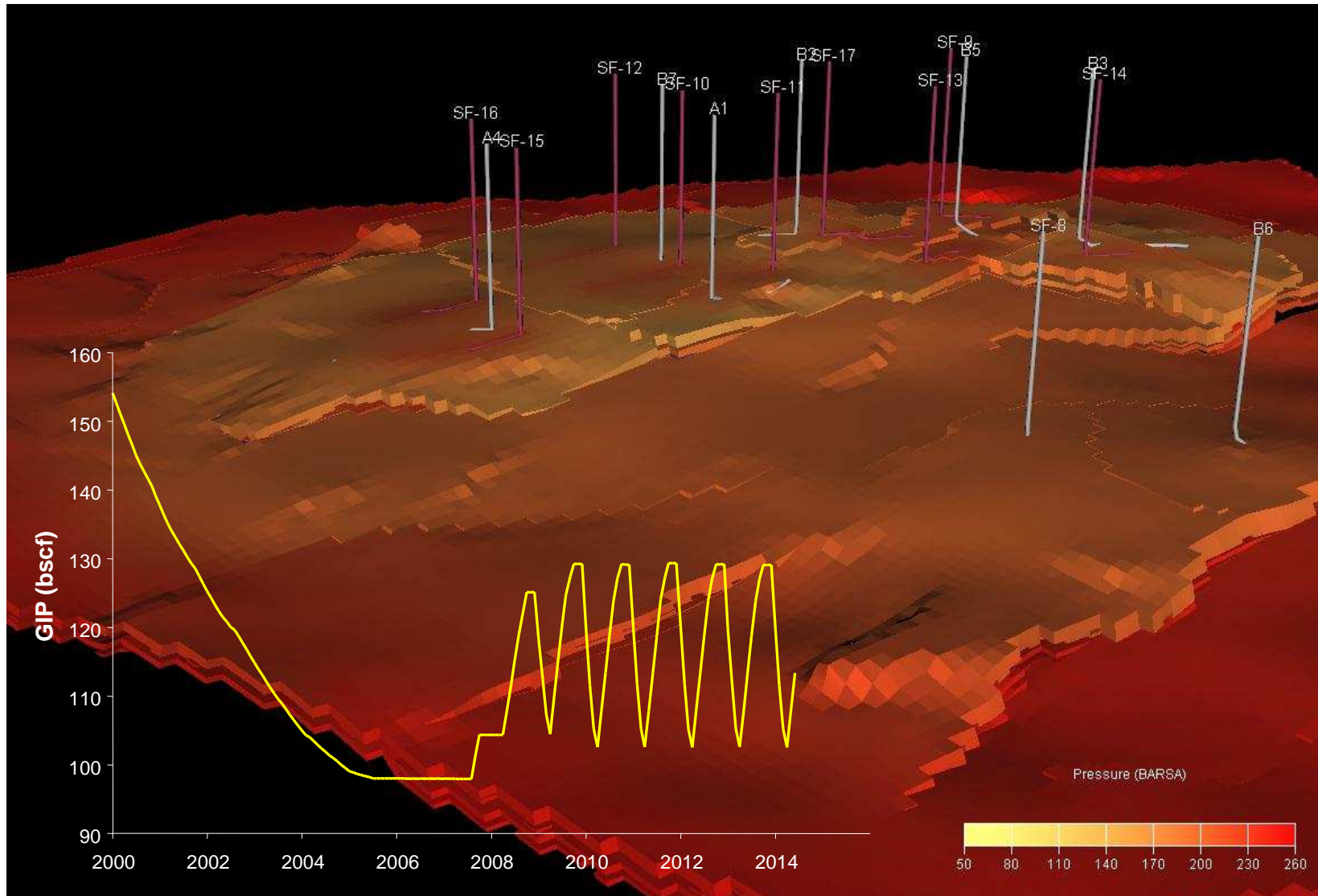
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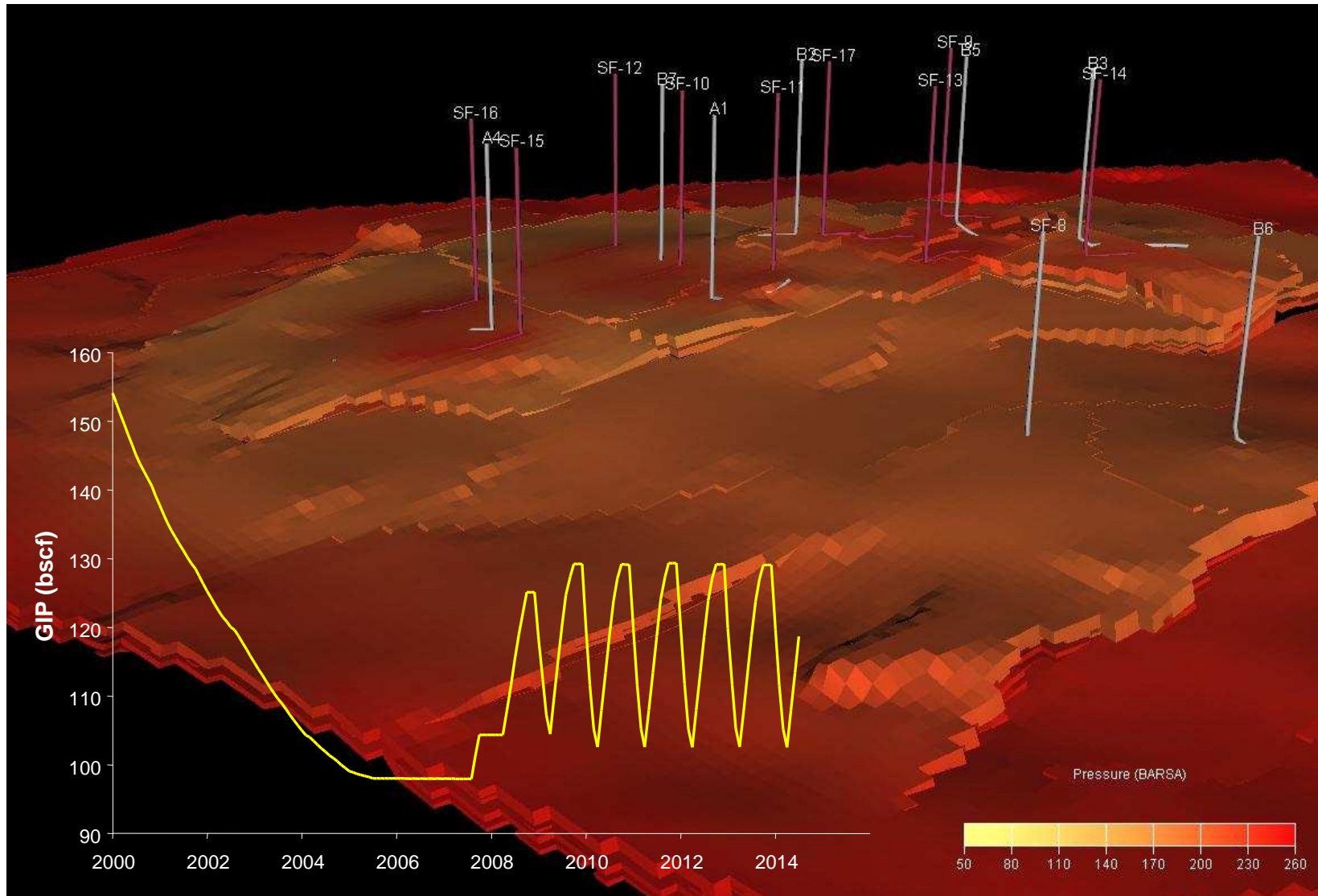
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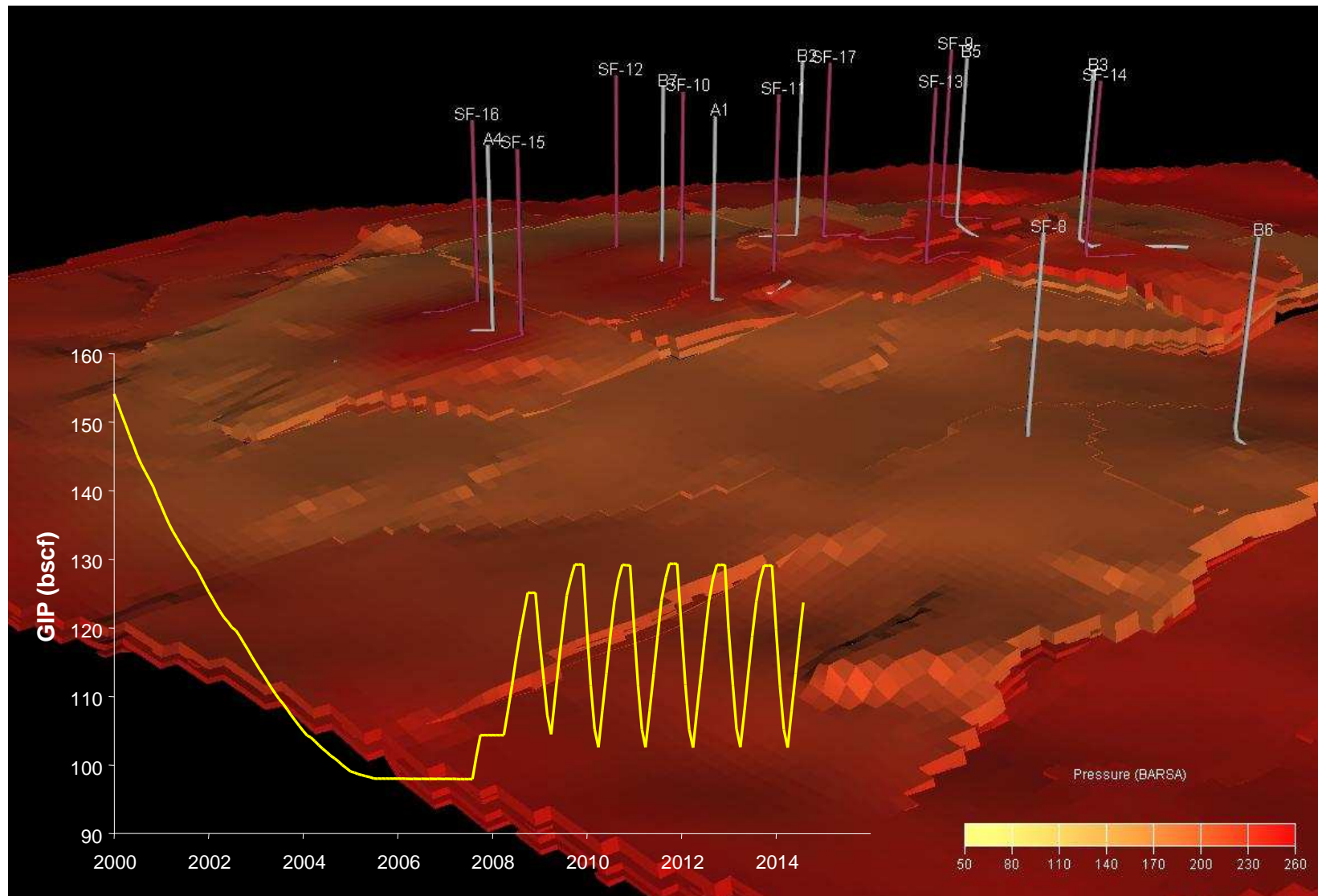
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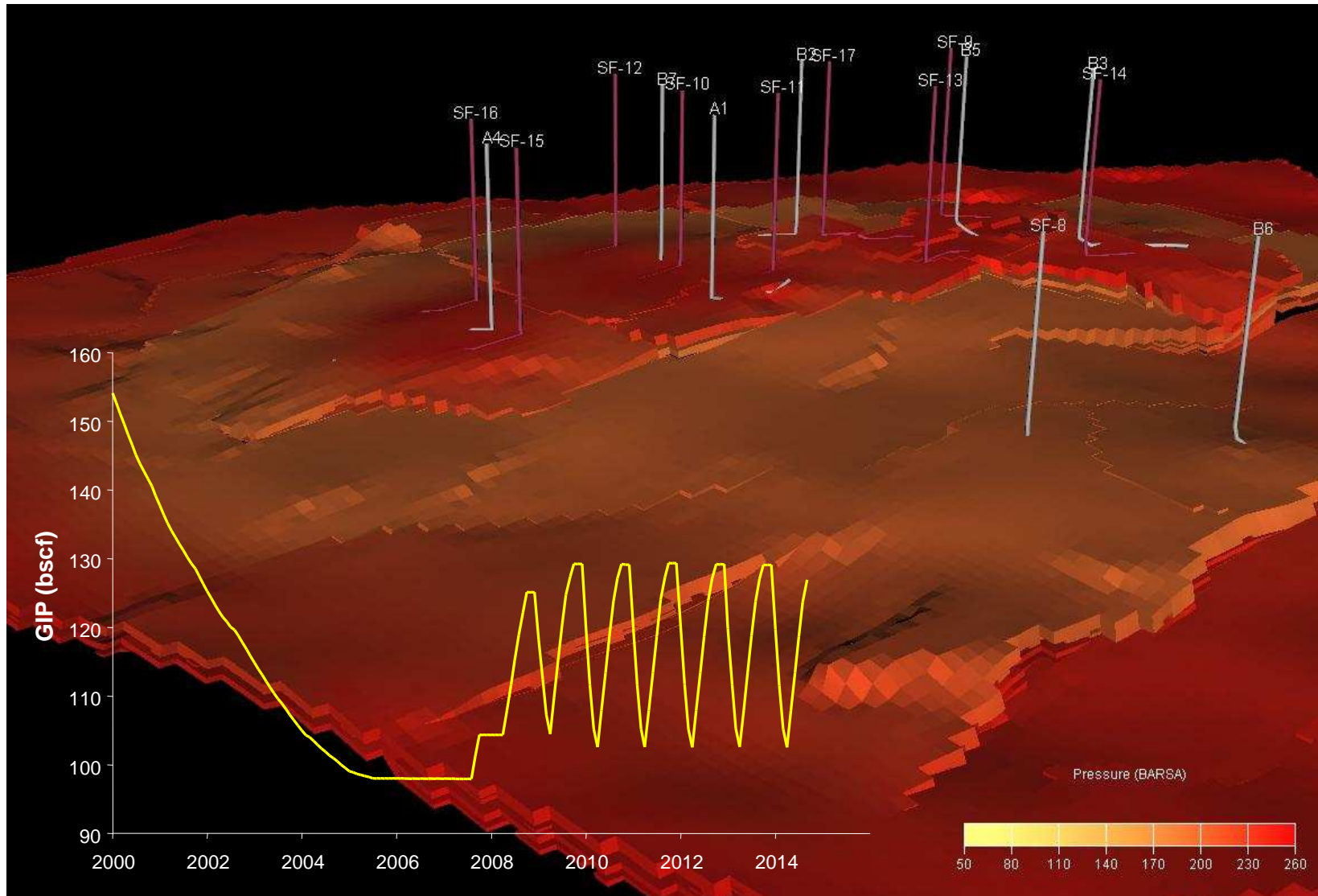
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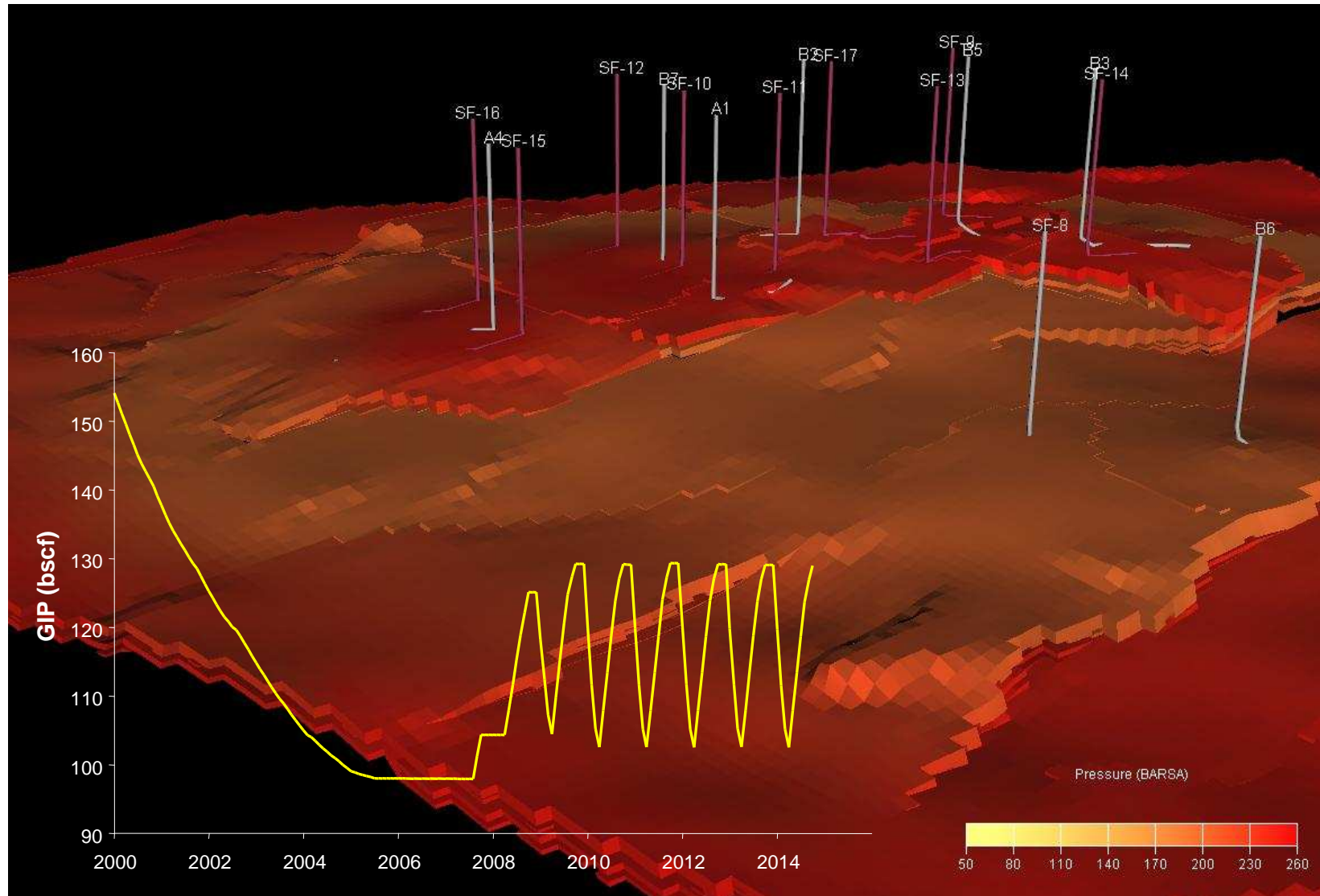
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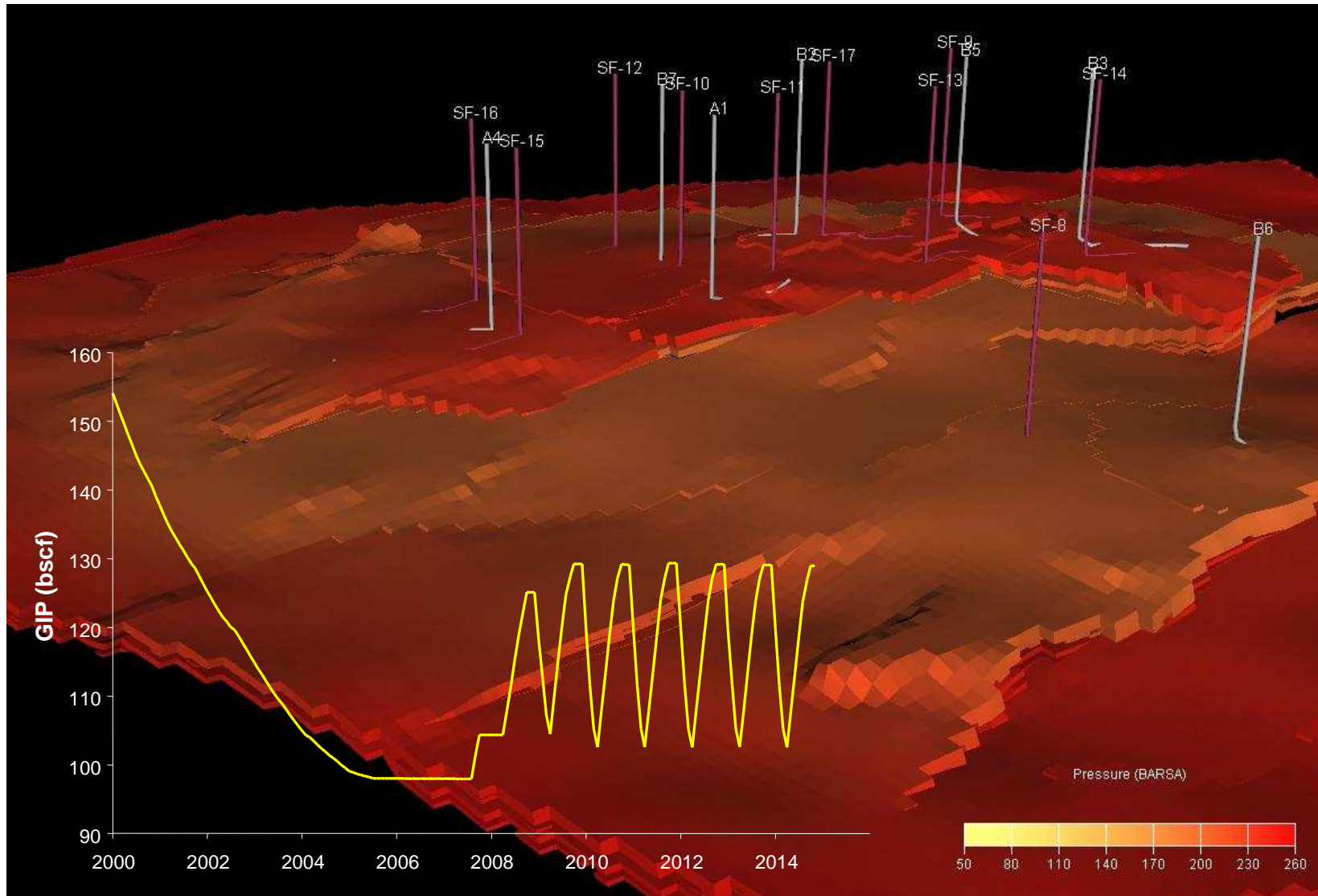
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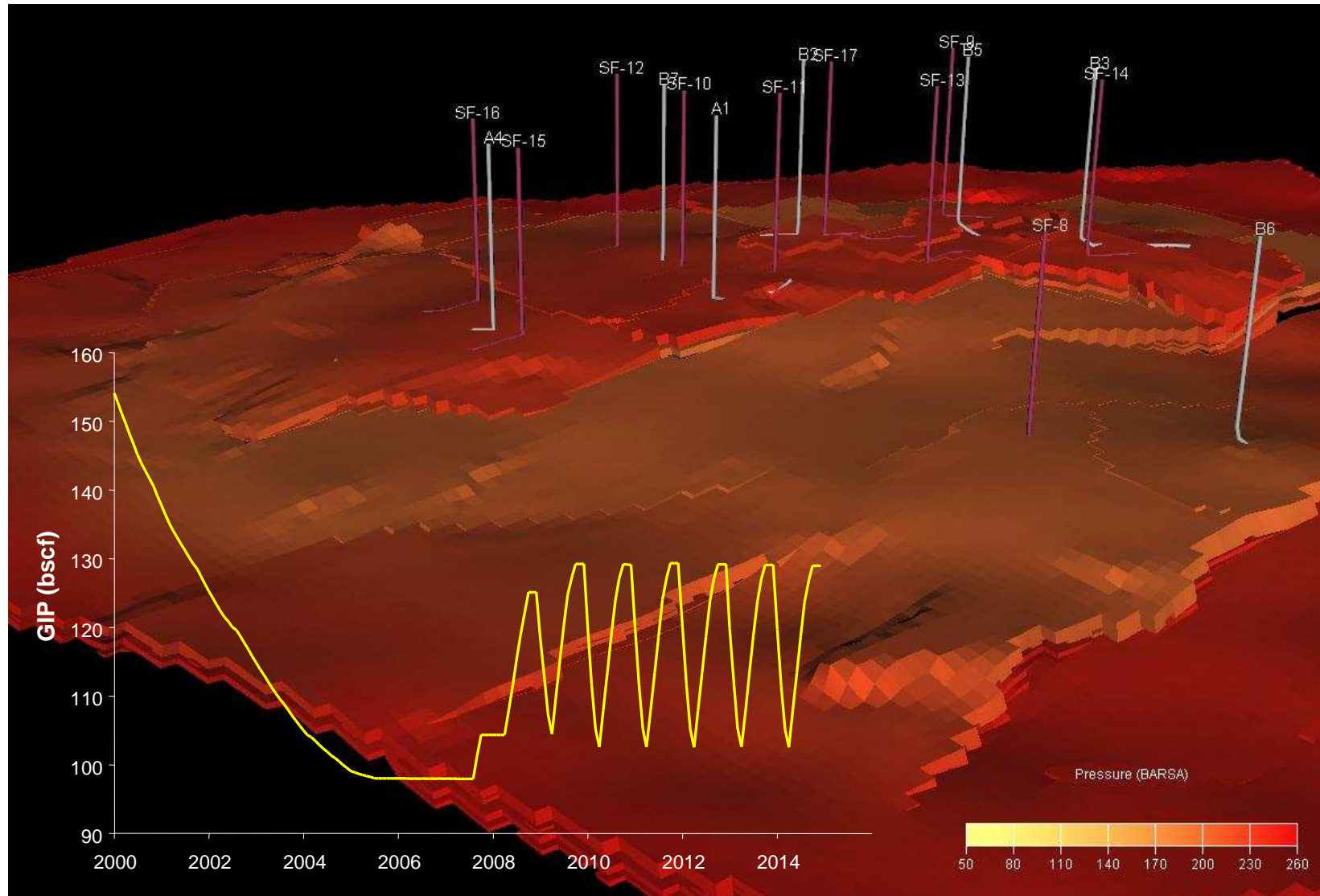
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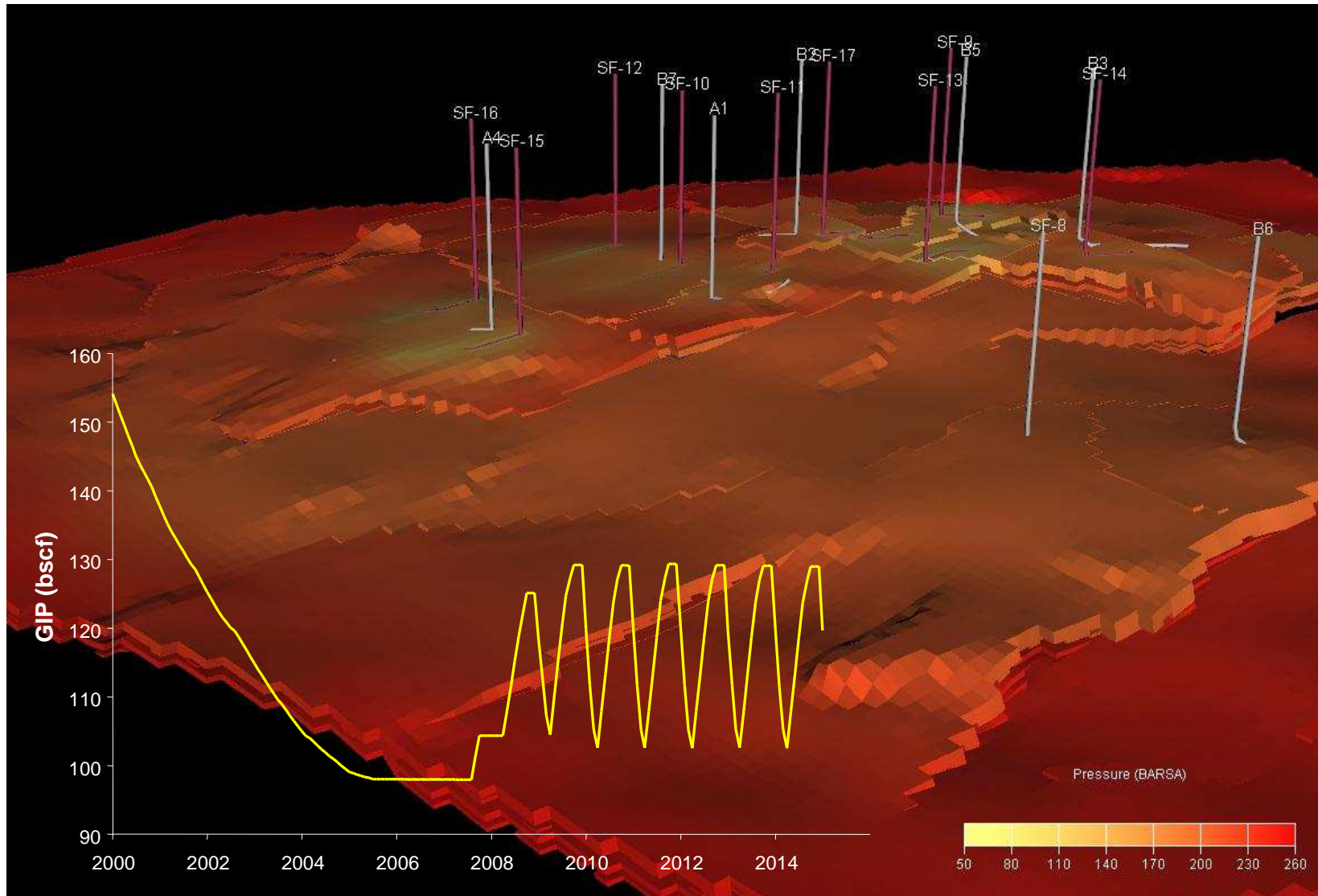
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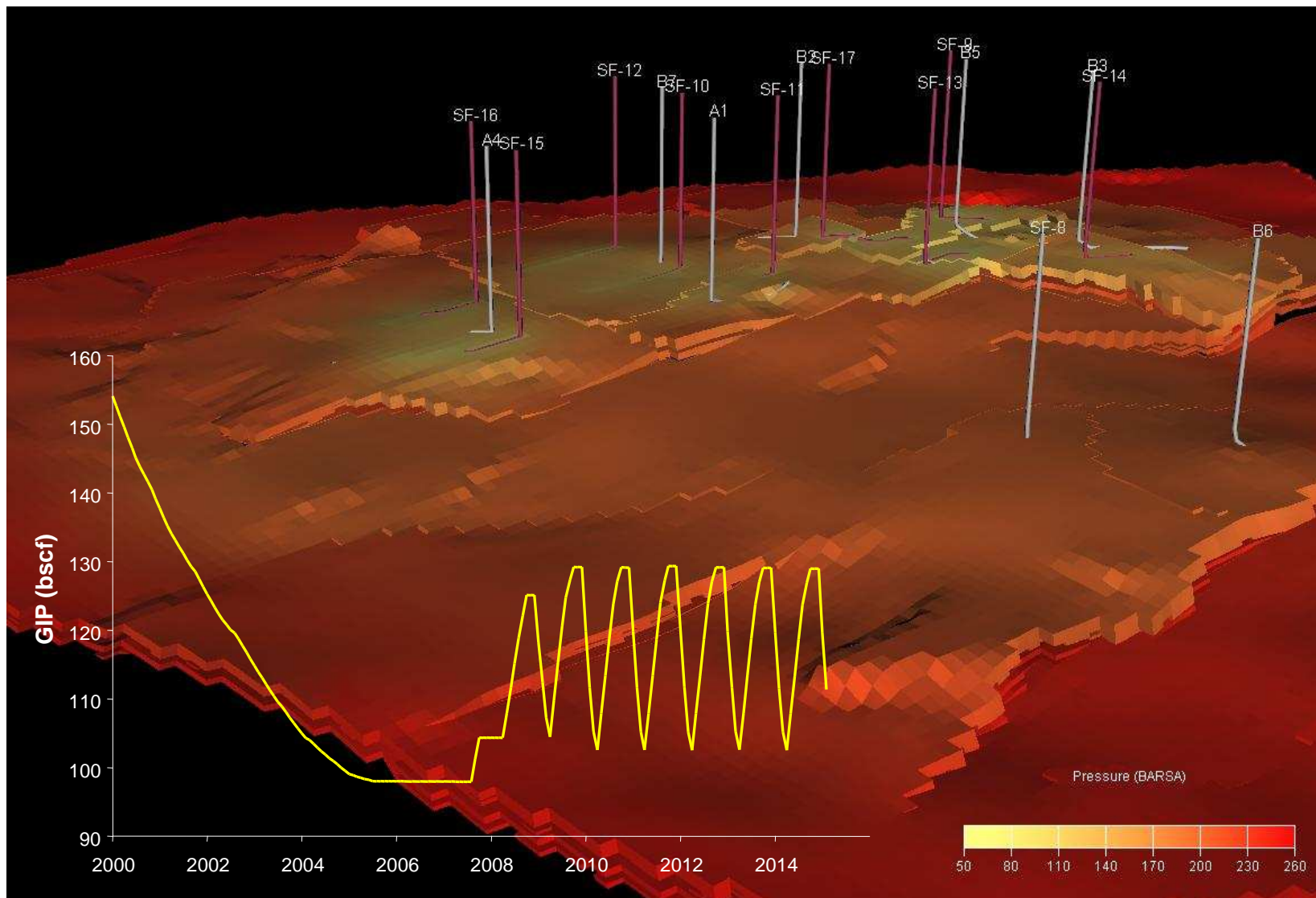
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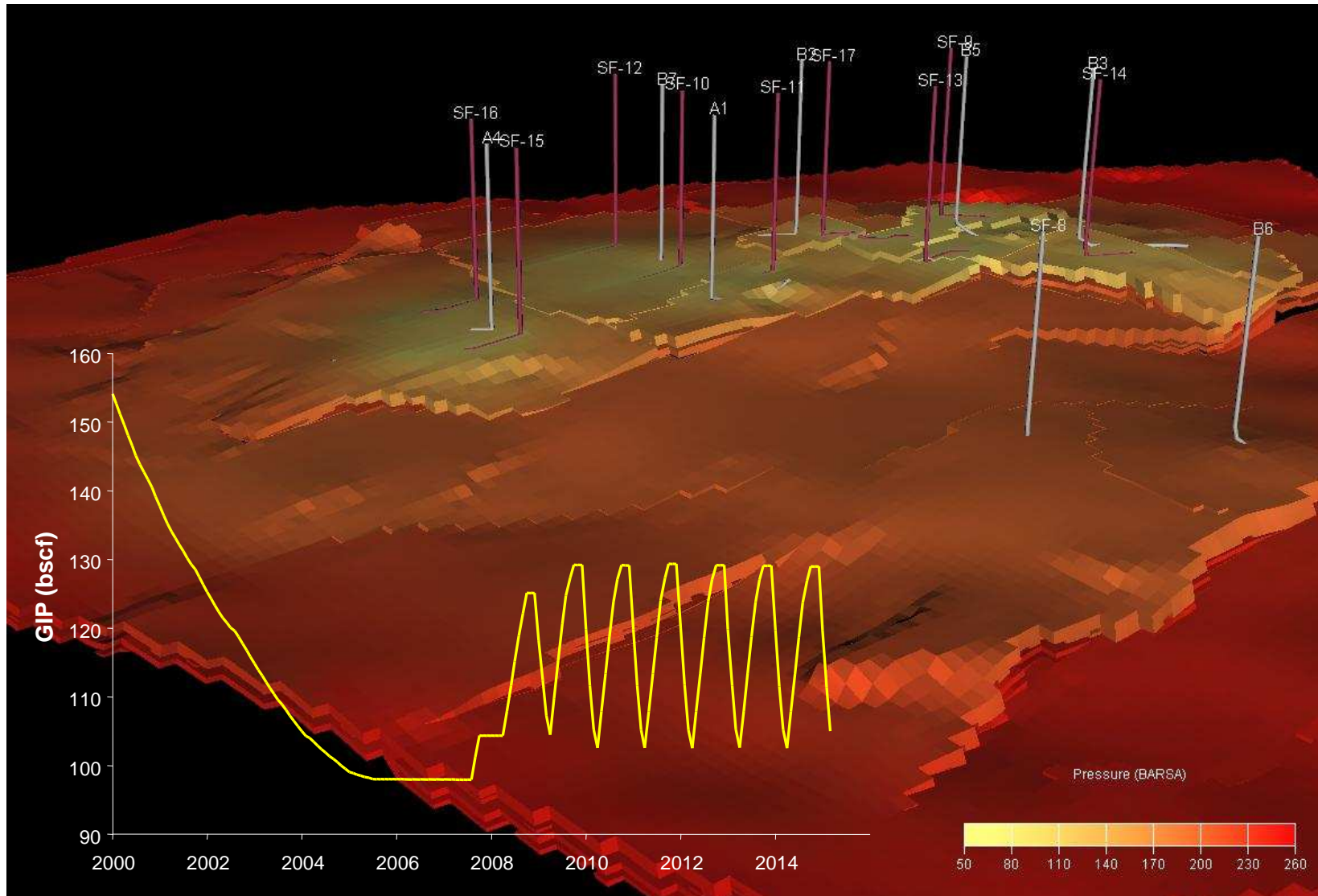
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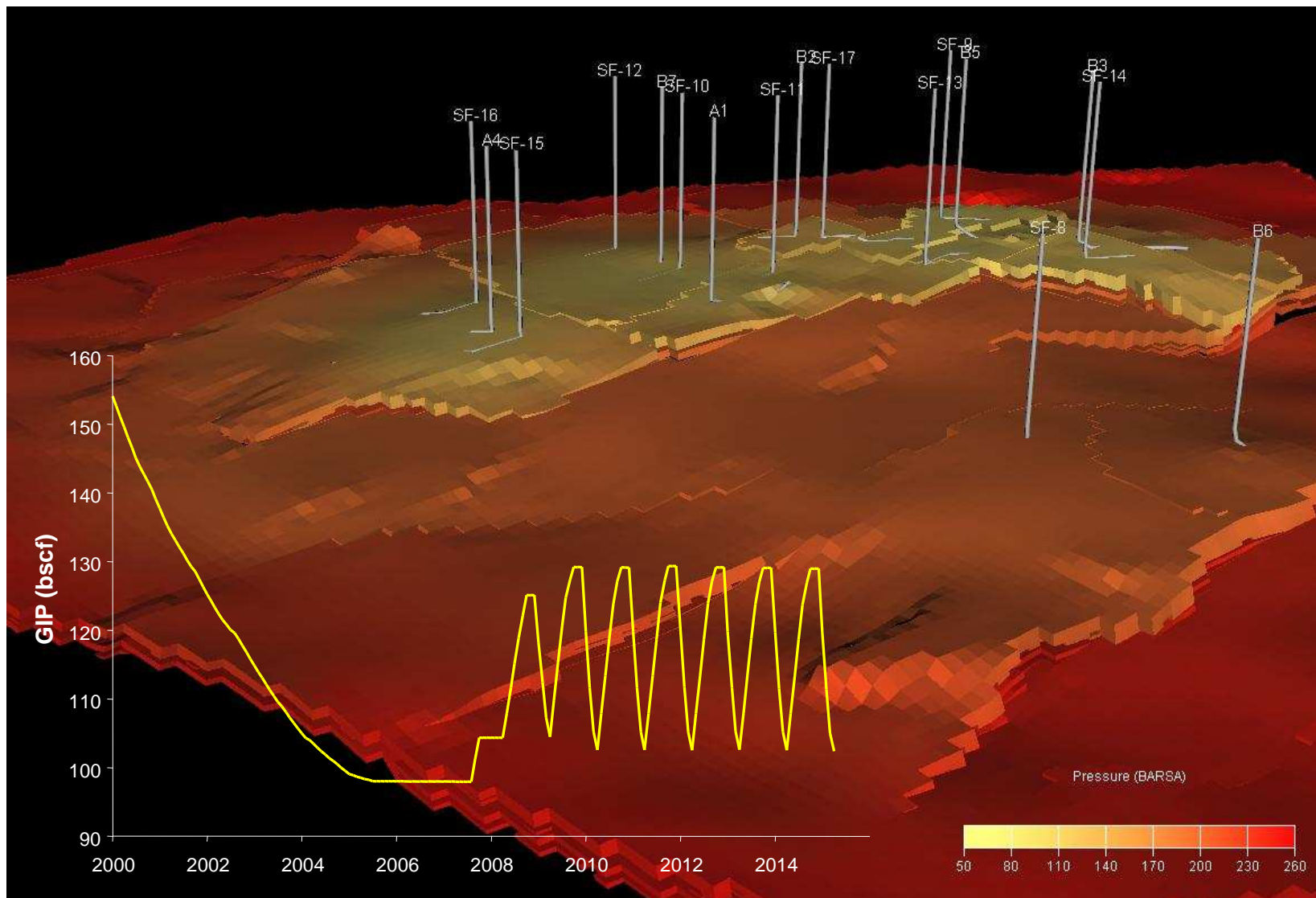
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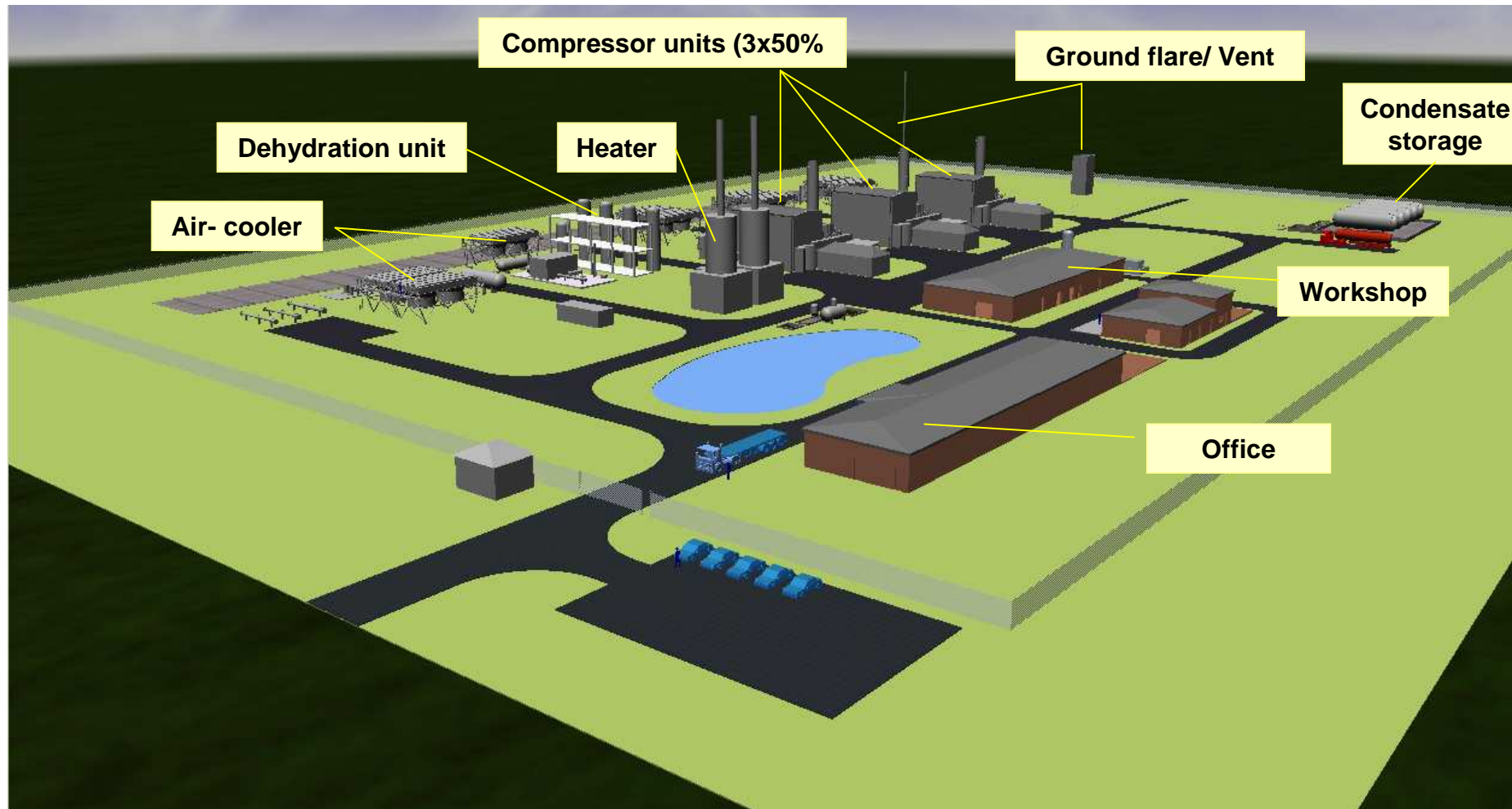
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Saltfleetby Gas Storage Project

Main Site (3-D model)



Saltfleetby Gas Storage Project Location (Photomontage)

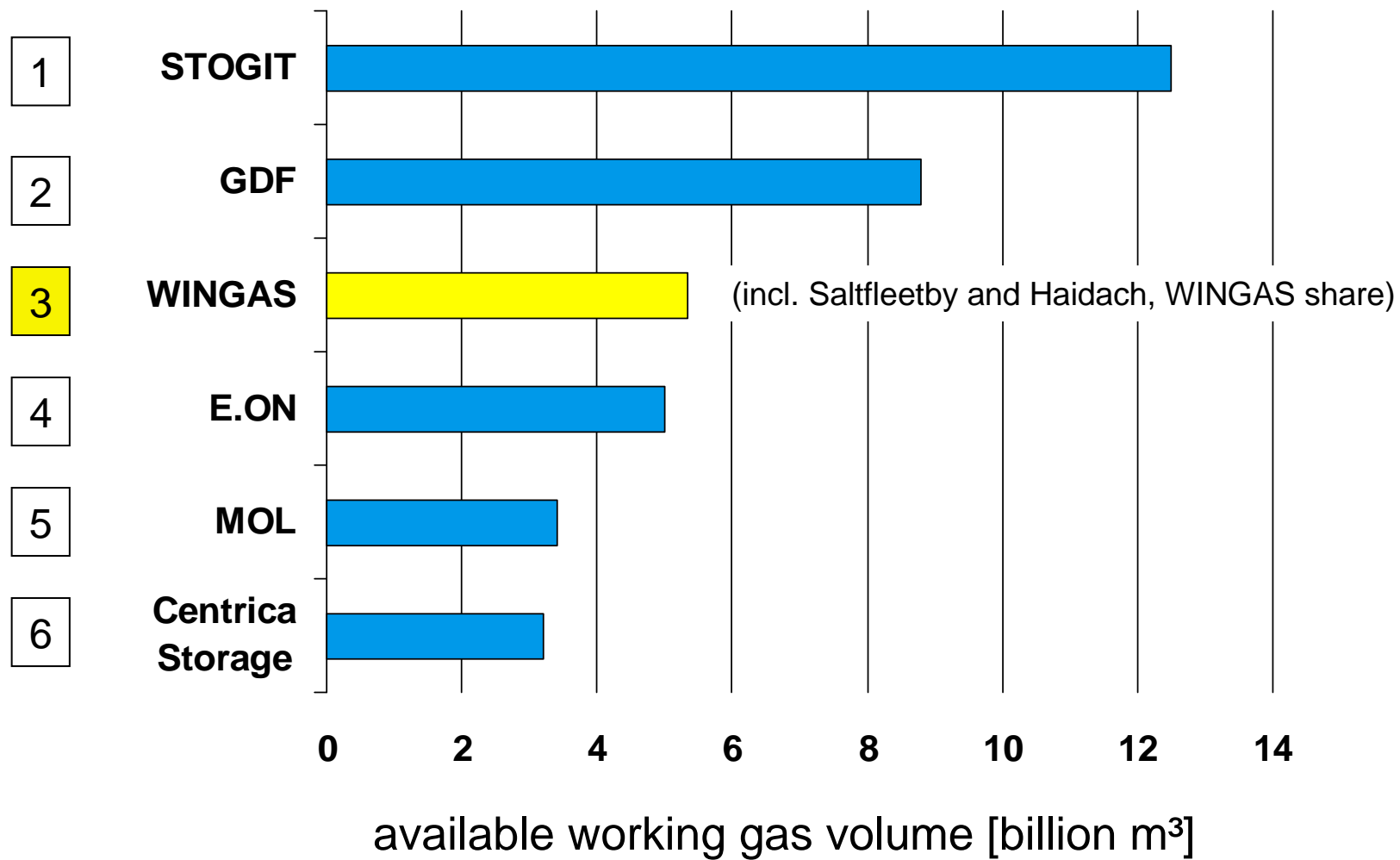


...and how it may look like in the future....



Storage Capacities in Europe

Ranking of the largest Storage operators





**“Business-Life is what happens
while you’re making plans!”**

Paul M. Lexington

Thank you for your attention!

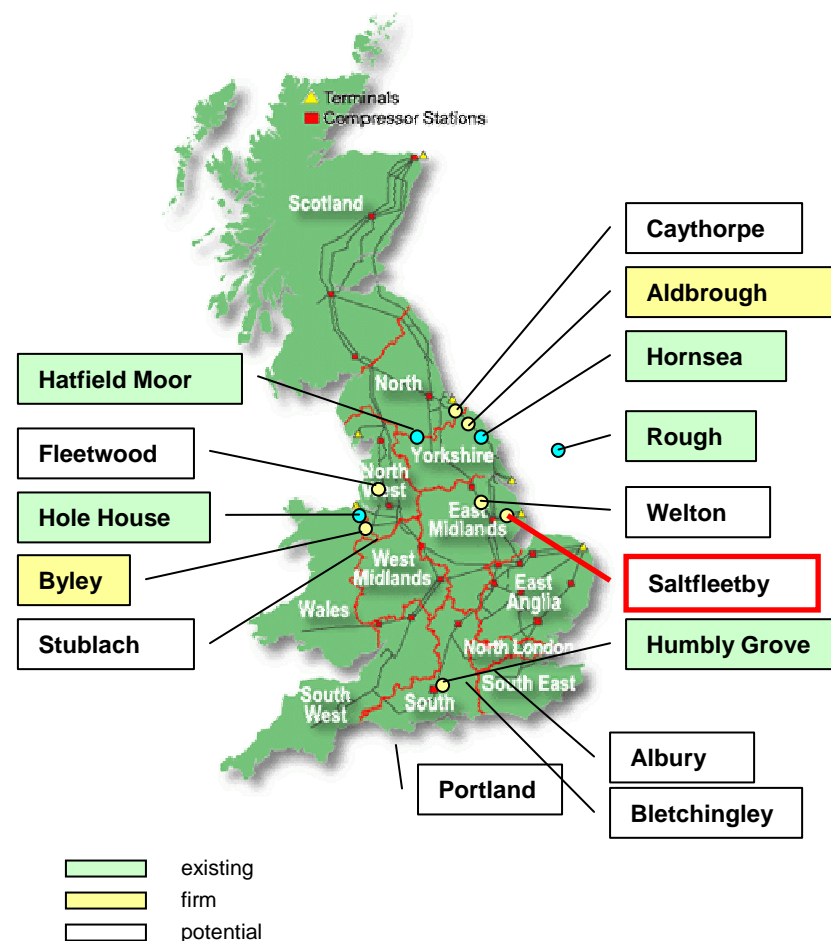
Storage facilities in the UK



Existing Storage			
Facility	Owner	Capacity [GWh]	Rate [GWh/d]
Rough	CSL	36,000	455
Hornsea	SSE	3,495	195
LNG Storage	Transco	2,806	525
Hatfield Moor	SP	1,260	25
Hole House	EdFT	600	90
Humbly Grove	Star Energy	3,146	79
Total		47,307	1,369

Planned Storage (planning consent recieved)			
Facility	Owner	Capacity [GWh]	Rate [GWh/d]
Aldbrough	Statoil/ SSE	4,427	421
Byley	E.ON UK	1,758	175
Total		6,185	596

Planned Storage (applied for planning consent / potential)			
Facility	Owner	Capacity [GWh]	Rate [GWh/d]
Saltfleetby	WINGAS	7,650	85
Welton	Star Energy	4,720	89
Caythorpe	Warwick	2,250	90
Fleetwood	Canatxx	18,000	1,200
Bletchingley	Star Energy	8,600	
Albury I + II	Star Energy	9,200	
.....			
Total		50,420	



Source: public domain