Lecture#4 Building a Structural Model for Buzurgan Oil Field

Dr. Dheiaa Alfarge

Structural Model

- structural model: Reservoir modeling is the process of creating a three-dimensional representation of a given reservoir based on its petrophysical, geological and geophysical properties.

Didger and Petrel

- Didger: is a georeferencing, digitizing, and coordinate conversion software program that provides many data transformation features.

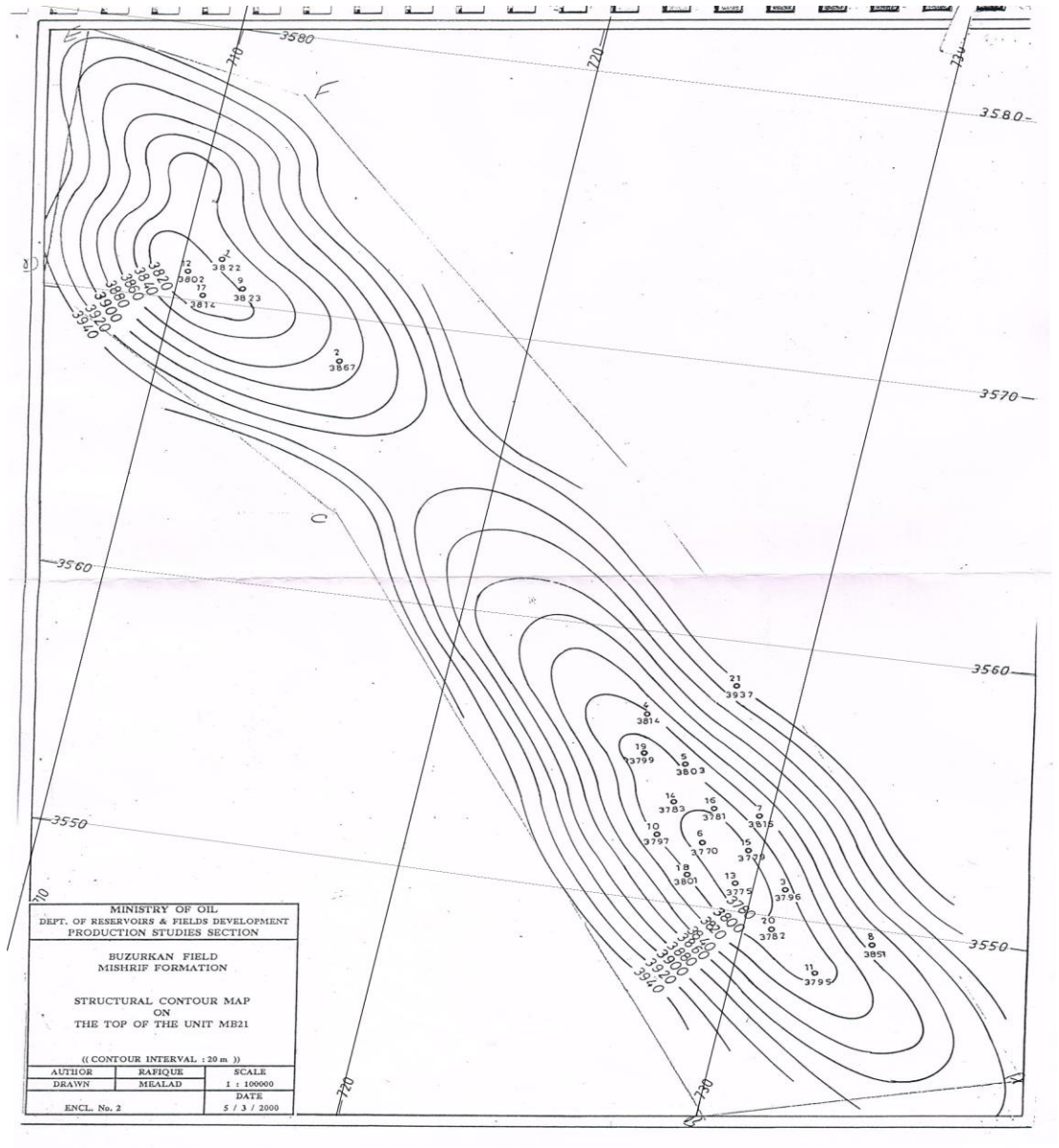
- Petrel: is a software platform used in the exploration and production sector of the petroleum industry. It allows the user to interpret seismic data, perform well correlation, build reservoir models, visualize reservoir simulation results, calculate volumes, produce maps and design development strategies to maximize reservoir exploitation. Petrel is developed and built by Schlumberger.

Model Design Workflow:

- 1.Read and transfer the coordinates from the contour map of the Mishrif Formation(figure.1), by Didger software.

- 2.input the coordinates in the Petrel software to do the structural model.

Data Given Vs. Output: Part I: Contour map to contour numbers



Shape

Digitizing

x	y	z
635870	3629641	3820
635869.9	3629641	3820
635869.7	3629641	3820
635869.5	3629641	3820
635869.3	3629641	3820
635869.2	3629642	3820
635869.1	3629642	3820
635869	3629642	3820
635868.9	3629642	3820
635868.8	3629643	3820
635868.8	3629643	3820
635868.7	3629643	3820
635868.7	3629643	3820
635868.8	3629644	3820
635868.8	3629644	3820
635868.8	3629644	3820
635868.9	3629644	3820

Numbers

Data Given Vs. Output: Part II: Well Top

TABLE No. : 1

BUZURKAN FIELD
MISHRIF FORMATION SUBDIVIDISIONS

SUB-DIVIDISIONS	WELL No.	BU-1 K.B. : 55 m DEPTH m	BU-1 THICK. m	BU-1 PHI %	BU-2 K.B. : 36.7 m DEPTH m	BU-2 THICK. m	BU-2 PHI %	BU-3 K.B. : 30.7 m DEPTH m	BU-3 THICK. m	BU-3 PHI %
MISHRIF	TOP	3732.6	342.2		3759.4	347.2		3689	363.6	
mA	TOP	3749	22.7		3778	20.4		3697	21	
	BOTTOM	3771.6			3798.4			3718		
mB11	TOP	3804.5	37.2		3832	37		3751	40	
	BOTTOM	3841.7			3869			3791		
mB12	TOP	3855.7	8.3		3882	9		3804	9	
	BOTTOM	3864			3891			3813		
mB21	TOP	3877.3	77	14.7	3904	79.8	17.6	3826.5	84	13.3
	BOTTOM	3954.3			3983.8			3910.5		
mC1	TOP	3954.3	61.2	17.3	3983.8	65.2	17.5	3910.5	92.1	16.3
	BOTTOM	4015.5			4049			4002.6		
mC2	TOP	4015.5	45.5	11	4049	43		4002.6	34.4	12.5
	BOTTOM	4061			4092			4037		
RUMAILA	TOP	4074.8			4106.6			4052.6		

ALL DEPTHS ARE MEASURED FROM K.B..

Contour map
Digitizing

well	surface	x	y	MD
BU 01	MISHRIF	710834.4	3571496	3732.6
BU 01	MA	710834.4	3571496	3749
BU 01	MB11	710834.4	3571496	3804.5
BU 01	MB12	710834.4	3571496	3855.7
BU 01	MB21	710834.4	3571496	3877.3
BU 01	MC1	710834.4	3571496	3954.3
BU 01	MC2	710834.4	3571496	4015.5
BU 01	RUMAILA	710834.4	3571496	4074.8

Shape

Numbers

Data Given Vs. Output: Part II: Well Head

TABLE No. : 1

BUZURKAN FIELD
MISHRIF FORMATION SUBDIVIDISIONS

SUB-DIVIDISIONS	WELL No.	BU-1 K.B. : 55 m DEPTH m	BU-1 THICK. m	BU-1 PHI %	BU-2 K.B. : 36.7 m DEPTH m	BU-2 THICK. m	BU-2 PHI %	BU-3 K.B. : 30.7 m DEPTH m	BU-3 THICK. m	BU-3 PHI %
MISHRIF	TOP	3732.6	342.2		3759.4	347.2		3689	363.6	
mA	TOP	3749	22.7		3778	20.4		3697	21	
	BOTTOM	3771.6			3798.4			3718		
mB11	TOP	3804.5	37.2		3832	37		3751	40	
	BOTTOM	3841.7			3869			3791		
mB12	TOP	3855.7	8.3		3882	9		3804	9	
	BOTTOM	3864			3891			3813		
mB21	TOP	3877.3	77	14.7	3904	79.8	17.6	3826.5	84	13.3
	BOTTOM	3954.3			3983.8			3910.5		
mC1	TOP	3954.3	61.2	17.3	3983.8	65.2	17.5	3910.5	92.1	16.3
	BOTTOM	4015.5			4049			4002.6		
mC2	TOP	4015.5	45.5	11	4049	43		4002.6	34.4	12.5
	BOTTOM	4061			4092			4037		
RUMAILA	TOP	4074.8			4106.6			4052.6		

ALL DEPTHS ARE MEASURED FROM K.B..

Contour map
Digitizing

Well head:

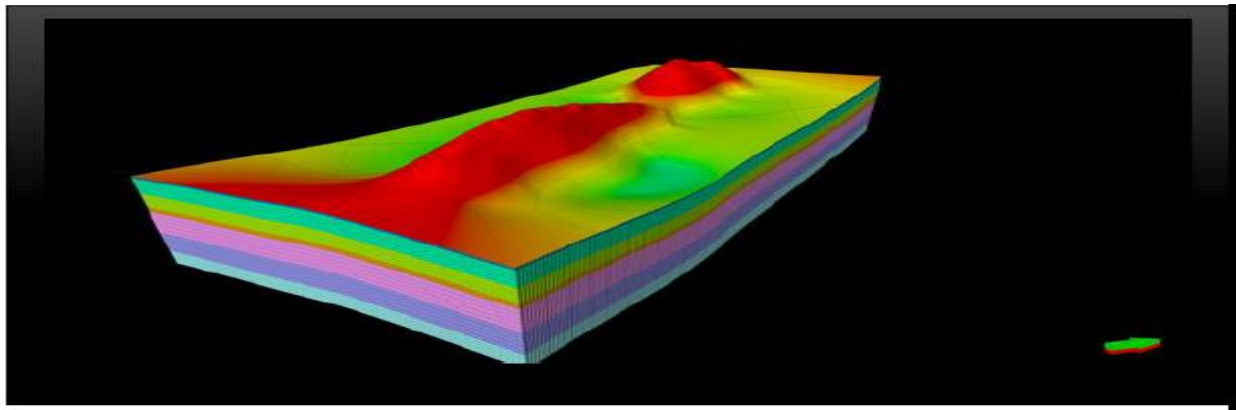
well	x	y	TD	Rtkb
BU 01	710834.4	3571496	4074.8	55
BU 02	714819.7	3568370	4106.6	36.7

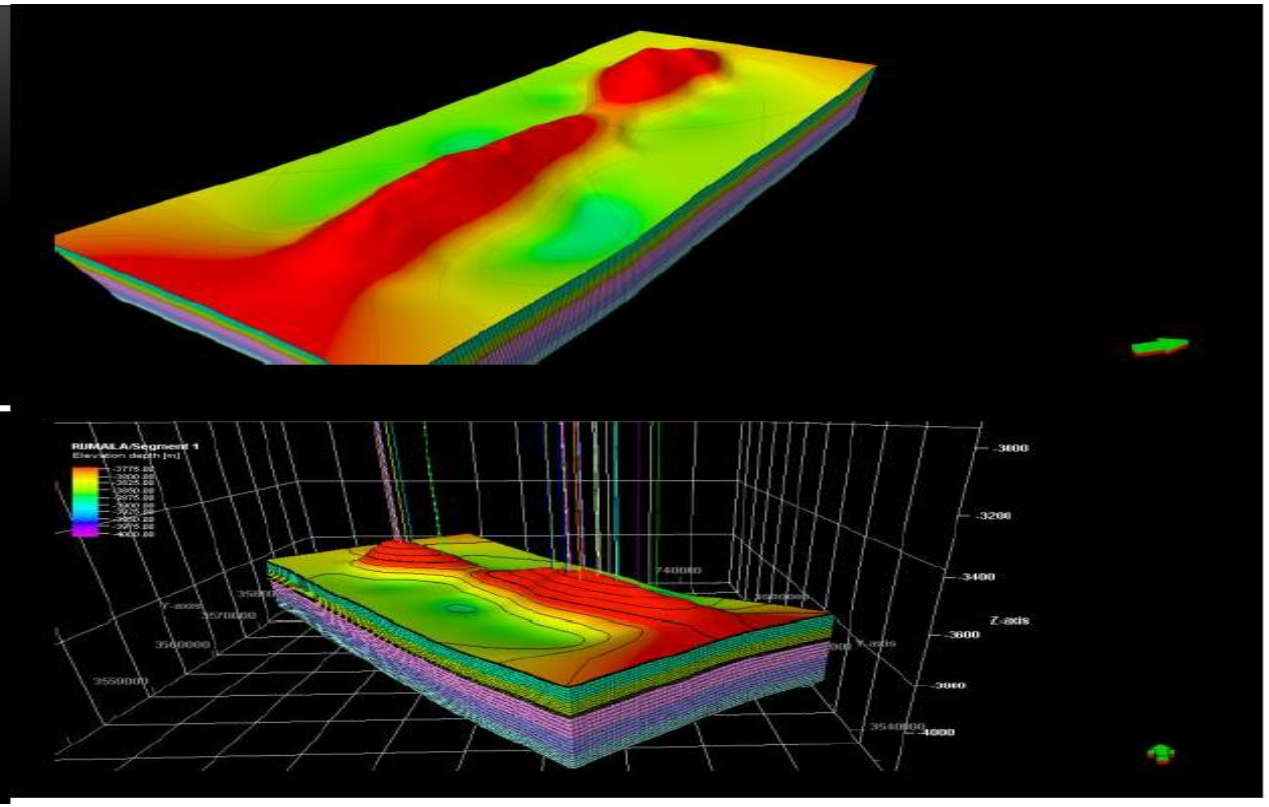
Shape

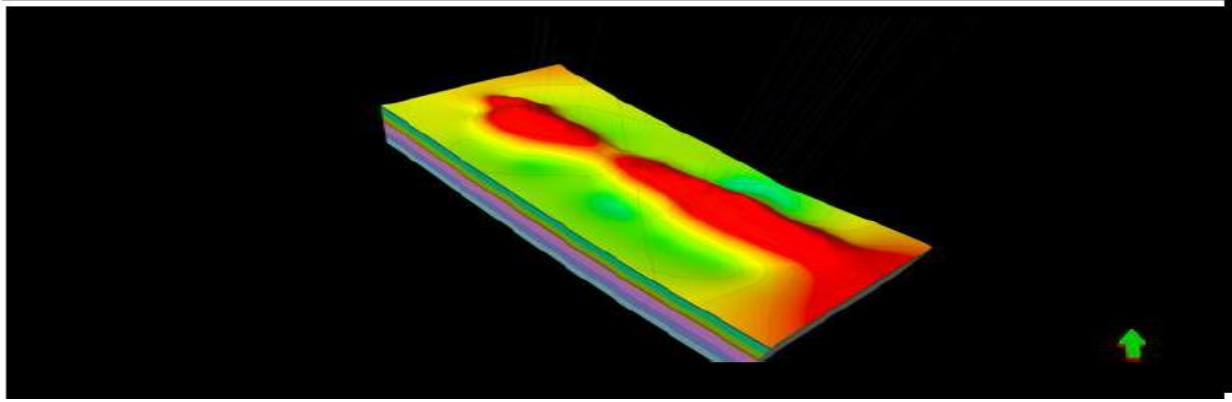
Numbers

Using Petrel to Construct the 3D Structural Map

- Contour map digitizing
- Well head file
- Well top file







What do you need to do and YouTube links to learn

- Install Didger
- Install Surfer
- Install Petrel

https://youtu.be/bCf-_QeAVX8

https://youtu.be/qDJ9aGwPpbc

https://youtu.be/dDw8YHzEDmw

https://youtu.be/uWZAZaKX9FY