

Cake & Discuss

The data

Organization Committee

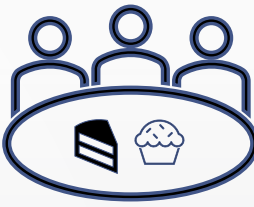
Daniel Forder

Marine Seignole

Oslo facilitator

Camilla Oftebro





HSE & Other Practicalities



Welcome to “Cake & Discuss”

TODAY:

29 January 26
The data

Past sessions:

13 April 23
The Structural Framework

7 November 23
The Property Model – Part1

27 August 24
The Uncertainty Study – Part1

24 March 25
My model, your model, OUR model

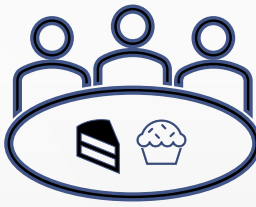
22 August 23
The Grid

23 April 24
The Property Model – Part2

7 November 24
The Uncertainty Study – Part2

Future sessions:

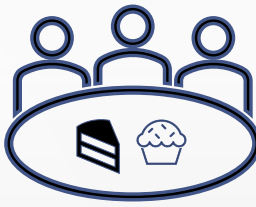
XXX



What is “Cake & Discuss”

- Fundamental spirit of FORCE
 - Cooperative forum
 - Facilitate cooperation within the industry
- Group discussions
 - Discussion based on impulse talk
 - Small group: Mix of experience and expertise
 - Summary session



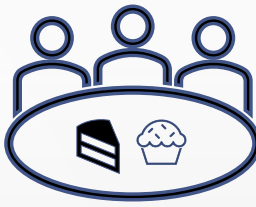


Impulse talk topics

- Pre-Modelling and Subsurface Exchange of data
- Subsurface data sharing
- Data flow and data sharing with partners



Time	Duration	Activity
12:30-13:00	30 min	Intro to concept Round the room: "who is here today" Sort groups
13:00-13:15	15 min	1. "Impulse" talk
13:15-13:45	30 min	Group discussion
13:45-13:50	5 min	Break (deliver talking points)
13:50-14:05	15 min	Presentations and overall discussion
14:05-14:15	10min	2. "Impulse" talk
14:15-15:00	45 min (25+5+15)	Group discussion Break (deliver talking points – send picture) Presentations and overall discussion
15:00-15:05	5 min	3. "Impulse" talk
15:05-15:40	35 min	Group discussion Break (deliver talking points – send picture) Presentations and overall discussion
15:40-15:55	15 min	Closeout / feedback



How this works

- Divide audience into groups
- Get to know your group
- Each group chooses a discussion keeper
- “Impulse” talks round today's topic
- Discussion time after talk
 - Have you seen this?/What's your best practice?
- Round the room: each group present findings (first round introduce your group)
- In total 3 impulse talks and follow-up discussion in groups and presentation to other groups
- Closeout and time to mingle and talk
- Enjoy food and drinks throughout the afternoon



The groups

Group 1

Group 2

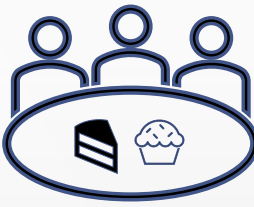
group3

Group 4



Choose a discussion keeper

- Role:
 - Make sure everybody in the group gets talking time
 - Time keeping
 - Make sure the key ideas are on the flip chart
 - Find a presenter to other groups- 1 presenter per impulse talk
 - When problems are raised
 - -> probe for solutions
 - -> keep the discussion going
 - TAKE A PICTURE OF YOUR FLIP CHART / SHARE YOUR PPT
 - Send it to marine.seignole@akerbp.com



Impulse talk 1



Cake & Discuss

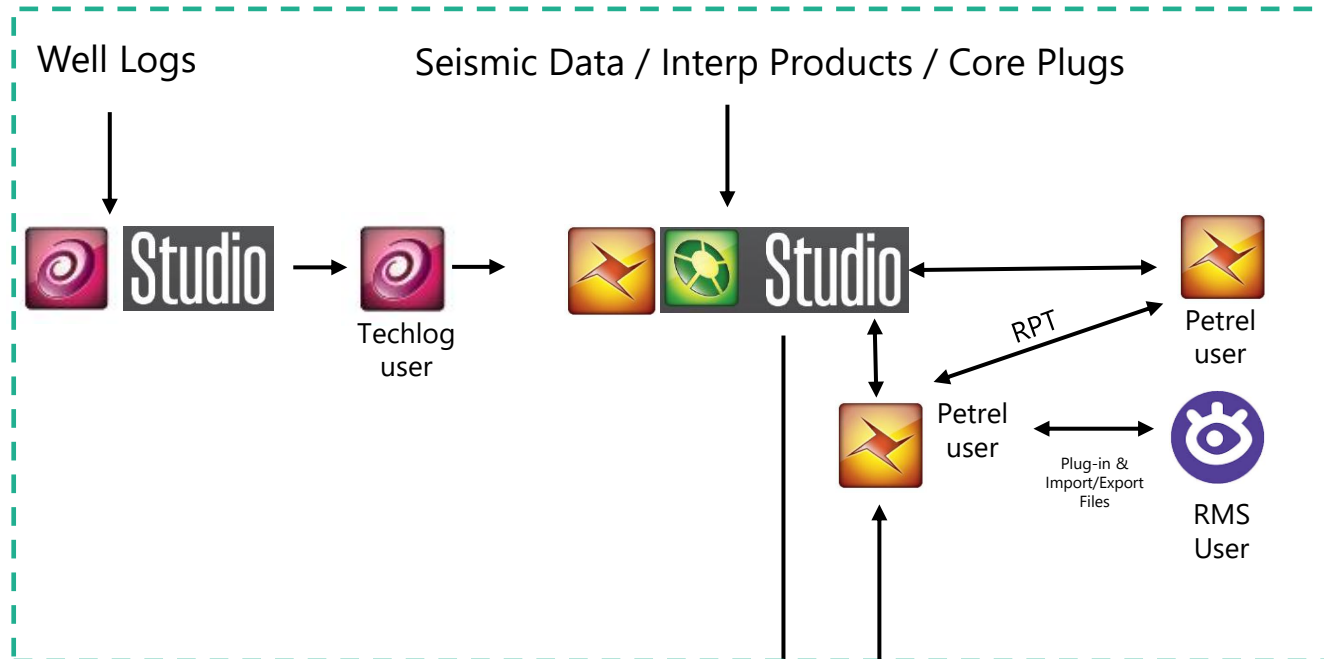
Software & Data Sharing

Januray 2026

Pre-Modelling Exchange of Data

On Prem

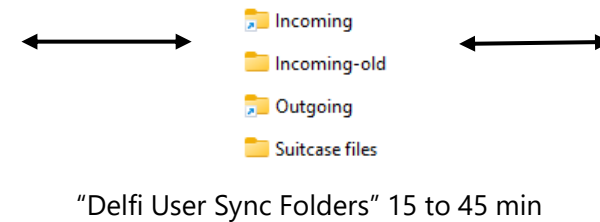
Petrophysicists & Geoscientists



One-Way Sync
No Seismic/No Models

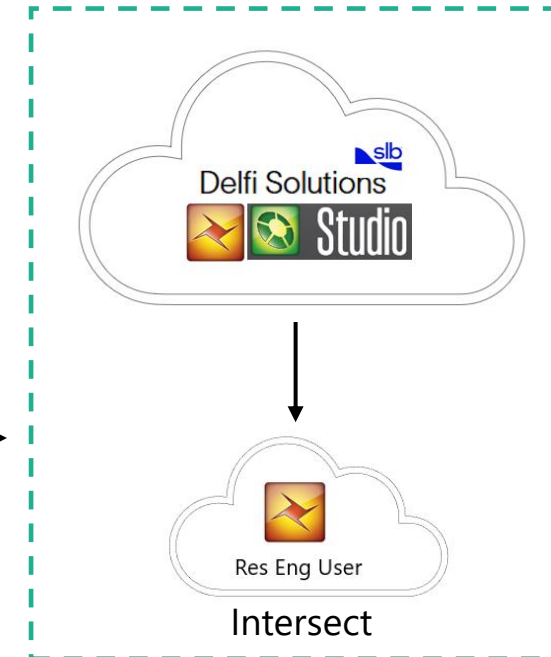


Updated every 24hrs



Cloud

Reservoir Engineers

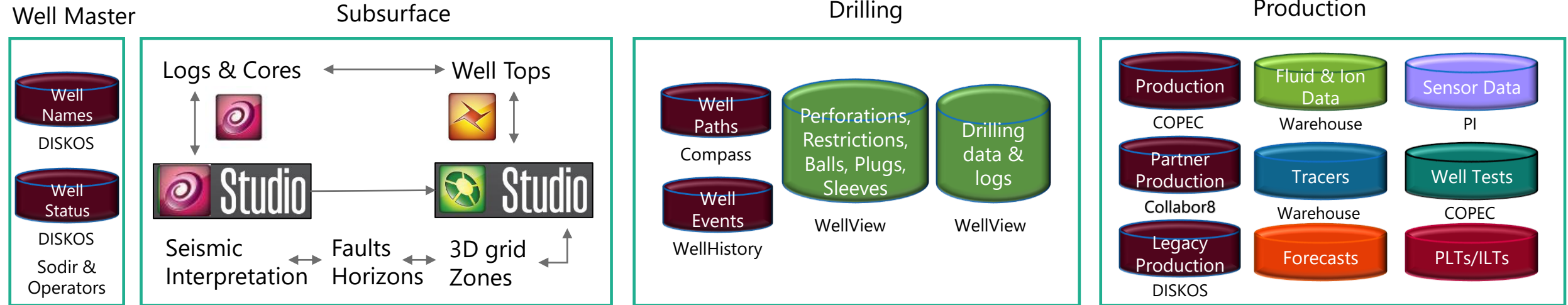


Perforations / PLTs
/ Pressure Points /
Production Data

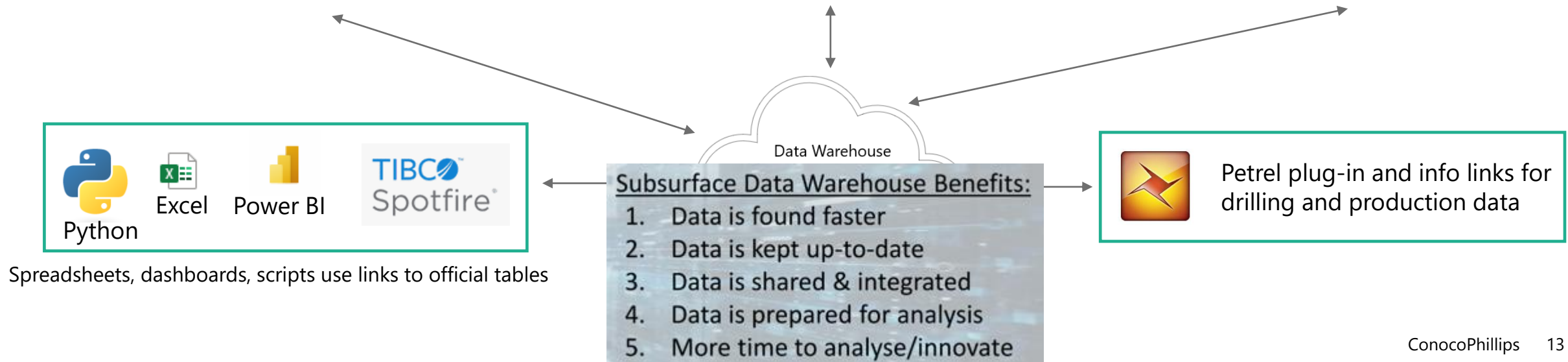


Production Data

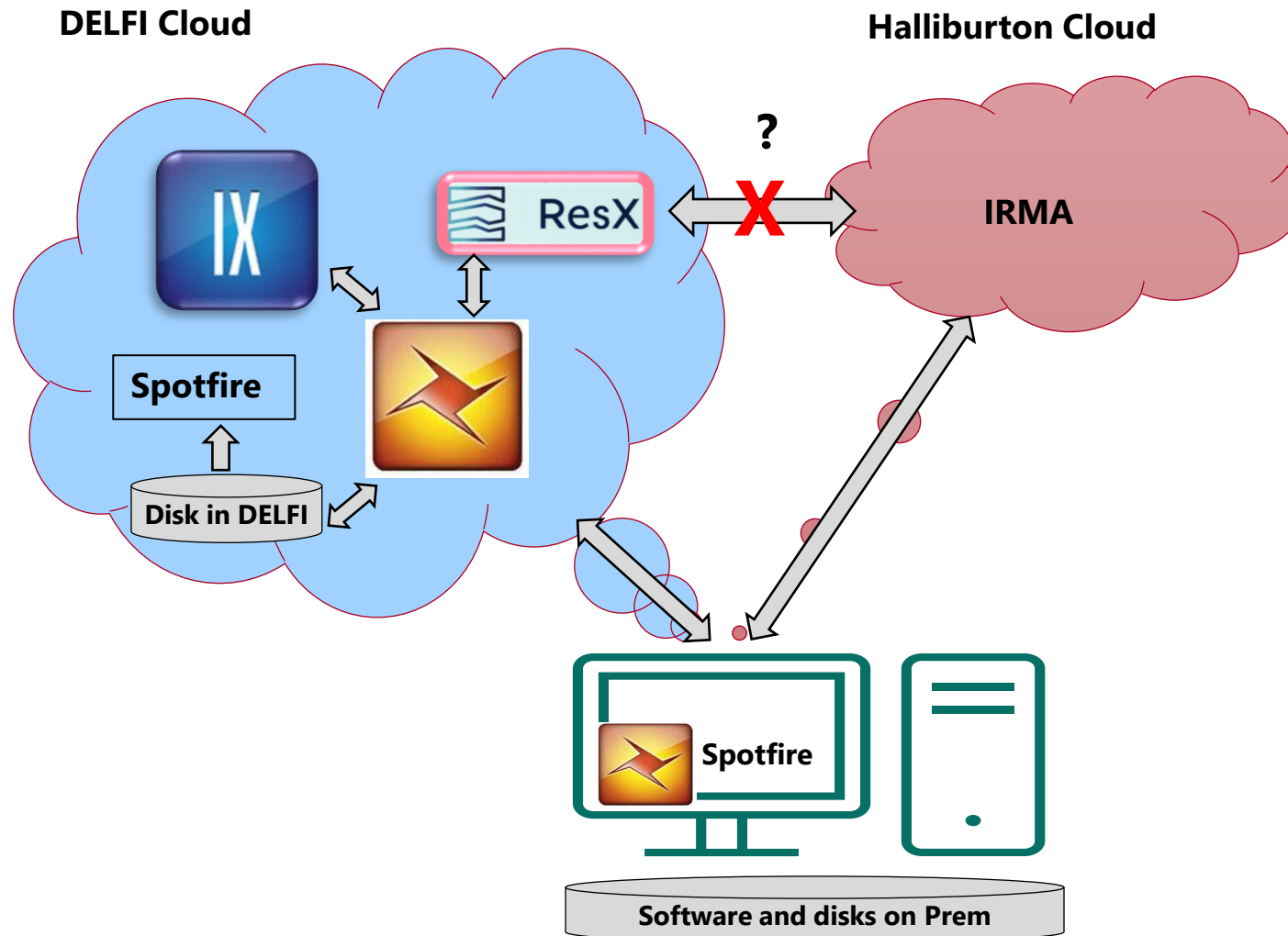
Subsurface data integration and exchange



Nightly warehouse workflows using business logic to add geological layer and depth and well status to make raw, combined & aggregated tables



IT Cloud & Software for Ensemble modelling @ConocoPhillips



Well on a Page Dashboard

Public



Put on **PRODUCTION: 10/1/2019** Last Allocation: **2/1/2022** Months in operation: **28**
Cums: Oil (MMSTB): **0.77** Gas (BSF): **0.95** Water (MMSTB): **1.93** Water Inj (MMBLS): **(Empty)**
Last Approved Test: Oil (STB/D): **215** Gas (MSCF/D): **216** Water (BBL/D): **2,319** Date: **2/27/2022**

Reset Date filter

10/1/2019 3/16/2022

Trend controls:

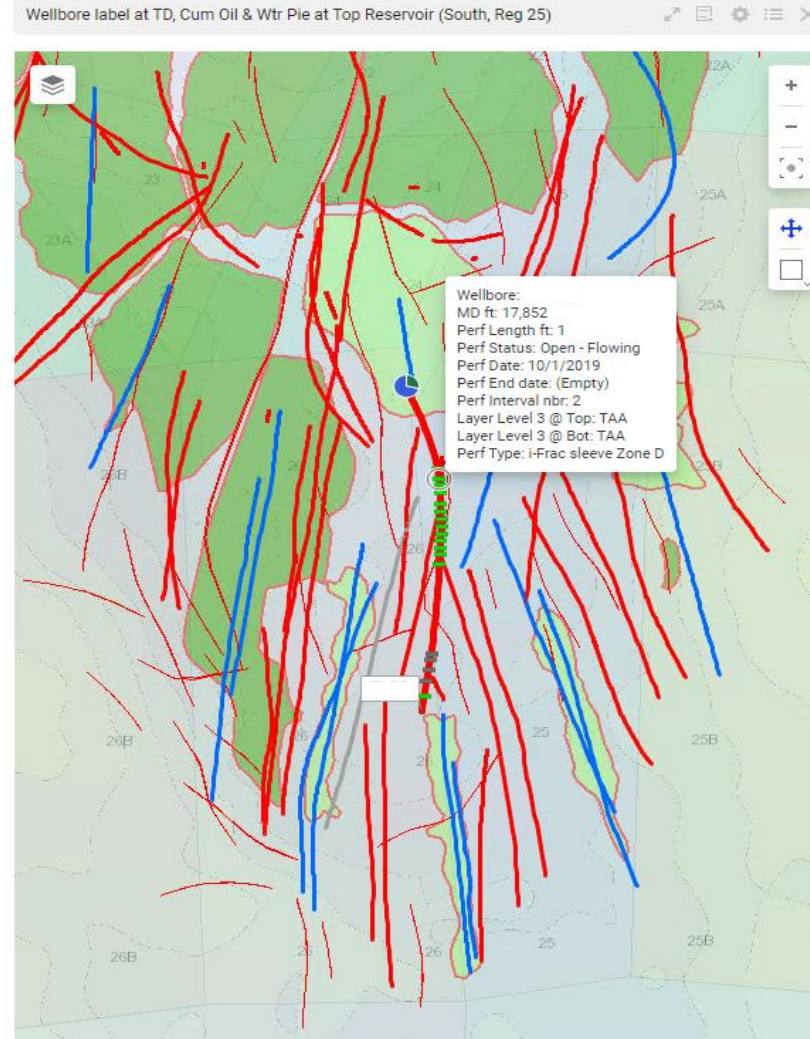
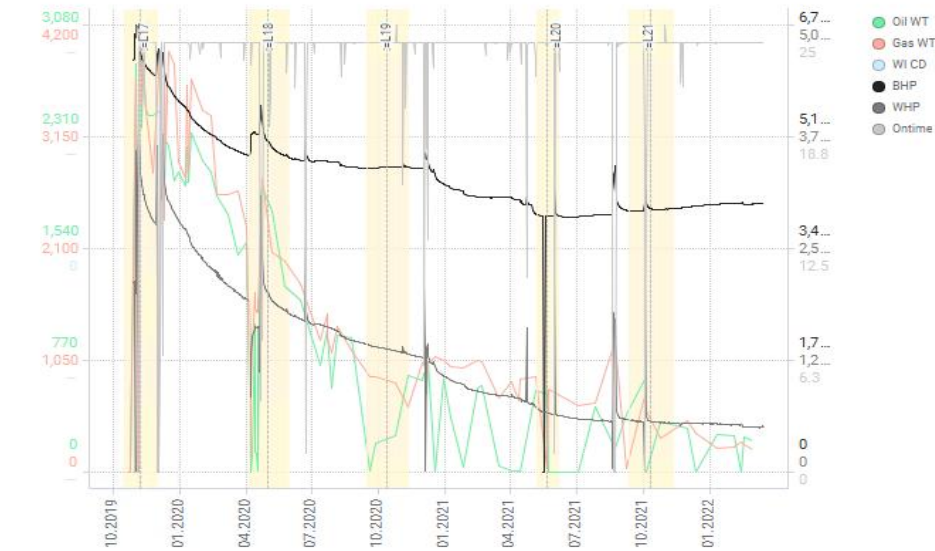
Choke WT
WHT WT (DEGC)
WHP WT (PSI)
Otime Hrs
GL (MSCF/D)
BHP (PSI)
BHT (DEGC)
WHP (PSI)
WHT (DEGC)

Hide Events
Well History
Wellview Job
Show Seismic Surveys
Hide Forecast

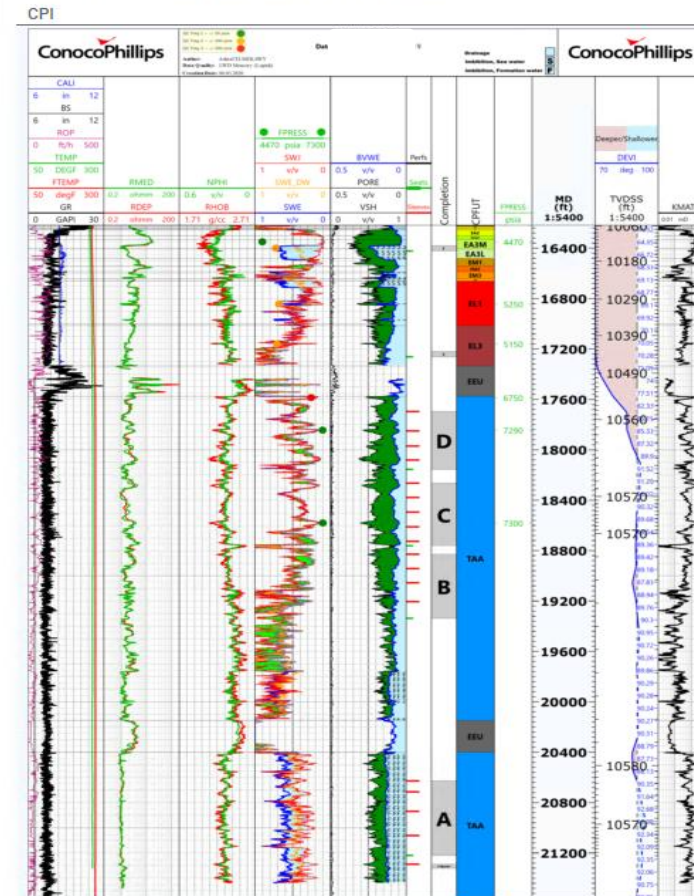
Map controls:

EKOFISK
Super Regions:
Alpha
Central
Northeast
Northwest
South

Show Active Wells
Hide Plugged Wells
Hide Well Label
Hide Perf Label
Well Type (Prod/Inj)



Use link in table below to open CPI in separate window



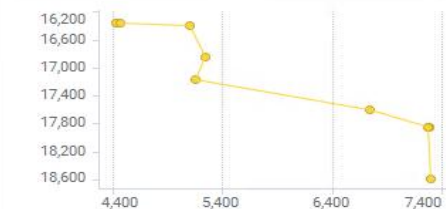
History Log (Well History Events, Wellview jobs, OVS annotations and blog)

Date	Event	Sub Event	Observations
4/7/2020	WBT - suspect failure of installed plugs	Performance	On the April 7th, 2020, a sudden change in well beh started to increase rapidly and the well stopped pro
4/7/2020	Well choked itself	Performance	Well significantly decreased production and had a potentially plugs have failed to restrict water entry
12/8/2019	Set Toe Plug 2	Zone Isolation (reservoir)	Second Hex plug set in toe section of well to stop v well still exhibited increasing WCT leading us to bel

Well Tops

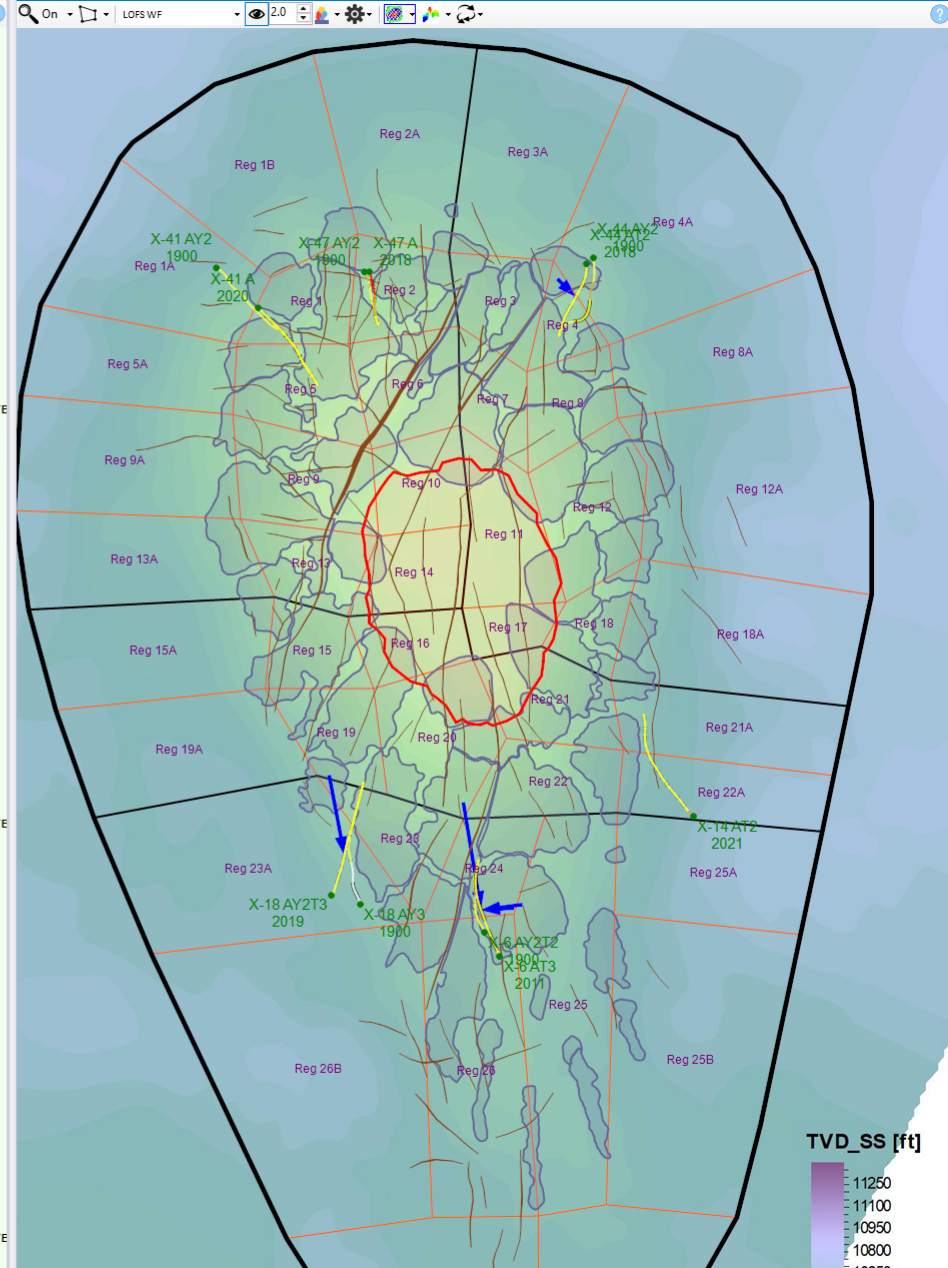
WELLBORE _NAME	TOP_MD _FT	BOT_MD _FT	LAYER_NA ME	LAYER_THICK TVD_FT	LAYER_LEN MD_FT	LAYER_ENTRY DIRECTION
	16228.00	16255.00	EA1	13.28	27.00	N
	16255.00	16300.00	EA2	20.05	45.00	N
	16300.00	16480.50	EAL	75.90	180.50	N
	16300.00	16331.00	EA3U	13.82	31.00	N
	16331.00	16406.00	EA3M	32.62	75.00	N

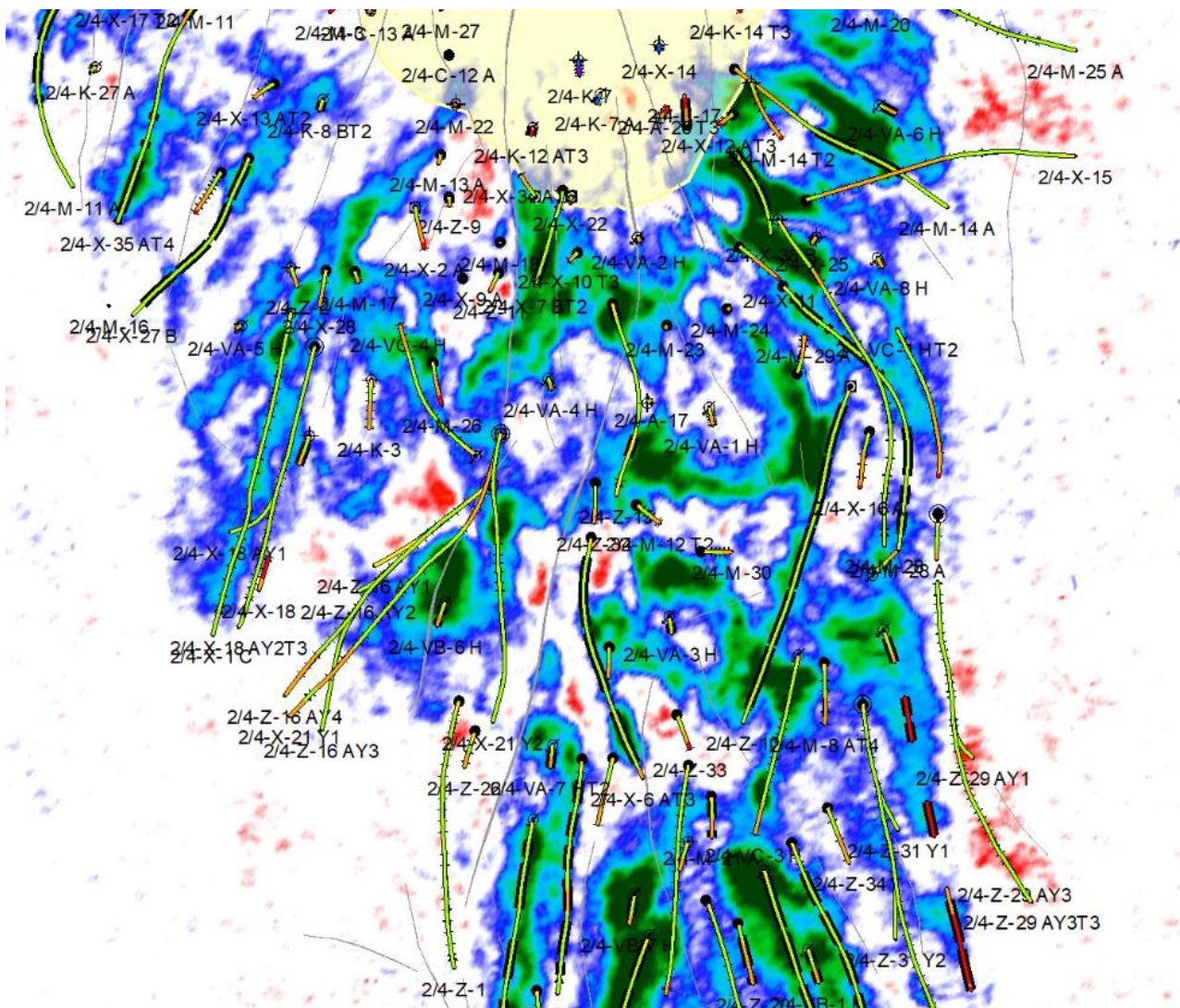
RFT(Avocet) ft vs psi



Links

TYPE	URL
CPI	\avgfs16\nsbu...
CPI(Dyn...	\avgfs16\nsbu...
CPI(old)	\avgfs16\nsbu...
NPD	https://factoag...
PIWEB	https://piweb.c...
WBS	http://svowapp...
WCS	http://15gwapp...
WIPNO	https://euroapp...





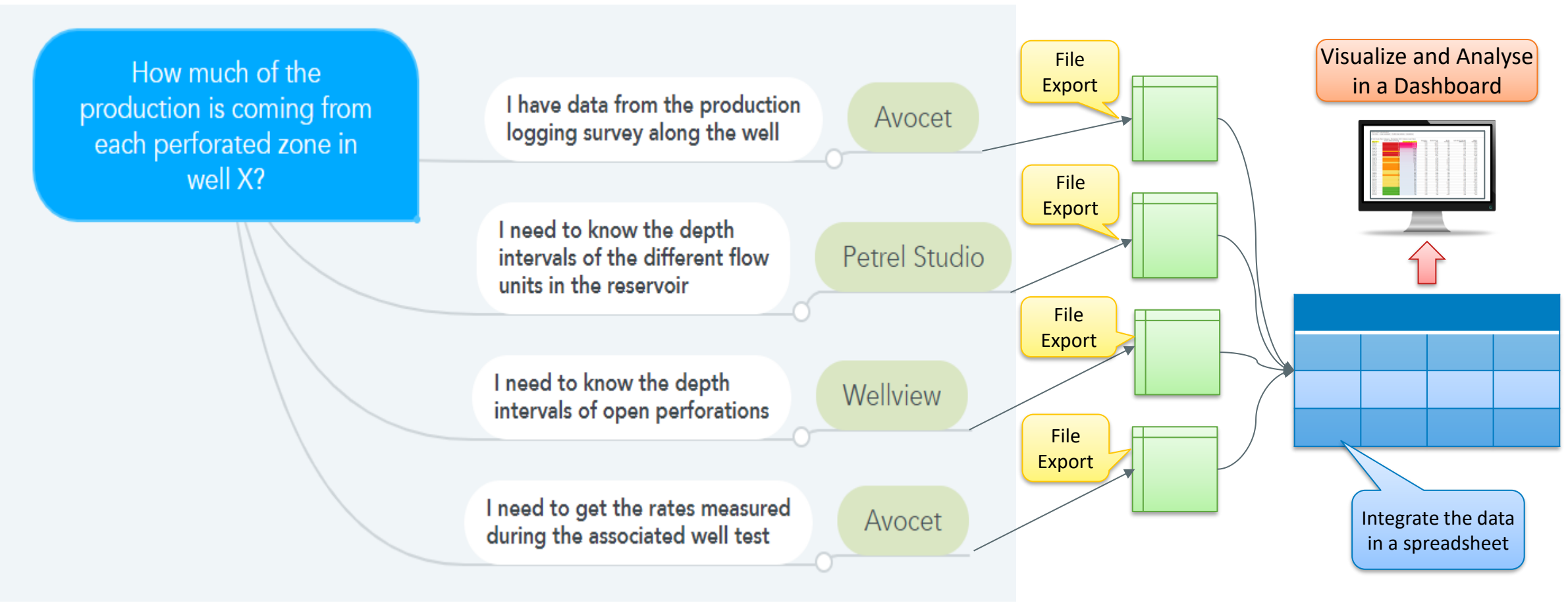
Interpretation of 4D seismic surveys requires integration:

- seismic data
- well data
- production data,

while knowing:

- the well status
- completion setup
- during all time periods

Conventional Integration of PLTs and Geological Interpretations



This manual and error prone process had to be repeated for each new well or if any of the input data change



Pre-modelling Data Exchange Discussion Points

- Who is responsible for the QC of data? (data mgmt & data governance)
- On prem vs cloud, pros & cons?
- Data types not stored in Studio, how to handle? (perfs, PLTs, pressures, production)
- Is it possible to stick to one modelling software vendor only?
 - Horizontal well placement issue in Structural frameworks with Petrel; use RMS for this
- Clouds owned by different vendor, ok? (HAL vs SLB)
- How to exchange key GG data into RE & drilling data stores?
- Is OSDU getting there?
- Any other topics for discussion?



Group - Notes

- TAKE A PICTURE OF YOUR FLIP CHART
 - Send it to marine.seignole@akerbp.com



Pre-modelling Data Exchange

- Storage is a key cost driver when preparing for going to the cloud
 - Data governance remains. Without it difficult when people leave, reorganizations. Strict guidelines before data is accepted as good enough.
- Still seeing wells being loaded on the wrong place
- Everything going to SharePoint. Going away from the individual drivers
 - 83k files → Keep them, not keep them? Who decides and based on what rules?
- Handling duplicates should be automated. Can we achieve this with the right governance/clear set of rules?
 - Clear rules to decide if a file should be kept or not: e.g. when was it last used?
- Good governance and structured data enables optimal AI results



QC of data

- The supplier of the data should as good as it goes ensure the data is correct.
- The recipient should also make a QC before the data is ingested into their “system”.

On prem vs. cloud

- Data security and performance speaks in favor of onprem.
- Reduced cost (maybe) speaks in favor of cloud.

Is OSDU getting there

- It looks like it but many data types still do not have an “agreed on” format.
- OSDU can store “unknown” data.

Is it possible to stick to one software vendor?

- Some companies prefer “second opinions”.
- Special functionalities may be required.
- Internal software.



Petrel/dms $\approx$ OK

(local vs on-prem)

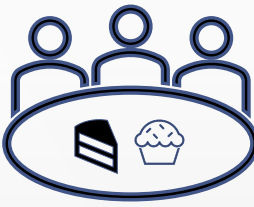
- Delfi is slow

- exchange:

nan studio data is
a challenge

- multi-vendor clouds

- exchange = bottle
neck



Impulse talk 2

Subsurface data sharing

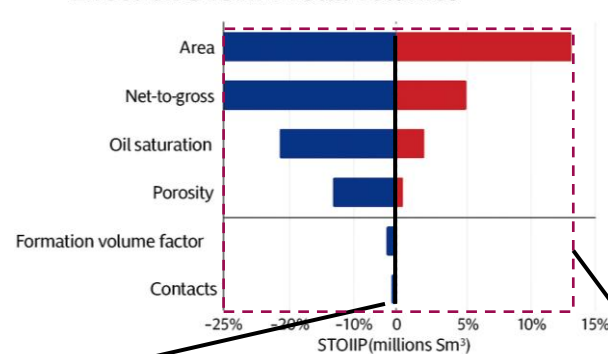
FORCE “Cake and discuss”

January 2026

Modelling approaches: Deterministic vs Ensemble

Overview

Effect on STOIIIP: Total volumes

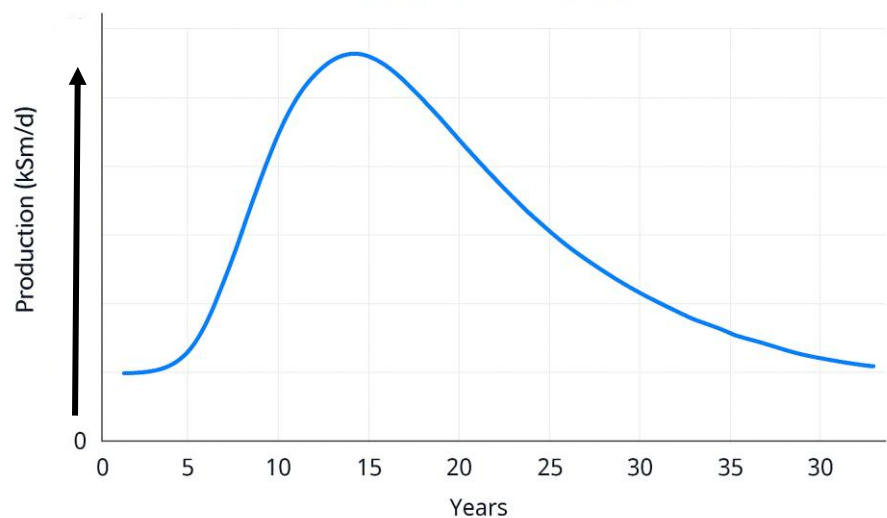


Key questions:

Framing of uncertainties prior to building ensemble? Or simply awareness?
Is there different approaches for a brownfield vs. greenfield development?
Should this be a multidisciplinary approach?

Deterministic approach

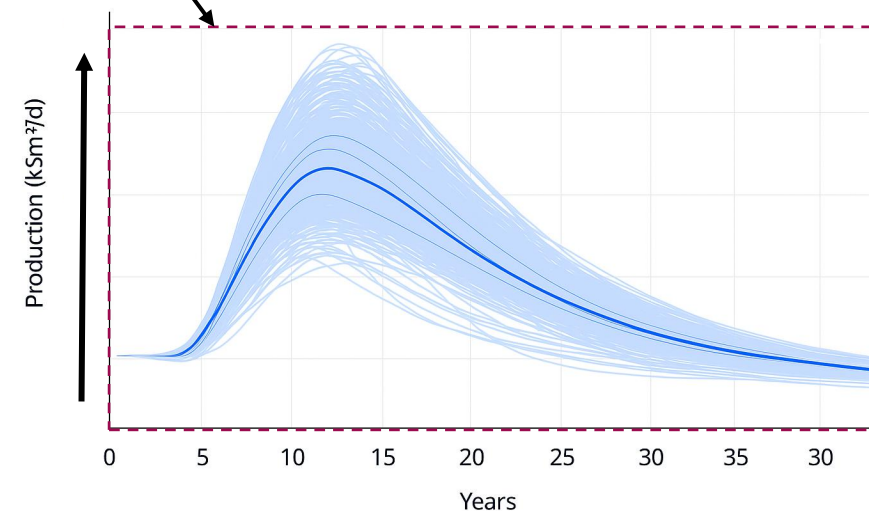
Production Profile



- Single scenario often representing "reference case"

Ensemble approach

Production Profiles



- Up to 100 (+?!) different realisations encompassing the span of uncertainty

Modelling approaches: Deterministic vs Ensemble

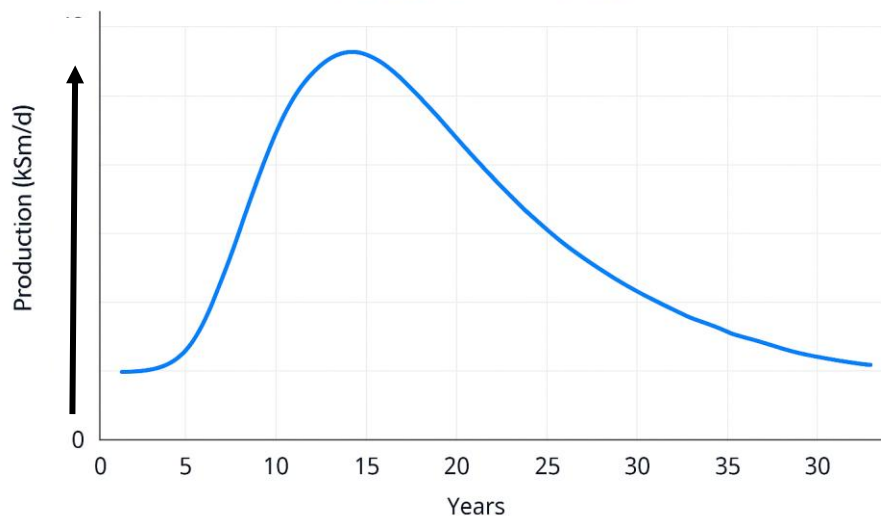
Data implications

Key point

The scale of the data being generated is significantly more than in a traditional modelling approach. Being able to properly understand and digest the data generated is a significant challenge.

Deterministic approach

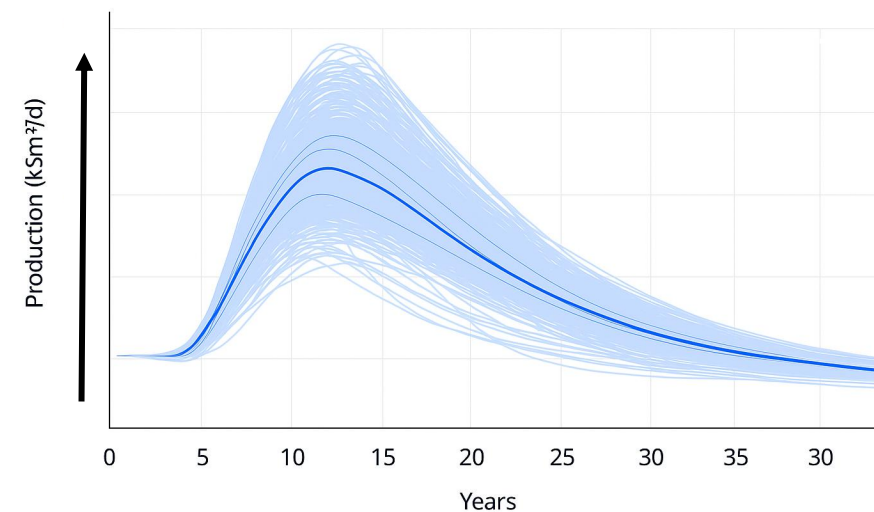
Production Profile



- 1 set of:
 - Property arrays
 - Fluid arrays
 - Simulation deck to QC

Ensemble approach

Production Profiles

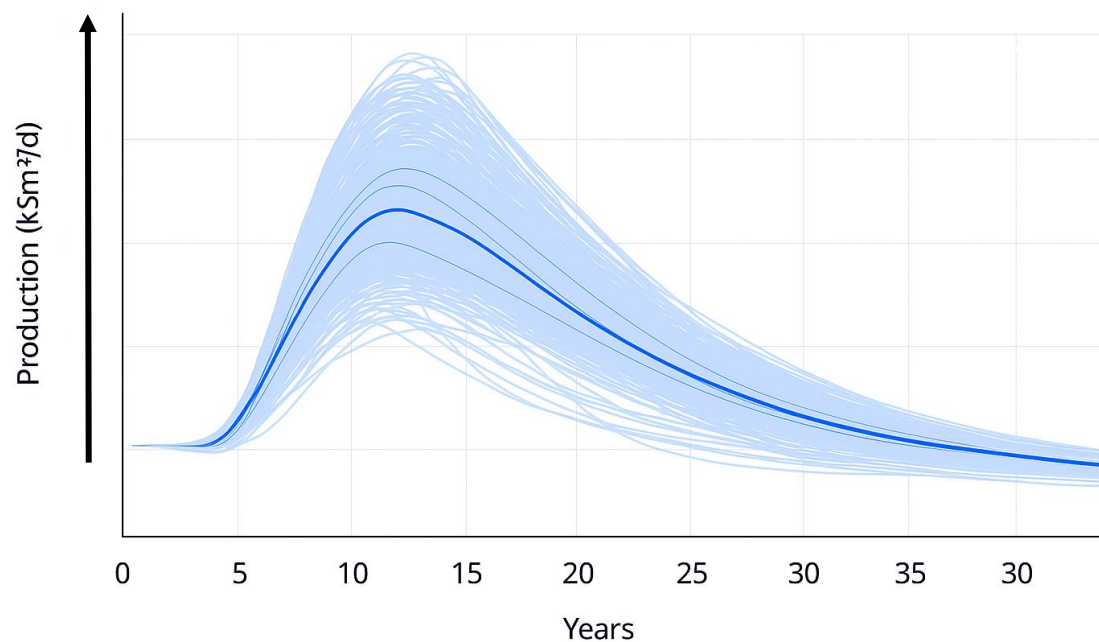


- 100 sets of:
 - Property arrays
 - Fluid
 - Simulation decks

Modelling approaches: Deterministic vs Ensemble

QC approach

Production Profiles

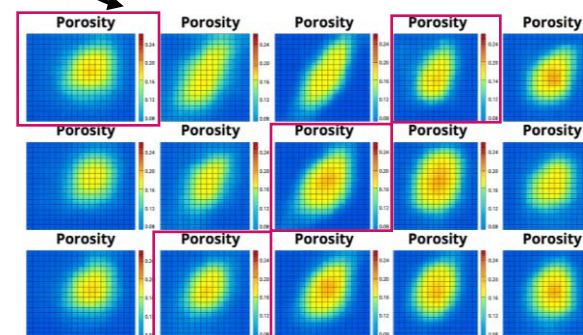


Key questions:

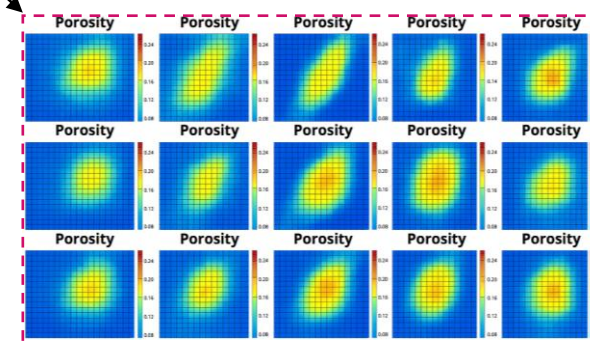
What are the key features we are trying to identify?

What is the best approach to QC an ensemble?

- **Focus on a selection** of models around key parameters (i.e. P10, P50, P90) to check for anomalies?
- **QC all the arrays** but use automation to speed up the process?



VS.



Key questions to consider

Prior to ensemble build

- Framing of uncertainties prior to building ensemble? Or simply awareness?
 - Is there different approaches for a brownfield vs. greenfield development?

Post ensemble build

- What are the key features we are trying to identify when Qcing the data?
- What is the best approach to QC an ensemble?
 - **Focus on a selection** of models around key parameters (i.e. P10, P50, P90) to check for anomalies?
 - **QC all the arrays** but use automation to speed up the process?

Modelling approaches

Framing is critical. Very different between brownfield and greenfield

- Experience is important here. Knowing what to focus on. Used to run it by a board of experts

Be aware on which parameters to focus on

Allocating more realistic amount of time for testing for potential uncertainties

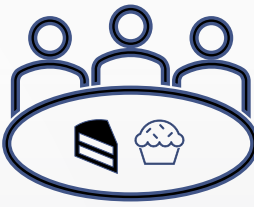
Petrel does not have the tools to QC the arrays/parametrization. Have to export to another software (Spotfire).

Prior to Ensemble build - Framing of uncertainties prior to building ensemble?

- Project group calls upon expert peers from outside the project group. Project group makes the final decisions.
- In principle production data should reduce the need for realizations but in reality, it is not like that.
- For a brown field there is still need for peer experts to interpret the production data.

Post Ensemble build – Key features and approach to QC an ensemble?

- This part lacks.



Impulse talk 3



Data flow with the partners

- Force guidelines to share ensembles : [Integrated Reservoir Modelling - The Norwegian Offshore Directorate](#)
- How do we work in a licence- how the data are handled ?
- How bigger set of data like ensembles are handles?
- how many of you have used the guidelines ?

Feedback: 12 returned questionnaires



• Participants:

- less subsurface topic= different type of professional in the group = different dynamics
- 15 people in Stavanger :various company ConocoPhillips-AkerBP- **Sokkeldirektoratet**- **Calsep**- Orlen Norge -Harbour Energy- **Total**-Vår Energy- **Cegal**- **Microsoft**(registered but cancel)
- 2 people from AkerBP in the room not registered , several cancelations
- not fully book – different topic
- Cancelation were known upfront

• Format and length:

- exchange of experience seems to be appreciated by all as well as the social and relax setting .
- 2 topics with small group discussion – 1 topic will full group discussion
- Sweet spot of too short vs too long (time allocation in busy schedule)
- The connection with Oslo has worked well

• Topics:

- the mix of topics were well received and considered relevant
- 1 comment on too generic topic- to be more specific

• Topics suggestions :

- Ensemble QC specifics
- More on database and sharing
- Re-run of old topics

Being new to the NCS, i really appreciated this format compared to what happens in other region globally