



Canadian Frac Sand Exhibition & Conference 2018

Western Canada Frac Sand Forecast 2018-22

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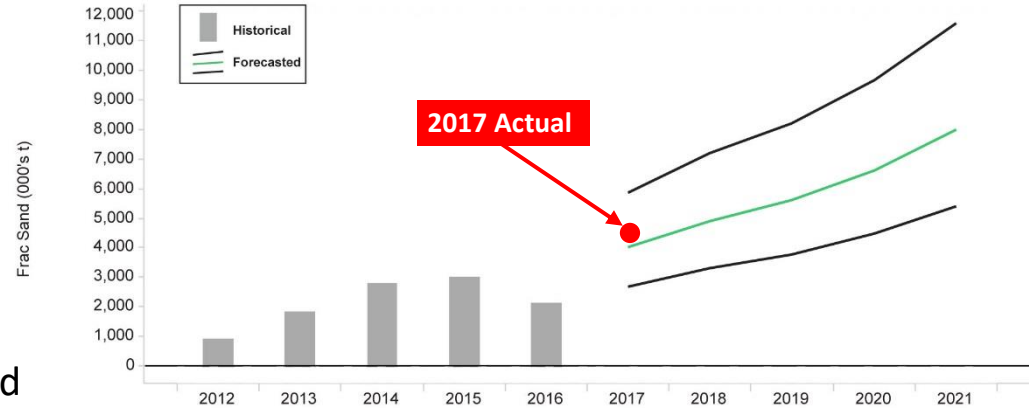
Frac Sand Forecast: 2018-2022

- CDL has updated prior Frac Sand Forecast
- Methodology has been fine tuned
- Incorporates the latest drilling forecasts
- Unmatched granularity:
 - Forecasts of each major resource play in Western Canada
 - Proppant types , sizes and tonnages
 - Fluid types and volumes
- 5 year forecast with five years of history displayed



Frac Sand Forecast: 2018-2022

- Looking back
 - ◉ 2017-2021 forecast tonnage
 - High 5,873,00 tonnes
 - Expected 4,025,000 tonnes
 - Low 2,692,000 tonnes
 - ◉ 2017 Tonnage pumped 4,500,000 tonnes, falling between the high and expected forecasts
 - ◉ 2017-2021 forecast fluids
 - High 40.2 million m³
 - Expected 26.0 million m³
 - Low 16.7 million m³
 - ◉ 2017 fluid volumes pumped 24.4 million m³, slightly below the expected forecast

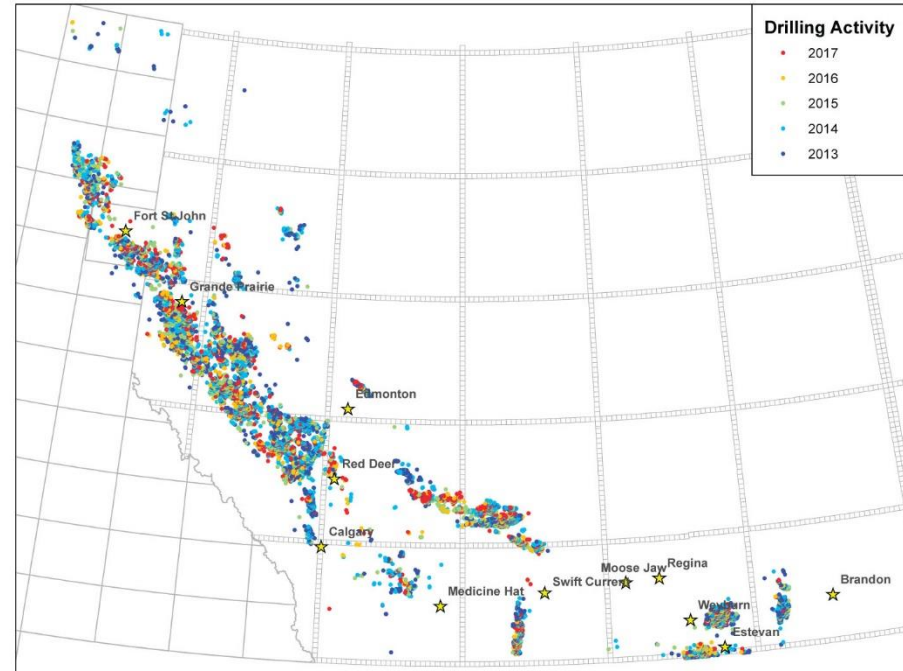


Frac Sand Forecast: 2018-2022

- Methodology
- Activity
 - Amalgamation of drilling forecasts
 - AER, ERCB, BCOGC, SME, NEB, CERl, CAODC, PSAC, CAPP
- Historical completion data drawn from geoLOGIC's Well Completion's & Frac Database
- Proprietary Monte Carlo simulation to generate high, expected and low trends
- Each resource play is modeled and forecast separately
- Improvements
- Estimates made for confidential wells based on offsets
- Applied weighting to activity forecasts

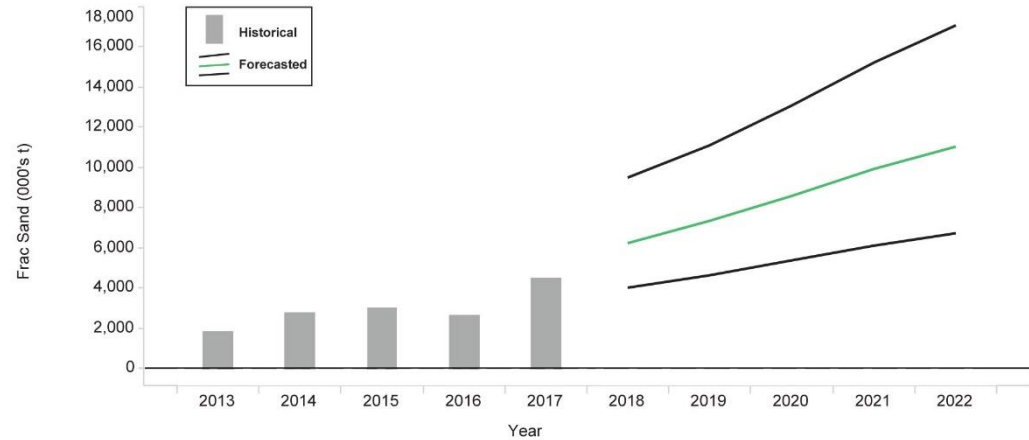
Frac Sand Forecast: 2018-2022

- Drilling in 2017 recovered strongly
 - ◉ 3,090 wells drilled in 2017
 - ◉ Up from 2,283 wells in 2016
- The recovery in drilling activity is expected to continue
 - ◉ Expected activity forecast at 3,768 wells

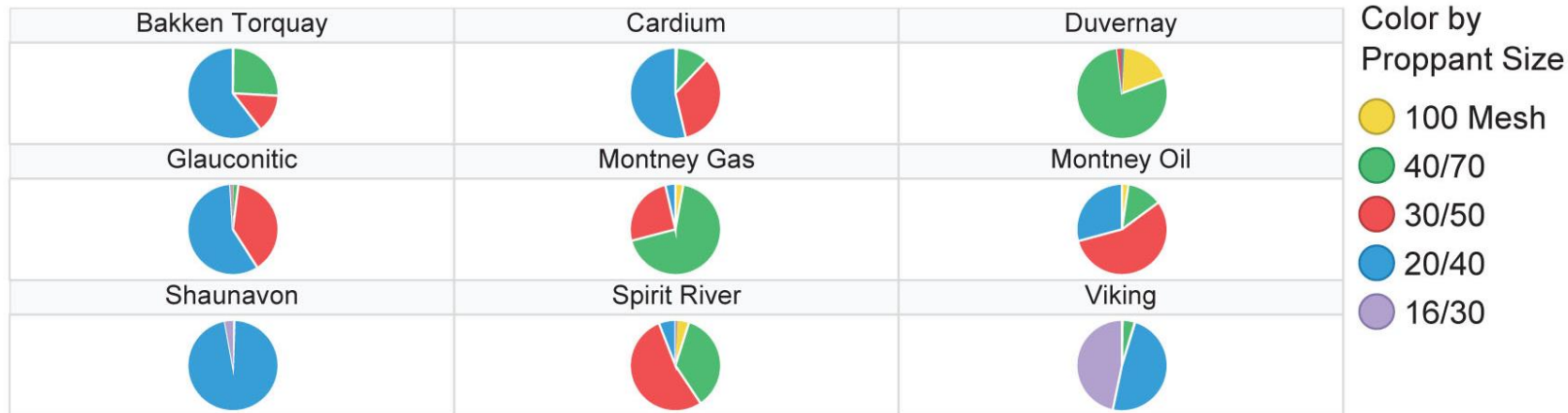


Frac Sand Forecast: 2018-2022

- Frac sand usage continues to trend upward
 - ◉ 4,500,000 tonnes pumped in 2017
 - ◉ 6,246,000 tonnes forecast with Expected forecast in 2018
- Overall upward trend continues
 - ◉ Operators continue to increase completion intensity (more stages, more tonnes)



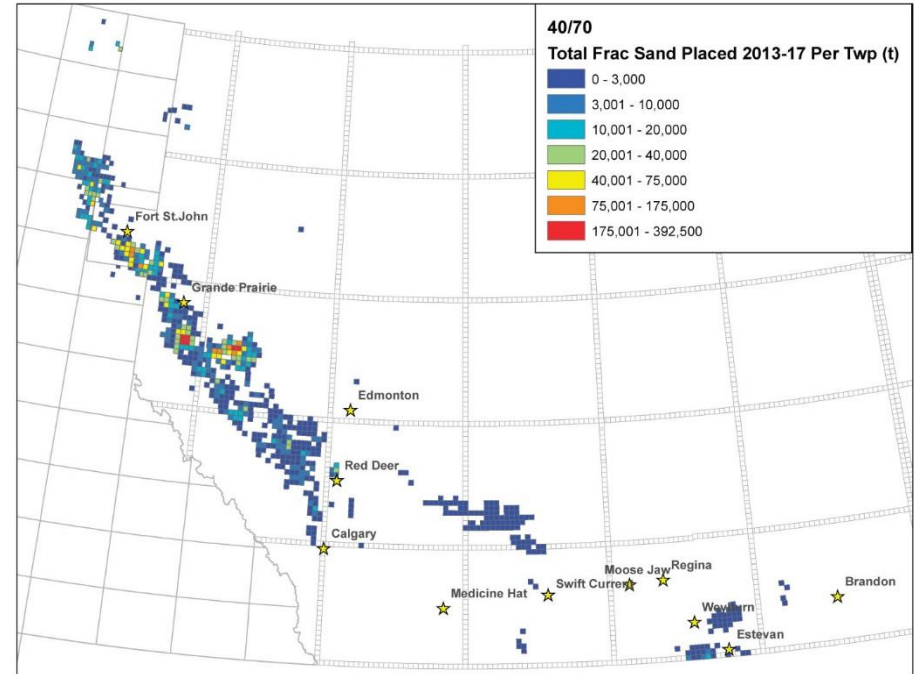
Frac Sand Forecast: 2018-2022



- Mesh sizes determined by fluid type
 - ◉ 20/40 and 16/30 predominate in oil zones (Bakken/Torquay, Glauconitic, Shaunavon, Viking and Montney Oil)
 - ◉ 40/70 and 100 mesh are the primary sand sizes for gas zones (Montney Gas, Duvernay)

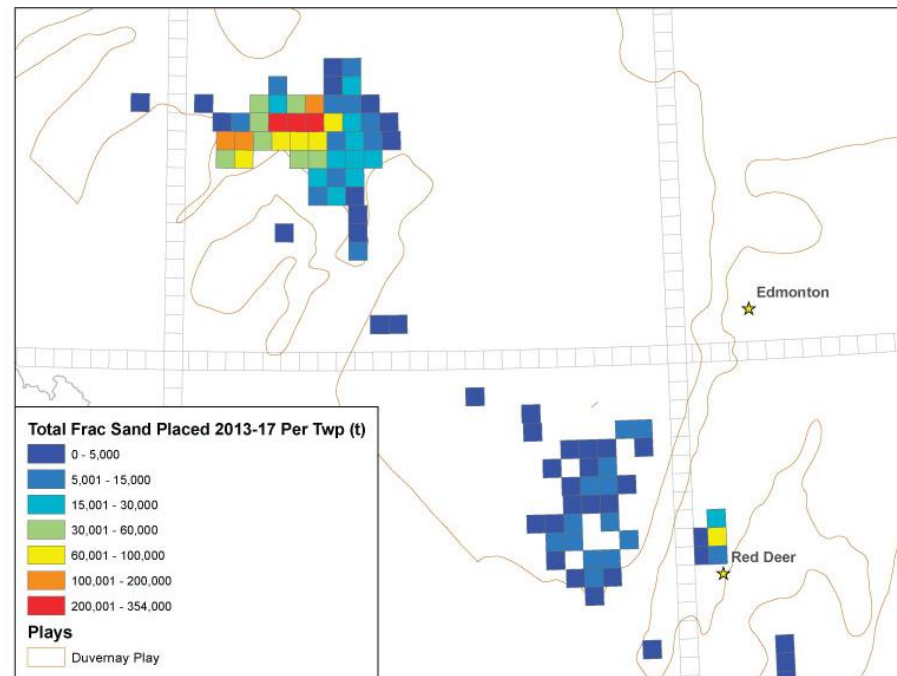
Frac Sand Forecast: 2018-2022

- 40/70 is a widely used mesh size, making up 50% of tonnage pumped in 2017
- Used across most formations in Western Canada

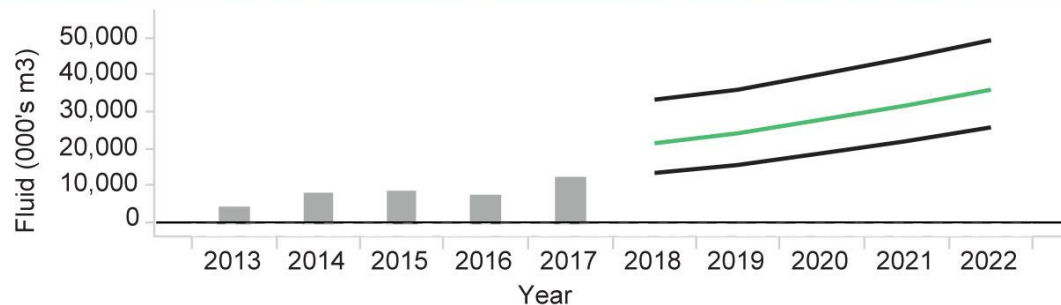
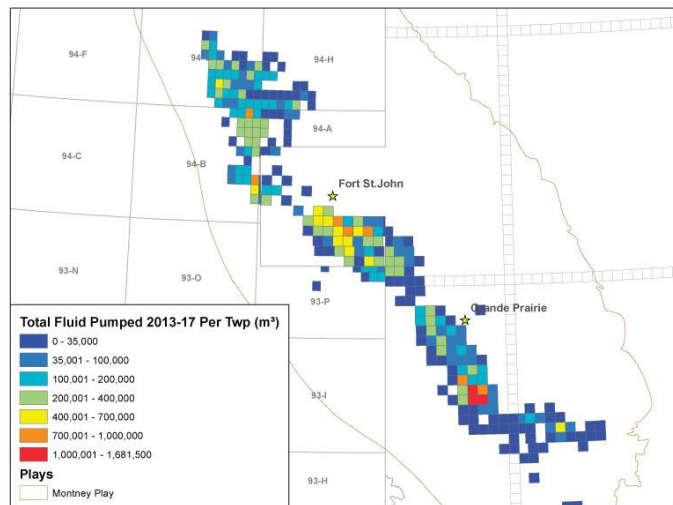


Frac Sand Forecast: 2018-2022

- Duvernay completions in the Kaybob region are some of largest completions in the basin
- Emerging East Shale Basin completions will see operators experiment with design



Frac Sand Forecast: 2018-2022



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Historical	4,437	8,135	8,770	7,252	12,284	-	-	-	-	-
Low	-	-	-	-	-	13,291	15,685	18,990	21,792	25,624
Expected	-	-	-	-	-	21,290	23,967	27,912	31,539	35,917
High	-	-	-	-	-	33,150	35,832	40,327	44,477	49,261



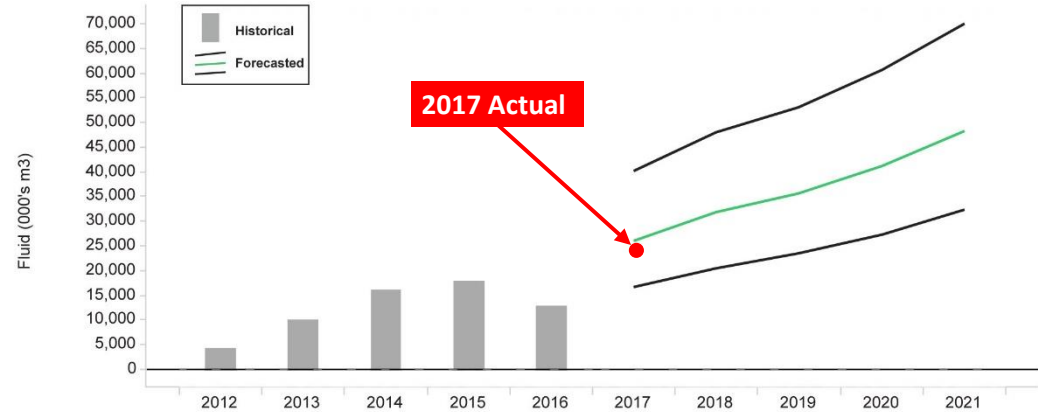
- Montney gas completions will use large aggregated volumes of fluid
 - Activity levels are growing
 - Completion intensity continues upward trend

Frac Sand Forecast: 2018-2022

- Be a step ahead of the competition!
 - ◉ Material suppliers
 - ◉ Logistics providers
 - ◉ Service companies
- Independent analysis
 - ◉ Capital providers
 - ◉ Stakeholders
 - ◉ Senior management

Frac Sand Forecast: 2018-2022

- Forecast fluids
 - ◉ High 40.2 million m³
 - ◉ Expected 26.0 million m³
 - ◉ Low 16.7 million m³
- 2017 fluid volumes pumped 24.4 million m³, slightly below the Expected forecast



Frac Sand Forecast: 2018-2022

- CDL's forecast was built on the analysis of each of the major resource plays
- Our forecast provides the granularity necessary to make critical decisions
 - ◉ Location of long term demand
 - ◉ Size fractions being pumped and the estimated tonnages
 - ◉ Fluid systems in use and out of favour
- Digital and hard copies provided to purchasers
- Author and analysts available to answer purchaser's questions
- Contact CDL's Client Relations team for more information



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