

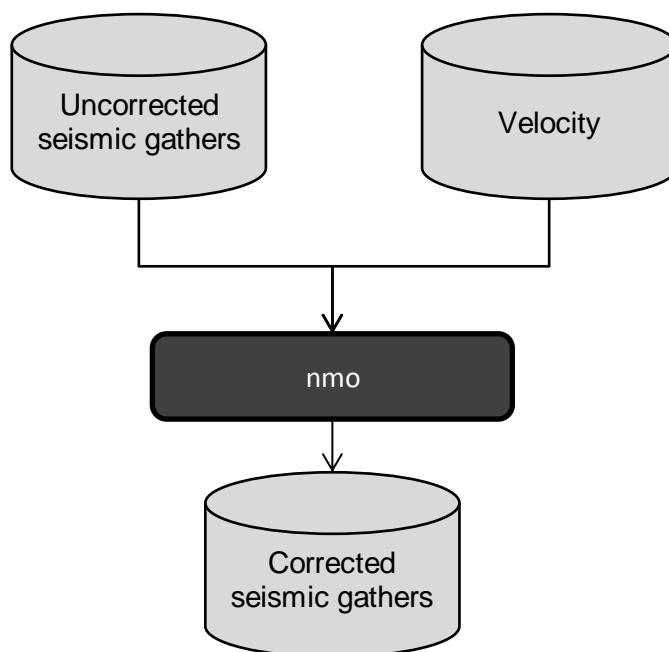
## CONVENTIONAL NORMAL MOVEOUT CORRECTION OF PRESTACK MIGRATED GATHERS – PROGRAM **nmo**

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### Computation flow chart

The input to program **nmo** consists of uncorrected seismic gathers and either an RMS or migration velocity model. The output is a volume of nmo-corrected gathers.



### Output file naming convention

## Prestack Data Conditioning: Program **nmo**

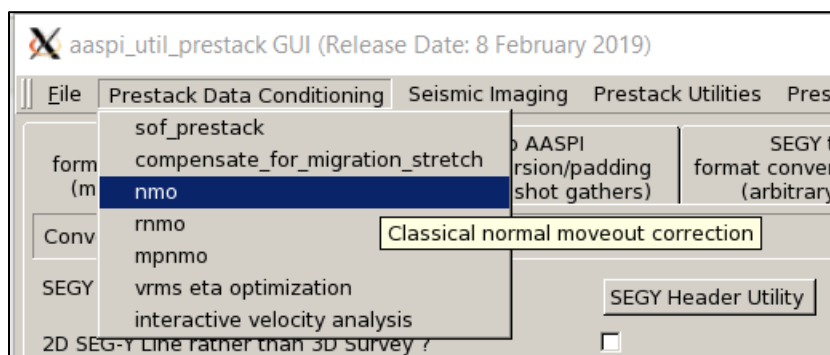
Program **nmo** will always generate the following output files:

Output file description	File name syntax
NMO-corrected data gathers	nmo_ <i>unique_project_name_suffix</i> .H
Program log information	nmo_ <i>unique_project_name_suffix</i> .log
Program error/completion information	nmo_ <i>unique_project_name_suffix</i> .err

where the values in red are defined by the program GUI. The errors we anticipated will be written to the \*.err file and be displayed in a pop-up window upon program termination. These errors, much of the input information, a description of intermediate variables, and any software trace-back errors will be contained in the \*.log file.

## Invoking the **nmo** GUI

The **nmo** GUI is found on the **aaspi\_util\_prestack** GUI under the *Prestack Data Conditioning* tab:



The GUI is quite simple (see next page):

## Prestack Data Conditioning: Program **nmo**

aaspi\_nmo GUI (Release Date: 8 February 2019)

File Help

NMO - Applies an NMO correction to migrated, unflattened gathers using an RMS velocity file, or a Residual moveout correction to migrated, flattened gathers using a Residual Parameter file

Input AASPI File Name (\*.H): /ouhomes6/marf2925/projects/Pioneer/d\_rnmo\_Locke.H Browse

Input AASPI Velocity File: /ouhomes6/marf2925/projects/Pioneer/Vel\_Locke.H Browse

Input AASPI Residual Parameter File: Browse

Unique Project Name Locke

Suffix d

Verbose Output? ☐

Parameters

Mute Percent 1.5

Mute ☒

Save NMO parameters for subsequent workflow

Save parameters and return to Workflow GUI

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Simply enter the name of the file containing the uncorrected gathers, and the corresponding velocity file.

### The NMO Correction

If the vertical two-way travel time is given by  $T_0$ , then the travel time for the same flat reflector at source-receiver offset  $h$  for velocity  $v_{RMS}$  is given by

$$t(T_0, v_{RMS}, h) = \left[ T_0^2 + \left( \frac{h}{v_{RMS}} \right)^2 \right]^{1/2}. \quad (1)$$

Each trace is defined by a fixed offset,  $h$ . The algorithm loops over values of  $T_0$ , beginning at the top and ending at the bottom. The amplitude of the NMO-corrected output trace at time  $T_0$  is an interpolated value of the input trace at time  $t(T_0, v_{RMS}, h)$ . Because the mapping is nonlinear, NMO-stretch and some duplication of events may occur. Traditionally, NMO-stretch is minimized by muting samples that exceed a user-defined limit.

## Examples

The image below shows a representative gather before and after the nmo correction. Note that the flattened events at farther offsets are slightly stretched.

