



## **Workflow for fill in gaps in sonic logs using regional velocity models.**

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### **Abstract**

Well logs are usually limited to a depth range covering exploratory targets. It means that most sonic logs present record gaps when compared to seismic velocity field which covers from sea bottom/land surface up to the basement. Thus, the velocity curves obtained from logs with gaps also present information gaps. These gaps of information may cause problems and/or errors when data from velocity curves are extrapolated laterally in the models and interpolated with other velocity curves or the background 3D velocity cube. To mitigate extrapolation and interpolation problems, curve gaps need to be filled with estimated values. Many techniques may be used to accomplish this task: simple linear interpolation, analytic functions (Athy, 1930; Gardner et al., 1974; Magara, 1976), estimation from other geophysical profiles (e.g., density (Gardner et al., 1974) and resistivity (Faust, 1953)) and extraction of velocity function from velocity volumes and splice with the well log curve. These techniques generally produce smoothed velocity intervals. If necessary, higher frequency velocity variations can be introduced later in the 3D model using algorithms which relate increases and decreases in the low frequency velocity trend with the positive and negative reflections, respectively (e.g., Freitas et al., 2022), or methods which obtain the missing lithology information from drilling cuts and establishes velocity values for each different lithology (e.g., Maul et al., 2019). This paper presents a workflow for fill in gaps in sonic logs using values from regional velocity models.