reservoir within the subsurface region may change. As such, it may be useful to determine how the image or map of the subsurface region changes over time, such that the operations related to extracting the hydrocarbons may be modified to more efficiently extract the hydrocarbons from the subsurface region of the Earth.

SUMMARY

[0007] A summary of certain embodiments disclosed herein is set forth below. It should be understood that these aspects are presented merely to provide the reader with a brief summary of these certain embodiments and that these aspects are not intended to limit the scope of this disclosure. Indeed, this disclosure may encompass a variety of aspects that may not be set forth below.

[0007a] According to a first aspect of the present disclosure, there is provided a method of seismic exploration above a region of subsurface containing structural or stratigraphic features conducive to determining a presence, migration, or accumulation of hydrocarbons, the method including: accessing at least a portion of a blended seismic source survey, wherein the blended seismic source survey corresponds to at least two interfering seismic source excitation groups therein, and wherein the seismic source excitations are produced by at least two seismic source groups having different signatures or frequency characteristics; separating the at least two interfering seismic source excitation groups using a deblending operation, wherein the deblending operation is performed based at least in part on an iterative interpolation and deblending operation to predict at least a portion of weak-coherence signals caused by the at least two interfering seismic source excitation groups; and producing at least two source gather groups based on the separating to be used in exploration for hydrocarbons within the region of the subsurface.

[0007b] According to a second aspect of the present disclosure, there is provided a tangible, non-transitory, machine-readable media, including instructions configured to cause a processor to: access at least a portion of a blended seismic source survey, wherein the blended source seismic survey corresponds to at least two interfering seismic source excitation groups, wherein the seismic source excitations are produced by at least two seismic source groups including a first source group and a second source group; separate the at least two interfering seismic source excitation groups based at least in part on an iterative interpolation and deblending operation to predict at least a portion of weak-coherence signals caused by the at least two interfering

seismic source excitation groups; produce at least two separate source gather groups based at least in part on the iterative interpolation and deblending operation, wherein the at least two separate source gather groups are respectively associated with the data sets that are non-overlapping or overlapping within the same source excitation group; and transmit the at least two separate source gathers for use in generating a seismic image, wherein the seismic image represents hydrocarbons in a subsurface region of Earth or subsurface drilling hazards.

[0007c] According to a third aspect of the present disclosure, there is provided a device, including: a processor configured to: access at least a portion of a blended seismic source survey, wherein the blended source seismic survey corresponds to at least two interfering seismic source excitation groups, wherein the seismic source excitations are produced by at least two seismic source groups including a first source group and a second source group; separate the at least two interfering seismic source excitation groups based at least in part on an iterative interpolation and deblending operation to predict at least a portion of weak-coherence signals caused by the at least two interfering seismic source excitation groups; produce at least two source gather groups based on the iterative interpolation and deblending operation, wherein the at least two source gather groups are respectively associated with the data sets that are non-overlapping or overlapping within the same source excitation group; and transmit the at least two source gathers for use in generating a seismic image, wherein the seismic image represents hydrocarbons in a subsurface region of Earth or subsurface drilling hazards.

[0008] Seismic acquisition utilizing sources and receivers may be useful in the generation of, for example, seismic images. Seismic images may be used, for example, in the determination of hydrocarbon deposits (e.g., areas within a subsurface that contain hydrocarbons) and/or subsurface drilling hazards. Seismic images are generally produced using seismic waveforms produced by a source, reflected off regions within a subsurface, and received by one or more receivers. The seismic image may be constructed using a high resolution seismic velocity model, such as full waveform inversion (FWI) model, a tomography model, or the like applied, for example, via a velocity model builder. The seismic velocity model may include data indicative of a change in velocity of the seismic waveforms during propagation through the subsurface region. The source that produces the seismic waveforms may be an

active source (e.g., anthropogenic sources of seismic waves such as explosives or airguns), or a passive source (e.g., non-anthropogenic such as waves or wind). Certain techniques employ active sources due to the resulting high signal-to-noise ratio (SNR) of the seismic waveforms. Passive sources may complement active source seismic surveys. For example, passive sources may assist in the generation of velocity models of a near surface region (e.g., less than approximately 500 meters (m) below the surface of the Earth and/or a seafloor).

[0009] In addition to the examples provided above, image and/or data registration techniques may be used for various applications in seismic data processing, as described herein. For example, the systems and methods described below may be used for signal recovery associated with returned signals received during simultaneous source data acquisition. To elaborate, sometimes simultaneous sources