CLAIMS

1. A method comprising:

distributing a plurality of transmitters among different locations;

distributing a plurality of receivers at different structures among different locations;

collecting signals received at the plurality of receivers in response to activating the plurality of transmitters, the collected signals used to generate a ratio;

generating the ratio from signals of the collected signals measured at the different structures, the structures subject to perturbative environmental effects and the ratio selected to compensate for the perturbative environmental effects, the signals related to an underground region; and

performing an inversion operation on the generated ratio to determine parameters of the underground region, wherein for receivers j and k of the plurality of receivers and for transmitters i and k of the plurality of transmitters, the generated ratio includes

$$\frac{V_{ij}V_{kl}}{V_{il}V_{kj}},$$

Where V_{ij} is the signal obtained at receiver j when transmitter i is transmitting, V_{kj} is the signal obtained at receiver j when transmitter k is transmitting, V_{il} is the signal obtained at receiver l when transmitter i is transmitting, V_{kl} is the signal obtained at receiver l when transmitter k is transmitting.

2. The method of claim 1, wherein the transmitters and receivers are disposed at or above the surface of a body of water, the transmitters and receivers are disposed in the body of water, the transmitters and receivers are disposed on or below a land surface and a floor of the body of water, or the transmitters and receivers are distributed among the body of water and land near the body of water.

3. The method of claim 1, wherein the method includes selecting transmitters and selecting a plurality of sets of receivers to pair with the selected transmitters such that activation of the selected transmitters and collection of measured signals from receivers in each respective set provides measured signals for array processing of ratios for performing inversion operations.

4. The method of claim 1, wherein performing the inversion operation includes using a

forward model or a library.

5. The method of claim 1, wherein performing the inversion operation includes performing an iterative process or performing a pattern matching process.

6. The method of claim 1, wherein the method includes applying the inversion operation such that a reservoir depth, a reservoir thickness, a reservoir resistivity, a reservoir shape, or a combination thereof is determined.

7. A system comprising:

ca plurality of transmitters, the transmitters distributed among different locations;

a plurality of receivers, the receivers at different structures distributed among different locations; and

a processing unit to control activation of the transmitters and to process signals received from the receivers to operatively generate a ratio from the received signals measured at the different locations, the structures subject to perturbative environmental effects and the ratio selected to compensate for the perturbative environmental effects, the signals related to an underground region, and to operatively perform an inversion operation on the generated ratio to determine parameters of the underground region, wherein for receivers j and k of the plurality of receivers and for transmitters i and k of the plurality of transmitters, the generated ratio includes

$$\frac{V_{ij}V_{kl}}{V_{il}V_{kj}},$$

where V_{ij} is the signal obtained at receiver j when transmitter i is transmitting, V_{kj} is the signal obtained at receiver j when transmitter k is transmitting, V_{il} is the signal obtained at receiver l when transmitter i is transmitting, V_{kl} is the signal obtained at receiver l when transmitter k is transmitting.

8. The system of claim 7, wherein the transmitters and receivers are disposed at or above the surface of a body of water, the transmitters and receivers are disposed in the body of water, the transmitters and receivers are disposed on or below a land surface and a floor of the body of water, or the transmitters and receivers are distributed among the body of water and land near the body of water.

9. The system of claim 7, wherein the processing unit is operable to select transmitters and select a plurality of sets of receivers to pair with the selected transmitters such that activation of the selected transmitters and collection of measured signals from receivers in each respective set provides measured signals for array processing of ratios as input to inversion operations.

10. The system of claim 7, wherein the processing unit is operable to perform the inversion operation using a forward model or a library.

11. The system of claim 7, wherein the processing unit is operable to perform the inversion operation by an iterative process, by a pattern matching process, or a combination thereof.

12. The system of claim 7, wherein the processing unit is operable to apply the inversion operation such that a reservoir depth, a reservoir thickness, a reservoir resistivity, a reservoir shape, or a combination thereof is determined.

13. A machine-readable storage device having instructions stored thereon, which, when performed by a machine, cause the machine to perform operations, the operations comprising operations to:

activate a plurality of transmitters;

collect signals received at a plurality of receivers in response to activating the plurality of transmitters, the collected signals used to generate a ratio;

generate the ratio from signals of the collected signals measured at different structures distributed among different locations, the structures subject to perturbative environmental effects and the ratio selected to compensate for the perturbative environmental effects, the signals related to an underground region; and

perform an inversion operation on the generated ratio to determine parameters of the underground region, wherein for receivers j and k of the plurality of receivers and for transmitters i and k of the plurality of transmitters, the generated ratio includes

$$\frac{V_{ij}V_{kl}}{V_{il}V_{kj}},$$

where V_{ij} is the signal obtained at receiver j when transmitter i is transmitting, V_{kj} is the signal obtained at receiver j when transmitter k is transmitting, V_{il} is the signal obtained at receiver l when transmitter i is transmitting, V_{kl} is the signal obtained at receiver l when transmitter k is transmitting.

14. The machine-readable storage device of claim 13, wherein the transmitters and receivers with the transmitters and receivers are disposed with respect to each other as a substantially rectangular arrangement.

15. The machine-readable storage device of claim 14, wherein the transmitters and receivers are disposed with respect to each other as a substantially square arrangement.

16. The machine-readable storage device of claim 13, wherein the transmitters and receivers are disposed at or above the surface of a body of water, the transmitters and receivers are disposed in the body of water, the transmitters and receivers are disposed on or below a land surface and a floor of the body of water, or the transmitters and receivers are distributed among the body of water and land near the body of water.

17. The machine-readable storage device of claim 13, wherein the instructions include selecting transmitters and selecting a plurality of sets of receivers to pair with the selected transmitters such that activation of the selected transmitters and collection of measured signals from receivers in each respective set provides measured signals for array processing of ratios for performing inversion operations.

18. The machine-readable storage device of claim 13, wherein the operations include performing the inversion operation or inversion operations using a forward model or a library.

19. The machine-readable storage device of claim 13, wherein the operations that include performing the inversion operation or inversion operations include performing an iterative process or performing a pattern matching process.

20. The machine-readable storage device of claim 13, wherein the operations include applying the inversion operation such that a reservoir depth, a reservoir thickness, a reservoir resistivity, a reservoir shape, or a combination thereof is determined.