

APPARATUS, SYSTEM AND METHOD FOR TRANSPORTING WATER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of US Provisional Patent Application Serial
5 No. 63/429,000 filed November 30, 2022, the content of which is incorporated herein by
reference in its entirety.

TECHNICAL FIELD

[0002] This disclosure generally relates to transport of water. In particular, this
disclosure relates to apparatus, a system and a method of transporting water that is suitable for
10 agriculture, livestock and/or human consumption through non-potable water.

BACKGROUND

[0003] Currently there are undeniable disturbances in the hydrological cycle in various
places on earth. Whether or not these disturbances are related to anthropological climate change
15 is uncertain, but there are large impact on the residents of these places where the access to
suitable water is disturbed. From the minor inconvenience of restricted water use in households
to the major consequences of increased costs in the agriculture industry, decreased access to
suitable water is causing economic and ecological problems.

SUMMARY

[0004] Some embodiments of the present disclosure relate to an apparatus for
transporting water from a first location to a second location through non-potable water. The
apparatus is a vessel for transporting water, the vessel comprising: an outer wall for defining an
internal plenum for receiving the water, the outer wall also defining front end, a back end and a
25 bulkhead port therebetween for providing fluid communication across the outer wall; a
propulsion system that is configured to move the vessel; a power system supported upon the
outer wall that is configured to capture energy and power the propulsion system; and an anti-roll
and buoyancy system that is positioned about the outer wall and below the power system.

[0005] Some embodiments of the present disclosure relate to a system for collecting
30 water at a first location, transporting the collected water to a second location and delivering the
collected water at the second location. In some embodiments of the present disclosure the
system comprises a pumping system that is configured to collect water for conducting to a
transport vessel. The pumping system comprising: a pump unit that comprises a pump, an intake

conduit and an output conduit, the pump unit is configured to draw water into the intake conduit and out the output conduit; and a float unit that is configured to float the pump unit in water.

[0006] Some embodiments of the present disclosure relate to a method for collecting water at a first location, transporting the collected water to a second location and delivering the collected water at the second location. A method of collecting and transporting water, the method comprising the steps of: positioning a pumping system within a first location that comprises the water to be collected and transported; collecting the water with the pumping system; conducting the collected water to a vessel; receiving the collected water in the vessel; transporting the received water to a second location; and offloading the transported water at the second location.

[0007] Without being bound by any particular theory, the embodiments of the present disclosure allow for water that is suitable for agriculture, livestock and/or human consumption to be moved in an energy efficient, low carbon footprint manner from a location of abundance to a location where there is a lack of water that is suitable for agriculture, livestock and/or human consumption, referred to herein as freshwater. The apparatus of the present disclosure can be assembled, loaded with freshwater, (semi-)autonomously transport the potable water over long distances between the first location and the second location, deliver the freshwater. Next the apparatus can be disassembled, compacted and transported back to the first location. If water is collected from areas where the suitability of the water is soon to change, for example in an estuary where freshwater is en route to mix with brackish water, then any negative impact of collecting and transporting that suitable water may be mitigated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] These and other features of the present disclosure will become more apparent in the following detailed description in which reference is made to the appended drawings.

[0009] **FIG. 1** shows an isometric view of a vessel for transporting water, according to embodiments of the present disclosure.

[0010] **FIG. 2** shows two views of another vessel for transporting water with an anti-roll and buoyancy system, an energy collection system and a propulsion system, according to embodiments of the present disclosure, wherein **FIG. 2A** shows an isometric view of the vessel and the systems; and, wherein **FIG. 2B** shows a front-elevation view of the vessel and the systems.

[0011] FIG. 3 shows an isometric view of another vessel for transporting water with another anti-roll and buoyancy system, another energy collection system and the propulsion system of FIG. 2, according to embodiments of the present disclosure.

[0012] FIG. 4 shows two views of the vessel of FIG. 3, wherein FIG. 4A shows a side-elevation view of the vessel; and, FIG. 4B shows a front-elevation view, according to
5 embodiments of the present disclosure.

[0013] FIG. 5 shows two views of an installable collar for use with the vessels of the present disclosure, wherein FIG. 5A shows an isometric view of the collar without any accessories installed thereon; and, FIG. 5B shows an isometric view of the collar with stabilizer
10 and propulsion systems installed on the collar.

[0014] FIG. 6 shows three views of a connection system for connecting together two vessels for transporting water, according to embodiments of the present disclosure, wherein FIG. 6A shows a side-elevation view of three vessels that can be connected by the connection system; FIG. 6B shows a closer view of dashed-line rectangle A in FIG. 6A, with the two
15 vessels not connected; and, FIG. 6C shows the same view as FIG. 6B but with the two vessels connected.

[0015] FIG. 7 shows three views of a chain of two or more connected vessels whereby each vessel is configured for a function, according to embodiments of the present disclosure, wherein FIG. 7A shows a perspective view of three vessels configured for navigation, propulsion, and energy; FIG. 7B shows an exploded view of the chain in FIG. 7A; and, FIG.
20 7C shows a top-down view of the chain in FIGs. 7A and 7B.

[0016] FIG. 8 shows a perspective view a chain of connected vessels for transporting water, according to embodiments of the present disclosure.

[0017] FIG. 9 shows a side view of a pumping system for use with the vessels of the
25 present disclosure.

[0018] FIG. 10 is a schematic that shows components of a system for transporting water, according to embodiments of the present disclosure.

[0019] FIG. 11 is a schematic that shows the steps of a method for transporting water, according to embodiments of the present disclosure.

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DETAILED DESCRIPTION

[0020] The embodiments of the present disclosure relate to an apparatus, a system and a method for collecting, transporting and delivering water. By the embodiments of the present disclosure, water is collected at a first location, transported and delivered to the second location.

- 5 [0021] As used herein, the term "about" refers to an approximately +/-10% variation from a given value. It is to be understood that such a variation is always included in any given value provided herein, whether or not it is specifically referred to.

[0022] Embodiments of the present disclosure will now be described by reference to the figures, which show representations of the apparatus, systems and methods according to the
10 present disclosure.

- [0023] Referring to FIG. 1, a vessel 10 is shown. The vessel 10 is configured to receive water for storage therein and for transporting the stored water through a body of non-potable water, such as an ocean or sea. The outer wall of the vessel 10 can be fabricated from various materials, provided such materials are not susceptible to degrade (i.e. break down on a
15 macroscopic, a microscopic level or leach) upon long term exposure to ultra-violet radiation found in sunlight, salt water or any combination thereof. Such materials should have sufficient strength to remain intact based upon the physical forces that can be exerted thereupon during the contemplated uses of the vessel 10, as described herein further below. Such materials should also be suitable for various construction techniques, such as, but not limited to: hot-air welding,
20 ultra-sonic welding, radio-frequency welding, adhesive connecting and other similar construction techniques. In some embodiments of the present disclosure, the walls of the vessel 10 can be single layered or they may comprise more than one layer. For example, the vessel 10 walls may have an outer layer that is made of more robust materials (in terms of the requirements described above) and an inner layer that is suitable for containing potable water.
25 The outer layer and the inner layer may be connected through one or more of the construction techniques described herein above. In some embodiments of the present disclosure, the outer layer of the wall may be a polymer sheet, or a sheet of material coated in a polymer and the inner layer may also be made up of a water tight polymer. For example, the outer layer may be made of polyester (PE) with an optional polyvinylchloride (PVC) coating. The inner layer may
30 be impermeable to salt and other chemicals so that when freshwater is contained therein, there is no (or very limited) intrusion of salt or other chemicals to contaminate the freshwater therein and there is no (or very limited) movement of the freshwater out across the walls of the vessel

10, except as described herein. The term "freshwater" is used herein to refer to water that is suitable for use in agriculture, livestock and/or human consumption.

[0024] As shown in FIG. 1, the walls of vessel 10 may be made up of one or more panels that are interconnected, for example by one or more of the construction techniques described
5 herein above. The walls of the vessel 10 can be formed so as to define a substantially cylindrical shape with a bulbous or frustoconical front end 10A and a flat or bulbous back end 10B. The front end 10A and the back end 10B define a longitudinal axis (shown as X on FIG. 1) of the vessel 10. The vessel 10 also has a top surface 10C and a bottom surface 10D.

[0025] The vessel 10 may further comprise a tow strap 14 that extends about the
10 perimeter of the vessel 10. The tow strap 14 may have a connection point 12, where a tow vessel (not shown) or an anchor (not shown) may be connected to the tow strap 14. The tow strap 14 may be affixed to the outer surface of the vessel 10 (either continuously or at various connection points) so as to distribute a load that may be generated by towing or anchoring, where the load is distributed about the vessel 10 by the strap 14.

15 [0026] The vessel 10 may further comprise one or more stabilizers 18. While the non-limiting example of the vessel 10 shown in FIG. 1 depicts three stabilizers 18 positioned proximal the back end 10B and about the longitudinal axis X, other numbers and configurations of the stabilizers 18 are contemplated herein.

[0027] The top surface 10C of the vessel 10 can support a power system 16 for providing
20 sufficient power for the operating the vessel 10. In some embodiments of the present disclosure, the power system 16 involves the capture and/or conversion of any of the following exemplary and non-limiting energy sources into electrical current (direct current or alternating current): solar, steam, wind, nuclear, fossil fuels, hydrogen, and helium. In some embodiments of the present disclosure, the power system 16 comprises one or more inverters, one or more
25 generators, one or more batteries, one or more turbines, one or more solar panels, one or more engines, or a combination thereof. As shown in FIG. 1, the power system is a solar energy collection system that comprises one or more solar panels that capture the energy of sunlight to generate electrical current (typically direct current), one or more inverters to convert the generated current into useable alternating current and, optionally, one or more batteries to store
30 the generated power. The solar panels may be flexible so as to wrap over the curved top surface 10C of the vessel 10.

[0028] The top surface 10C also defines an aperture that is covered by a quick connect, bulkhead port 19. The aperture provides fluid communication across the wall of the vessel 10 between outside the vessel 14 and inside the vessel 14. As will be described further below, a conduit may be connected to the port 19 to ingress water into the vessel 14 interior or to egress water out of the vessel 14 interior. When such a conduit is not connected to the port 19, the port 19 can close (either manually or automatically) to prevent fluid communication through the aperture.

[0029] FIG. 2 shows the vessel 14 with an anti-roll and buoyancy system 20. The anti-roll and buoyancy system 20 is connected to and positioned about the vessel 14. While FIG. 2 shows the system 20 as extending between the front end 10A and the back end 10B, however, various other configurations are contemplated herein. In operation, the system 20 prevents the vessel from rolling over and facilitates the vessel 1 maintaining its buoyancy. In particular, the system 20 may be positioned below the power system 16 so that the power system 16 is generally positioned above the water line so that during daylight the power system 16 is accessible to receive photon energy. The system 20 comprises at least one tube 21 that is pneumatically isolated from other components of the vessel 10 so that when the tube 21 is filled with a gas, such as air, it can maintain substantially the same volume of gas, within the tube 21 over at least 10 days. For the purpose of this disclosure, the term "pneumatically isolated" refers to a plenum that is fluid tight and does not fluidly communicate with any other plenum, unless such fluid communication is purposely established. The tube 21 may be lined with a non-porous material, such as polyurethane, that provides a fluid-tight seal. The walls of the tube 21 may comprise a larger gauge or thickness as compared to the walls of the vessel 10. When inflated, the tube 21 provides buoyancy so that the energy collecting system 16A, namely solar energy panels thereof, remains out of the body of water, meaning sufficiently above the water line so that collection of photon energy is minimally impaired (or not at all) by the surrounding water. Further, when inflated, the tube 21 may also act as an anti-roll feature, for example as an outrigger, to assist in keeping the solar energy panels facing towards the sun and to provide further stability to the vessel 10. As shown in FIG. 2B, the solar energy panels may be supported upon a rack system (not shown) so that they are substantially flat.

[0030] The vessel 10 in FIG. 2 also has a propulsion system that comprises one or more propulsion devices 22A, 22C that is configured to move the vessel 10 in any desired direction. In some embodiments of the present disclosure, the propulsion devices 22A, 22C are powered by the energy collected and stored by the energy collecting system 16A. Not shown, the propulsion devices 22A may be under the control of a remote user and/or an autonomous

guidance system that is configured to propel the vessel 10 between a first location and a second location.

[0031] FIG. 3 shows another embodiment of a vessel 11, according to embodiments of the present disclosure. The vessel 11 has the same features as described above for the vessel 10.
5 The differences are as follows and may be considered optional: the vessel 11 has a single wall made of one single piece of suitable material; an anti-roll and buoyancy system 20A that is made up of two or more tubes 21 that extend about the vessel 11, along the top surface 10C substantially parallel to the longitudinal axis X; the solar panels of an energy collection system 16B extend between two tubes 21 and are curved; the front propulsion device 22A is operatively
10 coupled directly to a front end 11A of the vessel 11, as may be the side propulsion device 22C; and, the port 19 is positioned towards the front end 11A of the vessel 11.

[0032] FIG. 4A shows a further difference between the vessel 10 and the vessel 11, in that the vessel 11 has a collar 110 positioned about the vessel 11 proximal the back end 11B. The collar 110 can be removably connected to the outer wall of the vessel 11 for supporting one
15 or more stabilizer fins 18 about the longitudinal axis of the vessel 11. As a further, non-limiting example, FIG. 4A shows a further collar 110 removably connected to the vessel 11, proximal the front end 11A and a further collar 110A removably connected to the vessel 11 between the front end 11A and the back end 11B. The collar 110A may be configured to couple to one or more propulsion devices 22C and one or more stabilizer fins 18. FIG. 4B shows a front-elevation view
20 of the vessel 11 with the stabilizer fins 18 and propulsion devices 22C operatively coupled thereto by the collars 110 (not shown in FIG. 4B). FIG. 4A also shows an antennae 23 that is configured to send and receive information, for example, positional information, guidance commands, distress beacons and the like, where the antennae 23 is operatively coupled to a processor unit (not shown) that is onboard the vessel 11.

25 [0033] FIG. 5A shows a non-limiting example of the collar 110 as defining multiple slots 118 each for releasably receiving a portion of a stabilizer fin 18 (as shown in FIG. 5B) or an antennae 23, and two apertures 122 each for releasably receiving a portion of a propulsion device 22 therein (as shown in FIG. 5B). The inner surface of the collar 110 defines one or more connectors 124 that are configured to releasably connect with a corresponding connector (not
30 shown) on the outer surface of vessel 11. The connectors 124 may be protrusions that fit into slots defined on the outer surface of the vessel 11 or vice versa, the connectors 124 may be slots that releasably receive protrusions defined by the outer surface of the vessel 11. When the collar 110 is connected to the vessel 11, the collar 110 will remain in its connected position in spite of

the various loads that may be place upon the collar 110 until such time that the collar 110 is purposefully removed.

[0034] FIG. 6 shows another embodiment of the present disclosure that relates to two or more vessels (shown as 100, 102 and 104) being releasably connected together by a connector assembly 111. As shown in greater detail in FIG. 6B, the connector assembly 111 comprises a connector flap 112 that wraps about the perimeter of a back end 100B of a vessel 100 and extends away from the back end 100B, substantially parallel to the longitudinal axis of the vessel 100. The flap 112 defines one or more reinforced apertures (for example grommets) that each can receive a connector extension 116 that extends radially outward from the outer surface of a front end 102A of the vessel 102. As shown in FIG. 6A, the front end 100A of the vessel 100 is shaped similarly to the vessels 10, 11, described herein above. In contrast, the front end 102A and the back end 102B of the vessel 102 are substantially flat, or optionally bulbous. To connect the first vessel 100 and the second vessel 102, the front end 102A of the second vessel 102 is positioned within the flap 112 and each of the extensions 116 are secured within individual apertures 114 (as shown in FIG. 6C). In this fashion, two or more vessels can be connected in a chain 150 with substantially aligned longitudinal axis and the last vessel 104 in the chain 150 may have a collar 110, stabilizer fins 18 (optionally an antennae 23) and one or more propulsion devices 22.

[0035] FIG. 7 shows another non-limiting embodiment of the two or more vessels (100, 102, and 104) that are releasably connected together by a connector assembly 111, wherein each of the two or more vessels (100, 102, and 104) have a particular function when connected in a chain 150 with substantially aligned longitudinal axis, from time to time. For example, and as shown in FIGs. 7A, 7B, and 7C, the chain 150 comprises a vessel configured for navigation 100, propulsion 102, and power 104. The chain 150 may comprise vessels configured for other and further functions than those listed such as, but not limited to, transportation, storage, and structure. The chain 150 has a plurality of concentrically arranged tow straps 14 spanning the length of the two or more vessels (100, 102, and 104) that come together at connection points (12A, 12B) (shown in FIG. 7C) located at both longitudinal ends of the chain 150. The vessel for navigation 100 comprises a propulsion device 22A configured to steer the chain 150 as well as a frustroconical front end 100A and a flat back end 100B (shown in FIG. 7B). The vessel for propulsion 102 comprises a plurality of propulsion devices (22C, 22D) (shown in FIG. 7C), a plurality of tubes 21 extending the length of the vessel 102, a flat front end 102A, and a flat back end 102B (shown in FIG. 7B). The vessel for power 104 comprises a plurality of stabilizer fins 18, a power system 16, a flat front end 104A, and a frustroconical back end 104B (shown in

FIG. 7B). As shown in FIG. 7, the power system 16 is a power bank system which comprises one or more generators and optionally, one or more batteries. In some embodiments of the present disclosure, the one or more generators may be a diesel generator, a natural gas generator, a gasoline generator, a biofuel generator, a hydrogen generator, a propane generator, a solar generator, or a combination thereof. Optionally, the power system 16 may comprise an anti-roll and buoyancy (not shown) positioned between an outer wall of the vessel and the power system 16. As shown in FIGs. 7A and 7C, the power system 16 provides generated power for the chain 150 through one or more electrical cables 126 running across and functionally connected to each of the vessels (100, 102, and 104). The generated power may be distributed to each of the vessels for operation according to their particular function (100, 102, and 104) through collars 110 located on each vessel. The chain 150 is connected so that each of the connecting vessels (100, 102, and 104) do not fluidly communicate with each other, and the contents therein can be accessed through each vessel's port 19 (shown in FIG. 7B). As will be appreciated by those skilled in the art, the number of vessels that are coupled together to form the chain may vary. In some embodiments of the present disclosure, the chain 150 may contain enough vessels to transport between about 1,000,000 liters and about 6,000,000 liters of fluid. In some embodiments of the present disclosure, the chain 150 may contain enough vessels to transport between about 2,000,000 liters and about 5,000,000 liters of fluid. As shown in FIG. 7, the chain 150 may contain enough vessels to transport between 3,000,000 liters and about 4,000,000 liters of fluid. While the non-limiting example of the chain 150 shows three vessels (100, 102, and 104) and functions thereof, other numbers of vessel and functions thereof are contemplated herein.

[0036] FIG. 8 shows another embodiment of the present disclosure that relates to a fleet 152 comprising at least a first chain 150A and at least a second chain 150B that are releasably connected through a first connection 12A. Optionally, the fleet 152 may comprise one or more additional chains 150C releasably connected to the second chain 150B through one or more additional connections 12B. In some embodiments of the present disclosure, the fleet 152 may comprise three chains, five chains, seven chains, nine chains, eleven chains, twenty chains, or more. As shown in FIG. 8, the fleet 152 has ten chains. The connections (12A and 12B) may be provided at any connection point 12 on a vessel or chain. In some embodiments of the present disclosure, the connections (12A and 12B) may comprise one or more fasteners (not shown) and one or more tow straps 14. The one or more fasteners may be a bolt, a screw, a socket, a nut, a pin, an anchor, a retaining ring and clip, a rivet, a threaded insert, a nail, and the like. The chain 150 may comprise connections (12A, 12B, and 12C) that are configured for a certain allowance

- of flexibility and movement between connected chains. Each of the chains in a fleet 152 may comprise one or more vessels configured for a function including navigation, propulsion, power, transportation, and optionally other functions. Alternatively, a portion or all of the chains in a fleet 152 may not be configured for any function. As shown in FIG. 8, each of the chains (150A, 150B, and 150C) in the fleet 152 are configured for power and/or propulsion, wherein each configured chain can operate either independently of the other chains in the fleet 152 or in concert with the other chains in the fleet 152. Optionally, some of the chains in the fleet 152 may not provide any function. The first chain 150A may be configured for navigating the fleet 152. Optionally, the first chain 150A may comprise a connection to a tow vessel (not shown) for navigating and/or propelling the fleet 152. In some embodiments of the present disclosure, the fleet 152 may contain or transport between about 10,000,000 liters and about 60,000,000 liters of fluid. In some embodiments of the present disclosure, the fleet 152 may contain or transport between about 20,000,000 liters and about 50,000,000 liters of fluid. As shown in FIG. 8, the fleet 152 contains or transports between 30,000,000 liters and about 40,000,000 liters of fluid.
- 15 [0037] FIG. 9 shows a pumping system 200 that comprises a float unit 202, a pump unit 204 that comprises a pump 206, an intake conduit 208 and an output conduit 210. The float unit 202 can be used with the vessels described herein for collecting water and pumping it through the port 19 of one or more vessels. For example, the pumping system 200 may be positioned to float in freshwater, near a boundary of salt water and freshwater in an estuary. Turning on the pump unit 204 will cause the pump to generate a negative pressure within the intake conduit 208 to draw freshwater up into the pump 206 and out the output conduit 210. The intake conduit 208 may have a screen positioned over the opening and that is configured to prevent solids and waterborne plants or animals from being drawing into the pump 206. For example, the screen may define multiple 1 mm² apertures that covers an intake opening with about a 30 cm diameter.
- 20 [0038] The pump 206 is configured to drive the collected water through the output conduit 210 into further conveyancing conduits 212 for delivery into a given vessel. Because the area surrounding the source of freshwater may be difficult to position the given vessel close to the pumping system 200, the output conduit 210 and the downstream conveyancing conduits 212 may, collectively, be tens or hundreds of feet long (see FIG. 10).
- 25 [0039] FIG. 10 shows the components of a system 500 for collecting freshwater, for example, from a first location 504 that may be the mouth of a river near the brackish water of an estuary 506. The system comprises a vessel 10 (or other vessels described herein), the conveyancing conduits 212 and the pumping system 204. In operation, the pumping system 204

is positioned in a body of freshwater 504 and the pumping system 204 collects and pumps a portion of the freshwater through the conveyancing conduit 212 into the vessel 10 which is waiting in the salt water of the ocean 500, or the brackish water 506 or even the freshwater 504, depending on the local terrain. The vessel 10 then propels itself to a second location 506 where there is a lack of freshwater. The vessel 10 may use ocean currents 502 to assist in transporting the freshwater to the second location 506. In some embodiments of the present disclosure, the vessel 10 may be a chain 150, as described herein above.

[0040] The vessel 10 can then be brought on land at the second location 506, collapsed into a smaller physical foot-print and transported back to the first location 504 by rail or otherwise.

[0041] FIG. 11 shows steps of a method 700 for collecting and transporting freshwater. The method 700 includes a step of positioning 702a pumping system within a first location, for example, a freshwater portion of an estuary. Without limiting the scope of the method 700, in some embodiments the pumping system 200 is suitable for use in the step 702 of positioning. Next a step of collecting 704 the freshwater is performed, for example the pumping system 200 can be started and water can be collected, drawn in through the intake conduit 208 and delivered to one or more conveyancing conduits 212 via the output conduit 210. The method 700 includes a step of conducting 706 the collected water to a vessel, for example the vessels 10, 11 described herein above. The method 700 includes a step of receiving 708 the conducted water, for example by the bulkhead port that is operatively coupled to the conveyancing conduits. The method 700 includes a step of transporting 710 the received water to a second location. For example, the vessel may at least partially rely on prevailing currents in a body of marine water and the vessel may also rely, at least partially, upon a propulsion system to move the received water to the second location. Upon arriving at the second location, the method further includes a step of offloading 712 the received and transported water. For example, the pumping system may be recoupled to the bulkhead port for egress of water from the vessel to a water or land based storage facility. Optionally, the method 700 can further include a step of collapsing 714 the vessel so that the physical footprint of the vessel is reduced. As a further option, the method 700 further includes a step of transporting 716 the collapsed vessel back to the first location in order to perform a step 718 of repeating the previous steps of the method 700.

[0042] As will be appreciated by those skilled in the art, the embodiments of the present disclosure present a solution to sharing freshwater from a first location -where the freshwater is abundant - to a second location where such freshwater is scarce. Furthermore, the embodiments

of the present disclosure provide such freshwater sharing at a significant carbon dioxide footprint discount, as compared to transporting freshwater by pipeline or by towing a payload of freshwater by a diesel engine powered boat. For example, a 1100 mile stretch of 10 inch pipe with three pumping stations could generate about 29000 tonnes of CO2 per year. Towing a load
5 of about 8300 tons of fresh water behind a diesel powered boat for 1100 miles at a speed of about 7 knots, could generate about 14,000 tonnes of CO2 per year, assuming 365 one-way trips per year. In contrast, the primary source of CO2 generated using the embodiments of the present disclosure relate to moving the payload from the loading point in an estuary out to a point where it can be reasonably towed by a sail powered vessel and from the offshore sail powered
10 point back to the offloading point in the destination estuary location.

I claim

1. A vessel for transporting water, the vessel comprising:
 - (a) an outer wall for defining an internal plenum for receiving the water, the outer wall also defining a front end, a back end and a bulkhead port therebetween for providing fluid communication across the outer wall;
 - (b) a propulsion system that is configured to move the vessel;
 - (c) a power system supported upon the outer wall that is configured to capture energy and power the propulsion system; and
 - (d) an anti-roll and buoyancy system that is positioned about the outer wall and below the power system.
2. The vessel of claim 1, wherein the outer wall comprises one or more panels that are interconnected.
3. The vessel of claim 1, wherein the power system is a solar power capture system, a power bank system, or a combination thereof.
4. The vessel of claim 3, wherein the solar power capture system comprises one or more flexible solar energy panels.
5. The vessel of claim 3, wherein the power bank system comprises one or more generators.
6. The vessel of claim 1, wherein the bulkhead port is configured as a quick connect for receiving a corresponding connector of a fluid conduction pipe.
7. The vessel of claim 1, wherein the anti-roll and buoyancy system is oriented substantially parallel to a longitudinal axis of the vessel.

8. The vessel of claim 1, wherein the anti-roll and buoyancy system comprises at least one tube that is pneumatically isolated from the plenum, wherein the at least one tube is inflatable with a fluid that is buoyant in marine water.
9. The vessel of claim 1, further comprising a collar that is removably connectible about the outer wall, proximal the back end, wherein the collar is configured to couple a stabilizer fin and/or a propulsion device and/or an antennae to the vessel.
10. The vessel of claim 9, wherein the collar has an inner surface that further defines one or more connectors for removably connecting the collar to the outer wall.
11. The vessel of claim 1, further comprises a connector flap that extends away from the back end and the connector flap is configured to receive a connector extension that extends from a front end of a second vessel, wherein the second vessel comprises an outer wall for defining an internal plenum for receiving the water, the outer wall also defining front end, a back end and a bulk head port therebetween for providing fluid communication across the outer wall.
12. The vessel of claim 11, wherein the second vessel further comprises a second connector flap that extends from the back end of the second vessel, the connector flap is configured to a received a second connector extension that extends from a front end of a third vessel, wherein the third vessel comprises an outer wall for defining an internal plenum for receiving the water, the outer wall also defining front end, a back end and a bulk head port therebetween for providing fluid communication across the outer wall.
13. A system that is configured to collect water for conducting to a transport vessel, the system comprising:

- (a) a pump unit that comprises a pump, an intake conduit and an output conduit, the pump unit is configured to draw water into the intake conduit and out the output conduit; and
- (b) a float unit that is configured to float the pump unit in water.

14. The pumping system of claim 13, wherein the intake conduit comprises a screen that is configured to prevent solids, water-borne plants or animals from being drawing into the pump unit.

15. The pumping system of claim 13, wherein the output conduit is in fluid communication with one or more conveyancing conduits.

16. The system of claim 15, further comprising the vessel of claim 1, wherein the one or more conveyancing conduits are operatively coupleable to the bulkhead port.

17. A method of collecting and transporting water, the method comprising steps of:

- (a) positioning a pumping system within a first location that comprises the water to be collected and transported;
- (b) collecting the water with the pumping system;
- (c) conducting the collected water to a vessel;
- (d) receiving the collected water in the vessel;
- (e) transporting the received water to a second location; and
- (f) offloading the transported water at the second location.

18. The method of claim 17, further comprising a step of collapsing the vessel.

19. The method of claim 18, further comprising a step of transporting the vessel to the first location.

20. The method of claim 17, further comprising a step of repeating steps (a) through (d).