



Launch Services Program presents...

# Aquarius/SAC-D

Aquarius/SAC-D is a cooperative Earth Science project with NASA and Argentina's Comisión Nacional de Actividades Espaciales (CONAE). NASA will provide the primary instrument Aquarius, and launch services, while CONAE will supply the SAC-D spacecraft and ground system. The SAC-D spacecraft will also carry a suite of seven other instruments with various science objectives.

The Aquarius instrument will provide unprecedented data to produce global maps of sea surface salinity, measuring changes in sea surface salinity equivalent to about a "pinch" (1/8 of a teaspoon) of salt in 1 gallon of water. Within a few months, Aquarius

will collect as many sea surface salinity measurements as the entire 125-year historical record from ships and buoys. Examples of science questions that Aquarius can help answer include:

- Why is the Atlantic the saltiest ocean?
- How do changes in rainfall over the tropical oceans and the resulting effects on sea surface salinity influence the development of monsoons?
- How can we use sea surface salinity data to improve climate models? El Niño and La Niña forecasts?
- What is the link between ocean circulation, the global water cycle and climate variability?

Aquarius/SAC-D is planned for a prime mission of three years.

**Launch Vehicle: Delta II 7320-10C**

**Launch Location: Vandenberg Air Force Base, CA**

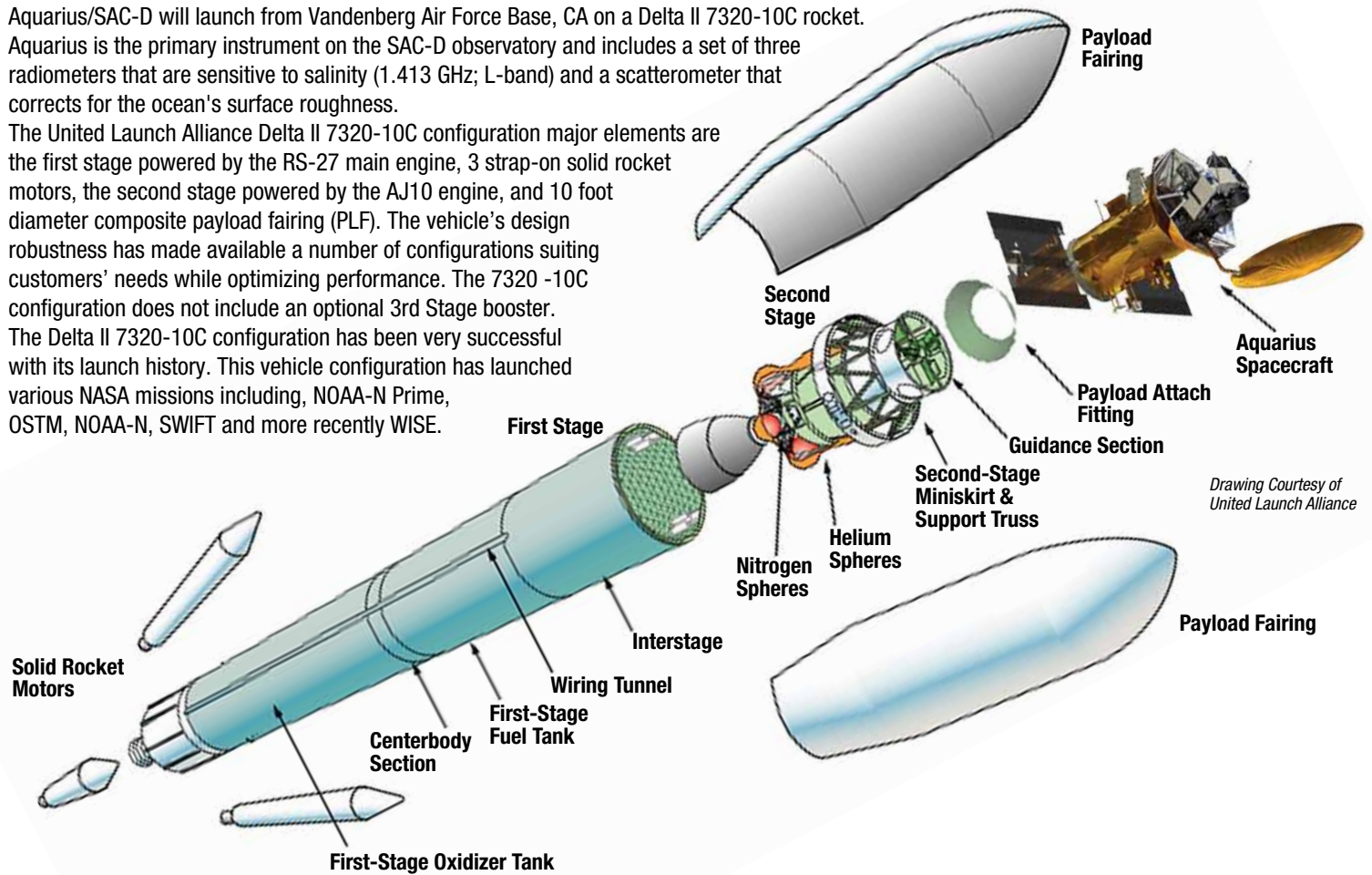
**Launch Date: 2011**



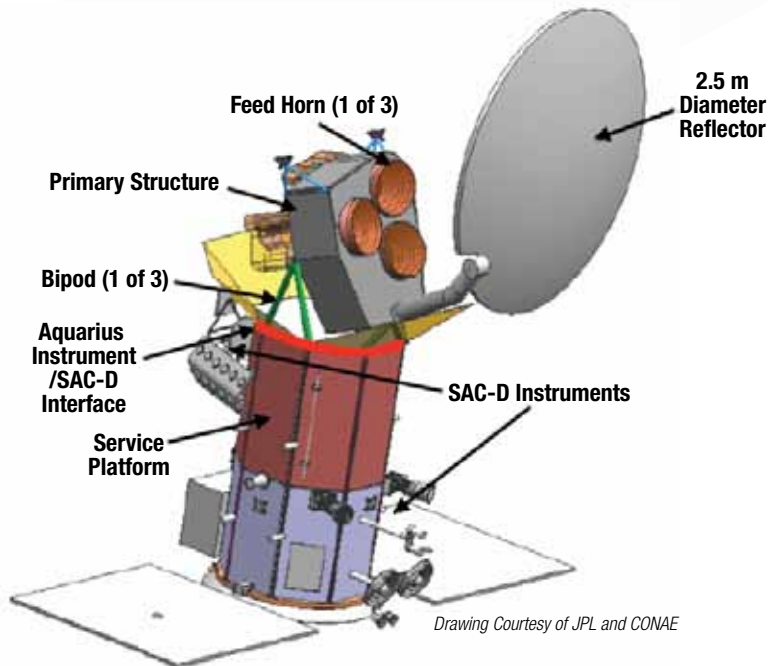
# AQUARIUS/SAC-D

Aquarius/SAC-D will launch from Vandenberg Air Force Base, CA on a Delta II 7320-10C rocket. Aquarius is the primary instrument on the SAC-D observatory and includes a set of three radiometers that are sensitive to salinity (1.413 GHz; L-band) and a scatterometer that corrects for the ocean's surface roughness.

The United Launch Alliance Delta II 7320-10C configuration major elements are the first stage powered by the RS-27 main engine, 3 strap-on solid rocket motors, the second stage powered by the AJ10 engine, and 10 foot diameter composite payload fairing (PLF). The vehicle's design robustness has made available a number of configurations suiting customers' needs while optimizing performance. The 7320 -10C configuration does not include an optional 3rd Stage booster. The Delta II 7320-10C configuration has been very successful with its launch history. This vehicle configuration has launched various NASA missions including, NOAA-N Prime, OSTM, NOAA-N, SWIFT and more recently WISE.



*Drawing Courtesy of United Launch Alliance*



*Drawing Courtesy of JPL and CONAE*

**Radiometer** - a device used for measuring the power of electromagnetic radiation.

**Scatterometer** - corrects for the ocean's surface roughness.

**Feed Horns** - a horn antenna used to convey radio waves between the transceiver and the reflector.

**Primary Structure** - carries all launch vehicle loads and contains the propulsion system.

**Bipod** - a support device with two legs attached.

**Service Platform** - has the ability to turn off the instrument.

**SAC-D Instruments** - Argentine instruments devoted to Earth observation.

**Reflector** - a device that causes reflection.