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- nadir**, *n.* The point on the celestial sphere vertically below the observer, or 180° from the zenith.
- name**, *n.* The label of a numerical value, used particularly to refer to the N (north) or S (south) label of latitude and declination. When latitude and declination are both N or both S, they are said to be of same name, but if one is N and the other S, they are said to be of contrary name.
- nano-**. A prefix meaning one-billionth (10⁻⁹).
- nanosecond**, *n.* One-billionth of a second.
- Napier diagram**. A diagram on which compass deviation is plotted for various headings, and the points connected by a smooth curve, permitting deviation problems to be solved quickly without interpolation. It consists of a vertical line, usually in two parts, each part being graduated for 180° of heading, and two additional sets of lines at an angle of 60° to each other and to the vertical lines. See also DEVIATION TABLE.
- Napierian logarithm**. A logarithm to the base e (2.7182818). Also called NATURAL LOGARITHM. See also COMMON LOGARITHM.
- narrows**, *n.* A navigable narrow part of a bay, strait, river, etc.
- nashi, n'aschi**, *n.* A northeast wind which occurs in winter on the Iranian coast of the Persian Gulf, especially near the entrance to the gulf, and also on the Makran coast. It is probably associated with an outflow from the central Asiatic anticyclone which extends over the high land of Iran. It is similar in character but less severe than the BORA.
- National Geodetic Vertical Datum**. A fixed reference once adopted as a standard geodetic datum for heights in the United States. The geodetic datum now in use in the United States is the North American Vertical Datum of 1988. The geodetic datum is fixed and does not take into account the changing stands of sea level. Because there are many variables affecting sea level, and because the geodetic datum represents a best fit over a broad area, the relationship between the geodetic datum and local mean sea level is not consistent from one location to another in either time or space. For this reason the National Geodetic Vertical Datum should not be confused with MEAN SEA LEVEL.
- National Tidal Datum Epoch**. The specific 19-year cycle adopted by the National Ocean Survey as the official time segment over which tide observations are taken and reduced to obtain mean values (e.g., mean lower low water, etc.) for tidal datums. It is necessary for standardization because of apparent periodic and apparent secular trends in sea level. The present National Tidal Datum Epoch is 1960 through 1978.
- National Water Level Observation Network. (National Tidal Datum Control Network)**. A network composed of the primary control tide stations of the National Ocean Service. This network of coastal observation stations provides the basic tidal datums for coastal boundaries and chart datums of the United States. Tidal datums obtained at secondary control tide stations and tertiary tide stations are referenced to the Network.
- natural**, *adj.* 1. Occurring in nature; not artificial. 2. Not logarithmic-used with the name of a trigonometric function to distinguish it from its logarithm (called LOGARITHMIC TRIGONOMETRIC FUNCTION).
- natural frequency**. The lowest resonant frequency of a body or system.
- natural harbor**. A harbor where the configuration of the coast provides the necessary protection. See also ARTIFICIAL HARBOR.
- natural logarithm**. See NAPIERIAN LOGARITHM.
- natural magnet**. A magnet occurring in nature, as contrasted with an ARTIFICIAL MAGNET, produced by artificial means.
- natural period**. The period of the natural frequency of a body or system.
- natural range**. A range formed by natural objects such as rocks, peaks, etc. See also ARTIFICIAL RANGE.
- natural scale**. See REPRESENTATIVE FRACTION.
- natural tangent**. See under TANGENT, definition 1.
- natural trigonometric function**. See under TRIGONOMETRIC FUNCTIONS.
- natural year**. See TROPICAL YEAR.
- nature of the bottom**. See BOTTOM CHARACTERISTICS.
- nautical**, *adj.* Of or pertaining to ships, marine navigation, or seamen.
- nautical almanac**. 1. A periodical publication of astronomical data designed primarily for marine navigation. Such a publication designed primarily for air navigation is called an AIR ALMANAC. 2. *Nautical Almanac*; a joint annual publication of the U.S. Naval Observatory and the Nautical Almanac Office, Royal Greenwich Observatory listing the Greenwich hour angle and declination of various celestial bodies to a precision of 0.1' at hourly intervals; time of sunrise, sunset, moon rise, moonset; and other astronomical information useful to navigators.
- nautical astronomy**. See NAVIGATIONAL ASTRONOMY.
- nautical chart**. A representation of a portion of the navigable waters of the earth and adjacent coastal areas on a specified map projection, designed specifically to meet requirements of marine navigation.
- nautical day**. Until January 1, 1925, a day that began at noon, 12 hours earlier than the calendar day, or 24 hours earlier than the astronomical day of the same date.
- nautical mile**. A unit of distance used principally in navigation. For practical consideration it is usually considered the length of 1 minute of any great circle of the earth, the meridian being the great circle most commonly used. Because of various lengths of the nautical mile in use throughout the world, due to differences in definition and the assumed size and shape of the earth, the International Hydrographic Bureau in 1929 proposed a standard length of 1,852 meters, which is known as the International Nautical Mile. This has been adopted by nearly all maritime nations. The U.S. Departments of Defense and Commerce adopted this value on July 1, 1954. With the yard-meter relationship then in use, the International Nautical Mile was equivalent to 6076.10333 feet, approximately. Using the yard-meter conversion factor effective July 1, 1959, (1 yard = 0.9144 meter, exactly) the International Nautical Mile is equivalent to 6076.11549 feet, approximately. See also SEA MILE.
- nautical twilight**. The time of incomplete darkness which begins (morning) or ends (evening) when the center of the sun is 12° below the celestial horizon. The times of nautical twilight are tabulated in the *Nautical Almanac*; at the times given the horizon is generally not visible and it is too dark for marine sextant observations. See also FIRST LIGHT.
- nautophone**, *n.* A sound signal emitter comprising an electrically oscillated diaphragm. It emits a signal similar in power and tone to that of a REED HORN.
- Naval Vessel Lights Act**. Authorized departure from the rules of the road for character and position of navigation lights for certain naval ships. Such modifications are published in *Notice to Mariners*.
- NAVAREA**. A geographical subdivision of the Long Range Radio Broadcast Service.
- NAVAREA Warnings**. Broadcast messages containing information which may affect the safety of navigation on the high seas. In accordance with international obligations, the Defense Mapping Agency Hydrographic/Topographic Center is responsible for disseminating navigation information for ocean areas designated as NAVAREAS IV and XII of the World Wide Navigational Warning Service. NAVAREA IV broadcasts cover the waters contiguous to North America from the Atlantic coast eastward to 35°W and between latitudes 7°N and 67°N. NAVAREA XII broadcasts cover the waters contiguous to North America extending westward to the International Date Line and from 67°N to the equator east of 120°W, south to 3°25'S, thence east to the coast. Other countries are responsible for disseminating navigational information for the remaining NAVAREAS. NAVAREA Warnings may be superseded by a numbered paragraph in *Notice to Mariners*. The text of effective warnings for NAVAREAS IV and XII is available through NAVINFONET and is printed in the weekly *Notice to Mariners*.
- navigable**, *adj.* Affording passage to a craft; capable of being navigated.
- navigable semicircle (less dangerous semicircle)**. The half of a cyclonic storm area in which the rotary and forward motions of the storm tend to counteract each other and the winds are in such a direction as to tend to blow a vessel away from the storm track. In the North-

- ern Hemisphere this is to the left of the storm center and in the Southern Hemisphere it is to the right. The opposite is DANGEROUS SEMICIRCLE.
- navigable waters.** Waters usable, with or without improvements, as routes for commerce in the customary means of travel on water.
- navigating sextant.** A sextant designed and used for observing the altitudes of celestial bodies, as opposed to a hydrographic sextant.
- navigation, n.** The process of planning, recording, and controlling the movement of a craft or vehicle from one place to another. The word navigate is from the Latin *navigatus*, the past participle of the verb *navigere*, which is derived from the words *navis*, meaning "ship," and *agere* meaning "to move" or "to direct." Navigation of water craft is called marine navigation to distinguish it from navigation of aircraft, called air navigation. Navigation of a vessel on the surface is sometimes called surface navigation to distinguish it from navigation of a submarine. Navigation of vehicles across land or ice is called land navigation. The expression polar navigation refers to navigation in the regions near the geographical poles of the earth, where special techniques are employed.
- navigational aid.** An instrument, device, chart, method, etc., intended to assist in the navigation of a craft. This expression is not the same as AID TO NAVIGATION, which refers to devices external to a craft such as lights and buoys.
- navigational astronomy.** Astronomy of direct use to a navigator, comprising principally celestial coordinates, time, and the apparent motions of celestial bodies. Also called NAUTICAL ASTRONOMY.
- navigational planets.** The four planets commonly used for celestial observations: Venus, Mars, Jupiter, and Saturn.
- navigational plot.** A graphic plot of the movements of a craft. A dead reckoning plot is the graphic plot of the dead reckoning, suitably labeled with respect to time, direction, and speed; a geographical plot is one relative to the surface of the earth.
- navigational triangle.** The spherical triangle solved in computing altitude and azimuth and great circle sailing problems. The celestial triangle is formed on the celestial sphere by the great circles connecting the elevated pole, zenith of the assumed position of the observer, and a celestial body. The terrestrial triangle is formed on the earth by the great circles connecting the pole and two places on the earth; the assumed position of the observer and geographical position of the body for celestial observations, and the point of departure and destination for great circle sailing problems. The expression astronomical triangle applies to either the celestial or terrestrial triangle used for solving celestial observations.
- navigation, head of.** A transshipment point at the end of a waterway where loads are transferred between water carriers and land carriers; also the point at which a river is no longer navigable due to rapids or falls.
- navigation lights.** Statutory, required lights shown by vessels during the hours between sunset and sunrise, in accordance with international agreements.
- navigation mark.** See MARK.
- navigation/positioning system.** A system capable of being used primarily for navigation or position fixing. It includes the equipment, its operators, the rules and procedures governing their actions and, to some extent, the environment which affects the craft or vehicle being navigated.
- navigation satellite.** An artificial satellite used in a system which determines positions based upon signals received from the satellite.
- Navigation Sensor System Interface (NAVSSI).** The U.S. Naval version of the electronic chart display and information system (ECDIS). It is integrated with command and control, weapons, and other systems.
- Navigation Tables for Mariners and Aviators.** See H.O. PUB. NO. 208.
- navigator, n.** 1. A person who navigates or is directly responsible for the navigation of a craft. 2. A book of instructions on navigation, such as the *The American Practical Navigator (Bowditch)*.
- NAVSTAR Global Positioning System.** A satellite navigation system developed by the Department of Defense. The system provides highly accurate position and velocity information in three dimensions and precise time and time interval on a global basis continuously, to an unlimited number of users. It is unaffected by weather and provides a worldwide common grid reference system. The objective of the program is to provide very precise position information for a wide spectrum of military missions. In addition, current policy calls for civil availability with a slight degradation in system accuracy required to protect U.S. national security interests.
- NAVTEX.** A medium frequency radiocommunications system intended for the broadcast of navigational information up to 200 miles at sea, which uses narrow band direct printing technology to print out MSI and safety messages aboard vessels, without operator monitoring.
- Navy Navigation Satellite System.** A satellite navigation system of the United States conceived and developed by the Applied Physics Laboratory of the Johns Hopkins University. It is an all-weather, worldwide, and passive system which provides two-dimensional positioning from low-altitude satellites in near-polar orbits. The Transit launch program ended in 1988, and the system is scheduled for termination in 1996, replaced by GPS.
- neaped, adj.** Left aground following a spring high tide. Also called BENEAPED.
- neap high water.** See under NEAP TIDES.
- neap low water.** See under NEAP TIDES.
- neap range.** See under NEAP TIDES.
- neap rise.** The height of neap high water above the elevation of reference or datum of chart.
- neap tidal currents.** Tidal currents of decreased speed occurring semi-monthly as the result of the moon being in quadrature. See also NEAP TIDES.
- neap tides.** Tides of decreased range occurring semimonthly as the result of the moon being in quadrature. The neap range of the tide is the average semidiurnal range occurring at the time of neap tides and is most conveniently computed from the harmonic constants. It is smaller than the mean range where the type of tide is either semidiurnal or mixed and is of no practical significance where the type of tide is diurnal. The average height of the high waters of the neap tides is called neap high water or high water neaps and the average height of the corresponding low waters is called neap low water or low water neaps.
- nearest approach.** The least distance between two objects having relative motion with respect to each other.
- near gale.** Wind of force 8 (28 to 33 knots or 32 to 38 miles per hour) on the Beaufort wind scale. See also GALE.
- nearshore current system.** The current system caused by wave action in or near the surf zone. The nearshore current system consists of four parts: the shoreward mass transport of water; longshore currents; rip currents; the longshore movement of expanding heads of rip currents.
- near vane.** That instrument sighting vane on the same side of the instrument as the observer's eye. The opposite is FAR VANE.
- neatline, n.** That border line which indicates the limit of the body of a map or chart. Also called SHEET LINE.
- nebula (pl. *nebulae*), n.** 1. An aggregation of matter outside the solar system, large enough to occupy a perceptible area but which has not been resolved into individual stars. One within our galaxy is called a galactic nebula and one beyond is called an extragalactic nebula. If a nebula is resolved into numerous individual stars, it is called a STAR CLUSTER. 2. A galaxy.
- necessary bandwidth.** As defined by the International Telecommunication Union (ITU) for a given class of emission, the minimum value of the occupied bandwidth sufficient to ensure the transmission of information at the rate and with the quality required for the system employed, under specified conditions. Emissions useful for the good functioning of the receiving equipment as, for example, the emission corresponding to the carrier of reduced carrier systems, shall be included in the necessary bandwidth.
- neck, n.** 1. A narrow isthmus, cape or promontory. 2. The land areas between streams flowing into a sound or bay. 3. A narrow strip of land which connects a peninsula with the mainland. 4. A narrow body of water between two larger bodies; a strait.
- negative altitude.** Angular distance below the horizon. Also called DEPRESSION.
- Network Coordinating Station.** An INMARSAT COAST EARTH STATION (CES) equipped to process messages in the EGC SafetyNET system.
- neutral occlusion.** See under OCCLUDED FRONT.
- new ice.** A general term for recently formed ice which includes frazil ice, grease ice, slush, and shuga. These types of ice are composed of ice crystals which are only weakly frozen together (if at all) and have definite form only while they are afloat.