SIDE SCAN SONAR RECORD INTERPRETATION pdf

1: OCEANSCIENCE: Side Scan Sonar

Training manual produced by Klein Associates, Inc., manufacturer of side scan sonars. Applies to interpretation of all commercial side scan sonars. The figures and photographs of actual sonar records depict mine and ship targets.

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2: Side Scan Sonar Operator

Find helpful customer reviews and review ratings for Side Scan Sonar Record Interpretation at www.enganchecubano.com Read honest and unbiased product reviews from our users.

Harold Edgerton dari Massachusetts Institute of Technology. Beliau disana sebagai Professor di bidang teknik elektro. Sebelumnya Edgerton telah membuat alat high-speed flash photography pada tahun an. Dia menemukan bahwa fotografi elektrik tersebut tidak dapat bekerja dalam air, oleh karena itu dia mencoba mengganti denyut pulsa elektrik dengan pulsa akustik. Dengan mengirim energy pulsa akustik dan merekam hasil pantulannya, Edgerton mulai menarik tow dengan kapal dan membuat gambar secara berkelanjutan dari permukaan dasar laut Dr Harold Edgerton yang sedang berada di labnyaPada tahun , Edgerton menggunakan Side scan sonar untuk menemukan kapal Vineyard diteluk Buzzards, Massachusetts. Selanjutnya pada tahun , bersama timnya yang di pimpin oleh Martin Klein membuat tow dengan system dual-channeldengan system side scan sonar untuk pertama kalinya. Peralatan ini digunakan untuk memetakan dasar laut yang juga dapat digunakan untuk mempelajari kehidupan di dasar laut. Gelombang suara yang digunakan dalam teknologi side scan sonar biasanya mempunyai frekuensi antara dan KHz. Pulsa gelombang dipancarkan dalam pola sudut yang lebar mengarah ke dasar laut, dan gemanya diterima kembali oleh receiver dalam hitungan detik. Untuk mencari suatu lokasi tertentu, perekaman perlu mengikuti pola lintasan survey tertentu dengan menggunakan peralatan penentu posisi GPS dan video plotter. Side scan sonar mampu membuat liputan perekaman dasar laut dari kedua sisi lintasan survey. Dalam kondisi laut yang tenang dan haluan kapal yang lurus, sonogram dapat memberikan gambar atau image yang sangat tajam dan rinci seperti layaknya sebuah foto. Side Scan Sonar mempunyai kemampuan menggandakan menduplikasikan beam yang diarahkan pada satu sisi ke sisi lainnya. Sehingga kita bias melihat ke kedua sisi, memetakan semua area penelitian secara efektif dan menghemat waktu penelitian. SSS menggunakan Narrow beam pada bidang horizontal untuk mendapatkan resolusi tinggi di sepanjang lintasan dasar laut Klien Associates Inc, SSS menggunakan prinsip backscatter akustik dalam mengindikasikan atau membedakan kenampakan bentuk dasar laut atau objek di dasar laut Russel, dalam Edi, Material seperti besi, bongkahan, kerikil atau batuan vulkanik sangat efisien dalam merefleksikan pulsa akustik backscatter kuat. Seimen halus seperti tanah liat, lumpur tidak merefleksikan pulsa suara dengan baik backscatter lemah. Reflektor kuat akan menghasilkan pantulan backscatter yang kuat sedangkan rflektor lemah menghailkan backscatter yang lemah. Dengan pengetahuan akan karakteritik ini, pengguna SSS dapat menguji komposisi dasar laut atau objek dengan mengamati pengembalian kekuatan akustik Tritech International Limited, Prinsip pendeteksian dan interpretasi Side Scan Sonar SSS dapat dipasang pada lunas kapal atau ditarik di belakang kapal. Ilustrasi pemasangan SSS menggunakan towed body dapat dilihat pada gambar 3 a. Pada gambar tersebut terlihat bahwa SSS mentransmisikan pulsa akustik secara menyamping terhadap arah perambatan. Dasar laut dan objek merefleksikan kembali backscatter gelombang suara pada system sonar. Instrumen SSS mendekati objek tiga dimensi dan menampilkan objek tersebut dalam bentuk citra dua dimensi. Oleh karena itu, SSS tidak hanya menampilkan objek, melainkan juga bayangan objek tersebut. Pembentukan objek bayangan SSS di ilusrasikan pada gambar 3 b. Pengolahan data SSS terdiri dari dua tahapan, yakni real time processing dan post processing. Tujuan real time processing adalah untuk memberikan koreksi selama pencitraan berlangsung sedangkan tujuan post processing adalah meningkatkan pemahaman akan suatu objek melalui interprestasi Mahyuddin, dalam Edi, Penelitian yang dilakukan ini, pengolahan datanya adalah post processing. Interpretasi pada post processing dapat dilakukan secara kulaitatif maupun kuantitatif. Interprestai secara kualitatif dilakukan untuk mendapatkan sifat fisik material dan bentuk objek, baik dengan mengetahui derajat kehitaman hue saturation , bentuk shape maupun ukuran size dari objek atau target. Secara umum, berdasarkan bentuk eksternalnya, target dapat dibedakan menjadi buatan manusia man made targets atau objek alam natural targets. Pada umunya, objek buatan manusia memiliki bentuk yang tidak beraturan Klien Associates Inc, Interprestasi secara kuantitatif bertujuan untuk mendefinisikan hubungan antara posisi kapal, posisi towfish dan posisi objek sehingga diperoleh besaran horisontal dan besaran vertikal. Besaran horisontal meliputi nilai posisi objek ketika lintasan towfish sejajar dengan lintasan

kapal maupun ketika lintasan dengan towfish membentuk sudut. Besaran vertikal meliputi tinggi objek dari asar laut serta kedalaman objek Mahyuddin, Dual-channel Side Scan Sonar System dengan kemampuan cakupan jarak minimal hingga 75m digunakan untuk mendapatkan data kenampakan dasar-laut seabed features di sepanjang koridor yang sama dengan survei Batimetri. Towfish sebaiknya dioperasikan dari winch bermotor lengkap dengan electrical slip rings. Rekaman data sonar dikoreksi untuk tow fish lay back dan slant range. Apabila menggunakan towfish yang dipasang pada lambung kapal vessel-mounted , sistim dilengkapi dengan heave compensator untuk mereduksi pengaruh gelombang. Sistem yang digunakan mampu menghasilkan clear record dari keadaan dasar laut, identifikasi adanya wrecks, obstacles, debris, sand waves, rock outcrops, mud flows atau slides dan sedimen. Kemungkinan adanya bahaya atau keadaan dasar laut yang perlu mendapatkan perhatian khusus dilakukan investigasi untuk memperjelas jenis dan ukuran bahaya tersebut. Investigasi tersebut dapat dilaksanakan dengan menjalankan lajur yang lebih rapat pada arah yang berbeda dengan lajur umum yang telah dijalankan sebelumnya. Penentuan posisi menggunakan jarak atau waktu tertentu ditandai pada rekaman sonar. Keterangan pada gambar 3 adalah ebaga berikut. Fakultas Perikanan dan Ilmu Kelautan. Departemen Ilmu dan Teknologi Kelautan. Side Scan Sonar Record Interpretation. Basic Principles Of Hydrographic Surveying.

SIDE SCAN SONAR RECORD INTERPRETATION pdf

3: Side-scan sonar - Wikipedia

A major shortcoming of most up-to-date literature on side-scan sonar is the lack of practical information and advice to solve the numerous technical and operational difficulties discussed at such length.

This three-course presents the key concepts needed to understand the state-of-the-art and practical use of bathymetric and side-scan sonars. It covers various classes of sonar systems, including multibeam, multitransducer, and interferometric. It provides the theory, system parameters, and design issues required to predict the system performance and accuracy of current and proposed equipment. The course emphasizes realistic expectations based on field operations. Case studies will provide a solid understanding of the major issues and effects. Noise testing and performance limitations of noise is covered as are the relationships between position, attitude, and bathymetry. The course presents some of the latest techniques used for topographic data review. The course is valuable for users of sonar records, for operators of equipment, and for scientists and engineers involved in the development and evaluation of sonar equipment. The course will discuss both commercial and military applications. All attendees will receive a complete set of notes and the text Side Scan Record Interpretation. Jack Capell has over 30 years of experience in the design and application of multibeam sonar systems. He retired as a Senior Analyst in Advanced Development. His duties at SeaBeam included design, fabrication, and implementation of hardware and signal processing algorithms for sonars. He lead the test and evaluation efforts for many multibeam installations. He did noise studies for performance predictions of multibeam sonars on various vessels. He has given training courses on the operation and maintenance of multibeam systems. He is currently a consultant for companies in the sonar field. He has over 30 years of service to the oceanographic community, including 25 years in search and survey operations with side scan sonar. He is a world recognized expert in the interpretation of side scan sonar data. For the past 20 years he has been employed by Klein Associates, one of the leading manufacturers of side scan sonar systems. He has specialized in M. Contact this instructor please mention course name in the subject line Course Outline: Sonar and Mapping Technology. Single beam echo sounders, multibeam systems including multitransducer systems , and stereoscopic depth sounding. Attitude and positioning systems, design characteristics of various sonar systems. Beam processing and interferometric processing. Signal processing for optimal estimation of arrival times and directions. Noise and its effects on accuracy. Multipath and data editing considerations. Beam bowing and ray bending. Survey System Performance and Accuracy. Requirements, standards, error budgets, and test techniques. Real-time survey monitoring systems. Determination and correction of system biases and offsets. Range, resolution, and coverage. Charting and Display Technology. Post-processing systems and software. Mapping and Charting Technology. Single beam echo sounders, multitransducer systems, multibeam systems, and interferometric depth sounding. Design characteristics of various bathymetric sonar systems. Attitude measurements and propagation corrections. Data processing and display. Principles of side-scan operations. Performance parameter selection and tradeoffs. Underwater acoustic relationships for echo and shadow modes. Record Interpretation and Effects. Basics of record interpretation, surface effects, targets, and shadows; design-related effects; towing effects. Target detection parameters including reflectivity, aspect, acoustic shadows. Case studies and example records. Towing from surface, subsurface, and air platforms. Towing configuration and hardware. Case Studies and Applications. Shipwrecks, aircraft, pipelines, cables, geology studies, sand deposit studies, engineering surveys, fisheries, harbor defense. Technology and Tactics for Mine Hunting. Positioning, Q-routes, lane spacing. State-of-the-art today and directions for future trends. This course is not on the current schedule of open enrollment courses. If you are interested in attending this or another course as open enrollment, please contact us at or at ati aticourses. ATI typically schedules courses with a lead time of months. Group courses can be presented at your facility. For on-site pricing, request an on-site quote. You may also call us at or email us at ati aticourses.

SIDE SCAN SONAR RECORD INTERPRETATION pdf

4: ATI's Hydrographics & Side-Scan Systems course

Side Scan Sonar Data Interpretation Course Since the quality of side scan sonar records is directly related to the conditions under which it was collected, Azulmar.

Side Scan Sonar 1. Karyanya ini didokumentasikan di US Patent 4. Teknologi Side Scan Sonar telah dikembangkan pada awal tahun oleh Dr. Harold Edgerton dari Massachusetts Institute of Technology. Beliau disana sebagai Professor di bidang teknik elektro. Sebelumnya Edgerton telah membuat alat high-speed flash photography pada tahun an. Dia menemukan bahwa fotografi elektrik tersebut tidak dapat bekerja dalam air, oleh karena itu dia mencoba mengganti denyut pulsa elektrik dengan pulsa akustik. Dengan mengirim energy pulsa akustik dan merekam hasil pantulannya, Edgerton mulai menarik tow dengan kapal dan membuat gambar secara berkelanjutan dari permukaan dasar laut. Pada tahun , Edgerton menggunakan Side scan sonar untuk menemukan kapal Vineyard diteluk Buzzards, Massachusetts. Selanjutnya pada tahun , bersama timnya yang di pimpin oleh Martin Klein membuat tow dengan system dual-channel dengan system side scan sonar untuk pertama kalinya. Tritech International Limited, Pada tahun yang sama Klein menggunakan sonar untuk membantu arkeolog George Bass menemukan kapal di lepas pantai Turki. Pada tahun didirikan Klein Klein Associates, Inc dan terus bekerja pada perbaikan termasuk komersial pertama frekuensi tinggi kHz sistem dan yang pertama frekuensi dual side-scan sonars. Selanjutnya berkembang pabrikan atau Produsen Side scan sonar berfrekuensi tinggi antara lain: Deskripsi Alat Sonar merupakan teknik yang menggunakan perambatan g elombang suara di bawah air digunakan untuk penunjuk arah, komunikasi atau mendeteksi kapal-kapal laut. Sistem sonar dapat diartikan sebagai penentuan posisi dengan metode akustik acoustic location. Side-scan sonar adalah salah satu alat dengan prinsip sistem sonar yang digunakan secara efisien melihat penampaan dasar laut dengan area yang besar. Alat ini digunakan untuk pemetaan dasar laut untuk berbagai tujuan, termasuk penciptaan nautical charts , identifikasi maupun deteksi objek bawah air dan fitur bathimetri. Side scan sonar biasa digunakan untuk survei batimetri atau arkeologi maritim, dalam kaitannya dengan sampel dasar laut mampu memberikan pemahaman tentang perbedaan-perbedaan dalam material dan tipe tekstur dasar laut. Side Scan Sonar Side scan sonar menggunakan perangkat yang memancarkan pulsa berbentuk kipas ke arah dasar laut di berbagai sudut tegak lurus terhadap lintasan dari sensor melalui air, yang dapat ditarik dari sebuah kapal permukaan atau kapal selam, atau dipasang pada kapal lambung. Side Scan Sonar mempunyai kemampuan menggandakan menduplikasikan beam yang diarahkan pada satu sisi ke sisi lainnya. Sehingga kita bisa melihat ke kedua sisi, memetakan semua area penelitian secara efektif dan menghemat waktu penelitian. Penggunaan posisi dengan metode akustik telah digunakan jauh sebelum adnya teknologi radar. Sistem sidescan mengirimkan pulsa akustik pada suatu sisi dari receiver dan merekam amplitude energi balikan dari pulsa yang dipancarkan oleh sensor. Tiap pancaran pulsa, satu lajur kecil sekitar sampai m ke tiap sisi dari dasar laut dipetakan. Tiap pergerakan kapal, lajur ke lajur dipetakan. Pada dasar laut yang datar sempurna semua energi dipantulkan dari sesor sonar dan tidak ada sinyal yang terekam. Dalam faktanya, dasar laut tidak rata sempurna. Ketidakteraturan seperti bebatuan dan riak-riak air karena pantulan backscatter dari energi akustik, dan sistem dapat menyediakan informasi secara kasar keadaan dasar laut. Citra hasil perkaman Side-scan sonar juga alat digunakan untuk mendeteksi puing-puing objek pengamatan, contoh kapal karam dan penghalang lain di dasar laut yang mungkin berbahaya untuk pengiriman atau untuk instalasi dasar laut oleh industri minyak dan gas. Selain itu, status pipa dan kabel di dasar laut dapat diselidiki dengan menggunakan sisi-scan sonar. Side-scan data yang sering diperoleh bersama dengan bathymetrik soundings dan sub-bottom profiler data, sehingga memberikan sekilas struktur dangkal dasar laut. Side-scan sonar juga digunakan untuk penelitian perikanan, pengerukan operasi dan studi lingkungan. Side scan sonar dapat digunakan karena terdiri dari perangkat yang hardwere yang telah di program untuk memancarkan sonar ke suatu objek diperairan dan dapat diketahui pemerekamannya sengan softwere, karena itu SSS terdiri dari presisi berupa perangkat hardwere dan softwere. SSS menggunakan prinsip backscatter akustik dalam mengindikasikan atau membedakan kenampakan bentuk dasar laut atau objek di dasar laut Russel, dalam Edi, Material seperti besi, bongkahan, kerikil atau batuan vulkanik sangat efisien dalam merefleksikan pulsa

akustik backscatter kuat. Sedimen halus seperti tanah liat, lumpur tidak merefleksikan pulsa suara dengan baik backscatter lemah. Reflektor kuat akan menghasilkan pantulan backscatter yang kuat sedangkan reflektor lemah menghailkan backscatter yang lemah. Dengan pengetahuan akan karakteritik ini, pengguna SSS dapat menguji komposisi dasar laut atau objek dengan mengamati pengembalian kekuatan akustik Tritech International Limited, Ilustrasi pemasangan SSS menggunakan towed body dapat dlihat pada gambar 3 a dan b. Pemasangan SSS pada tunas kapal. Prinsip kerja dari piezoelektric tranducer adalah jika diberikan tegangan maka akan menghasilkan getaran dan getaran ini akan menjadi sumber suara yang memiliki frekuensi tinggi sering disebut ultrasonic, Bunyi frekuensi yang digunakan di sisi-scan sonar biasanya berkisar kHz; frekuensi yang lebih tinggi menghasilkan lebih baik resolusi tapi kurang jangkauan , atau jika piezoelektric tranducer di getarkan artinya menerima suara maka akan timbul charge yang dapat diartikan sebagai sumber tegangan. Besar dan waktu yang diterima akan disinkronkan dengan posisi absolute dimana sonar ini diletakan maka akan menghasilkan bentuk peta terhadap lingkungan. Tampilan berupa jarak dan posisi benda berada akan dilihat pada PC melalui komunikasi serial dengan mikrokontroler sebagai pengolah dan pinyimpanan data, sehingga kita dapat melihat obstacle atau benda yang berada pada jangkauan sonar ini. SSS mentransmisikan pulsa akustik secara menyamping terhadap arah perambatan. Dasar laut dan objek merefleksikan kembali backscatter gelombang suara pada system sonar. Instrumen SSS mendekati objek tiga dimensi dan menampilkan objek tersebut dalam bentuk citra dua dimensi. Oleh karena itu, SSS tidak hanya menampilkan objek, melainkan juga bayangan objek tersebut. Pembentukan objek bayangan SSS di ilusrasikan pada gambar 4 dibawah ini. Objek merefleksikan kembali backscatter dan pembentukan objek bayangan. Keterangan pada gambar 3 adalah sebagai berikut. Tujuan real time processing adalah untuk memberikan koreksi selama pencitraan berlangsung sedangkan tujuan post processing adalah meningkatkan pemahaman akan suatu objek melalui interprestasi Mahyuddin, dalam Edi, Penelitian yang dilakukan ini, pengolahan datanya adalah post processing. Interpretasi pada post processing dapat dilakukan secara kulaitatif maupun kuantitatif. Interprestai secara kualitatif dilakukan untuk mendapatkan sifat fisik material dan bentuk objek, baik dengan mengetahui derajat kehitaman hue saturation , bentuk shape maupun ukuran size dari objek atau target. Keadaan dasar perairan hasil rekaman SSS 4. Side scan sonar mampu membuat liputan perekaman dasar laut dari kedua sisi lintasan survey. Dalam kondisi laut yang tenang dan haluan kapal yang lurus, sonogram dapat memberikan gambar atau image yang sangat tajam dan rinci seperti layaknya sebuah foto. Tiap pancaran pulsa, satu lajur kecil sekitar sampai m ke tiap sisi. Dibandingkan alat lain yang memakai prinsip akustik seperti echosounder, Sub Bottom Profilier jangkauan pemerumannya SSS lebih kecil. Penggunaan Side Scan Sonar user. Dalam melakukan suatu survey dengan menggunakan side scan sonar surveyor dapat memasang Side Scan Sonar SSS pada lunas kapal atau ditarik di belakang kapal. Side Scan Sonar tersambung dengan kabel konduktor ke PC yang berisi perangkat lunak untuk mengolah data dan memberikan hasil side scan view kepada operator sebagai kendali penuh agar mempermudah pengolahannya menggunakan menu pull-down dan ikon pada layar. Operator dapat mengubah warna, kisaran, dan kontrol lain dengan mengklik mouse. Perangkat Lunak untuk View data hasil rekaman SSS Dengan komputer, gambar hasil perkaman SSS dapat disimpan dalam memori untuk pemutaran dan pengolahan pasca sewaktu-waktu di masa mendatang. Setelah terhubung GPS kursor mouse dapat ditempatkan pada setiap objek di layar dan posisi koordinat akan ditampilkan. Sonar file dapat disimpan pada hard drive komputer atau DVD. Fakultas Perikanan dan Ilmu Kelautan. Departemen Ilmu dan Teknologi Kelautan. Side Scan Sonar Record Interpretation. Basic Principles Of Hydrographic Surveying.

SIDE SCAN SONAR RECORD INTERPRETATION pdf

5: DELPH SONAR | iXblue

The side-scanning sonar affords me the ability to approach a structure and scan until I find whether the fish are holding in the shallows or the depths, and on which side. I can then set a drift and rig the rods for how the fish are holding in that moment rather than blind-casting to a spot.

Uses[edit] Side-scan sonar may be used to conduct surveys for marine archaeology ; in conjunction with seafloor samples it is able to provide an understanding of the differences in material and texture type of the seabed. Side-scan sonar imagery is also a commonly used tool to detect debris items and other obstructions on the seafloor that may be hazardous to shipping or to seafloor installations by the oil and gas industry. In addition, the status of pipelines and cables on the seafloor can be investigated using side-scan sonar. Side-scan data are frequently acquired along with bathymetric soundings and sub-bottom profiler data, thus providing a glimpse of the shallow structure of the seabed. Side-scan sonar is also used for fisheries research, dredging operations and environmental studies. It also has military applications including mine detection. The intensity of the acoustic reflections from the seafloor of this fan-shaped beam is recorded in a series of cross-track slices. When stitched together along the direction of motion, these slices form an image of the sea bottom within the swath coverage width of the beam. The sound frequencies used in side-scan sonar usually range from to kHz ; higher frequencies yield better resolution but less range. Side-scan sonar image of shipwreck "Aid" in Estonia Side-scan sonar image of submerged bridge at the bottom of Lake Murray in South Carolina Technology[edit] The earliest side-scan sonars used a single conical-beam transducer. Next, units were made with two transducers to cover both sides. The transducers were either contained in one hull-mounted package or with two packages on either side of the vessel. Next the transducers evolved to fan-shaped beams to produce a better "sonogram" or sonar image. In order to get closer to the bottom in deep water the side-scan transducers were placed in a "tow fish" and pulled by a tow cable. Up until the mids, commercial side scan images were produced on paper records. The early paper records were produced with a sweeping plotter that burned the image into a scrolling paper record. Later plotters allowed for the simultaneous plotting of position and ship motion information onto the paper record. In the late s, commercial systems using the newer, cheaper computer systems developed digital scan-converters that could mimic more cheaply the analog scan converters used by the military systems to produce TV and computer displayed images of the scan, and store them on video tape. Currently data is stored on computer hard drives or solid-state media. Military application[edit] One of the inventors of side-scan sonar was German scientist, Dr. His work is documented in US Patent 4,, [1] which was first disclosed in Aug , but remained classified by the US Navy until it was finally issued in Experimental side-scan sonar systems were made during the s in laboratories including Scripps Institution of Oceanography and Hudson Laboratories and by Dr. Harold Edgerton at MIT. Military side-scan sonars were made in the s by Westinghouse. Advanced systems were later developed and built for special military purposes, such as to find H-Bombs lost at sea or to find a lost Russian submarine, at the Westinghouse facility in Annapolis up through the s. This group also produced the first and only working Angle Look Sonar that could trace objects while looking under the vehicle. Commercial application[edit] The first commercial side-scan system was the Kelvin Hughes "Transit Sonar", a converted echo-sounder with a single-channel, pole-mounted, fan-beam transducer introduced around Martin Klein is generally considered to be the "father" of commercial side-scan sonar. That same year Klein used the sonar to help archaeologist George Bass find a year-old ship off the coast of Turkey. In Klein founded Klein Associates, Inc. This operated at relatively low frequencies to obtain long range.

6: Consent Form | Sport Fishing Magazine

The steps involved in digitally mosaicking sidescan-sonar records are as follows: Ground Control Points - common targets (geologic features) on adjacent sidescan-sonar records are chosen as ground control points (GCPs); essentially used to "tie down" sidescan-sonar records at numerous locations throughout the image domain, and to correct for

navigational errors, or feature offset due to.

7: Sekilas Tentang Side Scan Sonar â€“ Karya Tulis Ilmiah

Side scan sonar records and supplementary bathymetry, bottom samples and hydrodynamic data reveal that the distribution of seafloor sediment is strongly related to oceanographic processes and the particular morphology and topography of the RÃ-a.

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