

NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS
and
THE HYDROGRAPHIC SOCIETY OF AMERICA

**U.S. Hydrographer Certification
Program Handbook**

September 2025



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Appendix A: Suggested References for Hydrographer Certification Examination

ACRONYMS AND ABBREVIATIONS

BOEM	Bureau of Ocean Energy Management
CAT A	Category A
CAT B	Category B
CH	Certified Hydrographer
CMH	Certified Master Hydrographer
FIG	International Federation of Surveyors
HCB	NSPS-THSOA Hydrographer Certification Board
IBSC	International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers
ICA	International Cartographic Association
IHO	International Hydrographic Organization
NOAA	National Oceanic and Atmospheric Administration
NSPS	National Society of Professional Surveyors
PDH	Professional Development Hours
PE	Professional Engineer
PLS	Professional Land Surveyor
THSOA	The Hydrographic Society of America
USACE	United States Army Corps of Engineers

LIST OF REVISIONS

Version No.	Date	Revision
1	April 1, 2022	Original document
2	June 28, 2022	Updated to conform with IBSC comments; reformatted
3	April 3, 2024	Revision to 2.1.4 Savings (Grandfather) Clause for Level 1
4	September 18, 2025	Revised text to address FAQs received from applicants and other known inconsistencies

1.0 INTRODUCTION

Hydrographer certification recognizes individuals with the qualifications and experience necessary to conduct quality hydrographic surveys and to advise their clients on appropriate methods and procedures relative to the type of survey being conducted. The National Society of Professional Surveyors (NSPS) and The Hydrographic Society of America (THSOA) jointly provide for official recognition by one's colleagues and peers that an individual has demonstrated a level of competence, education, knowledge, and experience for hydrographer certification. (See organizational descriptions at <https://www.nsps.us.com> and <http://www.thsoa.org>.)

Applicants for certification must meet the criteria detailed in this document and pass an examination administered by NSPS-THSOA. Certification as a hydrographer is official recognition by NSPS-THSOA that a person has demonstrated to the satisfaction of the NSPS-THSOA Hydrographer Certification Board (HCB) that he or she is sufficiently competent to conduct hydrographic surveys. Once certified, an individual must meet requirements biennially (every two years) for Professional Development Hours (PDH) outlined herein to retain status as an active Certified Hydrographer listed on the NSPS-THSOA websites. Ultimately, the PDH requirements provide a measure of confidence that the hydrographer stays current with advancements in technology and practices with the health, safety, and welfare of the public in mind.

2.0 QUALIFICATIONS: EDUCATION, COMPETENCY, EXPERIENCE

Qualifications denote the foundation of knowledge that a member has achieved through formal education, experience, post-graduate learning, or a combination from all these sources. Designation as a Certified Hydrographer denotes peer-recognition of adequate qualifications and competencies. Competence is demonstrated by application of knowledge and skills to provide service, advice, or opinion to clients or employers. By carefully limiting the professional work undertaken within the limits of qualifications and competence, members protect the interests of the community, clients, employers, and themselves.

The International Federation of Surveyors, International Hydrographic Organization, and the International Cartographic Association (FIG/IHO/ICA) International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) publish the internationally recognized Standards of Competence for Hydrographic Surveyors, which provides guidance for hydrographic education and training programs to be recognized at two levels, in accordance with the IBSC guidelines for the implementation of the Standards of Competence for Hydrographic Surveyors and Nautical Cartographers, <https://iho.int/en/standards-and-specifications>:

- **Category A (CAT A)** programs provide a comprehensive and broad-based knowledge in all aspects of the theory and practice of hydrography and allied disciplines for individuals who will practice analytical reasoning, decision making, and development of solutions to non-routine problems (IHO Publication S-5A, http://www.iho.int/iho_pubs/IHO_Download.htm).
- **Category B (CAT B)** programs provide a level of practical comprehension of hydrographic surveying for individuals with the skill to carry out the various hydrographic surveying tasks, along with the essential theoretical background, (IHO Publication S-5B, http://www.iho.int/iho_pubs/IHO_Download.htm).

The Hydrographer Certification Board recognizes that competence equals knowledge plus experience, and both must be demonstrated. Thus, upon successful achievement by any individual of a Category A or a Category B program, which addresses the topics within the relevant Standard, the Board assesses relevant experience during which competence has been demonstrated by that individual. In addition, hydrographic technology is constantly advancing and that, in order to maintain

competence, an individual must pursue continuing professional training and education to ensure that they maintain currency, which is also assessed by the Board. Individuals must also gain appropriate practical experience and current knowledge of hydrographic survey standards in the United States, listed below:

- U.S. Army Corps of Engineers, EM-1110-2-1003 “[Hydrographic Surveying](#)”
- NOAA, “[NOS Hydrographic Surveys Specifications and Deliverables](#)”
- NOAA, “[Field Procedures Manual](#)”

To assist with the assessment of the requisite degree of hydrographic surveying competence, applicants must demonstrate to the satisfaction of the HCB that he or she has the necessary education, training, and knowledge to perform hydrographic surveys. An applicant meets this requirement by demonstrating understanding of hydrographic surveying through detailed documentation of education, training, and experience, and by passing an examination.

The applicant must fully complete the appropriate Level 1 or Level 2 Competency Form. The HCB will evaluate the applicant’s transcripts for academic courses and other documented training using this form, with additional detail from the Education and Project Engagement Detail forms. Deficiencies will require the applicant to take courses from the approved educational and training institutions and obtain a C grade or better. At the discretion of the HCB, competencies may be gained through demonstrated experience. Detailed descriptions of how the relevant learning outcomes were obtained must be presented for the HCB to consider accepting experience in lieu of formal education. Any classes used to meet a subject requirement would require a grade of C or better to meet the requirement.

To qualify to take the examination, an applicant must meet the education and experience requirements specified in this document. If the applicant presents a certificate of completion from an IBSC-recognized Category A or Category B program of instruction, the education and experience requirements will be reduced depending on the certification level for which they are applying.

The NSPS-THSOA Hydrographer Certification Scheme provides for differing levels of certification for U.S. hydrographers. The levels are structured to denote a range of expertise and qualifications of individuals to support the varying levels of requirements of federal, state, local, and private industry surveys.

2.1 Certified Master Hydrographer (Level 1)

Certified Master Hydrographer (CMH) is the highest attainable level of Certified Hydrographer for surveyors, engineers, and mapping professionals to support requirements for high-quality hydrographic surveys. This level of professional certification meets international and national standards of competence. Level 1 hydrographers are fully capable of undertaking and managing hydrographic surveys that meet the International Hydrographic Organization current standards of S-44 and the more detailed U.S. standards and specifications provided by NOAA or the U.S. Army Corps of Engineers. Level 1 hydrographers must have a theoretical education and foundational background necessary for hydrographic surveyors in-charge and hydrographic managers who will develop specifications for surveys, establish quality control and quality assurance systems, provide expert testimony or consultation as a subject matter expert, respond to the specific requirements of a full range of hydrographic projects, hold the knowledge base to investigate and resolve problematic data, and who can work with competence across the full spectrum of the hydrographic profession.

Note: *Hydrographer certification is not a substitute for professional registration with state licensing boards, e.g., registration as a Professional Land Surveyor (PLS) or Professional Engineer (PE). Registration is a legal act on the part of states to protect the public health, safety, and welfare of its people. It is a procedure (required by various state and local*

governments) that requires the licensing of certain professions, practices, and trades under formal statutes and ordinances. Registration is required by the state or local ordinances whether or not one secures certification. Certification as a hydrographer will provide additional demarcation to users of hydrographic services that a PLS or PE has the qualifications to extend professional mapping services to the field of hydrography with all associated formal statutes and ordinances provided by the state in which they are licensed. It is the responsibility of the Certified Hydrographer to follow all applicable professional regulations when providing surveying services. Some jurisdictions may allow the Certified Hydrographer to work with a PLS or PE to meet requirements.

Level 1 hydrographers must have graduated from an eligible baccalaureate degree program in science and engineering (engineering, marine science, geomatics, land surveying, GIS, mathematics, or physical science) and must meet the current S-5A Learning Standards contained in Standards of Competence for Category “A” Hydrographic Surveyors (Edition 1.0.2, June 2018) with grade C or better in completed coursework. The HCB will evaluate the applicant’s transcripts for academic courses and other documented training and compare it to the list of required coursework shown below. Deficiencies will require the applicant to take courses from HCB-approved educational and training institutions and obtain a passing grade as judged by the HCB.

For details on the specific learning outcomes for each subject, see the IHO S-5A documentation. Since the NSPS-THSOA CMH (Level 1) program is internationally recognized, IBSC education requirements must be met. Many courses can be completed at any accredited academic institution that covers the material listed in the learning outcomes, as evidenced by the course syllabus. The University of Southern Mississippi (USM) and the University of New Hampshire (UNH) offer IBSC-recognized CAT A programs. In addition, both USM and UNH offer individual courses to qualified non-degree seeking students. Other IBSC-recognized international programs may also meet this requirement.

Following is the list of required subjects from S-5A, shown as **Basic subjects**, **Foundation Science subjects** and **Hydrographic Science subjects**:

B1: Mathematics, Statistics, Theory of Observations (This requirement can be satisfied at a number of accredited academic institutions.)

B2: Information and Communication Technology (This requirement can be satisfied at a number of accredited academic institutions.)

B3: Physics (This requirement can be satisfied at a number of accredited academic institutions.)

B4: Nautical Science (The basic Coast Guard boating course meets much of these learning standards, but a course in marine operations is also required.)

B5: Meteorology (This requirement can be satisfied at a number of accredited academic institutions.)

F1: Earth Models (This requirement can be satisfied at a number of accredited academic institutions.)

F2: Oceanography (This requirement can be satisfied at a number of accredited academic institutions.)

F3: Geology and Geophysics (This requirement can be satisfied at a number of accredited

academic institutions.)

H1: Positioning (This requirement may be satisfied at academic institutions with geomatics and survey programs, but acoustic positioning may have to be satisfied with a course in marine operations.)

H2: Underwater Sensors and Data Processing (This requirement may be satisfied at a number of academic institutions or through U.S. Navy training courses, but specific applications for single beam, multibeam, and side scan sonar can only be found at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

H3: Lidar and Remote Sensing (This requirement can be satisfied at a number of accredited academic institutions.)

H4: Survey Operations and Applications (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

H5: Water Levels and Flow (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

H6: Hydrographic Data Acquisition and Processing (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

H7: Management of Hydrographic Data (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

H8: Legal Aspects (Accredited academic institutions with marine science or oceanography programs can satisfy these requirements.)

2.1.1 Requirements for Level 1

- Completion of an IBSC-recognized Category A training, or an eligible degree supplemented with post-baccalaureate education and training that includes the above-listed coursework credits or ability to demonstrate sufficient knowledge of required subjects through practical experience, as judged by NSPS-THSOA Hydrographer Certification Board.
- Forty-eight (48) months of experience conducting hydrographic surveys.
- Twenty-four (24) months in responsible technical charge.
- Twenty-four (24) months in the field.
(The twenty-four (24) months in responsible technical charge and the twenty-four (24) months in the field may be counted for the same time period, if appropriate.)
- Logbook of education and practical hydrographic experience that covers at least forty-eight (48) months. The template and instructions for the logbook are included [here](#).
- An abstract and full report of a hydrographic survey project of at least four (4) weeks in duration that was peer reviewed. Details for report requirements are included [here](#).
- A minimum of four (4) references, preferably from the applicant's supervisors, or from someone else familiar with applicant's technical hydrographic work experience, one of which shall be a Certified Hydrographer, Professional Surveyor, or Professional Engineer. The fillable Reference Form is included [here](#).
- Successfully pass the NSPS-THSOA Certified Master Hydrographer examination.

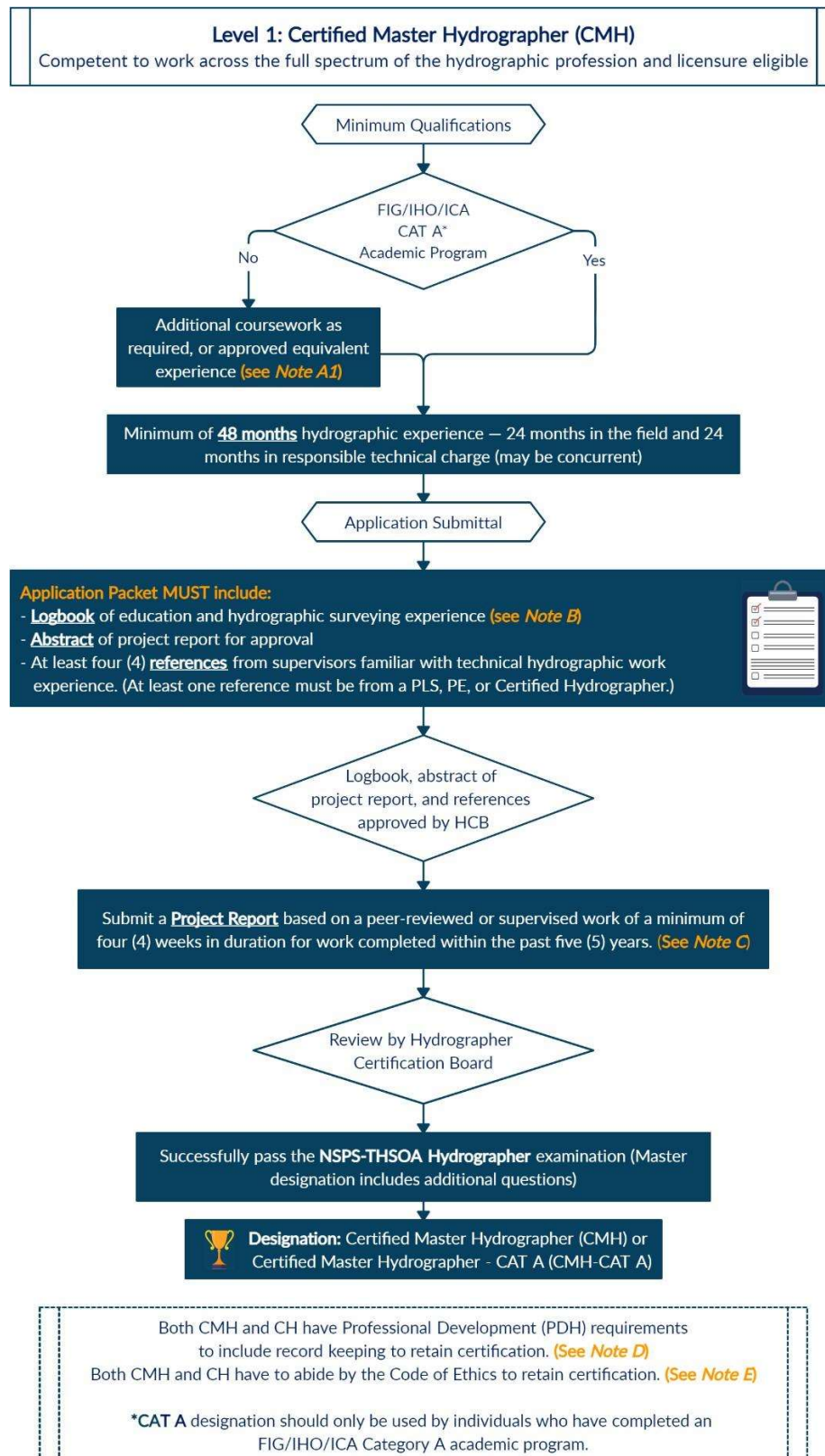


Figure 1: Flowchart for Level 1 Certification

2.1.2 Notes for Flowchart (Level 1 Certification)

A. The NSPS-THSOA Hydrographer Certification Board will evaluate the applicant's transcripts for academic courses and other documented training and compare it to a list of required coursework. Deficiencies will require the applicant to take courses from approved educational and training institutions and obtain a passing grade or higher.

A1. Level 1 applicants must have graduated from an eligible baccalaureate degree program (engineering, marine science, geomatics, land surveying, GIS, mathematics, or physical science) and meet the current S-5A Learning Standards contained in Standards of Competence for Category "A" Hydrographic Surveyors (Edition 1.0.2, June 2018) with grade C or better in completed coursework. Required coursework listed below may be from either a degree program, post-baccalaureate coursework, or HCB-approved training courses. The University of Southern Mississippi and the University of New Hampshire offer IBSC-recognized CAT A programs. Individual courses can also be taken as non-degree students.

- Mathematics, Statistics, Theory of Observations
- Information and Communication Technology
- Physics
- Nautical Science
- Meteorology
- Earth Models
- Oceanography
- Geology and Geophysics
- Positioning
- Underwater Sensors and Data Processing
- Lidar and Remote Sensing
- Survey Operations and Applications
- Water Levels and Flow
- Hydrographic Data Acquisition and Processing
- Management of Hydrographic Data
- Legal Aspects

B. Experience records will be evaluated based on the breadth and recency of the applicant's experience.

2.1.3 Additional Resources

C. See the [Applicant Guide to Logbook Forms](#) for information regarding the Logbook and its components (Engagement Summary Form, Education Detail Form, Project Engagement Detail Form, and Competency Form). In general, a separate Engagement Summary Form should be completed for each distinct period of employment - typically for each employer, or when a major promotion or significant change in job responsibilities occurs within the same organization.

D. See the [Project Report Requirements](#) and [Project Report Approval Form](#) for detailed project report requirements, including an evaluation scheme to guide report content. The project report should address all aspects of the survey from planning considerations, horizontal and vertical control, selection of equipment and coverage, QA/QC, issues encountered, and resolution, processing, and deliverables provided. Project reports from an academic setting will not be accepted.

E. See Section 5.0 of the *NSPS-THSOA U.S. Hydrographer Certification Program Handbook* for a description of the requirements for continuing professional development.

2.1.4 Transitions from Certified Hydrographer Level 2

Level 2 Certified Hydrographers may seek Level 1 Certification after completion of the following academic and experience requirements:

- Completion of an IBSC-recognized Category A training, or an eligible degree supplemented with post-baccalaureate education and training that includes coursework credits listed in Section 2.1, as judged by the NSPS-THSOA Hydrographer Certification Board.
- Logbook of education and practical hydrographic experience that covers at least forty-eight (48) months. The template and instructions for the logbook are included [here](#).
- An abstract and full report of a hydrographic survey project of at least four (4) weeks in duration that was peer reviewed. Details for report requirements are included [here](#).
- Successfully pass the NSPS-THSOA Advanced Hydrographic Surveying module of the Certified Master Hydrographer examination.
- A minimum of four (4) references, preferably from the applicant's supervisors or from someone else familiar with applicant's technical hydrographic work experience. It is required that one reference be a Certified Master Hydrographer, Certified Hydrographer, Professional Surveyor, or Professional Engineer. The fillable Reference Form is included [here](#).

2.2 Certified Hydrographer (Level 2)

Level 2 hydrographers are fully capable of undertaking and managing hydrographic surveys that meet the International Hydrographic Organization current standards of S-44 and the more detailed U.S. standards and specifications provided by NOAA or the U.S. Army Corps of Engineers. This level of professional certification meets international and national standards of competence, but Level 2 hydrographers are not expected to develop specifications for surveys, establish quality control and quality assurance systems, or respond to specific requirements of the full spectrum of hydrographic projects.

Level 2 applicants do not require a baccalaureate degree, but the Level 2 hydrographer must meet the current S-5B Learning Standards contained in Standards of Competence for Category "B" Hydrographic Surveyors (Edition 1.0.1, June 2017) with grade C or better in completed coursework. The HCB will evaluate the applicant's transcripts for academic courses and other documented training and compare it to the list of required coursework shown below. Deficiencies will require the applicant to take courses from HCB-approved educational and training institutions and obtain a passing grade as judged by the HCB. The following is the list of required subjects from S-5B:

B1: Mathematics, Statistics, Theory of Errors (This requirement can be satisfied at a number of accredited academic institutions.)

B2: Information and Communication Technology (This requirement can be satisfied at a number of accredited academic institutions.)

B3: Physics (This requirement can be satisfied at a number of accredited academic institutions.)

B4: Earth Sciences (This requirement can be satisfied at a number of accredited academic institutions.)

B5: Nautical Science (The basic Coast Guard boating course meets much of these learning standards, but a course in marine operations is also required.)

B6: Meteorology (This requirement can be satisfied at a number of accredited academic institutions.)

E1: Underwater Acoustics (This requirement may be satisfied at a number of academic institutions or through U.S. Navy training courses, but specific applications for single beam, multibeam, and side scan sonar can only be found at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

E2: Remote Sensing (This requirement can be satisfied at a number of accredited academic institutions.)

E3: Water Levels and Flow (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

E4: Positioning (This requirement may be satisfied at academic institutions with geomatics and survey programs, but acoustic positioning may have to be satisfied with a course in marine operations.)

E5: Hydrographic Practice (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

E6: Hydrographic Data Management (This requirement may be satisfied at hydrographic programs such as at the University of Southern Mississippi, University of New Hampshire, Oregon State University, NOAA, or industry training courses.)

E7: Environment (Accredited academic institutions with marine science or oceanography programs can satisfy these requirements.)

2.2.1 Requirements for Level 2

- Sixty (60) months of experience conducting hydrographic surveys; OR
- Completion of an IBSC-recognized Category A training, and twenty-four (24) months of full-time experience conducting hydrographic surveys; OR
- Completion of an IBSC-recognized Category B training, and thirty-six (36) months of full-time experience conducting hydrographic surveys
- Twenty-four (24) months in responsible technical charge
- Twenty-four (24) months in the field
(The twenty-four (24) months in responsible technical charge and the twenty-four (24) months in the field may be counted for the same time period if appropriate.)
- Logbook of education and practical hydrographic experience that covers the full-time experience time period required by paragraph 2.2.1. The template and instructions for the logbook are included [here](#).
- An abstract and full report of a hydrographic survey project of at least four (4) weeks in duration that was peer reviewed. Details for report requirements are included [here](#).
- A minimum of four (4) references, preferably from the applicant's supervisors, or from someone else familiar with applicant's technical hydrographic work experience. For Level 2, it is preferred, but not required, that one reference be a Certified Hydrographer, Professional Surveyor, or Professional Engineer. The fillable Reference Form is included [here](#).
- Successfully pass the NSPS-THSOA Certified Hydrographer examination

At this level, the hydrographer is assessed as competent to undertake and manage hydrographic surveying that meets or exceeds accuracy requirements as defined by IHO or U.S. national standards.

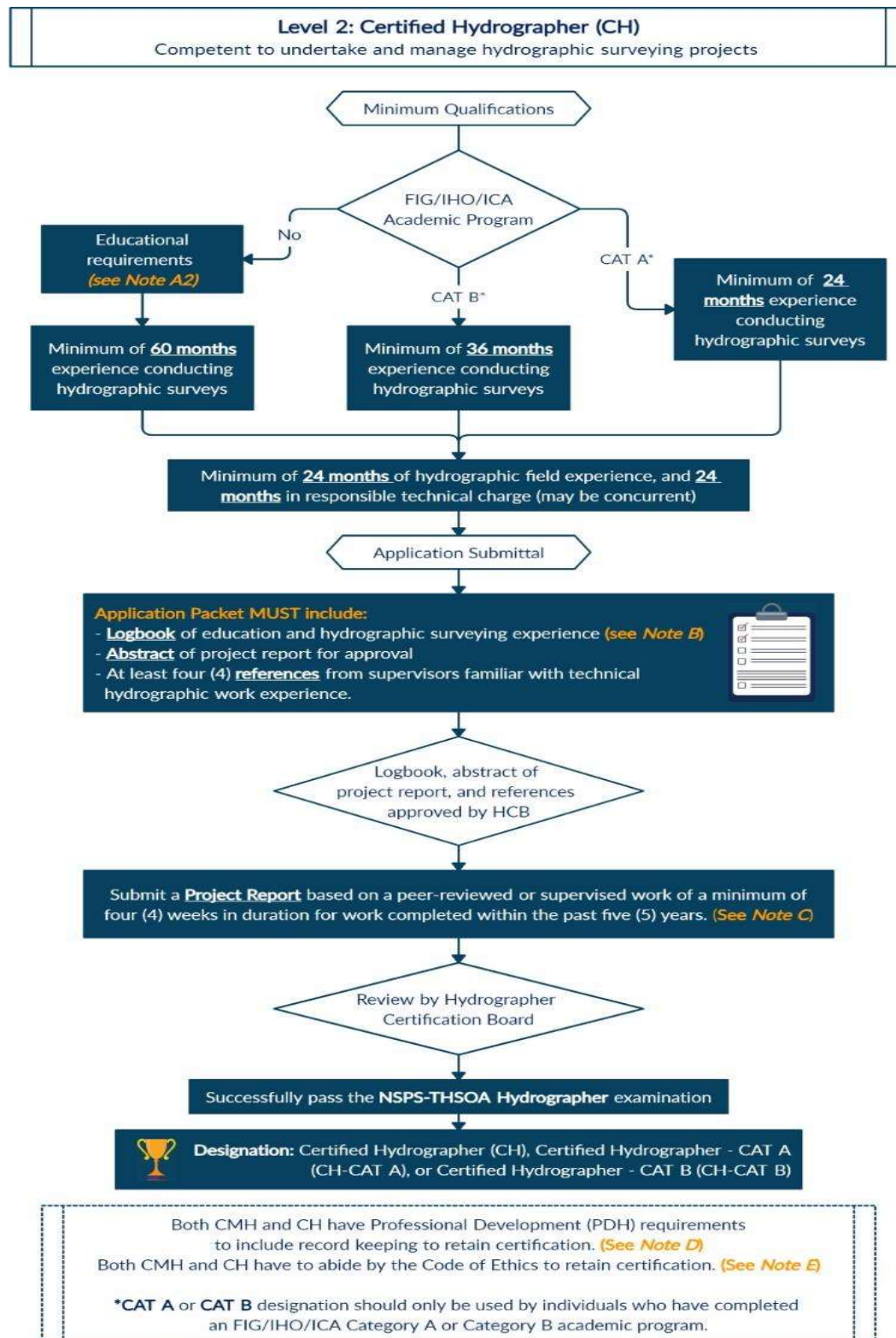


Figure 2: Flowchart for Level 2 Certification

2.2.2 Notes for Flowchart (Level 2 Certification)

A. The NSPS-THSOA Hydrographer Certification Board will evaluate the applicant's transcripts for academic courses and other documented training and compare it to a list of required coursework. Deficiencies will require the applicant to take courses from approved educational and training institutions and obtain a C grade or higher.

A2. Level 2 applicants do not require a baccalaureate degree, but the applicant must meet the current S-5B Learning Standards contained in Standards of Competence for Category "B" Hydrographic Surveyors (Edition 1.0.1, June 2017) with grade C or better in completed coursework. Many of these courses are available at local academic institutions or available online. The University of Southern Mississippi offers a full regime of courses that meet the CAT A and CAT B requirements. Individual courses can be taken as non-degree students. Also, Fugro Academy in Plymouth, UK, offers an online CAT B program.

- Mathematics, Statistics, Theory of Errors
- Information and Communication Technology
- Physics
- Earth Sciences
- Nautical Science
- Meteorology
- Underwater Acoustics
- Remote Sensing
- Water Levels and Flow
- Positioning
- Hydrographic Practice
- Hydrographic Data Management
- Environment

B. Experience records will be evaluated based on the breadth and recency of the applicant's experience.

2.2.3 Additional Resources

C. See the [Applicant Guide to Logbook Forms](#) for information regarding the Logbook and its components (Engagement Summary Form, Education Detail Form, Project Engagement Detail Form, and Competency Form). In general, a separate Engagement Summary Form should be completed for each distinct period of employment - typically for each employer, or when a major promotion or significant change in job responsibilities occurs within the same organization.

D. See the [Project Report Requirements](#) and [Project Report Approval Form](#) for detailed project report requirements, including an evaluation scheme to guide report content. The project report should address all aspects of the survey from planning considerations, horizontal and vertical control, selection of equipment and coverage, QA/QC, issues encountered, and resolution, processing, and deliverables provided. Project reports from an academic setting will not be accepted.

E. See Section 5.0 of the *NSPS-THSOA U.S. Hydrographer Certification Program Handbook* for a description of the requirements for continuing professional development.

2.3 Post Nominals And Certificates

Persons who have achieved a certification level will be entitled to use the post nominals after his or her name as follows:

- Certified Master Hydrographer (Level 1): CMH
- Certified Master Hydrographer (Level 1) with an IBSC Category A certificate: CMH(A)
- Certified Hydrographer Level (Level 2): CH
- Certified Hydrographer (Level 2) with an IBSC Category A certificate: CH(A)
- Certified Hydrographer (Level 2) with an IBSC Category B certificate: CH(B)

The HCB will issue certificates appropriate to the level and the IBSC-attained Category if appropriate.

3.0 APPLICATION PROCESS

3.1 Obtaining And Completing Forms

Application forms and supporting documentation are available to download from the [NSPS-THSOA Hydrographer Certification website](#).

Once completed, the Logbook forms should be submitted via email to info@nsps.us.com (RE: Application for Hydrographer Certification), in each form's original Microsoft Word or Excel file format. Do not print and scan application materials.

A \$50 application fee must be submitted along with the [Application and Fee Payment Form](#) to the following address:

The Hydrographer Certification Board
National Society of Professional Surveyors
5119 Pegasus Court, Suite Q
Frederick, MD 21704

The application review will not proceed until the application fee is received. The applicant will be notified by U.S. mail that the application and fee have been received.

3.2 Reference Forms

A minimum of four (4) references, preferably from the applicant's most recent hydrographic supervisors or someone else familiar with the applicant's technical hydrographic work experience, are required. The applicant is to provide the official [Reference Form](#) to at least four (4) persons listed in the Logbook of the applicant's application.

If an applicant is applying to Level 1, Certified Master Hydrographer, one of the references must be a Professional Land Surveyor, Professional Engineer, or Certified Hydrographer. It is the applicant's responsibility to provide references with a copy of their Logbook. It is the applicant's responsibility to see that the reference forms are completed by the persons to whom they are delivered and that those persons return the reference forms directly to the NSPS-THSOA Hydrographer Certification Board by following the instructions included on the Reference Form. If references are not received within ninety (90) days of application submittal, the application for certification will be denied.

3.3 Application Review Process

The Hydrographer Certification Board will determine whether the application meets minimum standards for taking the certification examination. The applicant may be required to submit additional evidence in support of the application. Such evidence could include, but is not restricted to, personal statements, copies of survey reports, additional letters of reference, affidavits, academic transcripts, and copies of professional licenses. Requested information must be received within 30 days (from date on letter) or certification will be denied. Additional information will only be requested one time before final evaluation of the application.

In the event the application does not meet the minimum requirements for certification, the Board can:

- a) Request additional specific information from the applicant, which, if properly supplied, will allow the application to meet minimum standards.
- b) Judge the applicant unqualified.

An applicant who has been denied certification may reapply after twelve (12) months from the submission date of the denied application. A person may reapply any number of times.

4.0 EXAMINATIONS

The examination is held in conjunction with each U.S. Hydrographic Conference, held on odd-numbered years. The examination is available at any time at NSPS headquarters in Frederick, Maryland (contact Trish Milburn at 240-439-4615, ext. 105, or trish.milburn@nsps.us.com). Requests from applicants for additional exam sites will be evaluated and offered when feasible. HCB members proctor such exams. The Board may approve a proctor for the exam in cases where a board member is not available.

The Certified Hydrographer examination lasts three (3) hours and consists of one hundred sixty (160) multiple choice questions and will test knowledge in the six (6) categories of the IHO Standards of Competence for Hydrographers. The exam fee is \$150.

The Certified Master Hydrographer examination will be the same examination as the Certified Hydrographer examination with the addition of the Advanced Surveying Module. Level 2 Hydrographers applying to the Level 1 program will only take the Advanced Surveying Module. A list of suggested references that may be useful in preparing for the examination are included in **Appendix A**.

The number of questions from each category of the Certified Hydrographer examination is as follows:

Hydrographic Specifications – 20 (12.5%)

- USACE/NOAA
- Other administrative questions

Nautical Science – 20 (12.5%)

- Rules of the road, safety, communication, work-life afloat, etc.

Positioning – 24 (15%)

- Horizontal control, GPS, acoustic positioning, tag line, auto-tracking theodolite, trilateration, lines-of-position, inertial, etc.

Bathymetry – 56 (35%)

- Soundings, wrecks, rocks, obstructions, dangers to navigation, etc.
- Single beam, multibeam, etc.
- Data analysis

Tides/Water Levels – 20 (12.5%)

- Tides/water levels, station installation, datum computations, water level correctors for soundings, zoning for correctors, etc.
- Vertical control
- GPS derived water levels

Seafloor Imagery – 20 (12.5%)

- 1.0 Side scan sonar, acoustic backscatter
- 2.0 Seafloor, structures, water column, sub-bottom, etc.

Advanced Hydrographic Surveying for Certified Master Hydrographer – 25

- Hydrographic and offshore survey requirements
- Advanced positioning techniques
- Data management, analytics, visualization, and presentation
- Hydrographic survey project management
- Hydrographic survey legal aspects
- United Nations Convention on the Law of the Sea (UNCLOS)

4.1 Procedure

Upon approval of an application, the applicant will receive detailed examination instructions, and notice of predetermined examination dates and sites. Examinations are offered at various times and sites throughout the year but are not limited to those advertised. The Certification Board will consider requests for alternative examination sites and dates to accommodate the applicant.

Photographic identification must be shown at the time the exam is taken (e.g., passport, current driver's license, government/military I.D., or current student I.D. card). Certification examinations will be open-book format exams. A list of suggested references is provided in **Appendix A**. The suggested references and other reference materials can be brought into the testing facility. Scientific calculators are useful for taking the exam. Cell phones, computers, scanners, cameras, recording devices, and similar items are prohibited in the examination room.

To protect the integrity of the exam, the types of calculators in which examinees may bring to exam sites is limited to those approved by the National Council of Examiners for Engineering and Surveying (NCEES) for exams. To review the list of approved calculators, visit the NCEES exams page (<https://ncees.org/exams/>) and select "Calculator Policy" at the bottom of the screen (Exam Resources).

4.2 Appeal

If an examinee has been denied certification by the Hydrographer Certification Board, that applicant may appeal to the Chairperson of the Board for reconsideration. Examinees will have thirty (30) days from the date on the examination results letter to appeal to the Chairperson of the Board by notifying the NSPS liaison in writing within (30) days from the date on the denial notification. The appeal must include the reasons for the appeal based on the application requirements. If the Chairperson

believes that an error may have been made during the certification process, the Chairperson can direct the Board to reconsider the application.

Applicants may appeal the Board Chairperson's decision by notifying the NSPS liaison in writing within thirty (30) days from the date on the appeal notification from the Chairperson of the Board. This second appeal will be forwarded to the President of NSPS for consideration and final resolution.

4.3 Disability Assistance

If you have a disability and require accommodation in order to fully participate in the certification program, please contact the Hydrographer Certification Board liaison at 240-439-4615, ext. 105, to discuss your specific needs.

5.0 REQUIRED CONTINUING PROFESSIONAL DEVELOPMENT

Continuing professional development is an essential element of maintaining competence implemented through a biennial certification renewal as detailed by NSPS-THSOA.

- The **Certified Master Hydrographer** must attain thirty (30) Professional Development Hours (PDH) every two (2) years. The requirement must be met by the time of certification renewal.
- The **Certified Hydrographer** must attain thirty (30) Professional Development Hours (PDH) every two (2) years. The requirement must be met by the time of certification renewal.

5.1 Earning Credit

Credit May Be Earned as Follows:

- Successful completion of college courses in hydrographic-related subjects, subject to HCB approval.
- Successful completion of continuing education courses in hydrographic-related subjects, subject to HCB approval.
- Successful completion of short courses, correspondence, tutorials, web-based courses, televised and videotaped/DVD courses in hydrographic-related subjects, subject to HCB approval.
- Active participation in seminars, in-house courses, workshops, and professional conferences.
- Teaching or instructing in the above.
- Authoring or co-authoring published papers, articles, or books.
- Active participation in professional or technical societies.
- Board-approved Self-Study.
- Participation in hydrographic surveys.

5.2 Professional Development Hours (PDH) Equivalencies

- One (1) college-level credit hour in a hydrographic-related course – 10 PDH
- One (1) continuing education unit (CEU) in a hydrographic-related course – 10 PDH
- One (1) hour of work in short courses, correspondence, tutorials, web-based courses, televised and videotaped/DVD courses in hydrographic-related subjects – 1 PDH

- Teaching a hydrographic-related course – 20 PDH/year (teaching credit is valid for teaching a given course or seminar *one time only* and does not apply to full-time faculty teaching college courses)
- For authoring or co-authoring a paper or article appearing in a recognized professional or technical publication – 5 PDH; author or co-author of a technical book – 10 PDH
- Active participation in a professional or technical society (each organization up to a maximum of six) – 5 PDH
- Speaker on a hydrographic-related topic at a conference, symposium, or workshop – 10 PDH
- Member or moderator of a panel discussion at a conference, symposium, or workshop – 10 PDH
- Volunteer service to a professional organization – elected officer is 10 PDH; committee member is 5 PDH
- Self-study of relevant materials such that the registrant's knowledge of the subject significantly improves the registrant's ability to work in the subject area – 1 PDH (up to a maximum of 5 PDH)
- Participation in hydrographic surveys – 1 PDH/year as hydrographer-in-charge of a hydrographic survey (party chief, lead scientist, lead hydrographer, chief hydrographer, survey manager)

5.3 Determination of Credit

The Board has final authority with respect to approval of courses, credit, PDH values for courses, and other methods of earning credit. The Board may maintain a list of approved courses and activities. Criteria for determination of credit shall follow these guidelines:

- Credit for college or community college-approved courses will be based upon course credit established by the college.
- Credit for qualifying seminars and workshops will be based on 1 PDH for each hour of attendance.

5.4 Record Keeping

Each certified hydrographer is charged with the responsibility of maintaining records of his/her own professional education activities and shall report their professional development activities using the [Professional Development Hours Organizational Form](#). This form should be submitted during the certification renewal process. The duty of maintaining records to support credits claimed is the responsibility of the Certified Hydrographer. Records required include but are not limited to:

- A record showing the activity claimed, sponsoring organization, date, location, duration, instructor's or speaker's name, and Professional Development Hours earned; and
- Attendance verification records in the form of completion certificates, paid receipts, or other documents supporting evidence of attendance. These records must be retained for three (3) years. Copies may be requested by the Board for audit verification purposes.

The Board may conduct random audits if necessary due to volume. Supporting documentation of the PDH units submitted, such as certificates, paid receipts, or other documents that support evidence of attendance or presentation shall be kept and, if audited, shall be submitted to the Board. An applicant will have three (3) months to resolve any rejected documentation. Failure to satisfy the

requirements of the Board for audit will result in removal of the individual's name from the listing of "Active" Certified Hydrographers.

5.5 Requests for Extension

Should a Certified Hydrographer not obtain the required PDH units by the end of the calendar year, he or she may request an extension. A formal request should be submitted to the Chair of the NSPS-THSOA Hydrographer Certification Board. Extensions will not normally be greater than three (3) months.

5.6 Exemption from Annual Professional Development Requirements

A person may be exempted from the professional development requirements for one of the following reasons:

- A person serving on active duty in the armed forces of the United States for a period of time exceeding one hundred twenty (120) consecutive days in a calendar year shall be exempt from obtaining the PDH required for that year.
- Persons experiencing physical disability, illness, or other extenuating circumstances as reviewed and approved by the Board may be exempt. Supporting documentation must be furnished to the Board.
- Certified Hydrographers who are listed as "Retired" or those who have requested an "Inactive" status and certify that they are no longer providing professional hydrographer services shall be exempt from the required PDH. A retired or "Inactive" Certified Hydrographer may upgrade such a designation to "Active" status by obtaining all delinquent PDH; however, if the total number of PDH required to become current exceeds thirty (30), then thirty (30) shall be the maximum required.

5.7 Recertification

Recertification shall be required every two (2) years. The recertification fee is \$100 per two-year certification period for a Certified Master Hydrographer or a Certified Hydrographer. The recertification fee and a completed PDH Form should be sent to the NSPS-THSOA Hydrographer Certification Program administrator.

5.8 Listings of Active and Inactive Certified Hydrographers

NSPS-THSOA will maintain an online listing of "Active" Certified Master Hydrographers and Certified Hydrographers who are maintaining their competency. Only "Active" Certified Master Hydrographers have the right to use "CMH" after their name, and only "Active" Certified Hydrographers have the right to use "CH" after their name.

To regain "Active" status as a Certified Master Hydrographer or Certified Hydrographer after being removed from the list, the individual must apply to the HCB by satisfactorily submitting PDH documentation to satisfy the period since last certification.

The listing of "Active" Certified Hydrographers can be found at <https://nsps.us.com/search/>

6.0 ETHICS

Certified hydrographers are bound by a common commitment to promote quality hydrographic surveys and to facilitate its practice for the common good of the community based upon shared values of:

- Competence
- Truth
- Innovative practice
- Excellence
- Equality of opportunity
- Social justice
- Ethical behavior

The community of hydrographers places its trust in the judgement and integrity of members to pursue the stated values and has a right to a high degree of confidence. Consultation with prospective clients often requires education of suitable methods and limitations of data usage.

Certified hydrographers recognize that their ethical responsibilities extend to the community, to their clients and employers, to their peers, and to their employees. Accordingly, they acknowledge the need for integrity, independence, care and competence, and a sense of duty. They uphold and advance these values by:

- Employing the industry standard of care in conduct of surveys;
- Supporting and participating in the continuing development of the science of hydrography;
- Serving with honesty and forthrightness and within areas of their competence;
- Not providing hydrographic services if not properly licensed, where states or Government agencies require professional licensure (e.g., PLS or PE) for specific hydrographic surveys; and
- Using their expertise for the enhancement of society and the stewardship of resources.

Certified hydrographers are required to abide by the Code of Ethics as a condition of membership. The Code of Ethics provides a statement of principles that have been adopted as the basis upon which members shall conduct their activities in order to meet a community of trust. The Code is the framework from which the Rules of Conduct is developed by the HCB.

The Tenets of the Code of Ethics:

- Member responsibility for the welfare and rights of the community shall come before their responsibility to their profession or private interests to other members;
- Members shall act with integrity, dignity, and honor to merit the trust of the community and the profession;
- Members shall act with honesty, good faith and equity, and without discrimination towards all in the community;
- Members shall provide services and advice carefully and diligently only within their areas of competence;
- Members shall develop their knowledge, skills, and experience continuously through their careers, and actively encourage their associates to do likewise;
- Members shall apply their skills and knowledge in the interests of their clients or employers for whom they will act without compromising any other of these tenets;

- Members shall take reasonable steps to inform themselves, their clients, or employers of the economic, social, environmental, or legal consequences that may arise from their actions; and
- Members shall inform their clients or employers of any interest which may be, or may be perceived as being, in conflict with their interests, or which may affect the quality of service or impartial judgement.

As part of the application process, members will be required to sign the following pledge:

As a Certified Hydrographer, I dedicate my professional knowledge and skills to the advancement and betterment of human welfare.

I pledge:

To give the utmost of performance;

To participate in none but honest enterprise;

To live and work according to the laws of humankind and the highest standards of professional conduct;

To place service before profit, honor and standing of the profession before personal advantage, and the public welfare above all other considerations;

In humility and with need for Divine Guidance, I make this pledge.

Canon 1:

A Certified Hydrographer shall refrain from conduct that is detrimental to the public.

Canon 2:

A Certified Hydrographer shall abide by the rules and regulations pertaining to the practice of surveying within the licensing jurisdiction.

Canon 3:

A Certified Hydrographer shall accept assignments only in one's area of professional competence and expertise.

Canon 4:

A Certified Hydrographer shall develop and communicate a professional analysis and opinion without bias or personal interest.

Canon 5:

A Certified Hydrographer shall maintain the confidential nature of the professional-client relationship.

Canon 6:

A Certified Hydrographer shall use care to avoid advertising or solicitation that is misleading or otherwise contrary to the public interest.

Canon 7:

A Certified Hydrographer shall maintain professional integrity when dealing with members of other professions.

Violation of these canons may result in an investigation by the Hydrographer Certification Board and possible disciplinary action, including suspension of certification.

7.0 GROUNDS FOR DISCIPLINARY ACTION

The Hydrographer Certification Board shall have the power to suspend and revoke, or refuse to issue, restore, or renew a certification to any Certified Hydrographer.

Procedures for Submission of Complaints:

Any person or entity, including the Board or staff, may file a complaint alleging a violation of any of the above actions by any Certified Hydrographer.

Any complaint shall be in writing and state specific facts, including copies of any related documents, on which the complaint is based.

All complaints shall be reviewed by an investigative committee designated by the Board.

8.0 DEFINITIONS

Practice of Hydrographic Surveying: The provision of, or offering to provide, professional services using such sciences as mathematics, geodesy, remote sensing, and acoustics, and involving both (1) the making of geometric measurements and gathering of related information pertaining to the physical features of the bottom/sub-bottom of water bodies; and (2) providing, utilizing, or developing the same into survey products such as graphics, data, charts, plans, reports, descriptions, or projects. Professional services comprise acts of consultation, investigation, testimony evaluation, expert technical testimony, planning, mapping/charting, assembling, and interpreting gathered measurements and information that may include, but is not limited to, the following:

- Determining, by measurement, the configuration or contour of the seafloor/water bottom (reservoir, lake, river, or seafloor topography) of the earth's surface or the position of fixed objects or islands thereon.
- Determining, by performing geodetically controlled surveys, the size and shape of the seafloor/water bottom or the position of any maritime or water body sounding, including hydrographic features and mapping of obstructions.
- Locating or relocating the baseline for maritime limits.
- Determining positions, alignments, or elevations for monitoring the status of navigational aids.
- Determining, by use of principles of surveying, the position for any survey monument or reference point, and establishing or replacing any such reference point relating to hydrographic surveys.
- Determining marine geoid models and establishing tides and water level control to establish vertical datum for hydrographic surveys.
- Determination of calibration factors/system bias for acoustic measurements.
- Creating, preparing, or modifying electronic or computerized or other data, relative to the performance of the activities described above.

Certified Master Hydrographer: A person who has been accepted as having met the NSPS-THSOA requirements and examination for recognition as a Certified Master Hydrographer.

Certified Hydrographer: A person who has been accepted as having met the NSPS-THSOA requirements and examination for recognition as a Certified Hydrographer.

International Board on Standards of Competence (IBSC): The International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers established jointly by the International Federation of Surveyors (FIG), the International Hydrographic Organization (IHO), and the International Cartographic Association (ICA).

Practical Hydrographic Surveying: Practical hydrographic surveying includes all activities directly related to hydrographic activities, such as equipment mobilization, calibration, data collection, processing, analysis, and reporting. At least 50% of this experience must be sea-time.

Responsible Technical Charge: Direct and personal supervision of the hydrographic survey work or products from a position with critical decision authority. This may include field work as well as office planning, data processing, analysis, and reporting where detailed knowledge of hydrography is applied to direct the outcomes of the task. Responsible technical charge may include but is not limited to:

- Selection of equipment, platforms, approach, and methodology to meet desired standards or specifications.
- Direction of the mobilization of survey platforms with authority to make key decisions on placement, measurement techniques, and interfacing methods of equipment.
- Data acquisition management with authority to direct the approach for safety, quality, coverage, and adherence to applicable standards.
- Data processing management with authority to design workflows, direct activities, correct errors, and validate applicable standards are met.

Responsible technical charge does not include work performed at a technician level where the personal responsibility and technical knowledge required are limited. Technician level work is completed under close supervision, not requiring the exercise of judgment where the individual performance of a task, set and supervised by others, is all that is required.

Hydrographic Field Experience: Includes the acquisition of hydrographic data (vessels, fixed-wing aircraft or helicopter, AUVs, and ASVs), setting control, and establishing water level stations.

Appropriate Surveying Experience: Experience need not all be time spent in the field, only 24 months are required in the field. Qualifying time may be a combination of practical field hydrographic surveying, office-related surveying activities, and spatial science activities.

Months of Experience: The Hydrographer Certification Board (HCB) looks at months of experience. The minimum time for a month of experience is based on normal working days at a minimum of 7.5 hours per day. Please note that this time is the minimum to qualify for a month of experience as many hydrographic operations run 7 days a week and 12 hours per day. If an applicant exceeded the minimum time for a given month, that excess time cannot be carried over to the following month. The maximum months claimed cannot exceed the actual calendar months of the engagement.

Appendix A: Suggested References for Hydrographer Certification Examination

The following are links to references that are useful for all hydrographers and may be beneficial in preparation for the Hydrographer Certification examination. Hard copies may be consulted during the open-book exam.

1. "Hydrographic Surveying," US Army Corps of Engineers Engineering Manual (EM) 1110-2-1003 — download from:
https://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2-1003.pdf?ver=qDGVUj_0XR2sXHiPQZv2Q%3d%3d
2. "Specifications and Deliverables," Office of Coast Survey, National Ocean Service, NOAA — download from:
https://www.nauticalcharts.noaa.gov/publications/documents/HSSD_2025-0-00.pdf
3. "IHO Standards for Hydrographic Surveys," (S-44) — download from:
https://iho.int/uploads/user/pubs/standards/s-44/S-44_Edition_6.2.0_adopted.pdf
4. "IHO Manual on Hydrography" (C-13) — download from:
<https://iho.int/uploads/user/pubs/cb/c-13/C-13.pdf>
5. "Tidal Datums and Their Applications," Center for Operational Oceanographic Products and Services, National Ocean Service, NOAA — download from:
http://tidesandcurrents.noaa.gov/publications/tidal_datums_and_their_applications.pdf
6. "Computational Techniques For Tidal Datums Handbook," Center for Operational Oceanographic Products and Services, National Ocean Service, NOAA — download from:
http://tidesandcurrents.noaa.gov/publications/Computational_Techniques_for_Tidal_Datums_handbook.pdf
7. "NAVIGATION RULES (International-Inland) COMDTINST M16672.2D, U.S. Department of Homeland Security, U.S. Coast Guard — download from:
https://www.navcen.uscg.gov/sites/default/files/pdf/navRules/Handbook/Nav%20Rules%20Handbook_Corrected_08-12-2024.pdf
8. "American Practical Navigator," Nathaniel Bowditch, National Geospatial-Intelligence Agency — download from:
 - a. Volume One
https://msi.nga.mil/api/publications/download?key=16693975/SFH00000/Bowditch_Vol_1.pdf&type=view
 - b. Volume Two
https://msi.nga.mil/api/publications/download?key=16693975/SFH00000/Bowditch_Vol_2.pdf&type=view
9. "NAVSTAR Global Positioning System Surveying," US Army Corps of Engineers Engineering Manual (EM) 1110-1-1003 — download from:

https://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-1-1003.pdf?ver=9itv5_kOc5LTphXdfytz0Q%3d%3d

10. "Field Procedures Manual," Office of Coast Survey, NOAA, February 2021— download from:

https://nauticalcharts.noaa.gov/publications/docs/standards-and-requirements/fpm/field_procedures_manual_2020.pdf

11. "Seabeam Multibeam Sonar Theory of Operation" Manual — download from:

<https://www3.mbari.org/data/mbsystem/sonarfunction/SeaBeamMultibeamTheoryOperation.pdf>

The following additional references provide background information and should be considered for inclusion in a hydrographer's technical library:

12. "Understanding Tides" NOAA NOS CO-OPS

https://tidesandcurrents.noaa.gov/publications/Understanding_Tides_by_Steacy_finalFINAL11_30.pdf

13. "Our Restless Tides" NOAA NOS CO-OPS <https://tidesandcurrents.noaa.gov/restles1.html>

14. "IHO Transfer Standard for Digital Hydrographic Data" (S-57),

<https://iho.int/uploads/user/pubs/standards/s-57/31Main.pdf>

15. "Federal Radio Navigation Plan," DOD/DOT. Download from:

<https://rosap.ntl.bts.gov/view/dot/43623>

16. "Hydrography for the Surveyor & Engineer," A.E. Ingham, ISBN# 0632029439, Blackwell Science, 238 Main Street, Cambridge, MA 02142, Phone 617-876-7000

17. "Chapman Piloting: Seamanship and Small Boat Handling," 62nd Edition, Edward S. Maloney, Morrow, William & Co.

18. "Dutton's Navigation and Piloting," published by US Naval Institute, by Benjamin Dutton, ISBN 0870211579

19. "Surveying: Theory & Practice," Anderson & Mikhail, Dec 97, McGraw Hill Book Co.

20. "GPS Satellite Surveying," Alfred Leick, Lev Rapoport, and Dmitry Tatarnikov 2015 ISBN 9781118675571

21. "Photogrammetric Mapping," US Army Corps of Engineers Engineer Manual (EM) 1110-1-1000 (31 May 93), download from: <https://corpslakes.erdc.dren.mil/employees/policy/EM/EM-1110-1-1000.pdf>

22. "Side Scan Sonar Image Interpretation", "Sub-bottom Surveys", and "Side Scan Sonar and Magnetometer Surveys", Black Laser Learning <http://www.blacklaserlearning.com>

23. "GPS for Land Surveyors Second Edition" Jan Van Sickle 2001

24. "Lidar 101: An Introduction to Lidar Technology, Data, and Applications." Revised. Charleston, SC: NOAA Coastal Services Center. <https://coast.noaa.gov/data/digitalcoast/pdf/lidar-101.pdf>

25. "Use of Lidar for Coastal Habitat Mapping", Jacques Populus (2019) http://www.coastalwiki.org/wiki/Use_of_Lidar_for_coastal_habitat_mapping

26. CUBE User Manual version 1.13 <https://scholars.unh.edu/cgi/viewcontent.cgi?article=2217&context=ccom>

27. A MANUAL ON TECHNICAL ASPECTS OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA – 1982 (TALOS)
Special Publication No. 51, Edition 5.0.0 – June 2014

Published by the International Hydrographic Bureau MONACO

- 28.** 2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0)

<https://www.fisheries.noaa.gov/s3/2023-05/TECHMEMOGuidance508.pdf>

- 29.** UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Ocean Energy Management Office of Renewable Energy Programs
Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585

<https://www.boem.gov/sites/default/files/documents/about-boem/GandG%20Guidelines.pdf>

- 30.** LIABILITY EXPOSURE FOR HYDROGRAPHIC SURVEYORS | Clark, Atcheson & Reisert

<https://www.itic-insure.com/our-publications/the-wire/liability-exposure-for-hydrographic-surveyors-2607/>