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Practical Claims Avoidance Techniques

How to Prevent Excess Costs and Unnecessary Delay on Dredging Projects

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WHAT IS A LAWYER DOING AT A DREDGING CONFERENCE?

If This Was Your Project, Would this Trouble You?

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Complications of Dredging Projects Today

- Dredging is uniquely situated at the heart of the world's largest and most complex infrastructure systems
- Long lead time between design, funding and construction can lead to complications as design may take place years before construction
  - Basic design specifications may be outdated by the time construction begins because of the industry's rapidly changing technology
  - Technology used on projects often fails to offer solutions for dealing with changes that occur as the project develops
  - The rise in environmental awareness has led to increased conservatism with regulators
  - Increased disputes because tolerances and limitations are often incongruous with the technology used to measure success
  - Deeper and wider channels only serve to compound these problems
- These issues make avoiding claims more difficult, but not impossible

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Ensuring that a finished project complies with the intent of the designed project is no longer simple…

Challenges Include:

- Failed Communication Between Project Personnel
- Environmental Restrictions = Tighter Dredge Envelopes
- Improper Surveys Leading to False Shoals

Basic Techniques for Meeting These Challenges

1) Early project communication

2) Proactive requests for and responses to requests for contract clarification

3) Understanding the interplay between error budgets and regulatory limits

4) Properly using raw survey data to identify survey deficiencies

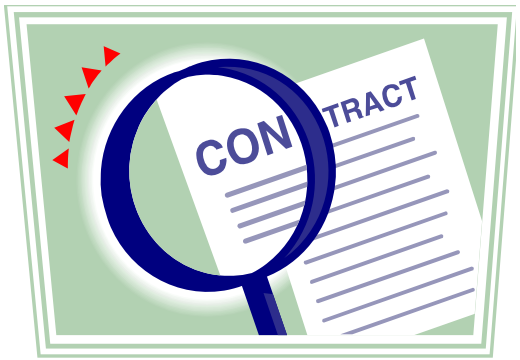
Early Requests for Contract Clarification and Concurrence on Methods = Project Success

Ask:

- Do all project participants have a clear understanding of *what* work the contract requires and *how* the work will be measured?
- Has the contractor performed a careful review of the project requirements to ensure compliance?
- On public projects, have the means and methods of before and after-dredge survey measurement been clearly and expressly stated in the bid documents?
- If possible, have all parties to the agreement come to consensus regarding the particular technology and methodology to be used on the project?

Importance of Understanding the Contract

- Disputes will ultimately be resolved one the four corners of the contract
  - Language within the contract will control
    - Ambiguities will be explored through discovery into the “meeting of the minds”
- Contractors *must* have a complete understanding of:
  - Duties / Obligations
  - Rights
  - Exactly *what* the contract requires
  - Exactly *how* the work is to be performed



- Miscommunications and ambiguities in the terms of a contract can lead to *costly* problems

Case Study: Be Mindful of Seemingly Innocuous Provisions!

- Although the contract clearly required a dredge depth, it was ambiguous about *how* and *under what* methodology the owner would verify the contractor's achievement of that required depth
  - Contract called for simply an "acoustic sweep survey" for acceptance surveys
  - This term could refer to **1 of 4** common processing methods, each of which may yield different results
    - The contractor assumed the owner intended to use the "average sounding method"
    - The owner actually used the "minimum depth processing method "
- Information like this ***should be made clear at the outset*** of a project
  - In this case, the contractor and owner did not communicate
  - As a result, there were discrepancies between the contractor's and the owner's after-dredge surveys
- The discrepancies led to a claim for excess shoaling
- ***It is essential*** that contractors familiarize themselves with a project's chosen survey methodology ***before entering into an agreement***

Take Proactive Steps and Find Consensus!

- It is imperative for contractors to take proactive steps to ensure they understand ***precisely what they are signing up for***
  - Proactively issue RFI's in the pre-contractual stage to clarify any ambiguities
  - ***Even if*** the language appears clear, contractors ***should review closely all terms***
    - Keep an eye towards practical implementation of the requirements listed within the contract
    - Determine whether there are any terms or conditions that could cause confusion
  - The "boiler plate" language of many contracts often lulls contractors into feeling that they do not have to review each individual contract term closely.
- Early, ***and thorough***, analyses of contract language will help contractors avoid the types of misunderstandings illustrated in the previous example
- It is ***critical*** for contractors and owners to come to a consensus regarding the technology and methodology to be used
  - Project participant buy-in prior to project-start ensures that parties are fully aware of the risks and benefits of the chosen methodology

Case Study: Repeated Rejection of Acceptance Requests

- Improper tide readings, in one project example, were one cause of repeated rejections of a contractor's requests for acceptance
  - The owner used a manual tide gauge and thus had been measuring the contractor's work in oftentimes less-than-perfect conditions
    - Choppy water, excess boat traffic, and poor weather negatively affected the owner's readings
- There was no contract requirement that the owner use an electronic tide gauge, but the contractor should have been made aware of the fact anyway
  - Because of the lack of communication and inaccurate, even "tainted", nature of the results, the owner was subjected to claims by the contractor
- ***If the owner had ID'ed*** its tide-reading methodology prior to the project-start, both parties could have evaluated the methodology's efficacy
- ***Prevent these issues from adversely impacting your project by:***
  - 1) Noting whether owners are using tried and true survey methodology
  - 2) Being watchful for obsolete procedures and specifications that can hamper progress

Has the Interplay Between Error Budgets and Dredge Limits Been Fully Explored and, If Necessary, Reconciled?

Ask:

- Does the contract include a dredge depth limitation beyond which the contractor may be sanctioned for over dredging?
- Are there any specific site challenges that will inhibit the accuracy of survey systems (i.e. rough bottom, ship traffic, fast or erratic currents, floating debris from outfalls)?
- Are such over dredge design restrictions compatible with standard error budgets or does the interplay between these two factors create an impossible situation for the contractor?

Contracts with Over-Dredge Penalties

- Contractors ***cannot take for granted*** that contractually mandated over-dredge limits will actually square with the survey technology as employed and operated
- When evaluating new project opportunities, ***contractors should:***
  - 1) Pay close attention to ***any*** restrictions on over-dredging, particularly where legal or financial penalties are involved
    - As environmental awareness increases, this issue will likely occur with more frequency
    - This is compounded by owners, or their representatives, who do not have a full understanding of the ramifications of environmental restrictions or the interplay of their survey methods and project realities.
  - 2) Have a clear understanding of the survey methodology/technology that the owner is using to evaluate their work
    - This will allow the identification of any inconsistencies or incompatibilities between error budgets and dredge limits at the outset of the project
  - 3) Seek the advice of industry experts!

Case Study: Irreconcilable Differences Between Dredge Limits and Error Budget

On one recent project, the contract had a 2 foot over dredge envelope

- But this was not just a pay limit, the over-dredging limit ***carried adverse legal consequences*** and ***severe financial penalties*** due to applicable environmental laws
- However, environmental conditions of the subject site created error budgets within the owner's surveys that actually ranged from a half foot to *over two feet.*
- Because of the inaccuracy of the owner's surveys led to variations of over 2 ft, the contractor's margin of error was at times ***less than zero***
- The contractor was prohibited from over-dredging more than 2 ft beyond the contract depth, but the surveys used to evaluate the contractor's work measured to a standard of accuracy ***incompatible with*** the contract design!

Performing a project with such incompatible extremes is equivalent to either:

1) Having a defective design

2) A tacit agreement by the owner that the measure of the finished work product can and will be done to a compatible tolerance

Contractors have the *right to expect* consistent, uniform, and accurate surveys

Field Conditions and Waterway Behavior

The prior example may sound extreme, but it is not

- Field conditions and waterway behavior can be very unfriendly towards even the most sophisticated surveyors and systems
  - A change of a tide or a major rain event can dramatically affect conditions
    - A good example of this is the lower Piscataqua River in New Hampshire near the Naval Facility
  - These conditions affect sound velocity in major ways and can introduce survey errors of ***over a foot***
- More often than not, designers and specifiers may be totally unaware of these conditions
- And the survey crews who deal with the conditions regularly may not understand the importance of communicating their difficult experiences to the design teams

Portsmouth Harbor and the Naval Facility along the Piscataqua River where tidal shifts and currents can create different water column conditions from one side of the river to the opposite side

Engage in Expert, In-the-Field Review of Raw Survey Data to Determine Shoal Validity

Ask:

- To the greatest extent possible, are all after dredge surveys being performed using best practices so that operational, environmental and equipment-based survey error is minimized?
- Has the contractor requested the owner's raw data files to make such determination on its own?
- Is the contractor aware of the signs it should look for in the data to determine that best practices are being followed?

Learn how to identify potential errors and anomalies in the survey data

- Particularly, contractors should ask for the data that underlies the after-dredge survey results
- Parties can protect themselves from unnecessary and costly disputes by doing so

Identifying Problems with Sound Velocity Casts

- It has become ***vitally important*** to check system quality during survey work
- Field interrogations consist of prescribed testing and calibration procedures measuring the system output against known standards
  - ***In theory***, following these procedures will lead to a reasonably accurate work product
- In field deployment, an abundance of potential issues remain, especially with respect to the outermost beam of the array including:
  - 1) Propensity of the beam to "bend"
  - 2) Ability of the small beams to identify and properly record the variability of bottom materials
  - 3) The true accuracy can be seriously affected by common variations in water temperature and salinity

Identifying Problems with Sound Velocity Casts

- Figure 1 is an example of what can happen to the outer beams of a multibeam array when sound velocity is not properly tuned

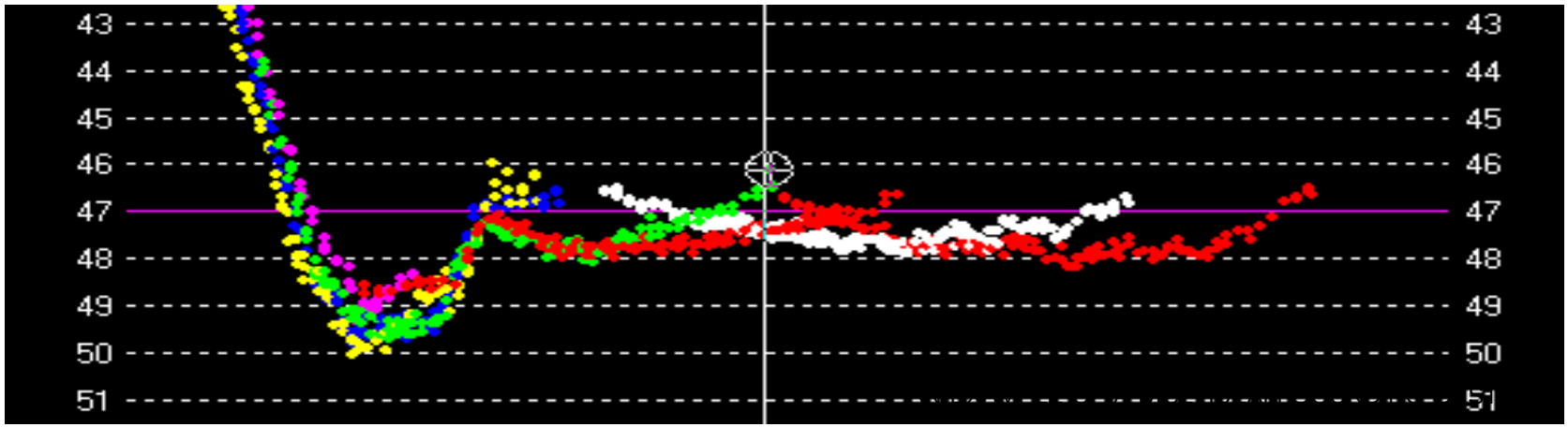


Figure 1. Multiple Sound Velocity Traces

- Figure 1 demonstrates that the conduct of several velocity probe casts per survey day becomes critically important to survey accuracy (impacted by water temp and salinity)
- Note how the ends of each pass (the extreme ends of each color band) are turned up like “smiley faces”
  - This is erroneous data that can represent a disparity of up to ***1.5 ft in depth***

Identifying Problems with Wave Disturbances

- Errors attributable to wave and wake disturbances can be a serious concern
  - Areas with heavy traffic or weather exposure are subject to considerable wave action
- HPR Compensators are used as a counter, but even they have correction problems
  - Especially when the vessel's "steady state" is thrown off rapidly

Figure 2 illustrates what happens to a multibeam survey performed with a state-of-the-art multibeam system in choppy seas

- Color legend bar is disparity between high and low soundings in the same bin
- Blue = near zero; Yellow = up to 1.5 feet
- Vertical thin strips = "swath" groups from multibeam fan
- Blue strips show good agreement in bins; see some yellow showing poor agreement over 1.5 feet

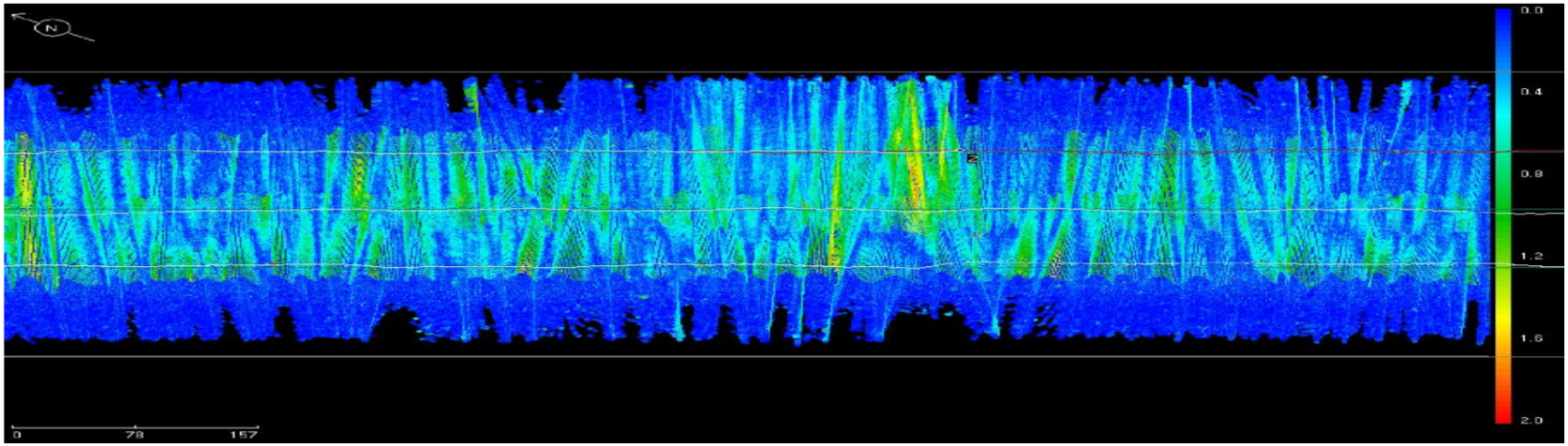


Figure 2. Multibeam Survey In Choppy Seas

Identifying Problems with Wave Disturbances

- Figure 3, like Figure 2, shows how steep, head-on seas produce an irregular bottom that resembles the sea surface.
- Typical false wave height (shown by arrows) is nearly a foot

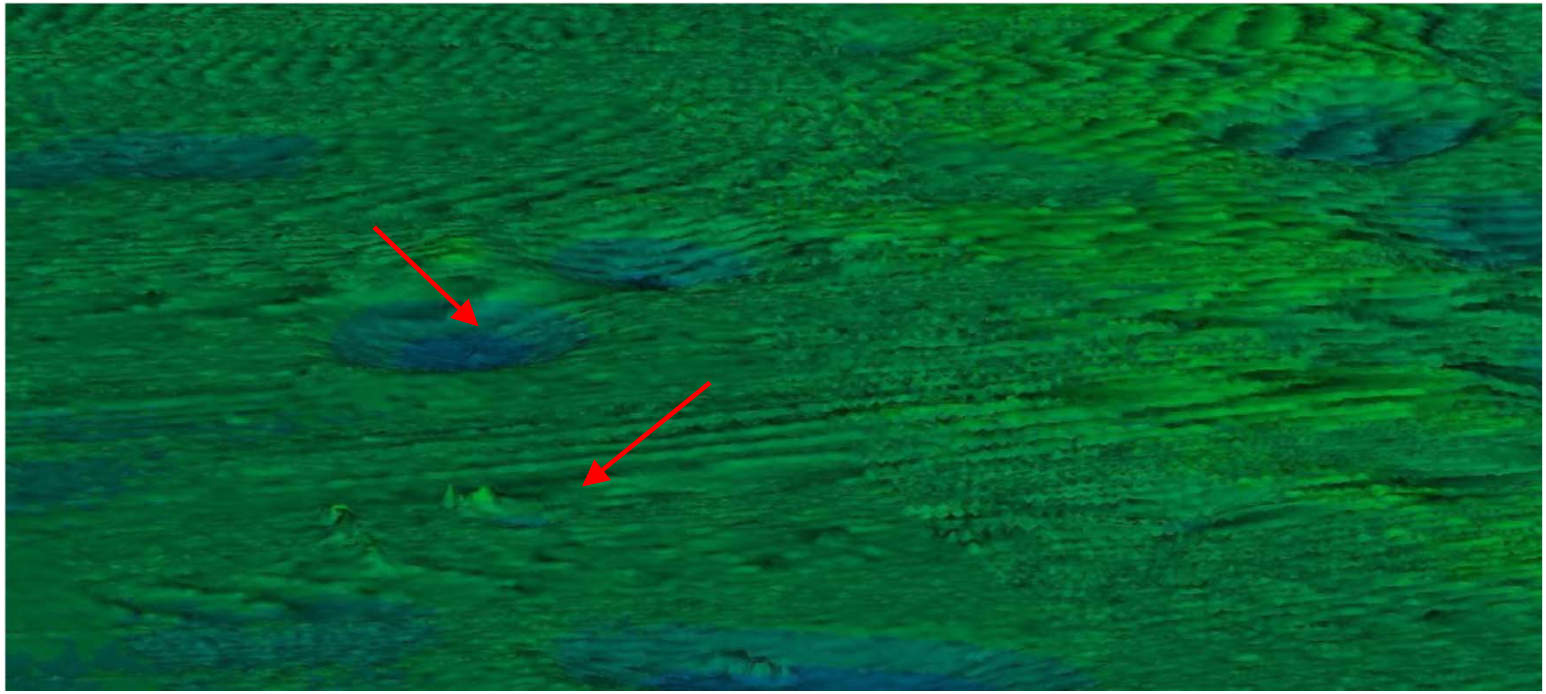


Figure 3. Effect of Head Seas on Bottom Irregularity

Identifying Problems with Wave Disturbances

- When steep waves or wakes hit the bow or stern of a survey vessel at an angle and throw it off course, triangular patterns of irregular soundings occur
- "Quartering" waves and wakes produce the typical triangular "hatched" areas

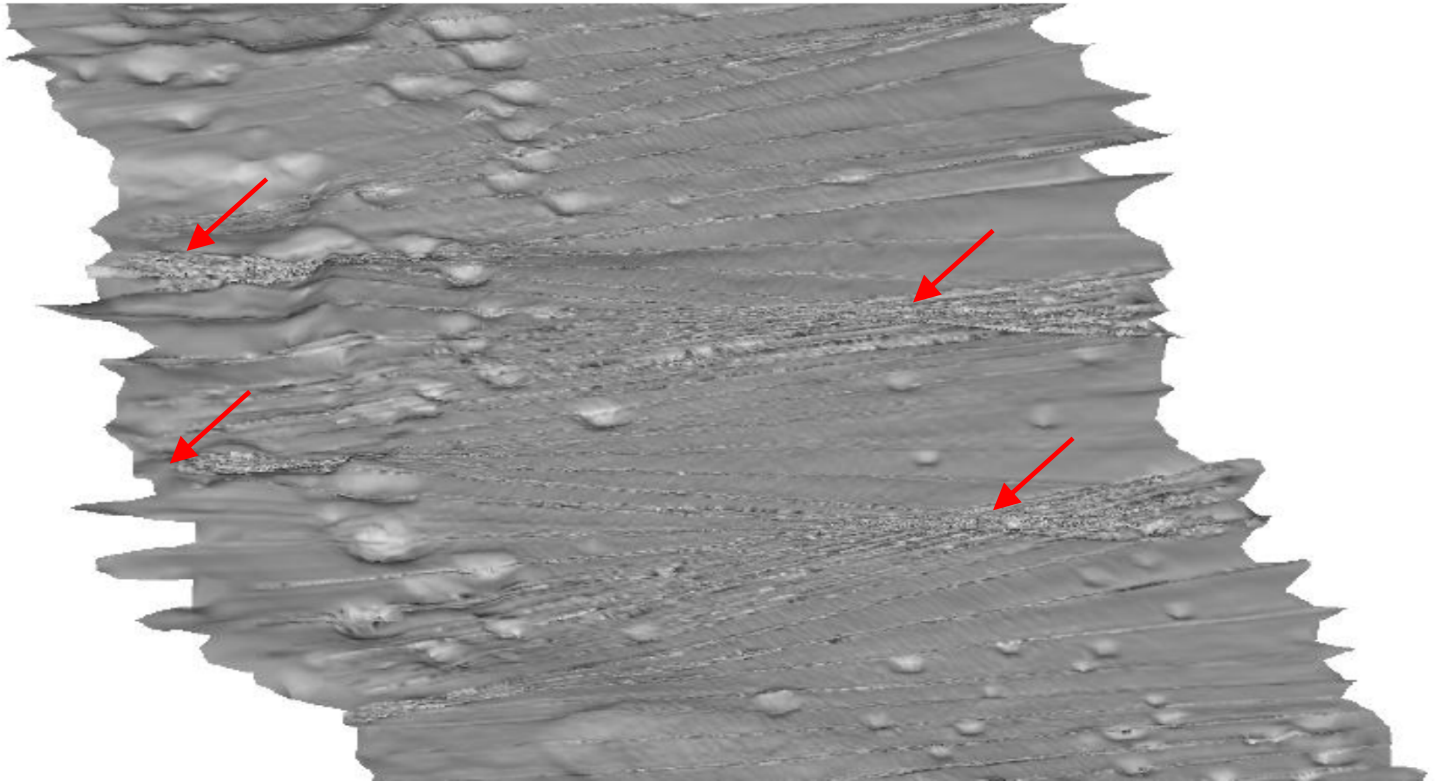


Figure 4. Survey Area Footprint Showing Effect of Quartering Waves

Identifying Scatter

- Scatter refers to a general disagreement of data points within a cell

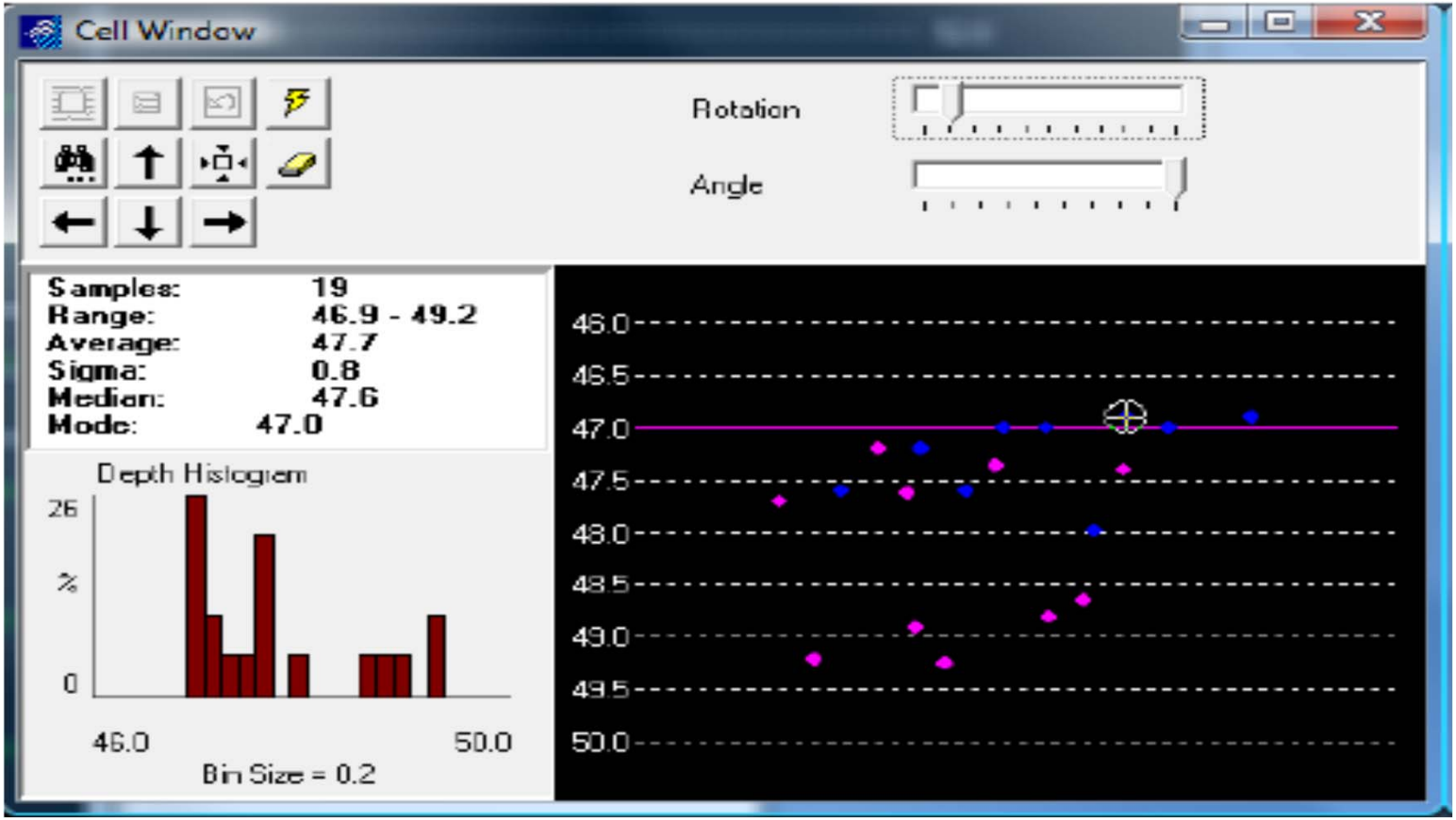


Figure 5. Example of Scatter

Identifying Scatter

- Figure 6 could merely represent a rough bottom condition, but extreme bottom conditions only shows up when multiple survey passes are overlaid

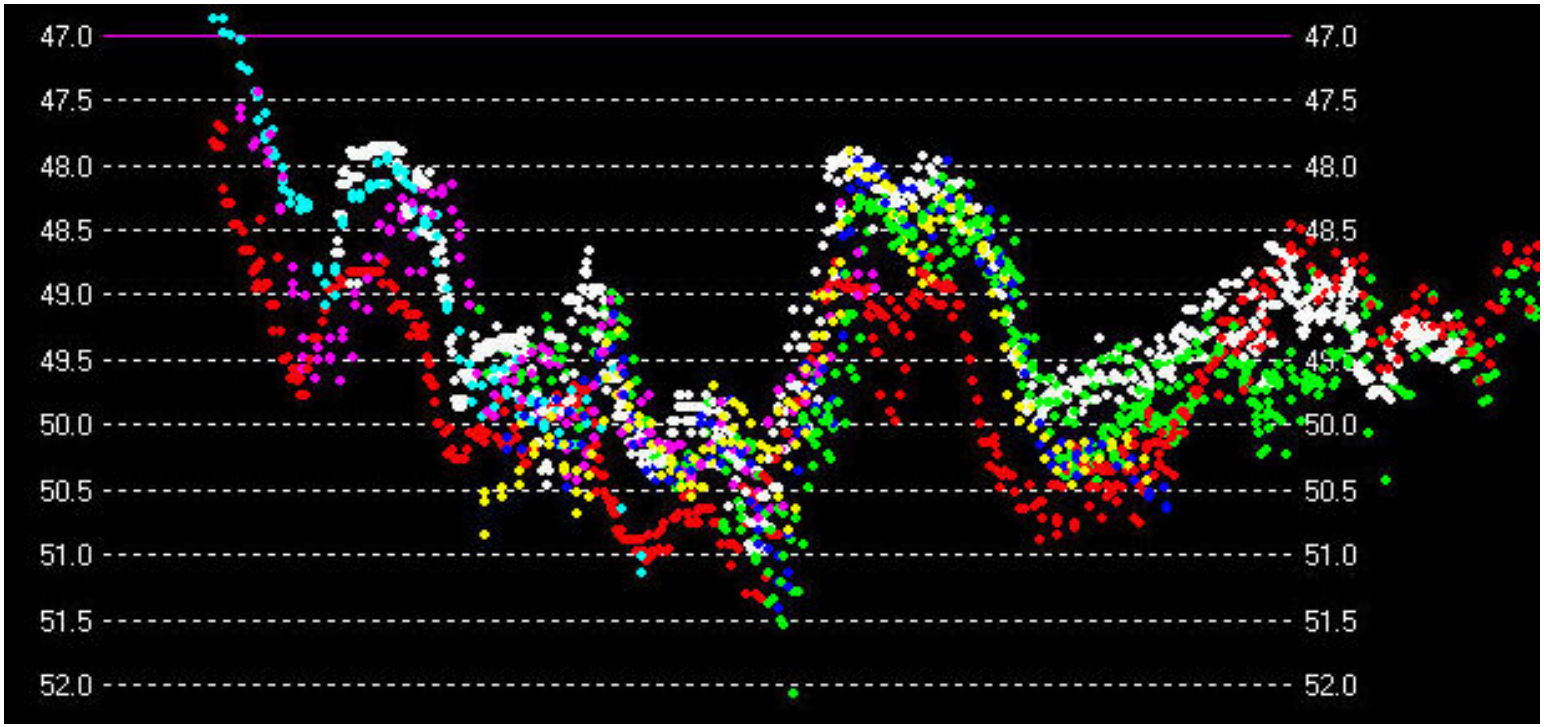


Figure 6. Example of Multiple Passes of Survey Vessel

Identifying Scatter

- Below is a visual overview of what happens to the quality of data in the finished work product based on conditions as seen in Figure 7.

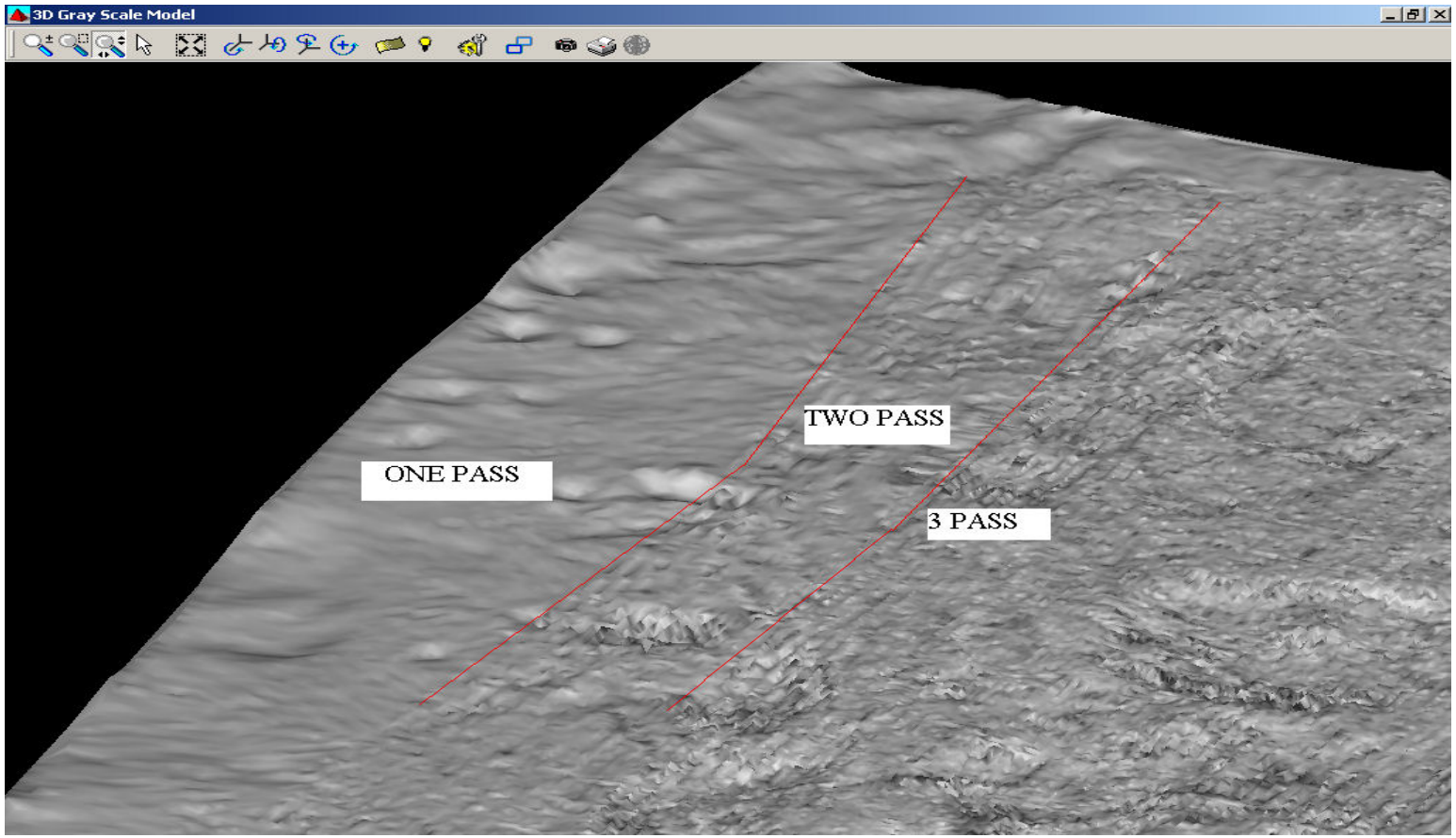


Figure 7. Visual Overview

Identifying Scatter

- Figure 8 is an isometric view showing unfiltered "noise" that shows up as rake-like ridges

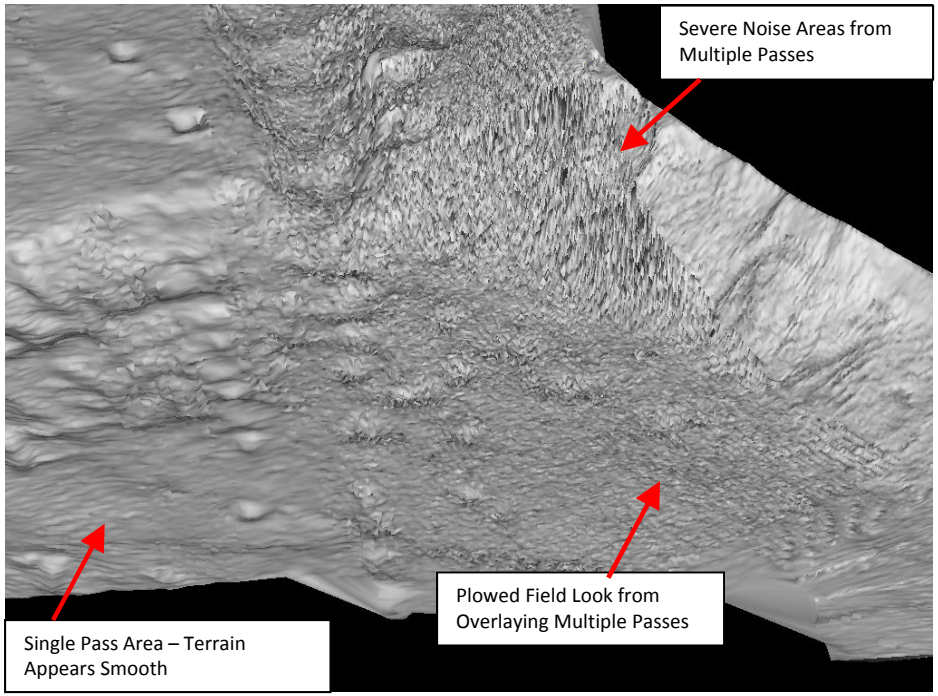


Figure 8. Survey Results

- Figure 9 comes from a different, but similar project.

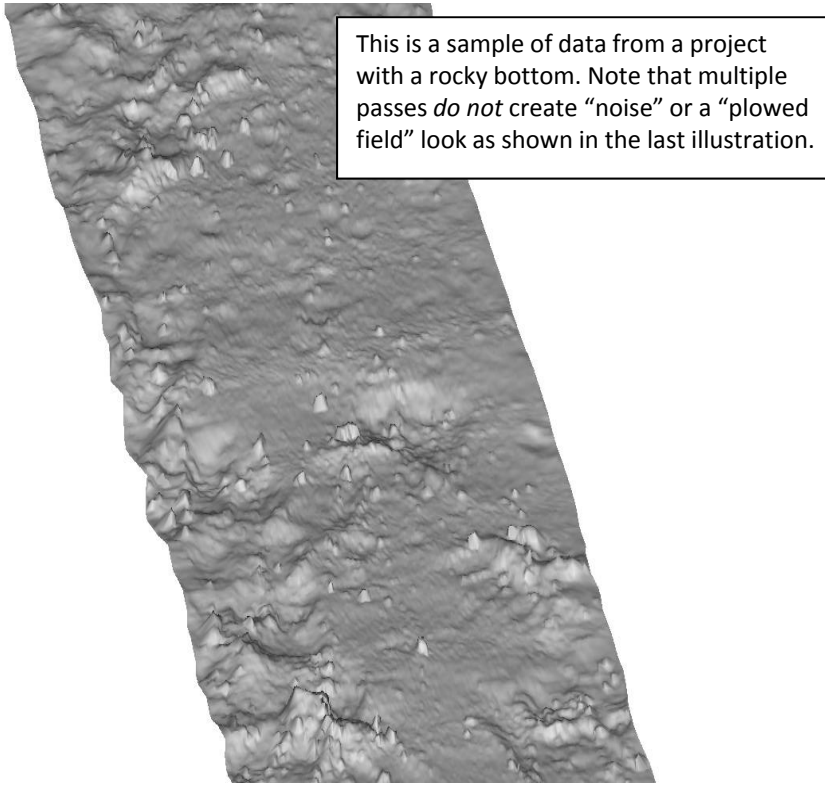


Figure 9. Survey Results from Rocky Bottom

Review the Data!

- The previous figures exemplify the different types of information about survey data quality that can be gleaned by examining raw survey data
  - By reviewing raw data ***rather than just accepting survey results*** parties can catch the types of problems identified in the previous figures.
- Additional steps that contractors can take to prevent unnecessary disputes include:
  - 1) Establishing, in conjunction with the project owner, a clear protocol by which contractors may review an owner's survey results
  - 2) Verifying that said results are acceptable prior to engaging in costly shoaling

Steps to Follow

- 1) Make early proactive RFI's
- 2) Carefully review the project requirements to ensure they are up to date
- 3) Train yourself to recognize when a difficult demand has been placed on the initial design from the regulatory review process
- 4) Educate yourself on the different manuals and/or published guidelines in relation to a particular project
- 5) Request raw survey data instead of merely accepting results
- 6) COMMUNICATION, COMMUNICATION, COMMUNICATION!