



# Seamanship - Set and Drift - "Leaning In"

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Imagine that you are walking along the sidewalk, trying to get to the coffee shop on the corner. But the person next to you is leaning against your shoulder, keeping pace with you and pushing you away from it... There is only one way you are going to make it to the coffee shop (short of belting the guy!). You have to lean into him to such a degree that you overcome the force of his push and the speed at which he is applying it.

This is the essence of "Set and Drift" when navigating as well.

## Set and Drift

The force that this rude dude above is applying to your shoulder is the "drift"; the speed at which he is walking while applying that force is the "set". If he were the tide, or the wind for that matter, the set is the direction of the force against your hull and the drift is the speed that the current is running at. The combination can be considered the force that is keeping you from (or speeding you to) the "coffee shop."

Sail boaters are more concerned with these forces as they typically travel at far slower speeds than a powered vessel and thus need greater distances to apply countervailing force to overcome it. But imagine yourself heading out to the Canyons to do some shark fishing. You leave Moriches Inlet and your pal told you to make your point of sail 200o magnetic and put the hammer down for 60 nautical miles... "plug 39° 40' 29" N and 071° 14' 36" W into your GPS and fish all night..."

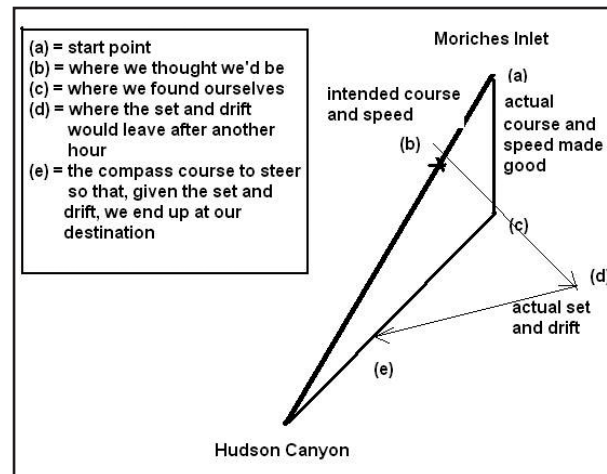
So, you do - and when you've traveled the amount of time specified, you find yourself way to the east and south of your mark... Why...? Because the tidal forces of the Hudson have been just like that guy outside the coffee shop... The set (direction) of the tidal current - on your starboard quarter in this example - pushed you to port (to the east of the rhumb line) while its force (drift) added to your speed - and pushed you further south than engine speed alone would have taken you...

In reality, once you plugged a way point into your GPS, the GPS is calculating the "cross track error (XTS)." What is that? It is the computer doing the calculations (see below) that we all used to do by hand - except the computer can do it constantly and continuously. (We had to wait for errors big enough to matter to the human computer!) It is calculating how far off course you'll be, taking into account your true course over the bottom, if you continue to ignore the set and drift of the current (or wind for that matter!) In the example above, it would start to show that you'll end up well to the east of your mark - and you'll get there ahead of schedule! Using your helm, you start to "lean in", i.e., in this case, you would have to turn your helm over towards starboard until the GPS says that your XTS is zero... Now, assuming that all these forces stay constant, you'll arrive exactly where you intended (even if you get there ahead of schedule!)

But how many degrees should you have turned to starboard in this example? Rather than trial and error ("turn a little more, dear, wait, now a little

more, dear, wait..."), couldn't you calculate it precisely? Yes, you can!

Take a quick look at the diagram:



In the weeks ahead, we'll spell out exactly how you relate all these vectors - as well as your boat speed since that adds more countervailing power as you run at higher speeds - into a precise calculation and give you a new Course To Steer (CTS). And become a better seaman...

BTW, if you are interested in being part of USCG Forces, email me at USCGAUX2007@aol.com or go direct to MaryJo Cruickshank, who is in charge of new members matters, at FSO-PS@emcg.us and we will help you "get in this thing..."

## Moriches Inlet September 2007

Day	High	Low	High	Low	High
Sat 1		4:05 AM / -0.24ft	10:31 AM / 3.60ft	4:46 PM / 0.03ft	10:58 PM / 3.12ft
Sun 2		4:51 AM / -0.06ft	11:26 AM / 3.53ft	5:44 PM / 0.20ft	11:57 PM / 2.92ft
Mon 3		5:43 AM / 0.16ft	12:24 PM / 3.42ft	6:52 PM / 0.36ft	
Tue 4	12:59 AM / 2.75ft	6:48 AM / 0.36ft	1:25 PM / 3.31ft	8:06 PM / 0.43ft	
Wed 5	2:02 AM / 2.64ft	8:02 AM / 0.47ft	2:28 PM / 3.22ft	9:15 PM / 0.39ft	
Thu 6	3:09 AM / 2.62ft	9:12 AM / 0.46ft	3:35 PM / 3.19ft	10:15 PM / 0.30ft	
Fri 7	4:16 AM / 2.69ft	10:13 AM / 0.39ft	4:39 PM / 3.24ft	11:07 PM / 0.18ft	
Sat 8	5:16 AM / 2.84ft	11:07 AM / 0.30ft	5:34 PM / 3.31ft	11:54 PM / 0.09ft	
Sun 9	6:07 AM / 3.01ft	11:57 AM / 0.22ft	6:21 PM / 3.37ft		
Mon 10		12:38 AM / 0.01ft	6:51 AM / 3.16ft	12:44 PM / 0.16ft	7:03P M / 3.39ft
Tue 11		1:18 AM / -0.02ft	7:32 AM / 3.25ft	1:28 PM / 0.13ft	7:41 PM / 3.34ft
Wed 12		1:55 AM / -0.01ft	8:10 AM / 3.29ft	2:09 PM / 0.14ft	8:18 PM / 3.24ft

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# CROSSWORD

1	2	3	4	5	6	7	8	9	10	11	12	13
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61					62				63			

**ACROSS**

- 1 Gambling game
- 5 French islands
- 9 Respond to astimulus
- 14 Grace ending
- 15 Church part
- 16 Mistake
- 17 Formal hairclip?
- 19 Picture border
- 20 Period
- 21 Relaxes
- 22 Fire remains
- 23 Walk worriedly
- 24 Arrive merci, Andre
- 26 Wretched
- 29 Be dazzle
- 30 Q-Uspan
- 33 Textile
- 34 Hotel workers
- 35 Actress Sandra
- 36 Aahs O partners
- 37 Missile berths
- 38 M. Descartes
- 39 Flowed
- 40 Up and about
- 41 Saltedmeat
- 42 Fina ldegree
- 43 Food scraps
- 44 Freely granted friendly acts
- 45 Spritein "The Tempest"
- 47 Rank's partner?
- 48 Sixths of sets in tennis
- 50 Holliman and Scruggs
- 52 Dog tags, e.g.
- 55 Not ful filled
- 56 Formal alley prowler?
- 58 Martin of "Roxanne"
- 59 Seep
- 60 Corn concoction
- 61 Employer, initially
- 62 Ogled
- 63 Medical school subj.
- 11 Formal Erte creations?
- 12 Dove home
- 13 Vervyn Giverny
- 18 Arrive at
- 23 Cocker spaniels and cockatoos
- 25 Flops
- 26 Potential oak
- 27 Become in flated
- 28 Formal ground breaker?
- 29 Merchant's figures
- 31 Toledo man
- 32 Green years
- 34 Decorative Christmas sprig
- 37 Male parent
- 38 Great review
- 40 Revel noisily
- 41 Light weigh wood
- 44 Caught on camera
- 46 "Still Me" writer
- 47 Stood stock-still
- 48 Flow freely
- 49 Against
- 51 Nautical shout
- 52 Religious image
- 53 Comic Carvey
- 54 Leave textasis!
- 57 Mineral spring

**DOWN**

- 1 Token value
- 2 Love of Don Quixote?
- 3 Singer McEntire
- 4 Any person
- 5 Unaltered
- 6 Gap in time
- 7 Actress Arden, casually
- 8 Physical feeling
- 9 Stays
- 10 Rubout

See Solution on Page 7