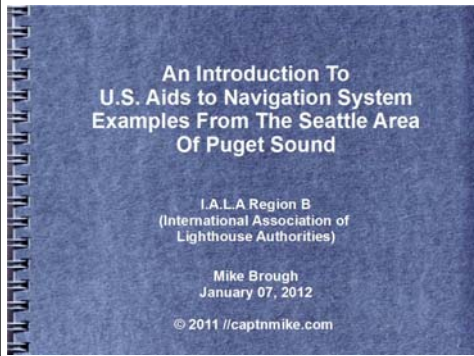
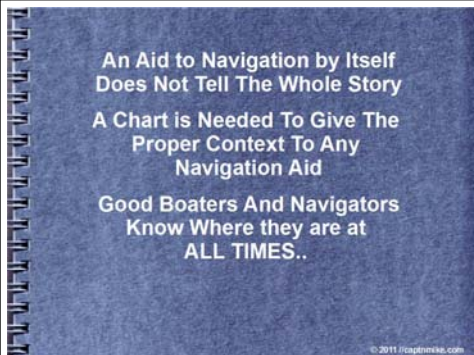



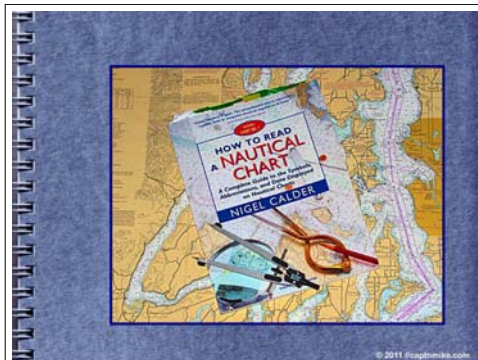
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 <p>An Introduction To U.S. Aids to Navigation System Examples From The Seattle Area Of Puget Sound</p> <p>I.A.L.A Region B (International Association of Lighthouse Authorities)</p> <p>Mike Brough January 07, 2012 © 2011 //captnmike.com</p>	<p>Revised January 07, 2012</p> <p>An Illustrated introduction to U. S. Aids to Navigation in the Seattle area of Puget Sound, Washington.</p> <p>The chart symbols are show with a picture of the Aid and the context of the Aid is shown.</p>
 <p>An Aid to Navigation by Itself Does Not Tell The Whole Story A Chart is Needed To Give The Proper Context To Any Navigation Aid Good Boaters And Navigators Know Where they are at ALL TIMES..</p> <p>© 2011 //captnmike.com</p>	<p>Just saying “There is a Red Buoy” does not say much other than there is a safe water concern.</p> <p>(... PPT)</p> <p>A Chart is Needed To Give The Proper Context To Any Navigation Aid</p> <p>Good Boaters And Navigators Know Where they are at ALL TIMES..</p>
 <p>NEVER USE A SINGLE POINT OF NAVIGATION!!! The Chart You Are Using Might Not Be Up To Date Charts Should Be Kept Up To Date Using LNM (Local Notice to Mariners) An Aid To Navigation Might Have Been Moved Either By Accident Or On Purpose.</p> <p>© 2011 //captnmike.com</p>	<p>NEVER USE A SINGLE POINT OF NAVIGATION!!!</p> <p>The Chart You Are Using Might Not Be Up To Date</p> <p>Charts Should Be Kept Up To Date Using LNM (Local Notice to Mariners)</p> <p>An Aid To Navigation Might Have Been Moved Either By Accident Or On Purpose.</p>
 <p>What Color Is That Light?</p> <p>White And Yellow Lights Are Likely To Be Confused Short Duration Green Lights Can Be Confused For White Always Check Pattern & Timing Many Lights on ATON's Are Only Visible for 2 or 3 Miles.</p> <p>© 2011 //captnmike.com</p>	<p>What Color Is That Light?</p> <p>White And Yellow Lights Are Likely To Be Confused</p> <p>Short Duration Green Lights Can Be Confused For White</p> <p>Always Check Pattern & Timing</p> <p>Many Lights on ATON's Are Only Visible for 2 or 3 Miles.</p>

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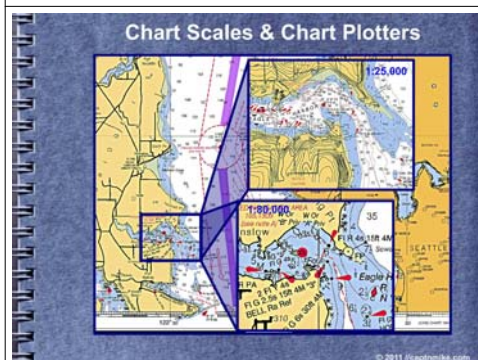


Slide 05

Good Resource

Has all of Chart # 1

Expands and explains surprises that a boater might encounter when on the water. Many added pictures.



Slide 06

GPS Like looking through a little window

Zoom in and out to see detail and overall area.

Proper scale of chart is needed for safe navigation,

Detail needed for entering a harbor,

A larger area is needed to show how to get **TO** the harbor.

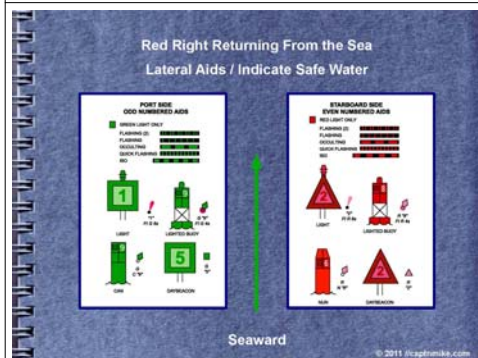
Remember that a GPS unit can fail so keeping some paper charts on board just in case, and many find paper charts easier to use to get the overall layout of an area.



Slide 07

The Aids To Navigation Examples are from the greater Seattle area of Puget Sound but apply to any area of the U.S. Or any Region B, (Canada, Mexico etc.)

We will start by coming down from the north to the Shilshole Bay Marina Area.



Slide 08

Red Right Returning From the Sea

Lateral Aids / Indicate Safe Water.

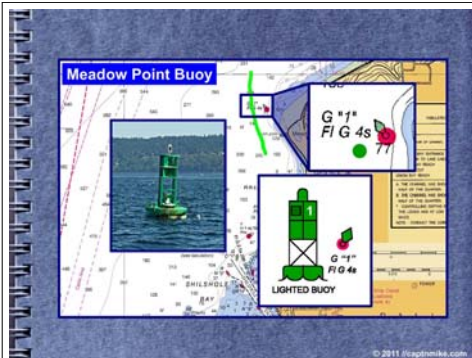
You need to stay on the Correct side of the mark for Safety.

Red, Nun, Pointy, Triangular

Green, Can, Square

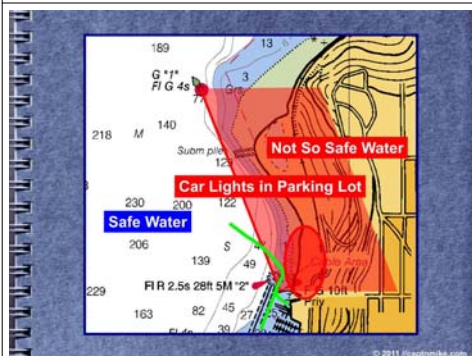
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Slide 09

Coming from the North
Green Meadow Point Buoy
Magenta Circle indicates a Lighted Buoy.
Fl = Flashing
Flashing Green 4 second cycle.
Circle at base indicates not fastened solid to earth.
Position Approximate due to Anchor Rode and Watch Circle.
Red Right Returning From the Sea
Leave Buoy on Left or Port side of Vessel when Southbound.



Slide 10

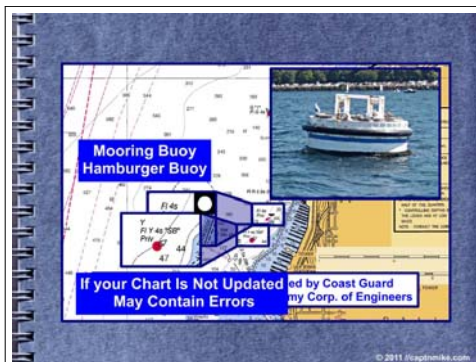
At night, the cars in the parking lot can be distracting, confusing and make the lights on the Aids To Navigation Difficult to see.
Stay outside of a line running from the Meadow Point Buoy to the North Breakwater Lights
Vessel traffic turns Northwest just North of the Breakwater.
The traffic pattern can be confusing, with some inbound traffic going to the Boat Launch Ramp or Dry Storage and other Traffic going southbound in the Fairway.



Slide 11

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Slide 12

Buoy "SB" no longer present

This chart is a bit out of date

Should keep charts updated with Local Notice To Mariners.

North Mooring Buoy – commonly called "Hamburger Buoy"

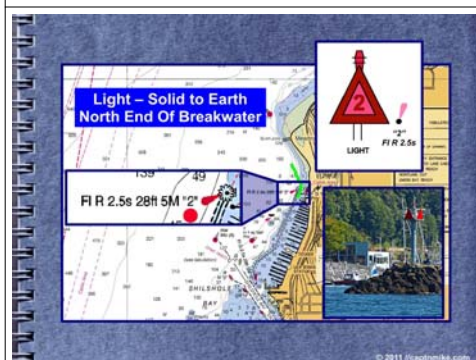
Magenta Exclamation Point indicates a Lighted Buoy.

No color for light indicates White Color

Flashing White Light 4 second cycle.

"Priv" = Private – Not maintained by the Coast Guard.

Note the Horizontal Blue Band for Mooring Buoys.



Slide 13

North Breakwater Light

Flashing Red – 2.5 seconds – light is 28 feet above Mean Higher High Water – 5 M = can be seen from 5 nautical miles away in good visibility if the observer is high enough above the water.

Solid dot on the chart indicates it is fastened solid to the earth and does not move

Magenta Exclamation Point indicates a Lighted Aid.

Red Right Returning From the Sea – Pass on your Right or Starboard side of vessel.

Don't pass too close to the breakwater – you want to be able to see around the breakwater for traffic.

If you are coming down from the north the Breakwater light can be shielded by Meadow Point until you are close to the Meadow Point Buoy.



Slide 14

Plain Green Light – No Numbering. 10 feet above Mean Higher High Water.

F = Fixed light – no flashing

Leave on the left side or Port side of the vessel when southbound and entering the marina.

This light gets hit a couple of times a year by boats.

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Slide 15

Unobstructed Water on all Sides

May Be Lettered

May Have a Red Topmark

Fairways, Mid-Channel, Offshore Approach Points.



Slide 16

Safe Water Marker

Locally Called “Red and White Buoy” or “Red and White Entrance Buoy”

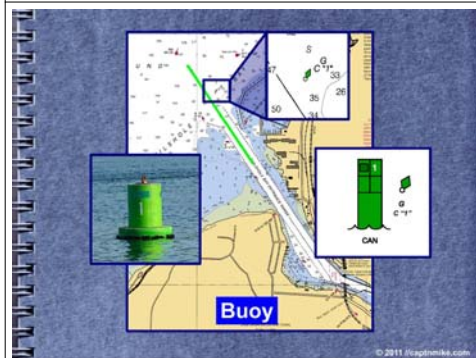
Red and White Structure

White Light Flashes **Morse Code “A”** (DOT – DASH)

This marks the center of the channel into the Ballard Locks.

Can be passed on either side BUT need to be careful about the traffic pattern.

100 or more boats can be outbound when the Large Locks empty making the traffic in the channel, a bit of a challenge.



Slide 17

Green Buoy – Floating -

Position Approximate due to Anchor Rode and Watch Circle.

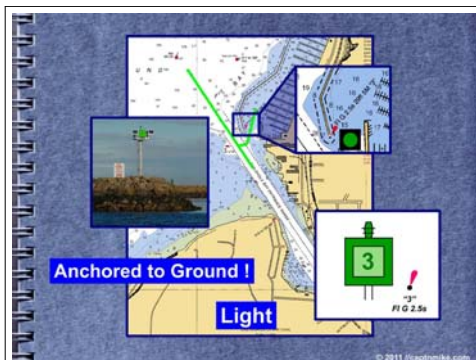
Shaped like a Can.

Not Lighted

Red Right Returning from the Sea – Pass the Buoy on your left or Port side when inbound.

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Slide 18

South Breakwater Light

Flashing Green Light 2.5 second cycle - Number 3—
Tower – Solid to Earth or Breakwater

Magenta exclamation point indicates a lighted Aid

Red Right Returning From the Sea – pass light to left or
Port Side of the vessel when entering the marina.

Don't get too close to rocks.

SLOW DOWN when entering or leaving the marina and
Swing a bit wide to be able to see around the breakwater.



Slide 19

Red Buoy Number 4

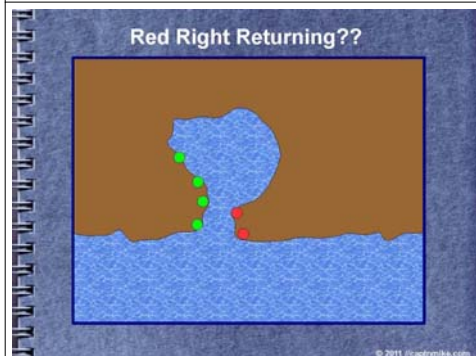
Not lighted

Red Right Returning From the Sea.

Pass Buoy on Right or Starboard side of Vessel when
inbound.

Marks the Right Side of the Channel.

Cutting the corner between Buoy's 2 & 4, while a
common practice can be a problem at low tide.

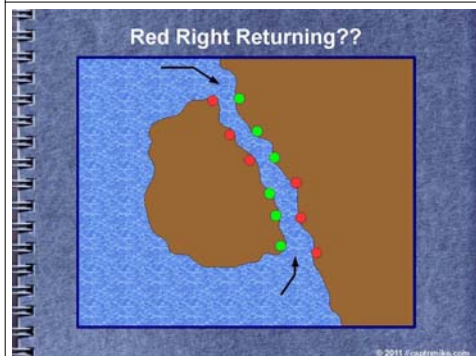


Slide 20

Red Right Retuning

Aids to Navigation don't need to come in matched pairs.

Placement depends on Navigation hazards and vessel
traffic.



Slide 21

Going around islands and channels there can be two
“Returning From the Sea” entrances.

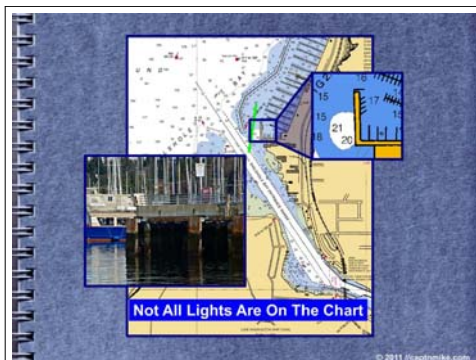
Need to look on chart to see where the change takes
place and the context of the marks.

The Swinomish Channel north of Seattle from Anacortes
to south of La Conner.

The switch over is now at the south end of Padilla Bay as
the channel goes under the Route 20 Bridge.

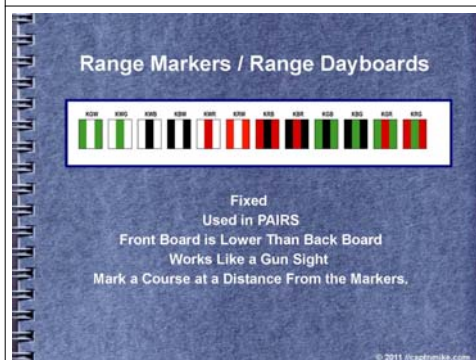
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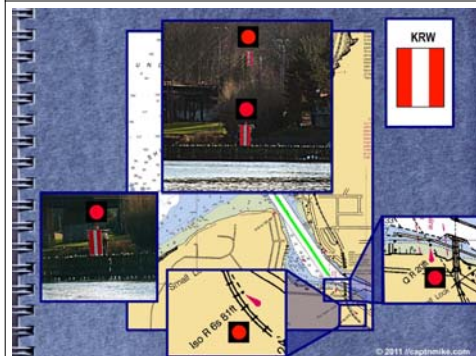
Slide 22

Not all lights are shown on a Chart
There are Flashing Yellow Lights on the Northwest and Southwest corners of the pier – Three Yellowish White flood lights at ladders and about 14 lights on the walkway – so the pier should be easy to see at night.
None of the above lights are on the chart
The Wall is sometimes used for mooring large ships.



Slide 23

Range Markers / Range Dayboards
Fixed
Used in PAIRS
Front Board is Lower Than Back Board
Works Like a Gun Sight
Can Mark a Course at a Distance From the Markers.

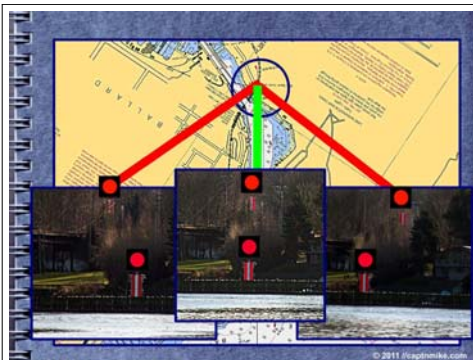


Slide 24

Range Markers.
Mark a channel without Buoys or Lights in or along the channel.
The Front (Lower) Light is Quick Flashing Red (Q R) (over 60 flashes a minute)
The Rear (Upper) Light is Iso (Isophase) with the duration time of the light and dark being equal
Line the marks up vertically to properly position your vessel.
Drive Toward the Lower Marker

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Slide 25

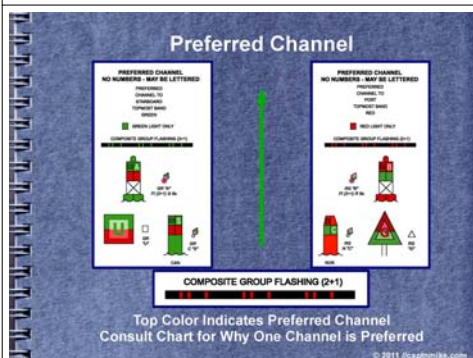
How Range Markers work

First view is from the Right Side of the Channel – drive to the Left or Port - toward the Lower Mark.

View from the Left Side of the Channel – Drive to the Lower Marker - Right or Starboard.

The last view is from the center of the channel the Range Markers are lined up vertically.

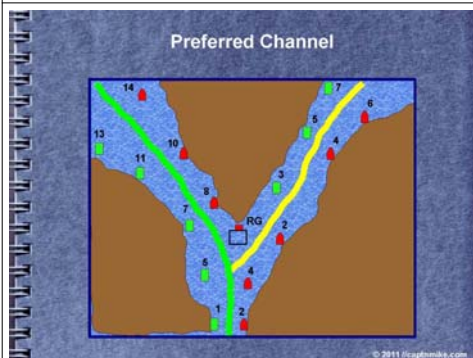
End Part # 1 / Start Part # 2



Slide 26

Note the Composite Group flashing light pattern is only used on Preferred Channel Markers.

Used when a channel splits



Slide 27

Preferred Channel is to the left – need to look at a chart to see why one channel is preferred over another.

Pretend the bottom color does not exist to determine the preferred channel.

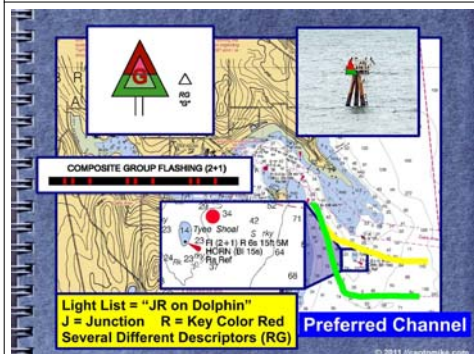
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Slide 28

Entrance to Eagle Harbor / Winslow on Bainbridge Island.



Slide 29

Preferred Channel

Solid Dot indicates fixed solid to earth – reliable position –
Magenta Exclamation Point indicate lighted Aid

Identifying on the chart can be a bit confusing:
RG shown in most texts

This light identified by the light pattern

FI (2+1) R 6s

Composite Group Flashing (2+1) Red 6 Second Cycle

Light List = "JR on Dolphin"

J = Junction R = Key Color Red



Slide 30

West Point

West of Magnolia and Discovery Park.

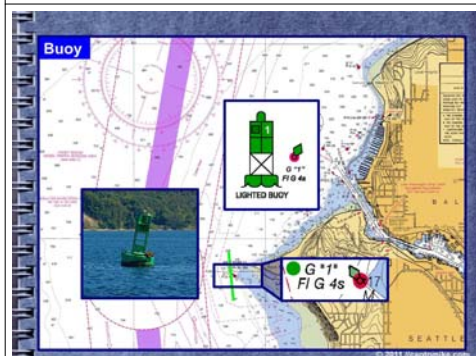
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Slide 31

West Point Lighthouse
 Alternating White / Red Light 10 second cycle.
 TR = Tower
 Dot in center of the Radar Tower circle indicates an accurate position.



Slide 32

Green West Point Buoy Number 1
 Magenta circle at base indicates it is a lighted Buoy.
 Flashing Green 4 second cycle.
 Red Right Returning From The Sea
 Pass this Buoy to your left or Port Side when southbound.
Note: This is the Third Green Buoy Number 1 in a 1.5 nm Radius – Two of the Green Buoys # 1 are Flashing 4 Seconds.
You need to know where you are at all times.



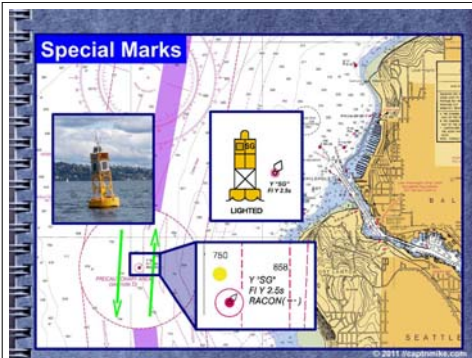
Slide 33

Special Marks
 Yellow in Color
 (...)

 May be Lighted or Unlighted
 May Be Lettered
 Never Numbered
Mark Special Features or Areas
 Traffic Separation or VTS Lanes
 Anchoring Areas
 Military Exercise Areas – Firing Ranges – Torpedo Test areas
 Cables or Pipelines
 Fishnet Areas
 Test Areas – North Lake Union

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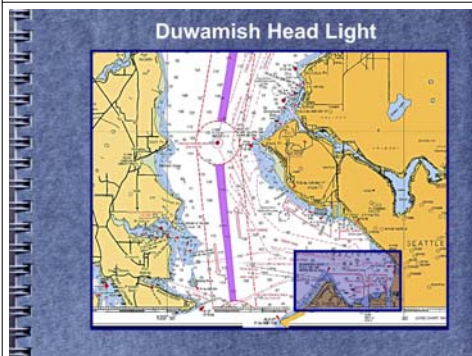
Slide 34

Sierra Golf (SG) in the VTS – Vessel Traffic System
Sierra Golf marks the center of the VTS Lanes (like a median in a freeway) and also marks a Turning Point in the Traffic Flow – some traffic will turn into Elliot Bay and some will continue down to Tacoma.
Flashing Yellow 2.5 seconds

Has a “RACON” (Radar Transponder) returns a “DASH – DOT” when swept by radar – to identify the Buoy on the Radar screen.

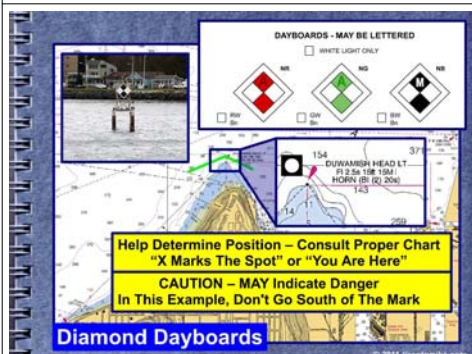
Safe water on all sides of Buoy – **BUT** need to watch for vessel traffic following the VTS lanes.

Precautionary Area – BE VERY CAREFUL.



Slide 35

Duwamish Head Light



Slide 36

Diamond Shaped Dayboard
Non-Lateral Aid
NR – Non-Lateral Red
RW / Bn = = Red and White beacon
Flashing White Light – 2.5 Seconds

Help Determine position - “You are Here” or “X Marks the Spot”

White with Red, Green or Black Diamonds.

Also used to assist on Western Rivers to indicate the side the channel is on.

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Slide 37

Cardinal Marks

Not used in the U.S. Some use in Canada,
Used in Europe

Safe water indicated by the direction to pass the Mark on
the direction is indicated by the

Top Conical Mark,
Color Pattern or
Retro-reflector pattern
Light flashing pattern

May be Pillar or Spar Buoys

(...)

Lights:

Q – Quick – (50 to 79 Flashes per minute –
usually 50 or 60 Flashes)

VQ – Very Quick (80 to 159 Flashes per minute –
usually 100 or 120 Flashes)

South Mark has Long Flash added right after Q or
VQ flashes.



Slide 38

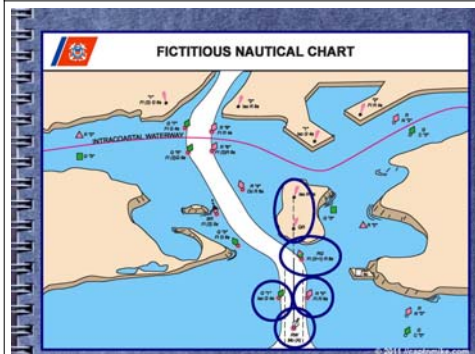
Safe Water to East of Mark

Top Marks Pointing away from each other

Black – Yellow – Black color pattern

VQ(3) 5s –

3 Very Quick Flashes 5 second cycle

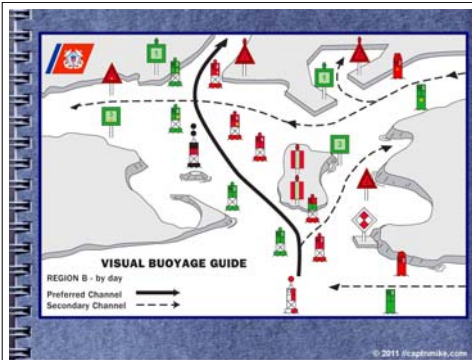


Slide 39

Fictitious / Fake Nautical Chart

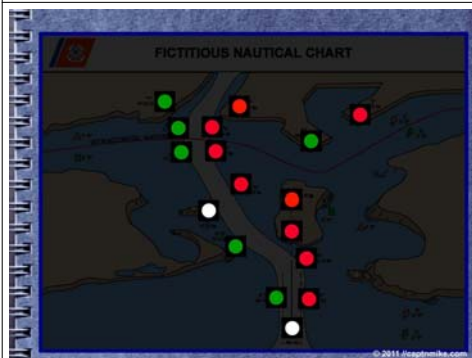
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Fake navigation chart – stick figure diagram

Slide 40



Fake navigation chart night time light patterns.

Slide 41



An Aid to Navigation by Itself
Does Not Tell The Whole Story

A Chart is Needed To Give The Proper Context To Any
Navigation Aid

NEVER USE A SINGLE POINT OF NAVIGATION!!

Thank You For Your Interest In Boating Safety.

Slide 42