Washington Seaplane Pilots Association FAAST Seminar Rainier Flight Service April 20th, 2017

# Seaplane Operations in the Pacific Northwest

Austin Watson, P.E., CFI





#### Seaplanes in the Pacific Northwest

- History
- Destinations and Routes
- Operations and Radios
- Preflight and Weather
- Docks and Ropes
- Safety and Responsible Operations
- \* Training
- \* WSPA / SPA Resources



This talk is based on what I have learned flying seaplanes in the PNW for 10 years. Have fun and learn something today.

#### WSPA Mission

- Protect and grow seaplane access to Washington waters
- Promote safe and responsible seaplane operations
- Foster communications among owners, operators, service providers and the community
- \* Facilitate events sharing the joy of seaplane flying in Washington and the Pacific Northwest. Please join us.

http://washingtonseaplanepilots.org/join

Washington Seaplane Pilots Association





- \* Austin Watson, P.E., CFI, Certified Flight Instructor
- \* SPA WA Field Director. WSPA Communications Director.
- Electrical Engineer, P.E., Boeing Military Training Systems Architect, SW Guy, Seattle Techie
- PNW Native

## Seaplane Operations in the Pacific Northwest Stuff I Promised To Talk About

- What makes the Pacific Northwest such a special place for seaplane flying?
- Why is seaplane flying both challenging and satisfying?
- Learn about seaplane operations in the Pacific Northwest
- · Learn some local history and the reasons why its the most fun flying ever
- · Learn how a seaplane pilot thinks and plans for local operations
- Learn what resources are available to pilots and students
- Learn what kinds of seaplanes are used in the Pacific Northwest
- Learn what are some favorite destinations for both the beginner and advanced seaplane pilot
- Learn some new ways of thinking about your flights from this seminar

## Why PNW Seaplane flying is fun

- 1. You get to land in nature
- 2. It's just you, your airplane and nature
  - The decision making is challenging
  - You really get to know your personal limitations and your airplanes performance envelope
- 3. You get to land in nature!

#### Imagine this:

Your runway is moving vertically and horizontally underneath you. It has debris (*FOD*) on it and under it that you may or may not be able to see. There are animals and humans and other vehicles and vessels on it. There is no control tower or wind sock or ATIS. It's a cold rainy windy gusty day.

## History



Pulling B&W into Boeing's Seaplane Assembly/Hangar on Lake Union - 1916

#### Boeing Roanoke Seaplane Base in 2017



#### Boeing's Hangar/Assembly Plant on Lake Union - 1916



#### **Boeing 314 Clipper**



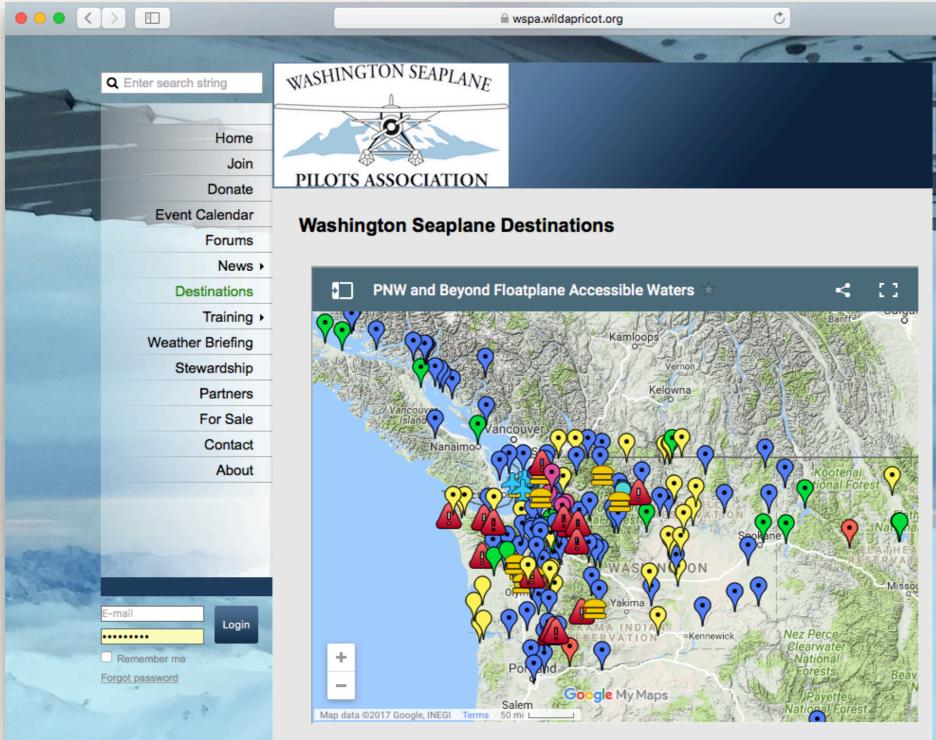
Loading Passengers At Treasure Island, San Francisco Bay

- 12 built (1938-1941)
- Top speed: 210 mph
- Range: 3,685 miles
- Ceiling: 19,600 feet
- 11 crew, 74 passengers



#### Destinations & Routes

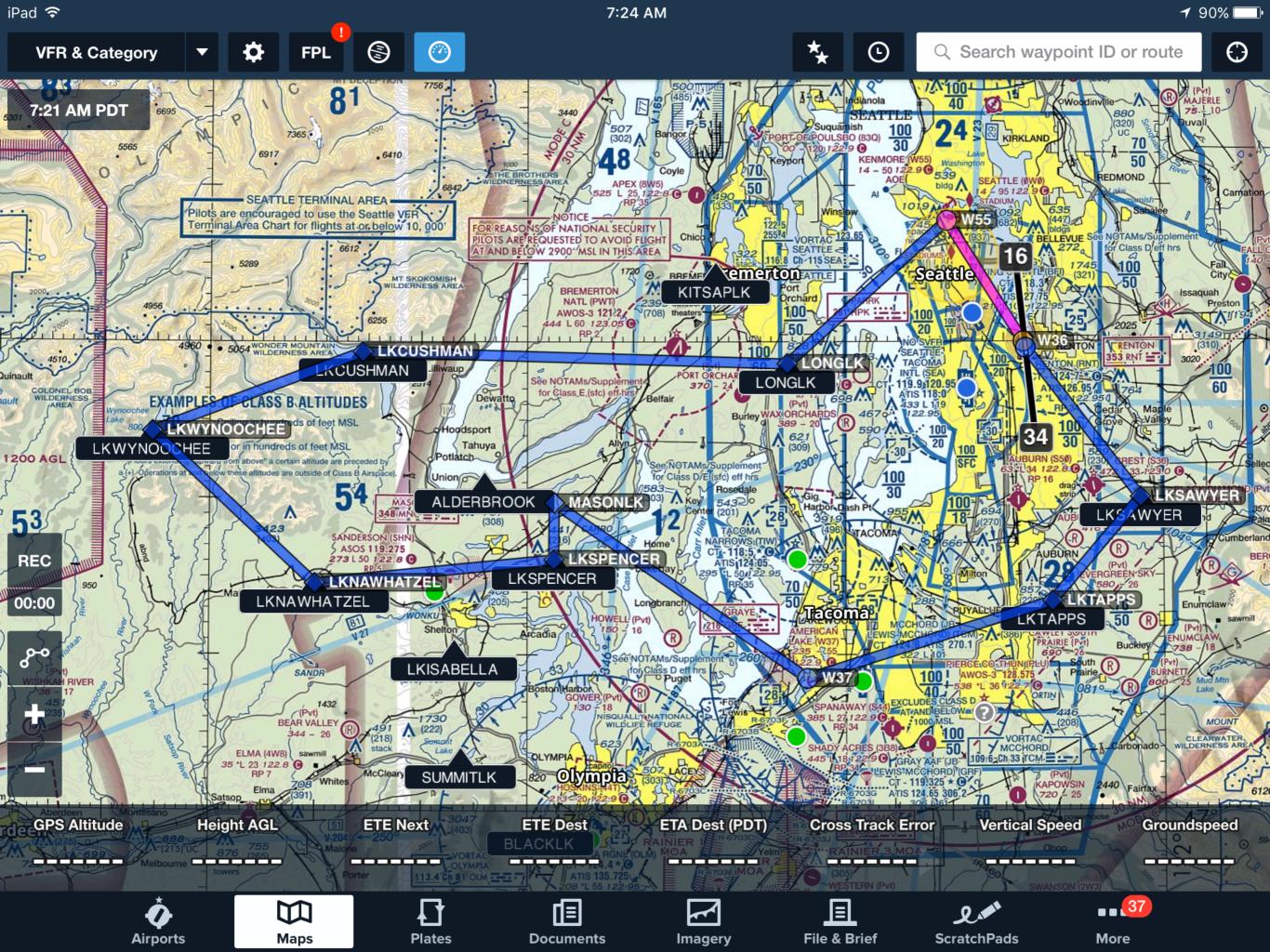
#### WSPA Destination Map

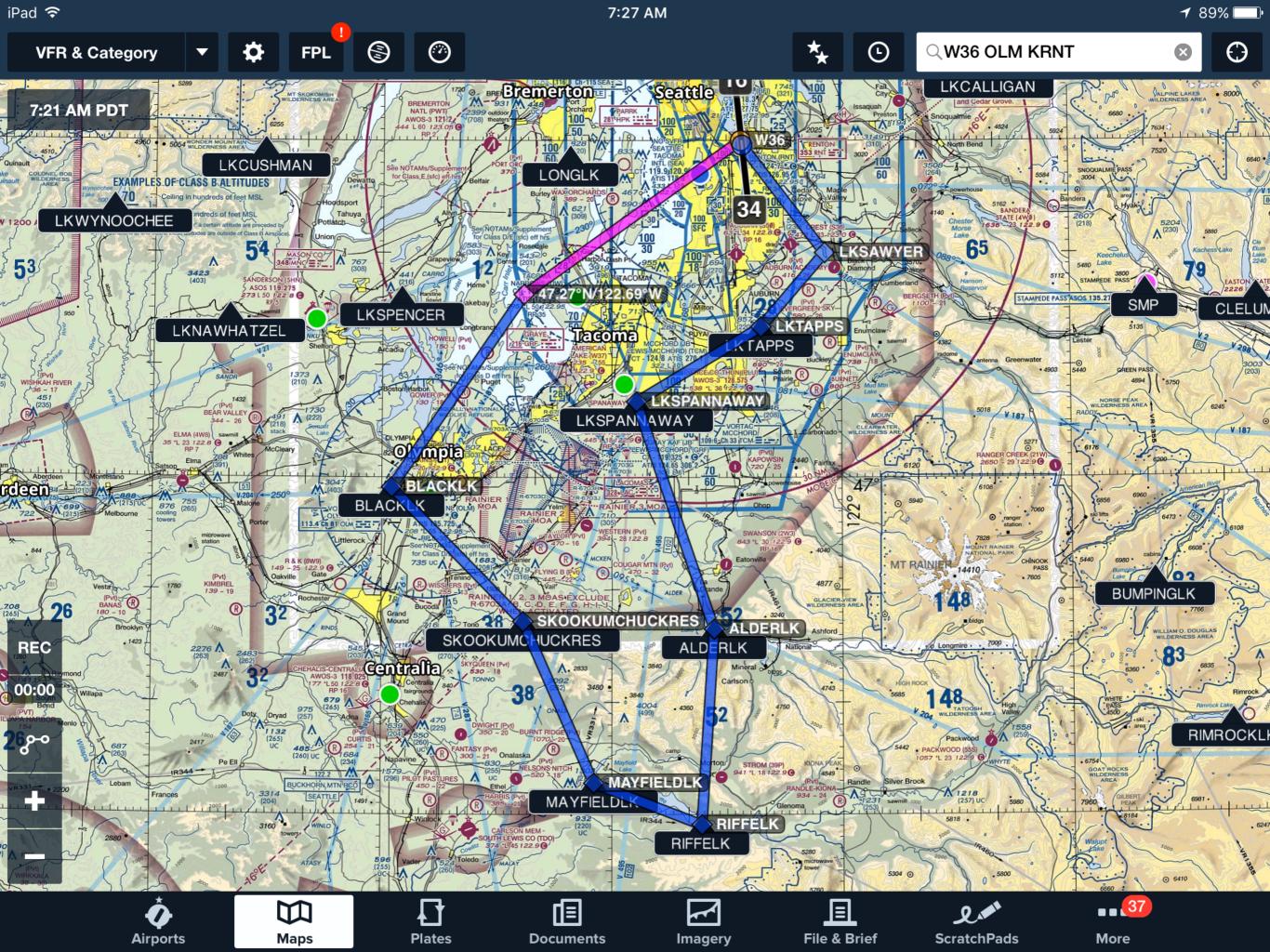


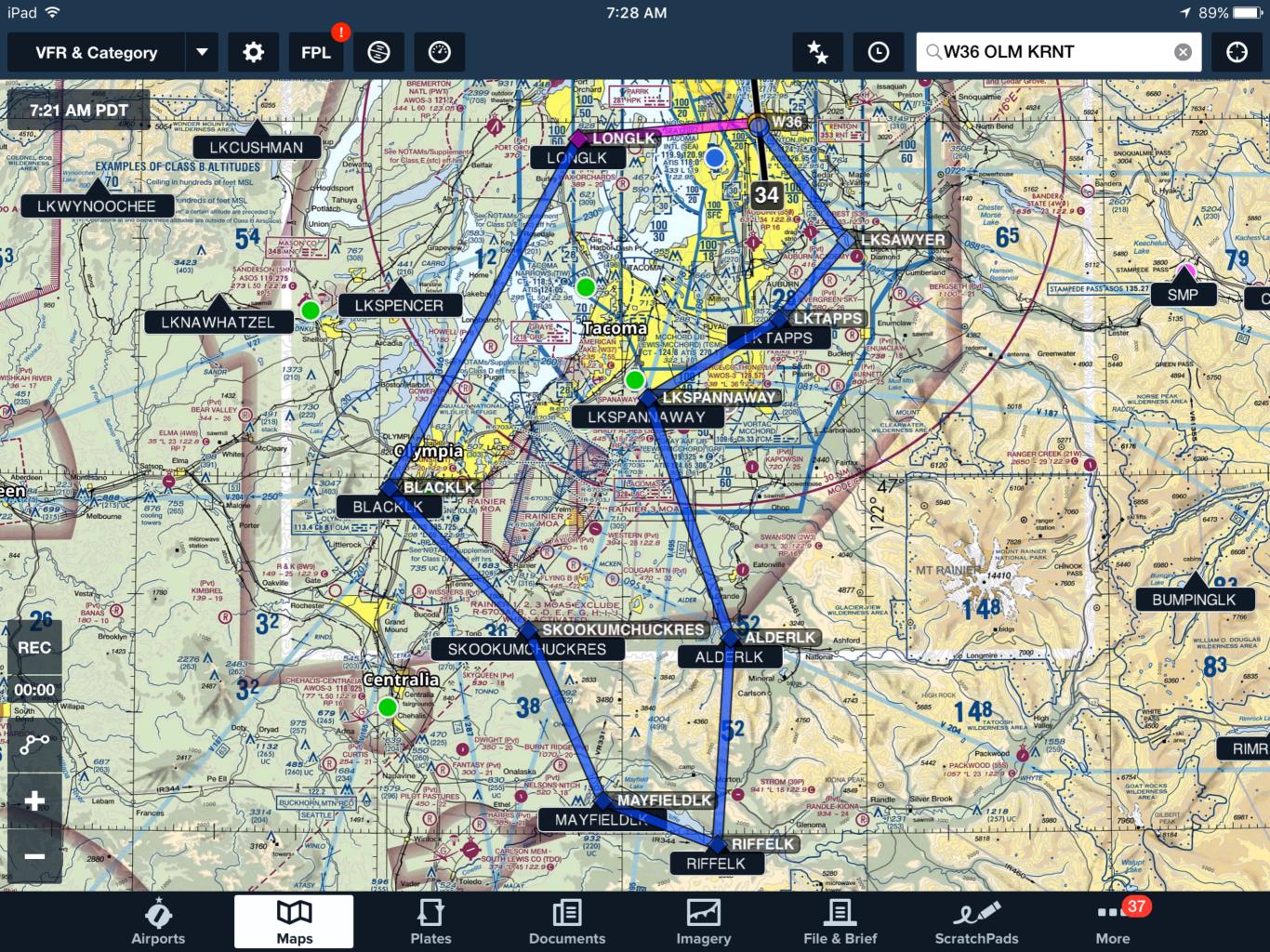
Refer to "The Controlling Authority"

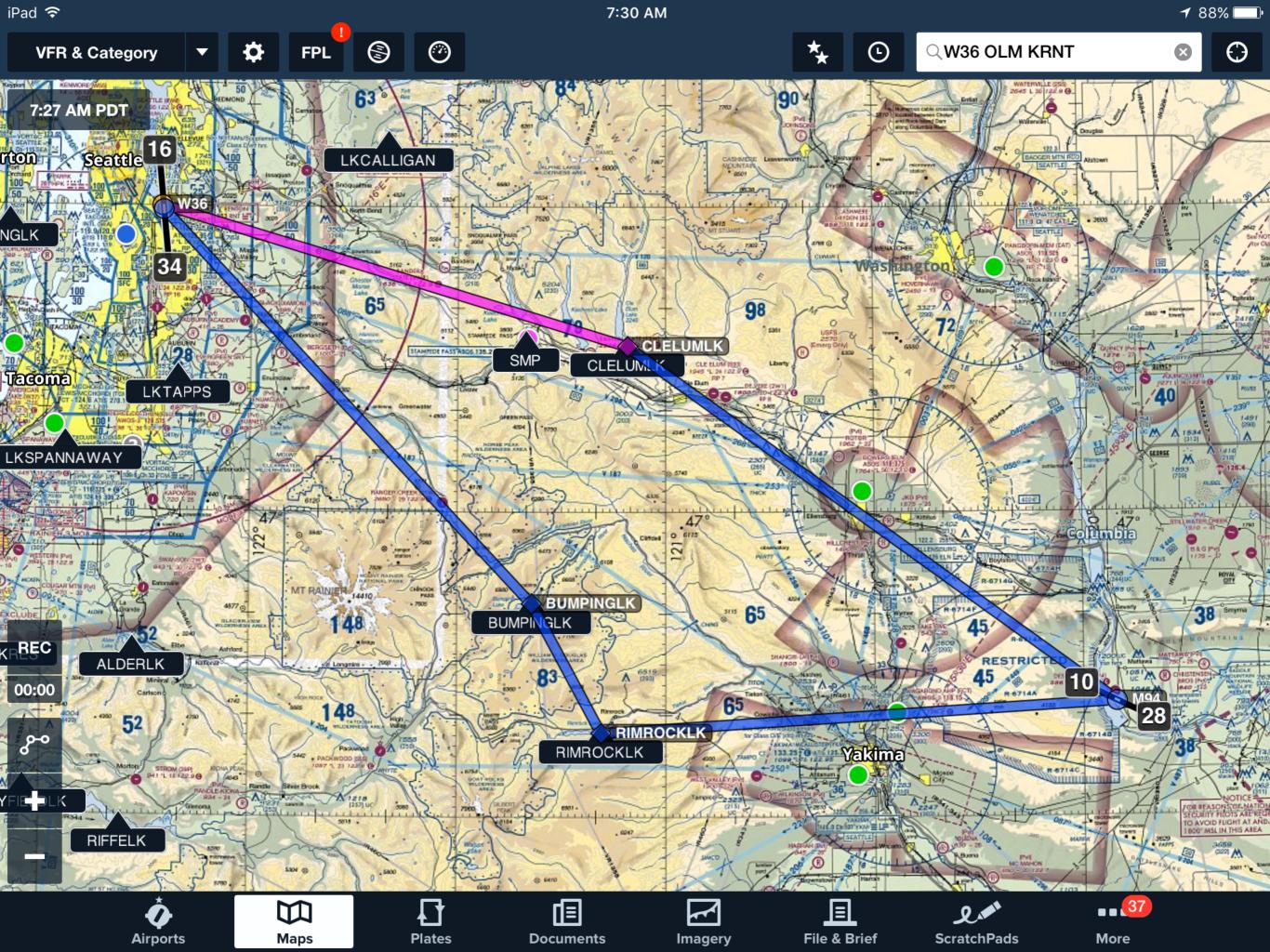


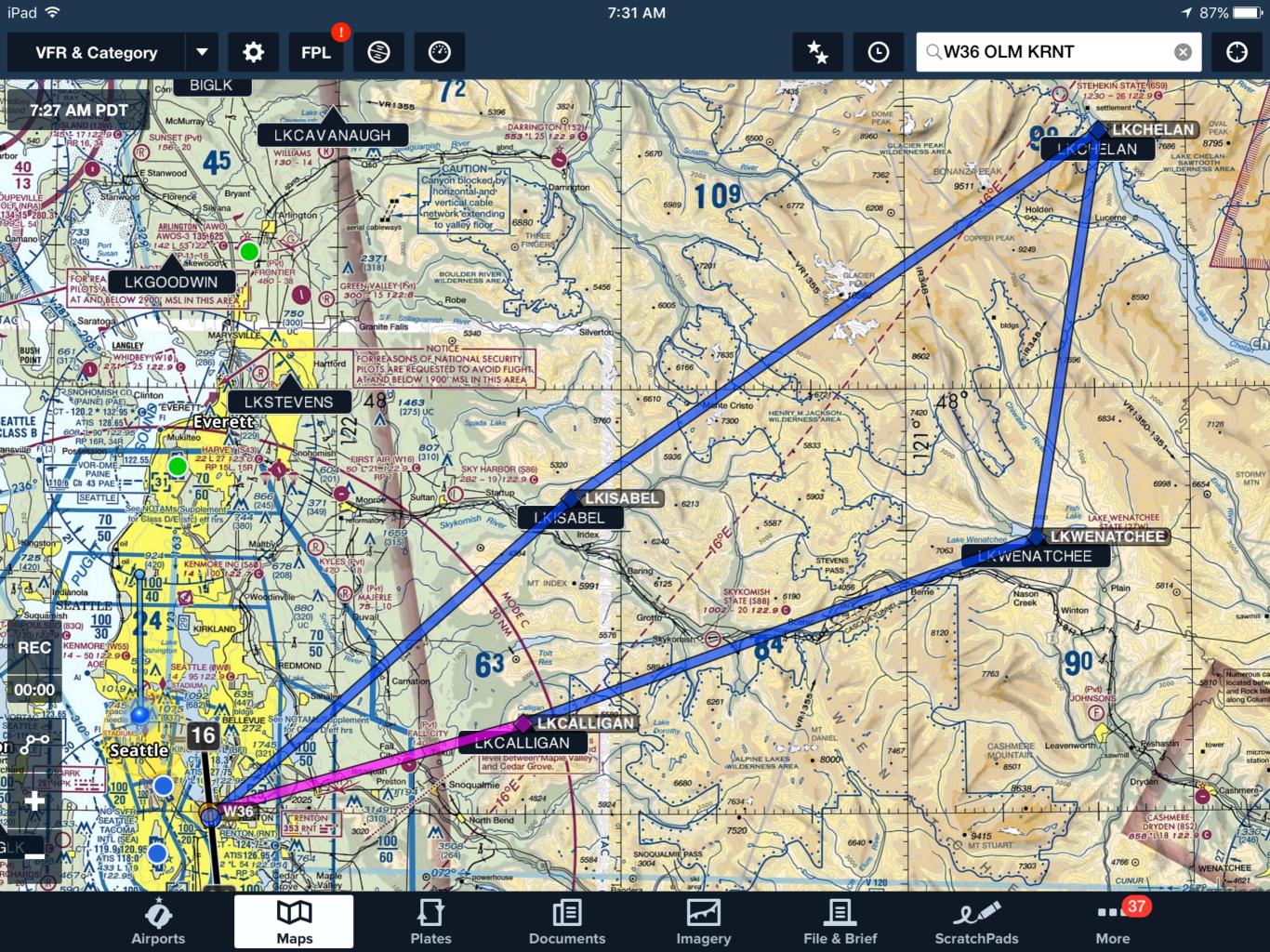
Also see SPA water
Landing Directory at
seaplanes.org
members only

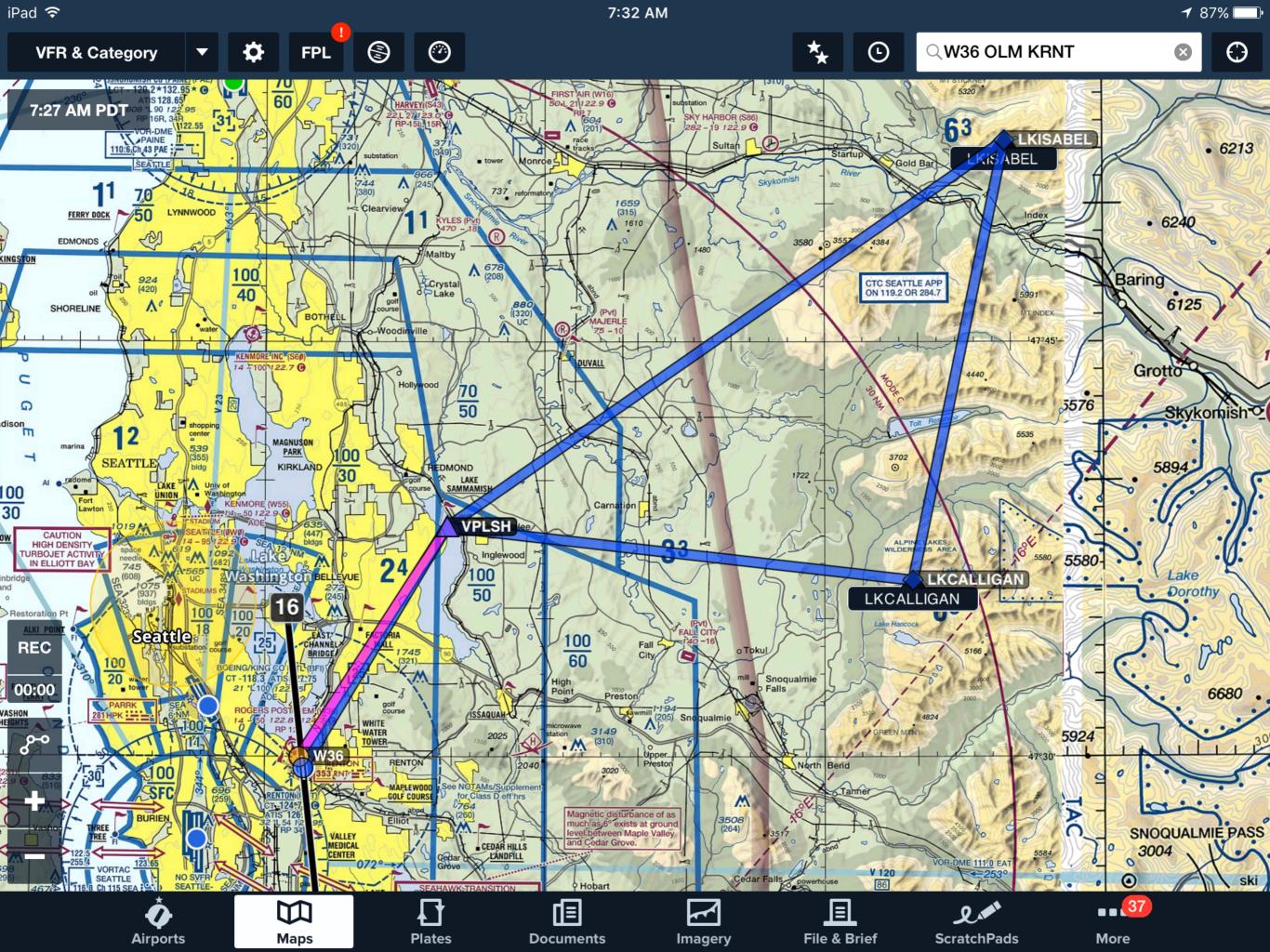


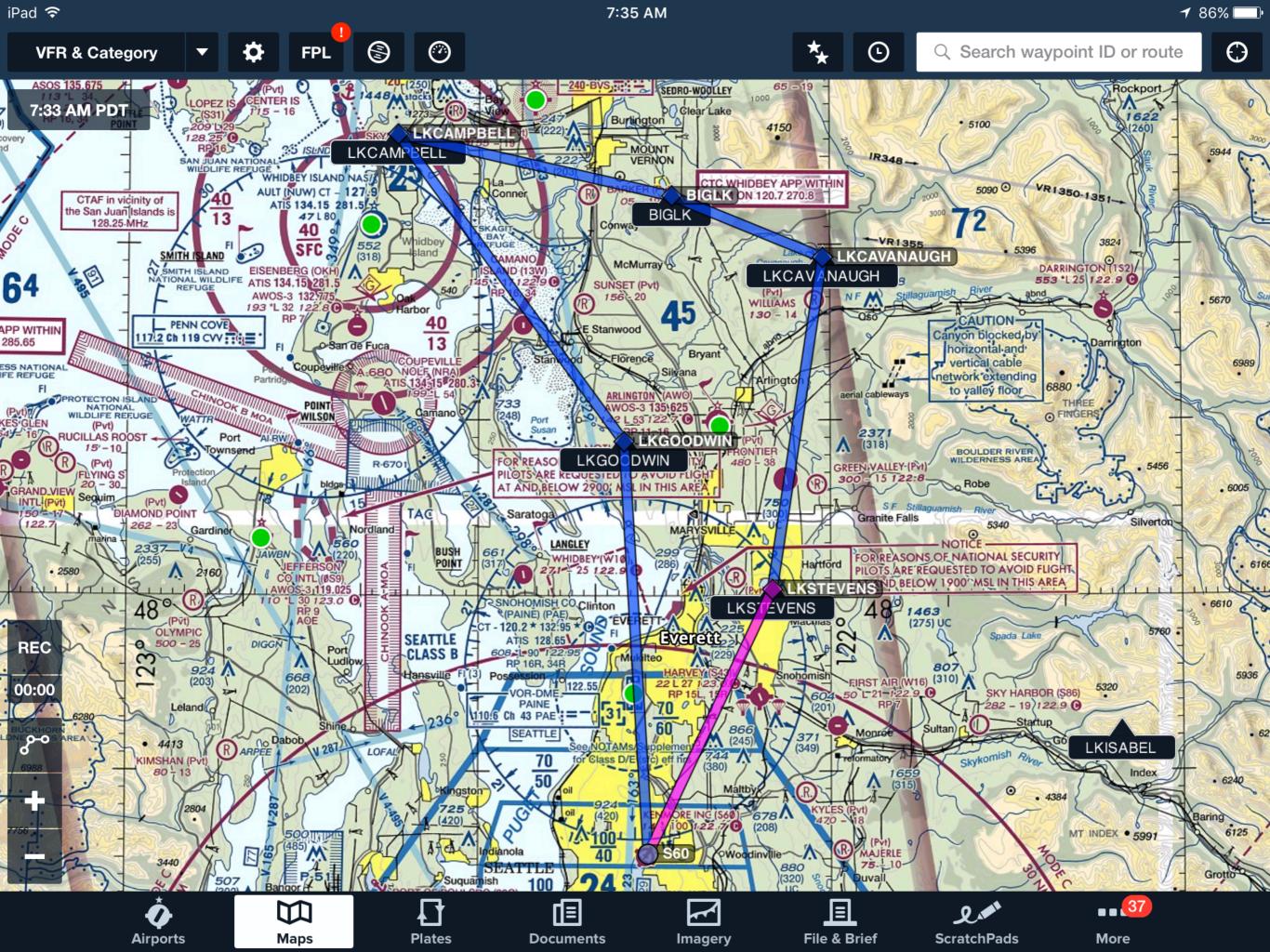


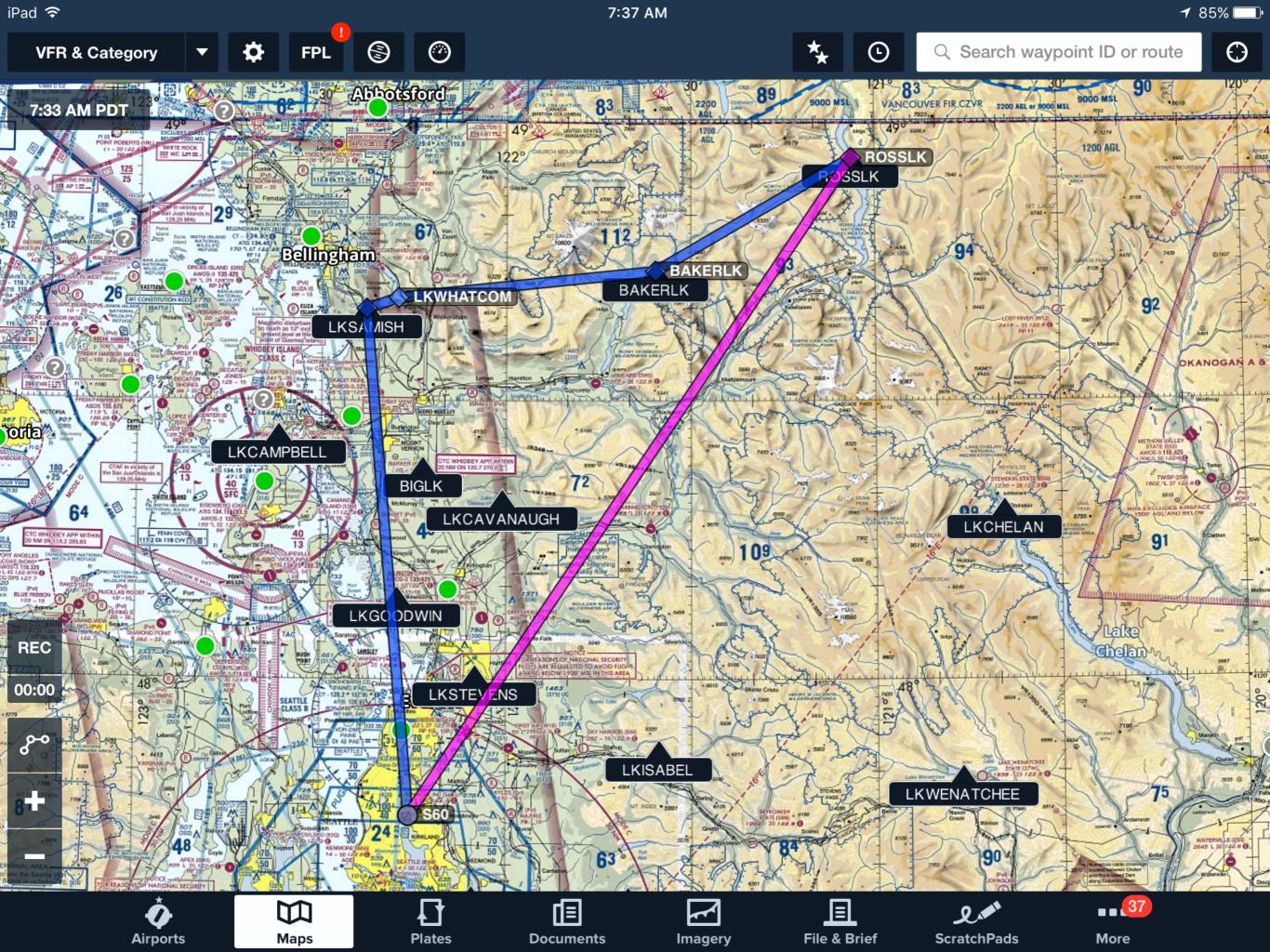


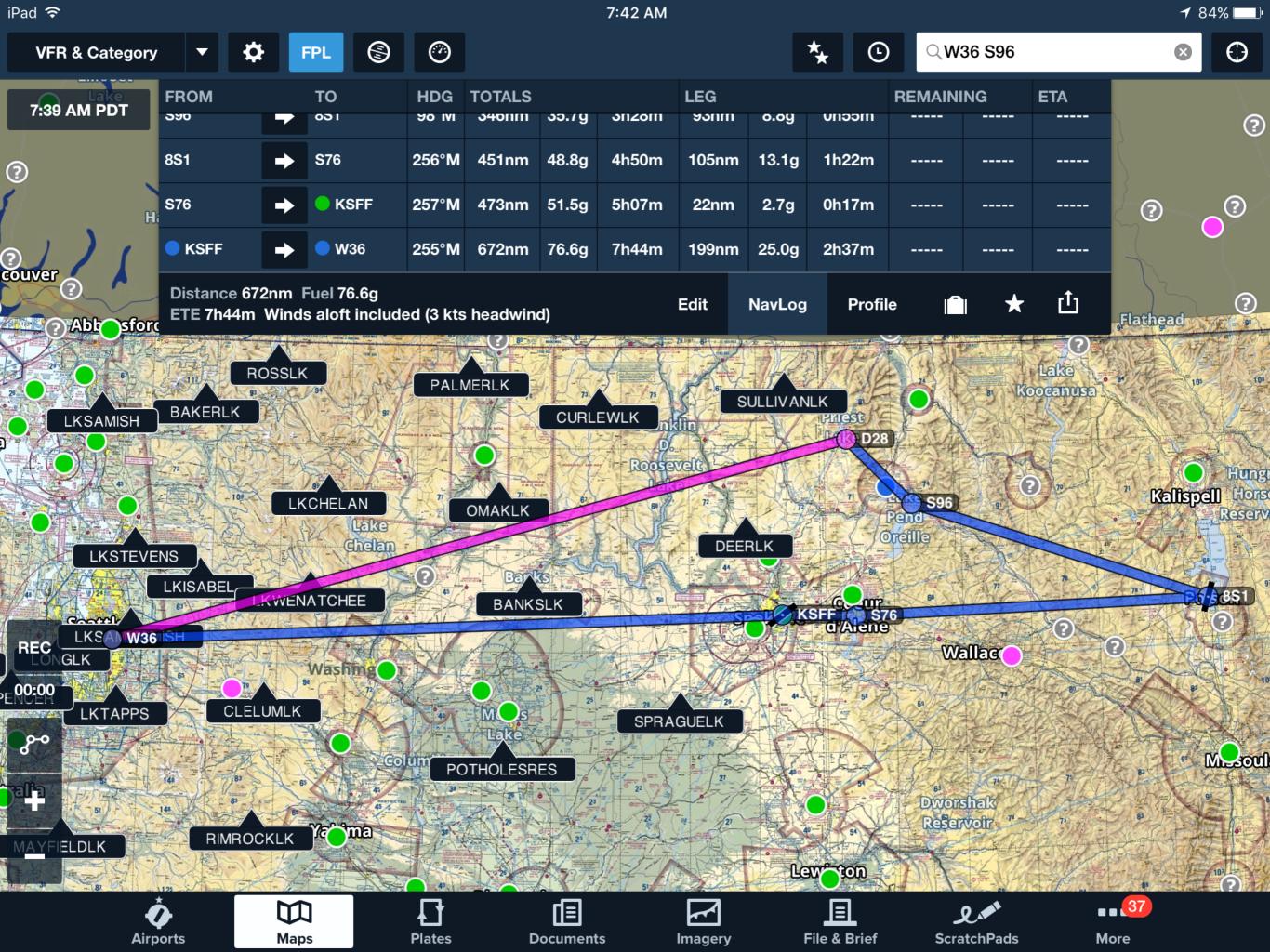




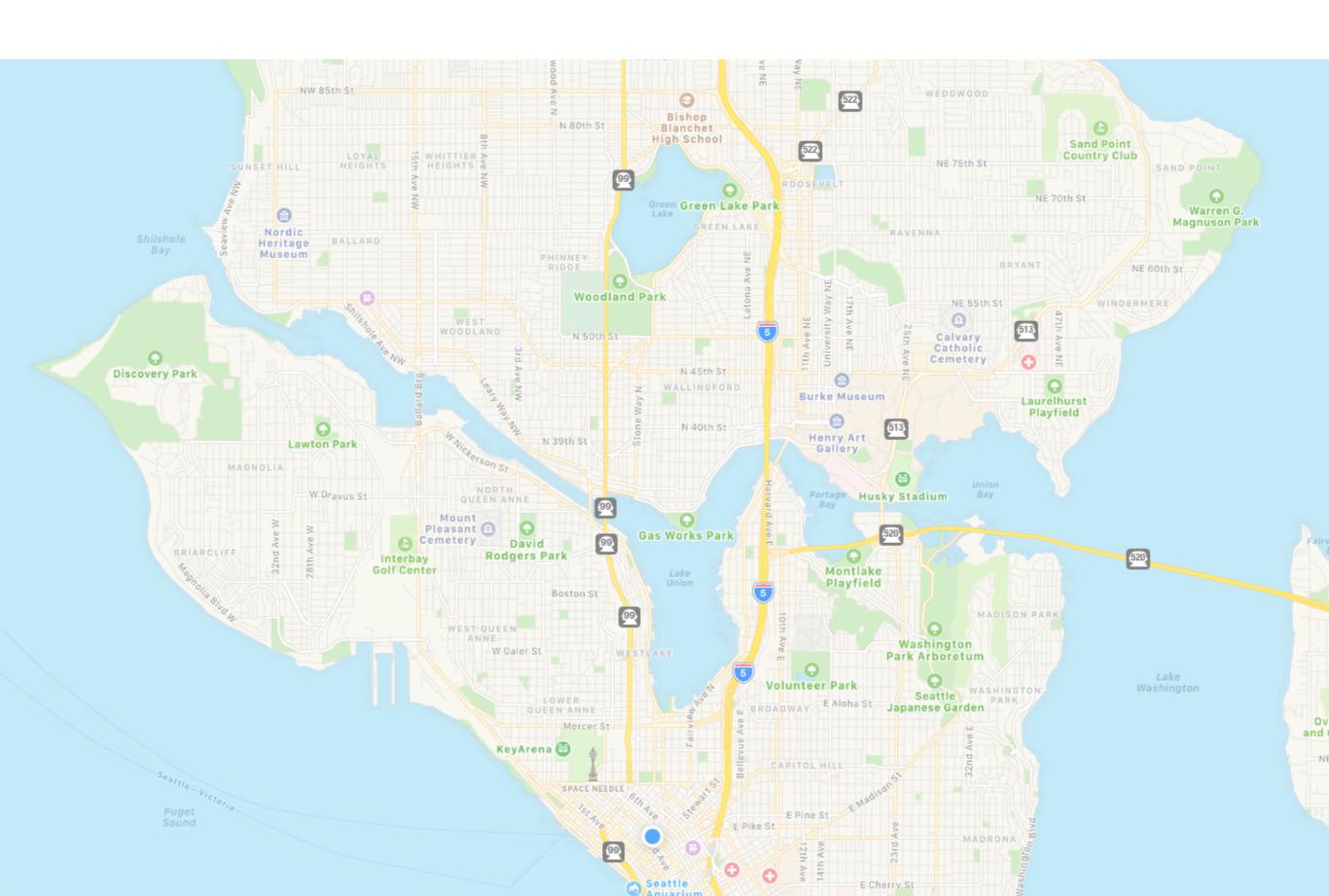


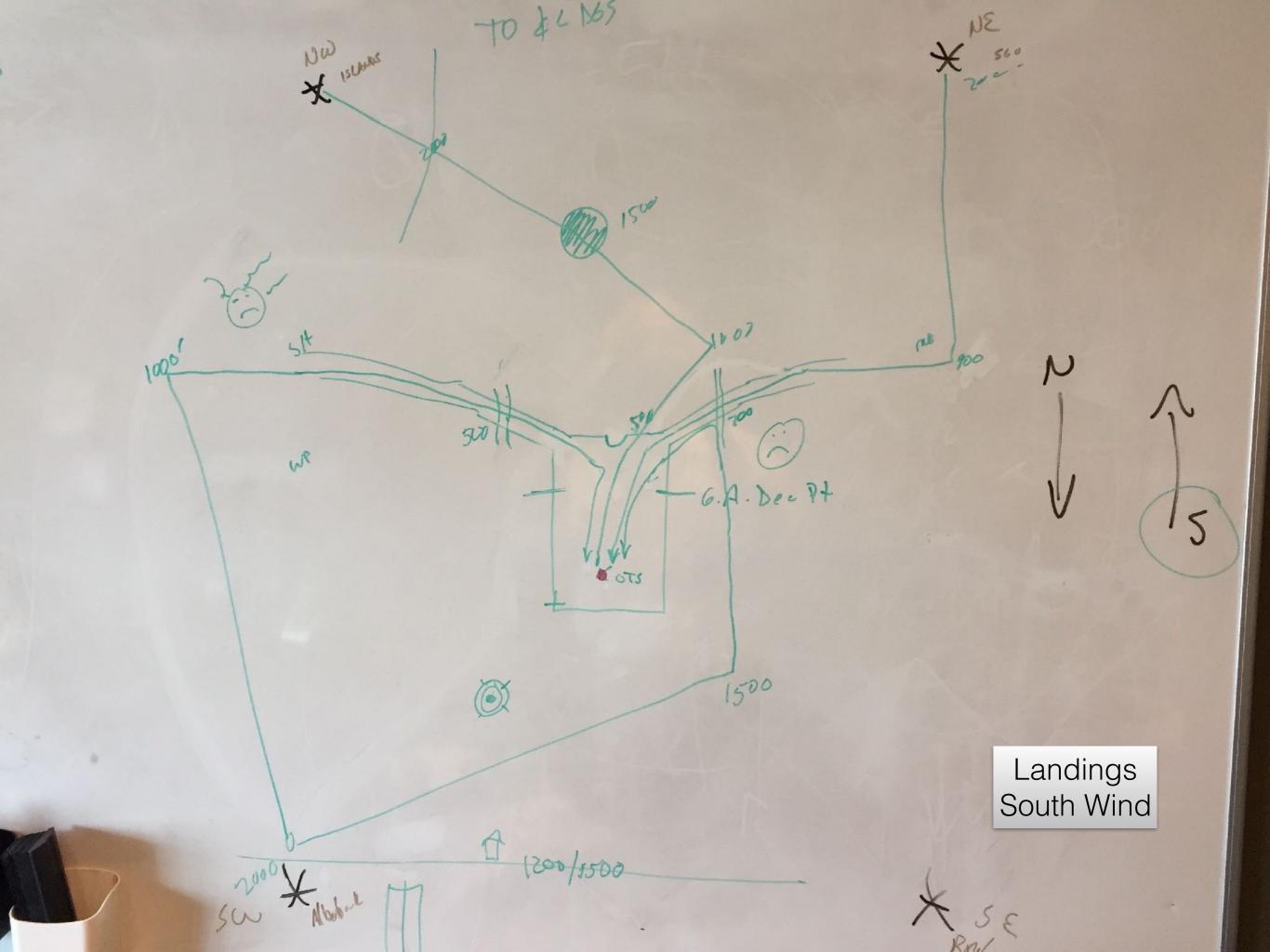




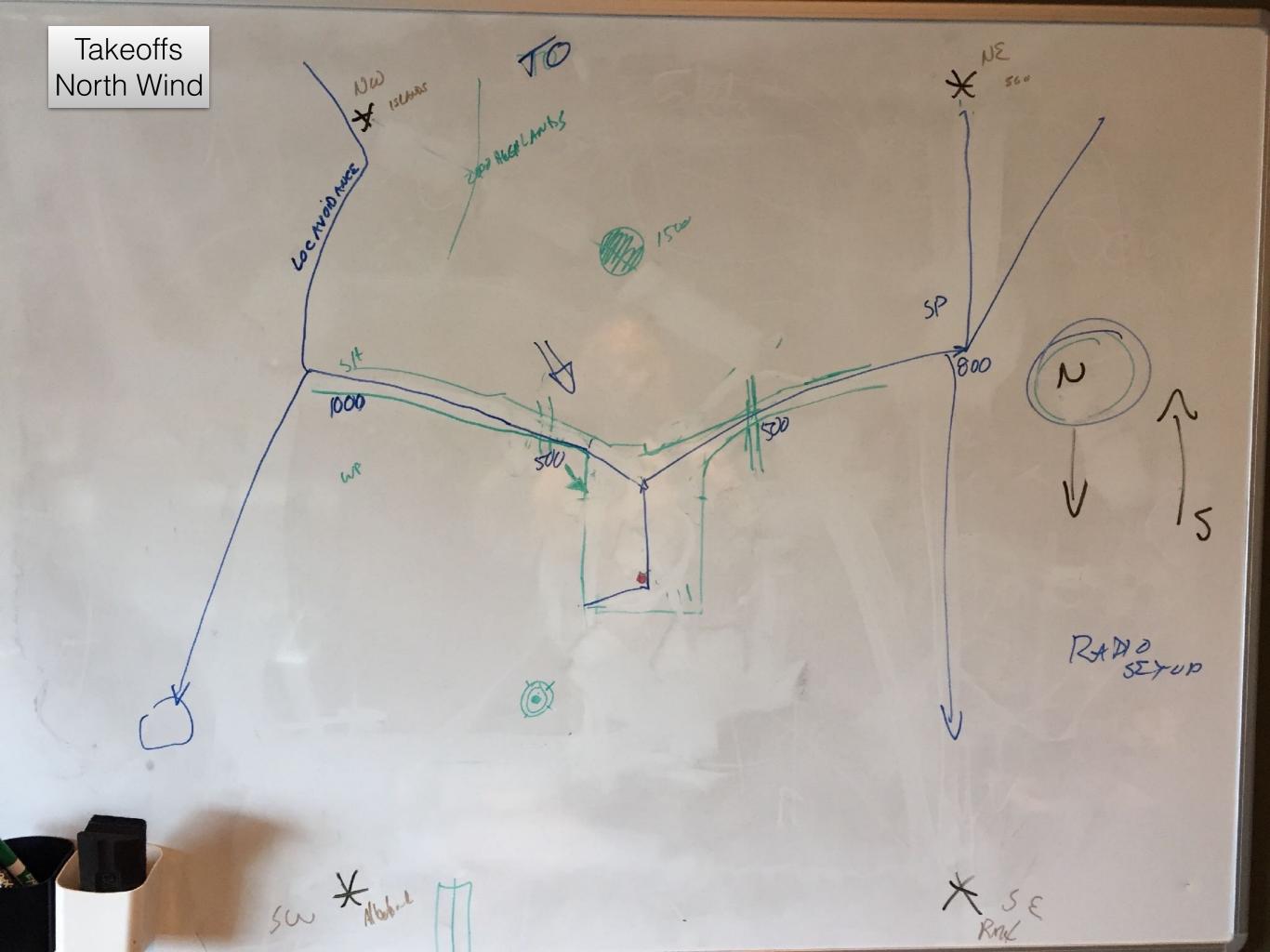


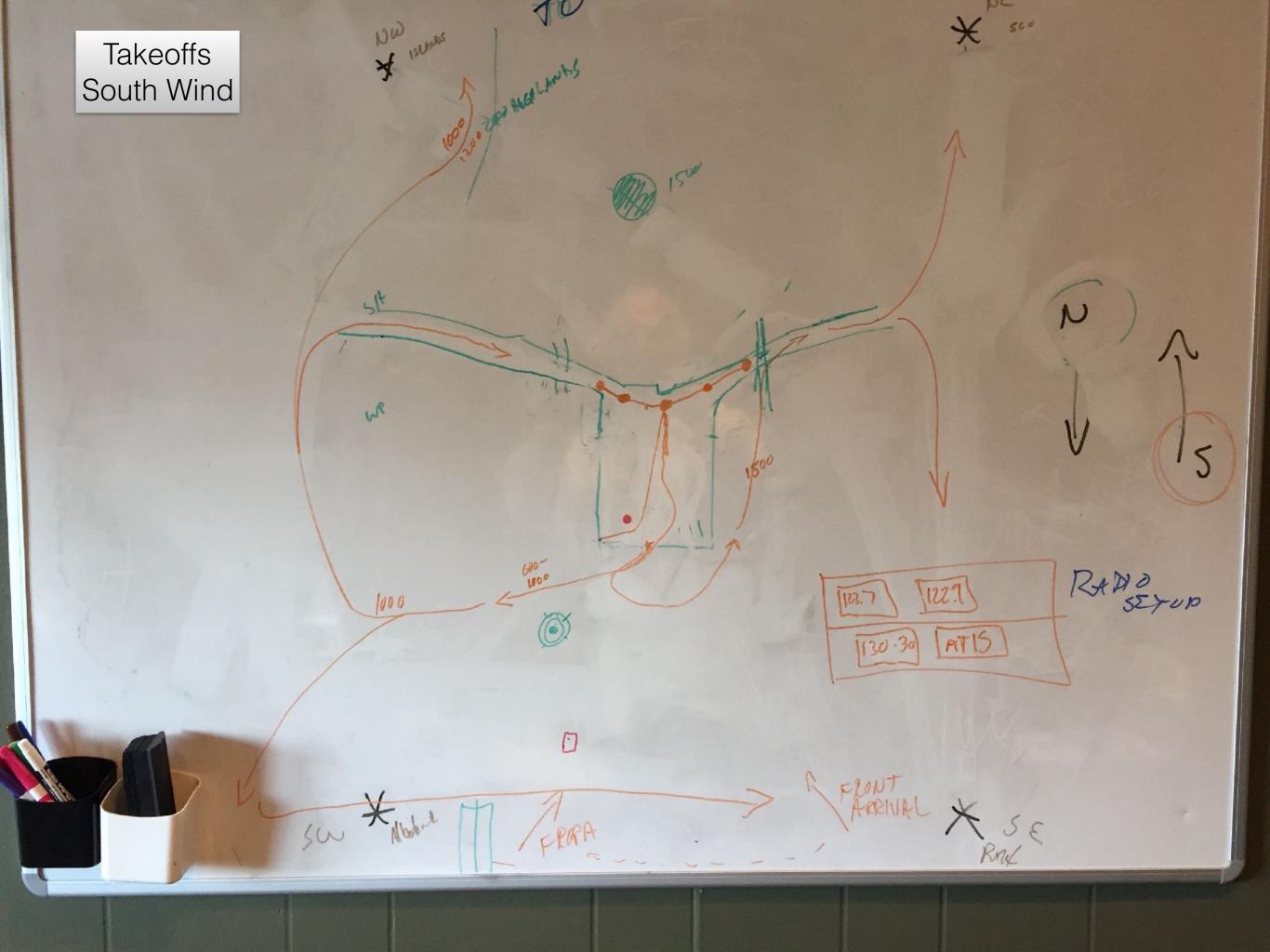
#### Lake Union Ops





TO \$ L N65 LINGS OF. A Isther THE HEAL ANDS 4000 1000 PLINE WR 1000 WP 1200 290 Z90 1500 0 1000' Landings North Wind A 1300/1500 was son X Modern





## Operations and Radios

### Popular PNW Seaplanes

















## Seaplane Sizing Chart

Seaplane Sizing Chart					
Plane	Float Length (ft)	Fuselage Length (ft)	Wing Span (ft)	Float / Fuselage	Float Type
Cessna 150	14	24	33	59%	Edo 1650A
Piper PA-18	16	23.9	35.3	67%	Edo 2000
Cessna 172	16	28	36	57%	Edo 2130
Maule M6	17	24	33.2	71%	Edo 2440
Cessna 206	19	30	36	63%	Edo 3430
Cessna 185	20	27	36	74%	Edo 2960
DHC-2 Beaver	23	31	48	74%	Edo 4930
DHC-3 Otter	31	42	58	74%	Wipline 8000
DHC-6 Twin Otter	31	51.75	65	60%	Wipline 13000

#### radio use

- 122.7 Kenmore (north of Sand Point)
- \* 122.9 Pretty much everywhere else (definitely Lake Union)
- \* 124.7 twr, 126.95 atis- Renton
- 118.3 twr-e, 120.6 twr-w Boeing
- \* 118.2 apch-w, 120.7 apch-e, 127.9 twr, 134.15 axis Whidbey
- 128.25 San Juan's (Island Radio)

Radio Calls - Examples

https://wspa.wildapricot.org/page-18047

https://skyvector.com

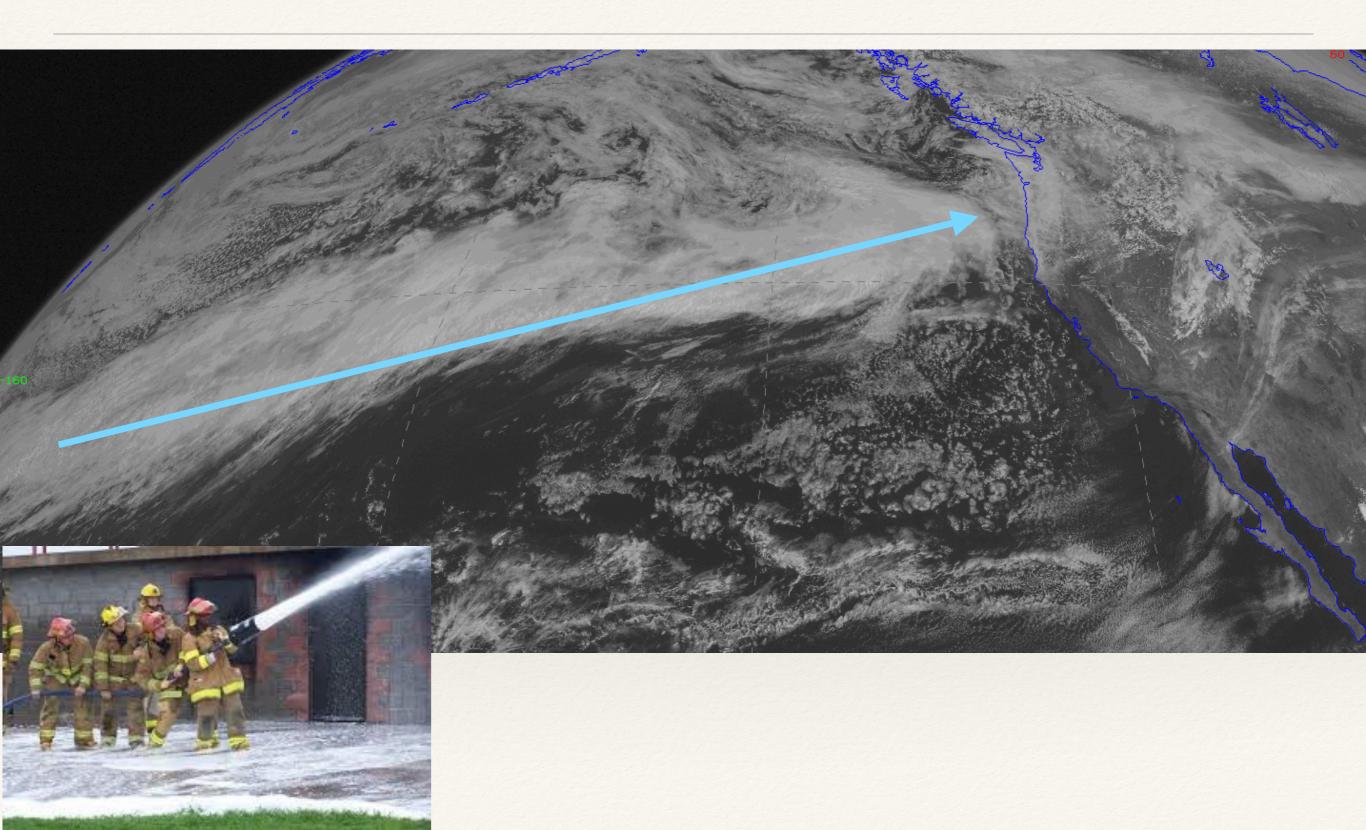
discuss common reporting locations

#### Weather

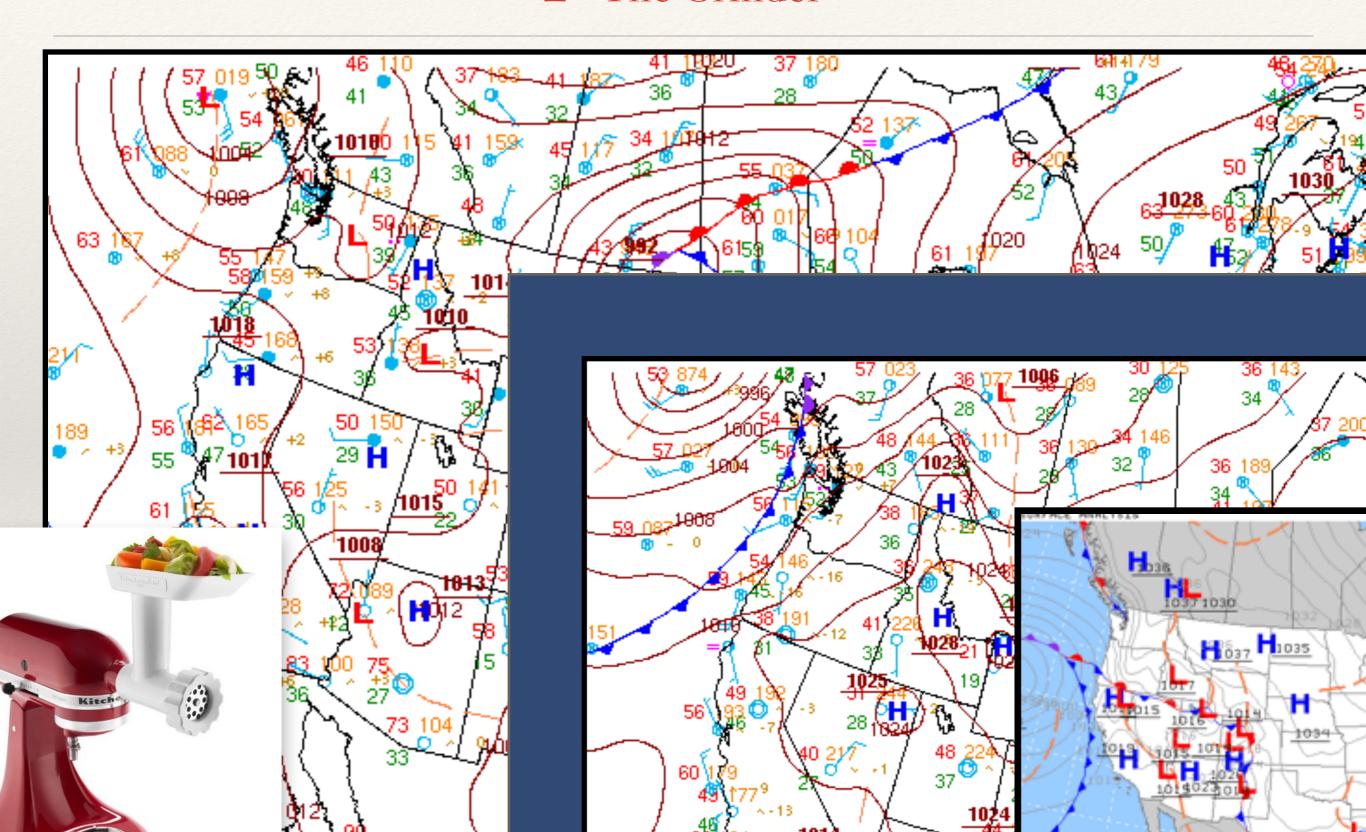
#### Weather For Seaplane Pilots

- \*Do an Out The Window (OTW) Forecast
- \*Never believe ATIS
- \*Rain is annoying but Wind Sucks
- \*Look at Winds Aloft
- \*Have an out

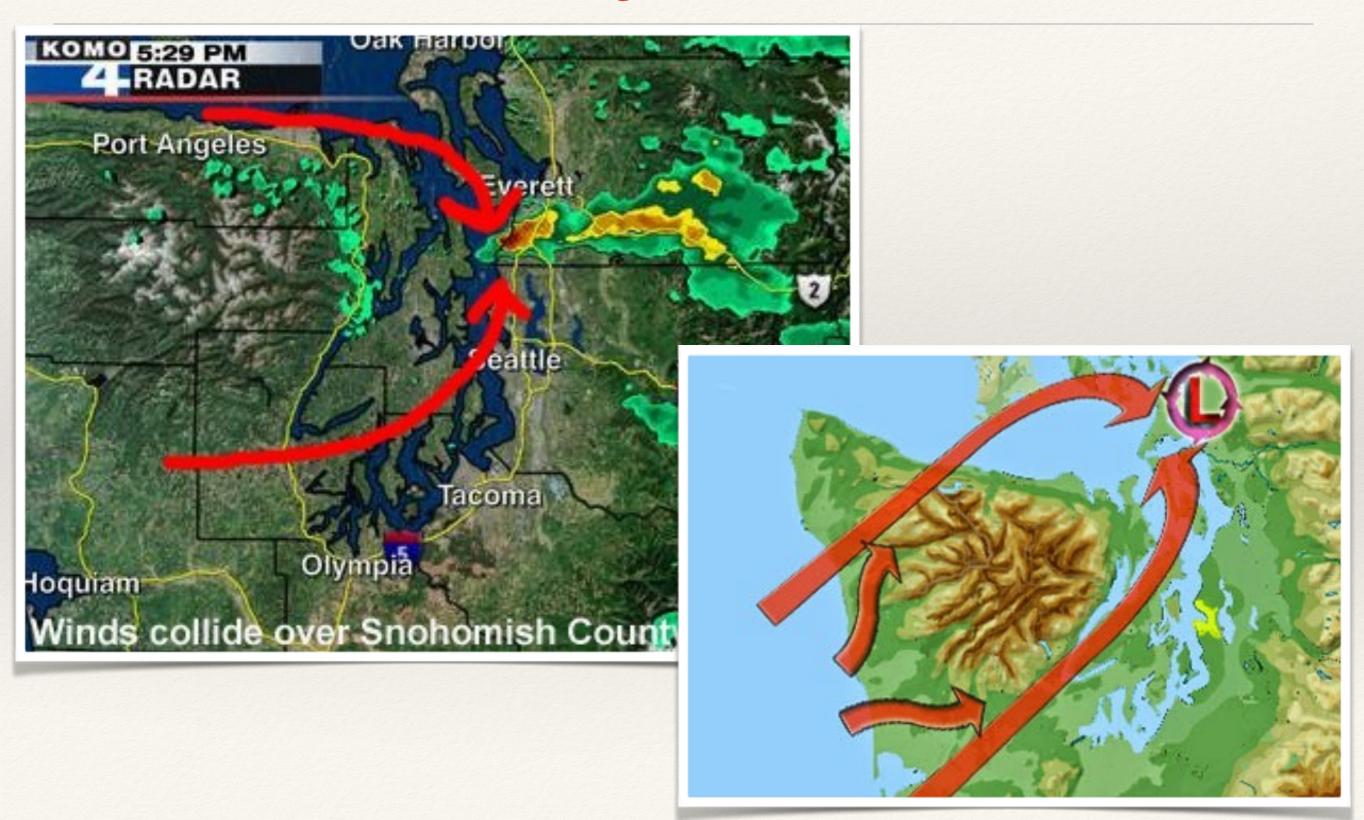
#### How WA Weather Works 1 - The Firehose



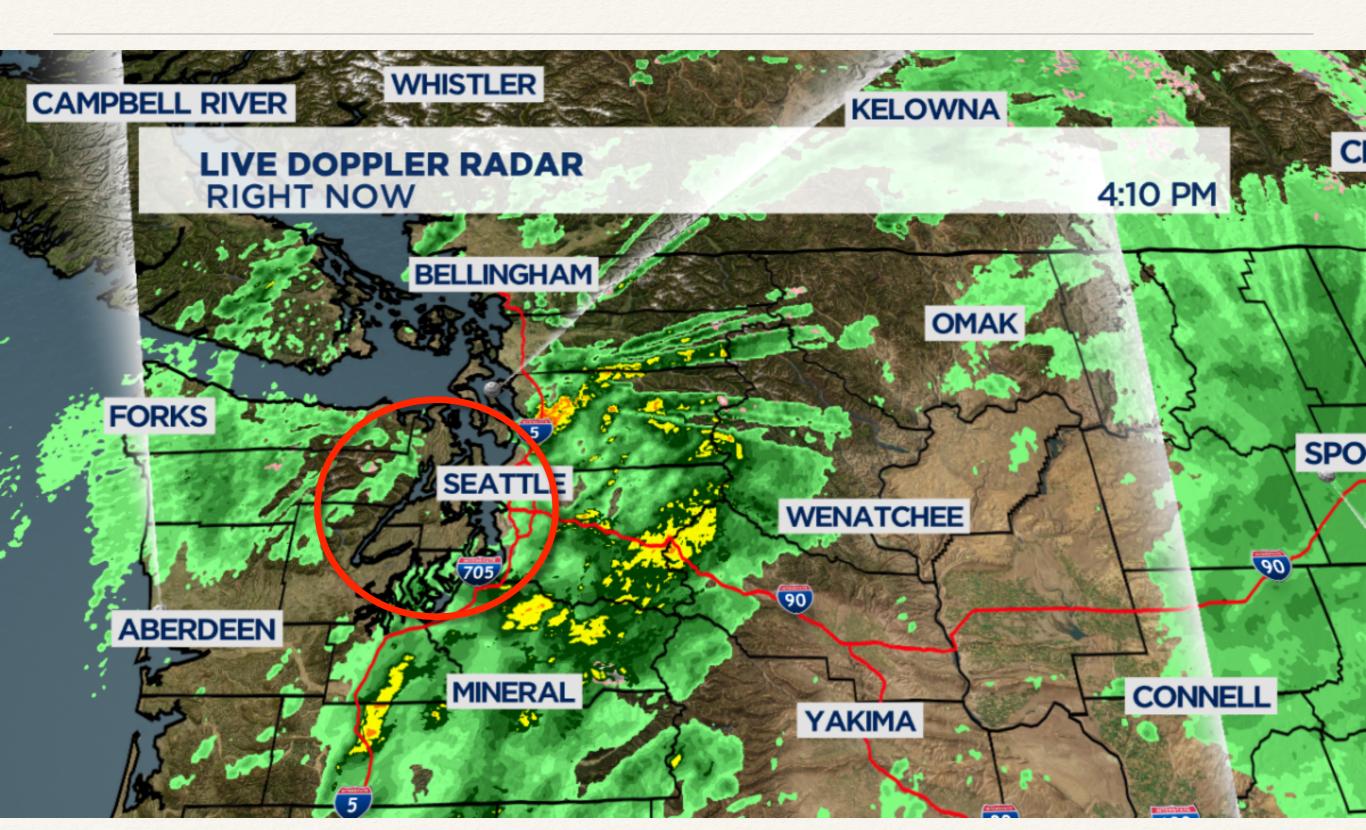
#### How WA Weather Works 2 - The Grinder



# How WA Weather Works 3 - The Convergence Zone, *The PSCZ*



#### How WA Weather Works 4 - The Rain Shadow



### Local Weather Patterns

- \* Weather is local
- \* It gets nice at 1PM. Just wait till 1PM
- \* Mornings are foggy. Go preflight
- It's foggier longer in the valleys to the south of Tacoma
- \* Big Wind and Rain comes from the SW. Look to the SW
- \* The Convergence Zone (PSCZ) is like a pincer. The grey blob moves around
- \* There actually is a rain shadow off The Olympics. It's like the inverse of the PSCZ.
- \* Winds aloft from the east mean it's going to be an unusual day. Go west
- \* High winds aloft means flying at ridge lines will be a rough ride. Watch out for downslope winds
- \* North wind is associated with sunny days and high pressure. South wind grey days and low pressure
- \* It gets nicer behind a cold front. If it sucks out this morning, it'll get better this afternoon.
- \* Grey muck usually indicates smooth dense cool airplane friendly air







Speed Bumps

## Preflight

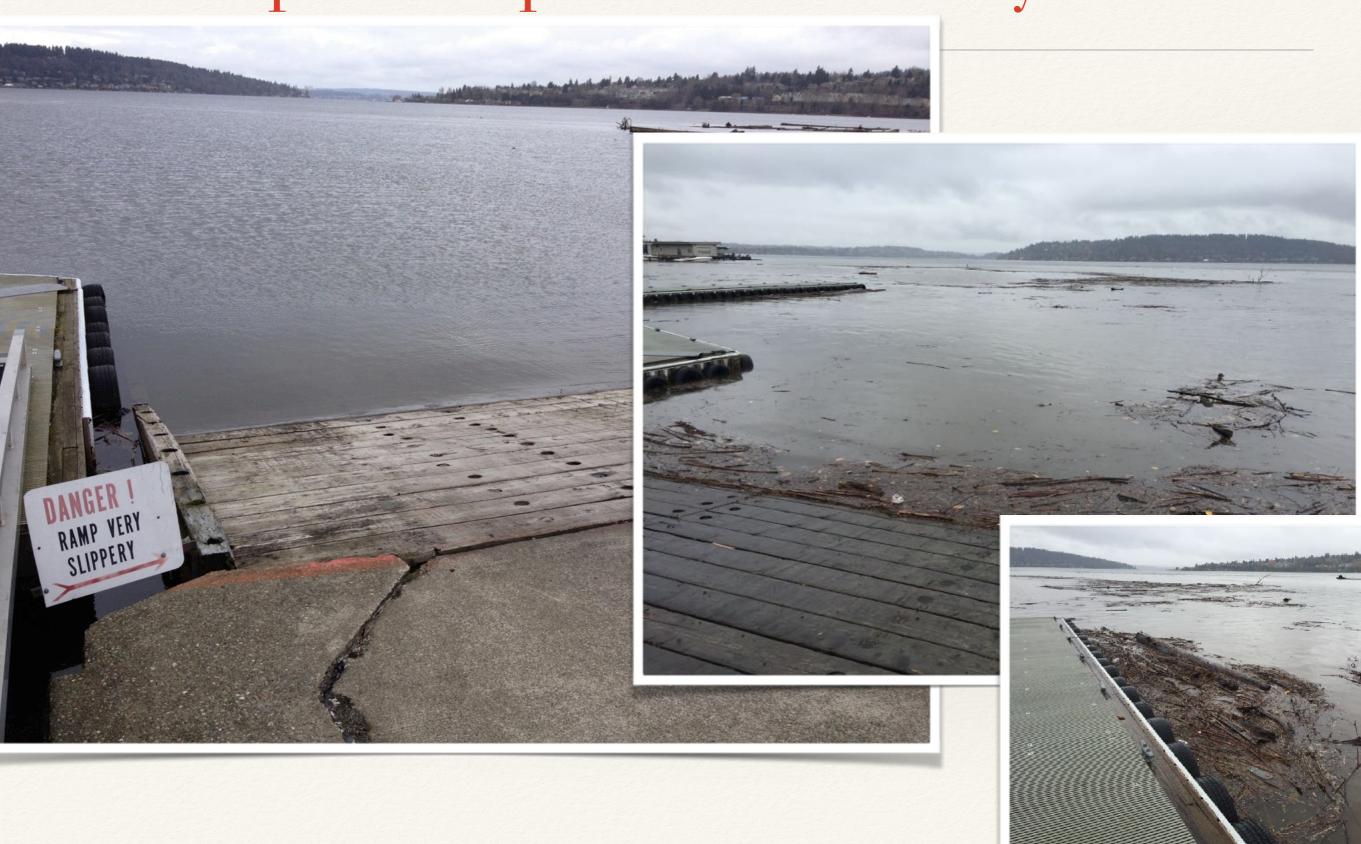
### Check the wind and water



North wind makes big water at south end of a lake on an otherwise nice day



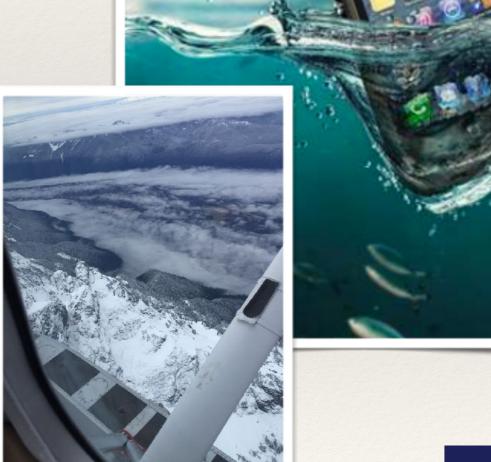
Clean up the ramp and dock before you launch



## Preflight your clothing

- \* Q: What's the worst thing that can happen to a seaplane pilot?
  - A: Your cellphone falls in the water
- Dress to minimize risk
  - \* Zipper & Velcro Pockets
  - Appropriate for camping overnight
  - Quick Drying, Warm
  - Close fitting. No bangles and dangles
- Bring extra clothes



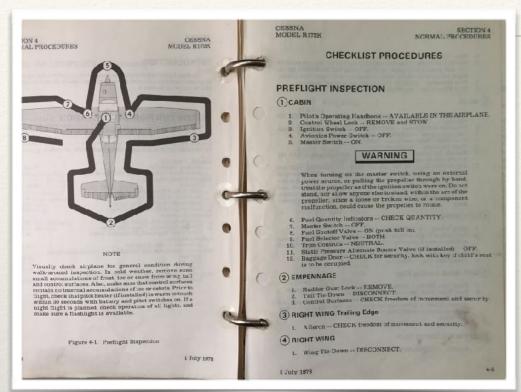








## Preflight the Plane



- \* When do you want to find out you have a checklist item failure?
- \* Do the POH Checklist then add your unique seaplane checklist items
- \* How much of this checklist do you want done before you cast off from the shoreline?

#### C172-XP Float Checklists

#### Pre-Flight

- POH Chapter Four
- Window Cover Stow
- Engine Plugs Stow
- Water Rudders Test
- Floats Inspect & Pump
- Vortex Gens Inspect
- Passengers Briefed

#### Engine Start

- Tach/Hobbs Record
- · Circuit Breakers Check
- Instruments As reg'd
- Fuel Both
- Cowl Flaps Open
- Trim Takeoff
- Mixture Rich / as req'd
- Prop/RPM Full
- Primer
  - o Cold as req'd
  - Hot None
- Master Switch- On
- Fuel Pump
  - Cold On till flow
  - Hot Off
- Key On
- Throttle Advance slowly
- RPM Set 800
- Oil Pressure Green

#### Runup

- Seatbelts fastened
- Doors close and lock
- Radios Set
- Transponder On
- ATIS Set DG, Altimeter
- Flight Controls Free and Correct
- Oil temp > 75 deg
- Lights As Required
- Throttle 1800 RPM
- Magnetos 175/50
- Propeller Cycle
- · Engine Insts. Check
- Ammeter Check
- · Suction Green
- Throttle Idle

#### Takeoff

- Area Clear
- Water Rudders Up
- Fuel Both
- Trim Takeoff
- Cowl Flaps Open
- Flaps 20 deg
- Mixture Rich
- Prop/RPM Full
- Throttle/MP Full
- All Inst Green

Takeoff - 1135' water / 1850' 50'

### Seaplanes have unique preflight actions

- \* Pump the floats
- \* Inspect floats for punctures, bends, dents and dings
- \* Check the structurally unique components
  - \* Float Attachment points, Spreader Bars and Brace Wires
  - \* Water Rudders, Cables, Springs and Pulleys, Transom
    - **Attach Points**
- Prop Water Spray Damage
- Corrosion and Blistering







If it's freezing you won't be able to pump and perhaps you shouldn't be flying a seaplane anyway

## Know your initial waterline



### At Home

- \* Weather
- **IMSAFE**
- \* At Home Checklist



- 1. Wallet, Credit Cards, Cash, and Drivers License
- 2. Pilots License and Medical Certificate
- 3. Charts (VFR, IFR, Approach, Departure, Runway)
- 4. Airport Facility Directory
- 5. Navigation Log, Flight Plan, and Weather Briefing
- 6. Headsets, batteries charged, spares
- 7. Kneeboard, Logbook, pens, pencils, and highlighters
- 8. Keys (Car, Airport, Airplane)
- 9. Portable GPS, batteries charged, spares
- 10. Handheld Radio, batteries charged, spares
- 11. Flashlights, Batteries charged, spares
- 12. Seat Cushion
- 13. Glasses, Sunglasses, Cleaner
- 14. Hat, Jacket, Gloves, Umbrella
- 15. Medicines and first aid kit
- 16. Cell Phone, charged
- 17. Watch



#### Observed at Seattle, WA

Light Rain, 45° F Wind South at 6 mph

UNDERGROUND Pressure 29,42 in

Click for weather forecast

#### **WA Weather**

#### Weather Briefing

- · Seattle Local Aviation Flight Conditions
- Seattle NWS Forecast Office
- Seattle Area Forecast Discussion
- Prog Charts Surface Analysis
- METARS & TAFS
- Winds Aloft NWS
- Winds Aloft Air Sports Net
- Convective Forecast
- PIREPS
- TFRS & NOTAMS
- PNW Ferry Weather
- Mt Rainier Forecast
- Hwy 520 Bridge Weather Ferry Weather Surface Wind for Puget Sound
- Tides NOAA
- UW Weather
- Cliff Mass WX Bolg
- INTELLICAST
- 1800WXBRIEF (Excellent Briefing Site)

#### Weather Imagery

- Seattle Wundermap
- PNW Accuweather
- East Pacific & PNW Accuweather
- Pacific Intellicast
- Jet Stream Intellicast
- World Map Intellicast Polar
- WindyTY Great Wind Visualization
- VAD Wind Profile

#### **Charts and Cameras**

#### Aeronautical Charts

SkyVector

WEATHER

- AIRNAV Airport Info
- FLTPLAN Airport Info

#### **Nautical Charts**

- NOAA Chart Viewer
- · Pacific Coast Charts

#### Web Cams

- Seaplane Cam Map
- UW Atmos Sci PNW Weather Cams
- KOMO News Weather Cams
- Space Needle Pano Cam
- Skunk Bay Weather Cam
- Dyes Inlet, Silverdale Cam NEW
- Edmonds Marina Cam
- Port Townsend Cam
- San Juan Island Cams
- Penn Cove Cam NEW
- Lake Chelan Cams NEW
- Vancouver Island Air Web Cams
- WSDOT Airport Cameras NEW

#### BC Weather

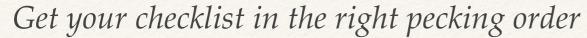
. BigWaveDave - Wind info from BC

### What should you do first at the seaplane base?

- A. Fuel the plane
- B. Look at the water
- C. Start the truck



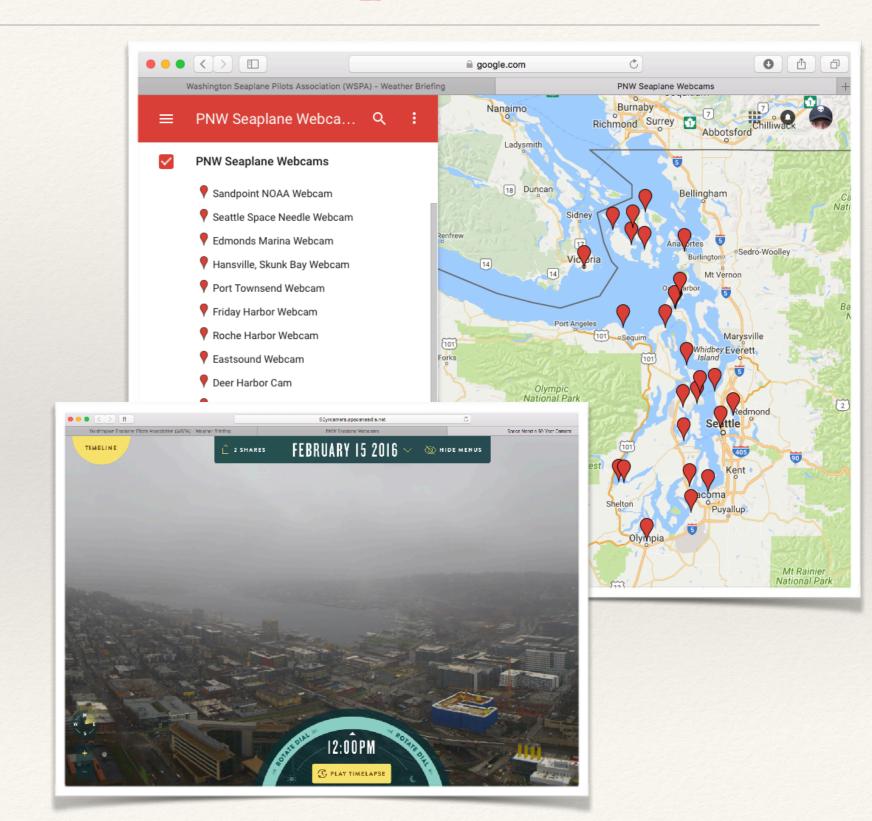


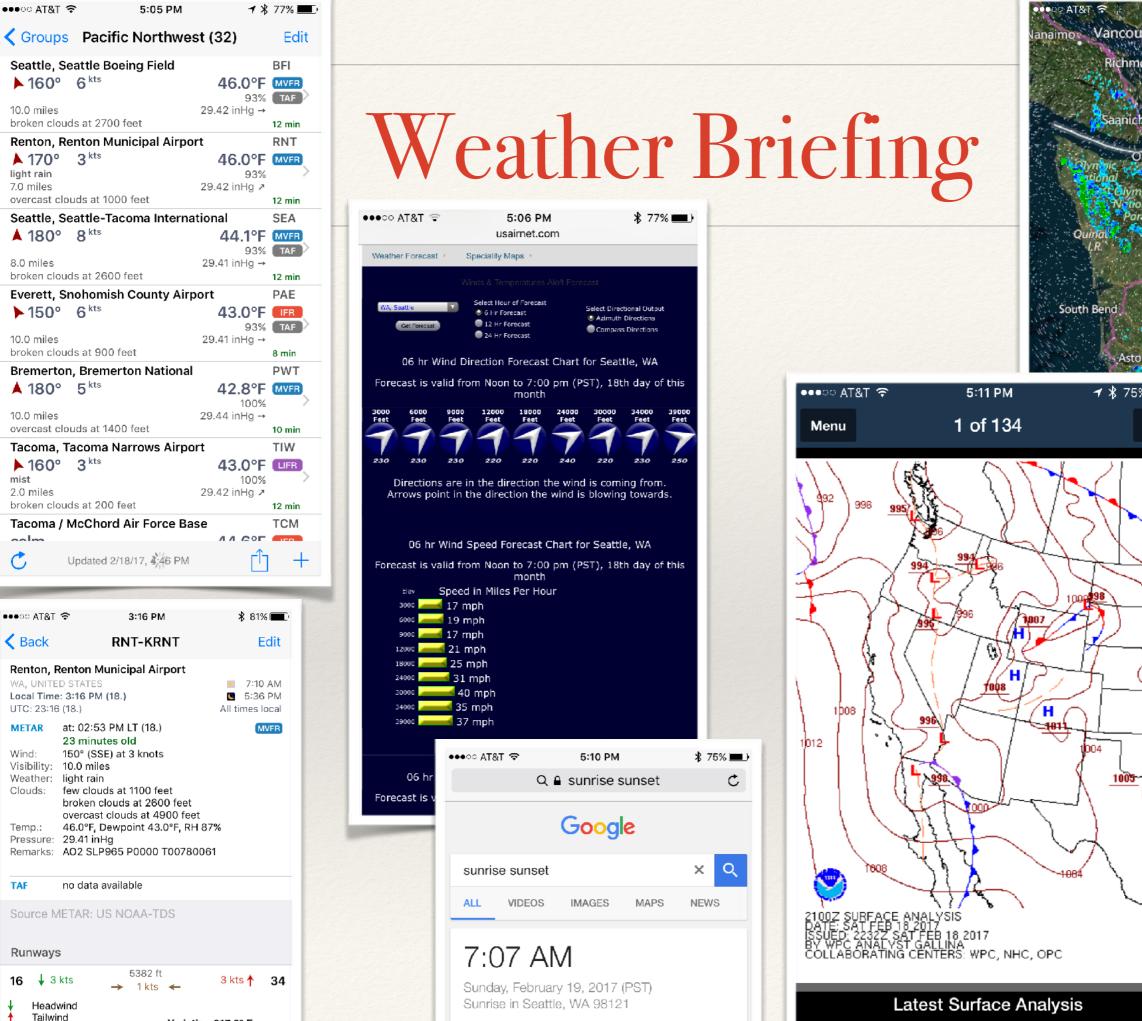




### Weather for Seaplanes

- \* Look Out the Window!
- Look at the Cameras
- Do a Proper Briefing
  - \* Brief for now
  - \* Brief for the trend
- Learn Local Patterns
- \* Never listen to ATIS 😉
  - \* look out the window!









# Ropes

### What happens when you let go of the rope?

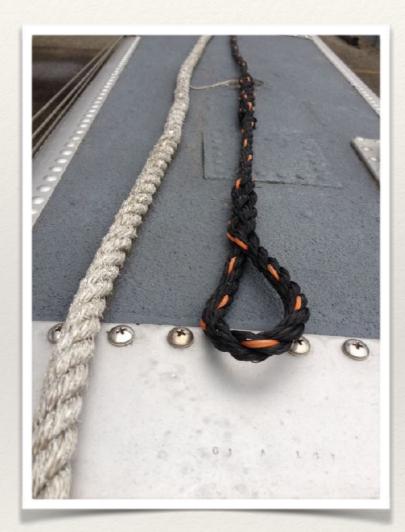
- \* Your seaplane is going somewhere
  - there are no brakes on your seaplane
  - \* it's a very fragile sailboat
  - \* it's nearly impossible to control without power
  - \* Do you know where?
  - \* Are you in control?



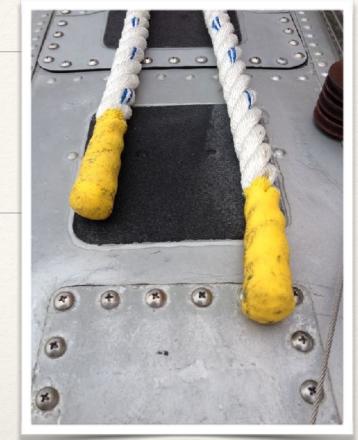
## check your ropes



Too long - interferes with cables and water rudder



Looped end - catches on things

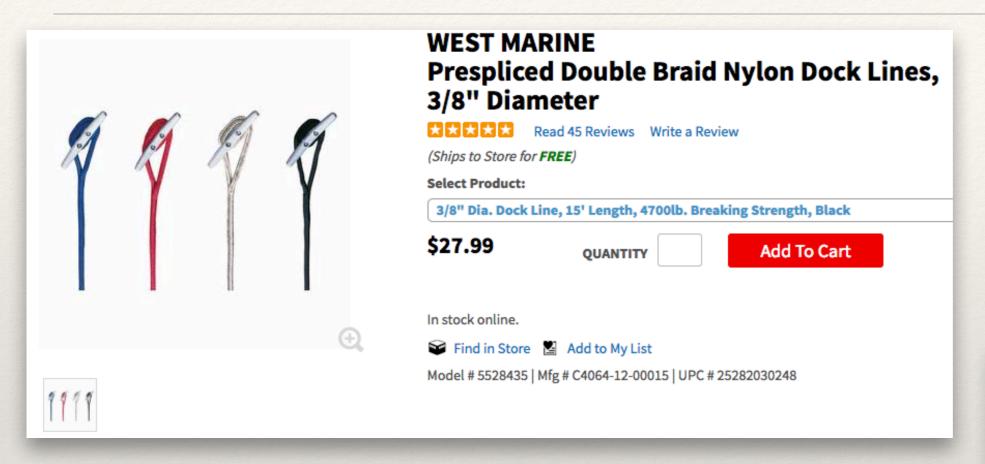


Nice ends

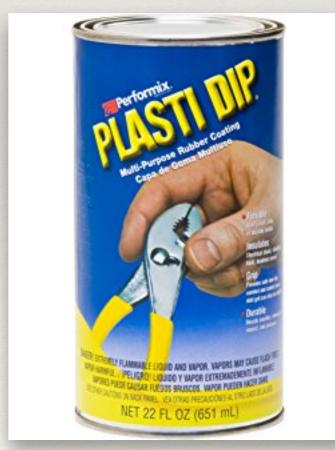


Perfect length

### ropes i like

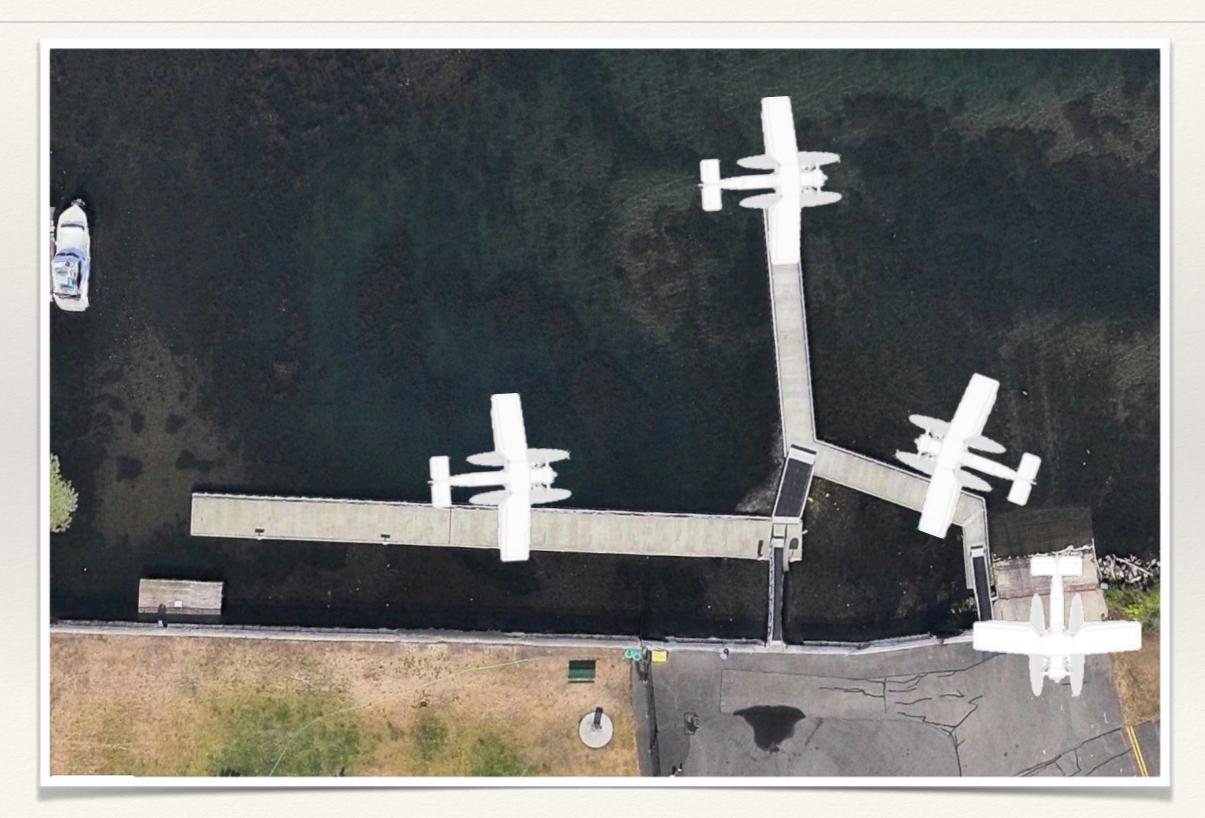


West Marine 3/8" Prespliced Double-Braid Nylon Dock Lines which come with a professionally spliced 12" eye and heat-sealed bitter end. Re-cut to length then melt the end and finish with Plasti-Dip.

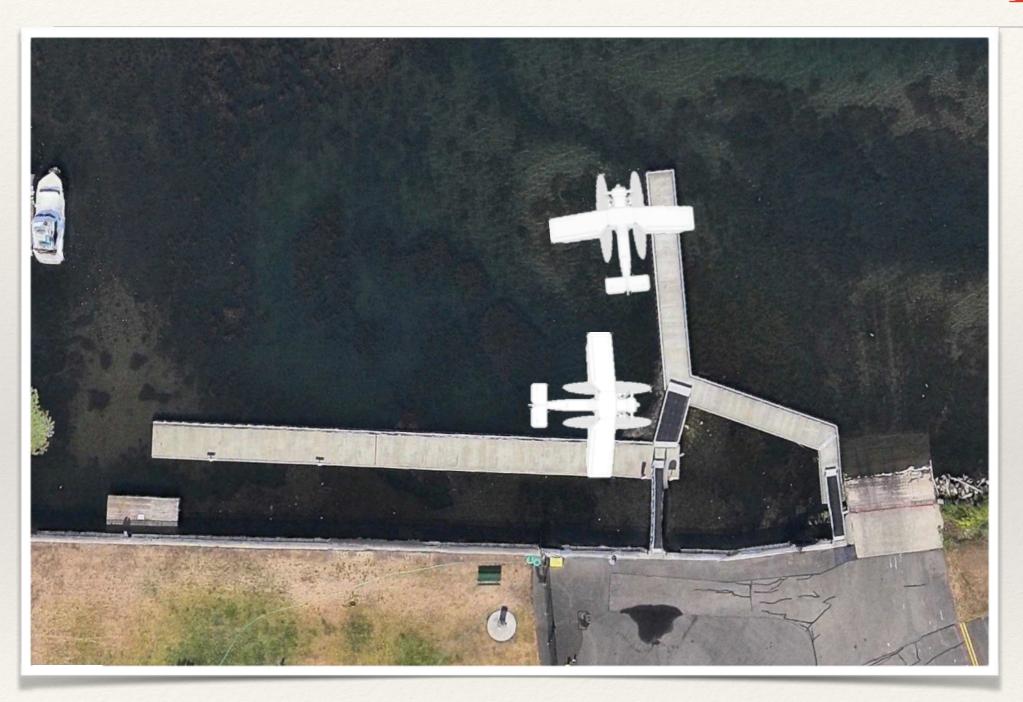


### The Dock

## Where will the next plane go?



### Leave room for the next plane



- \* Get on and off the dock quickly so others can use it
- \* Get your plane out of the way of the next plane
- Do not do student briefings on the ramp
- \* Do not fuel in the water

- Departing planes can access the ramp
- \* Arriving planes can use the dock

## Some dock procedures

- \* Put your mind in the next-planes head. Where will the next plane arriving or departing go?
- Avoid Seaplane Rush Hours
- Get on and off the dock and ramp quickly so others can use it
- Get your plane out of the way of the next plane
- Do not do student briefings on the ramp
- Do not fuel on the water (or the ramp)
- Time is money. Respect other the peoples time

- \* Think, Plan, Act
- \* If you are using manly brute force to move your plane, then you are doing something wrong.
- \* Don't ramp unless your launch truck is waiting for you.
- Don't solo launch over 5 Kt north wind.
- \* Think twice if waves are more than 1/2 float height.
- Be Helpful

### Arrival and Retrieval

- Think about where the next plane will go when you decide where to put yours
- Get out of the way of the next plane
- Drive carefully



\* The driver thought the float truck was a sports car. It cost the owner \$18,000. The plane was down for four months.

## Post Flight

## Post-flighting the plane

- Pump The Floats
- Check for Invasive Species
- Wash off the bugs
- Wash for an hour if you landed in Salt



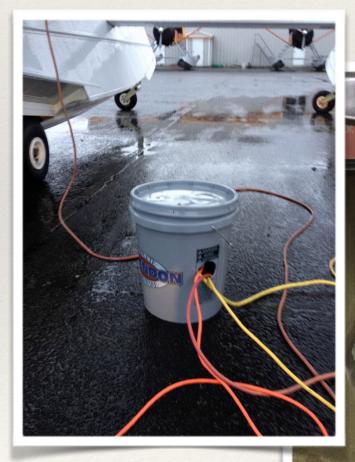


## Post-flight extras for wet planes

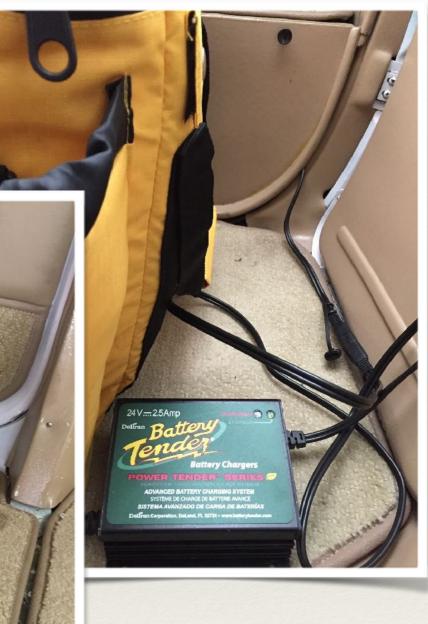
Battery Tender

\* Dry Z Air

\* Heater / Fan







## Safety and Responsible Operations

### Launch and Departure

- \* Q: Where are you most likely to get injured?
  - \* *A*: On the ramp or dock

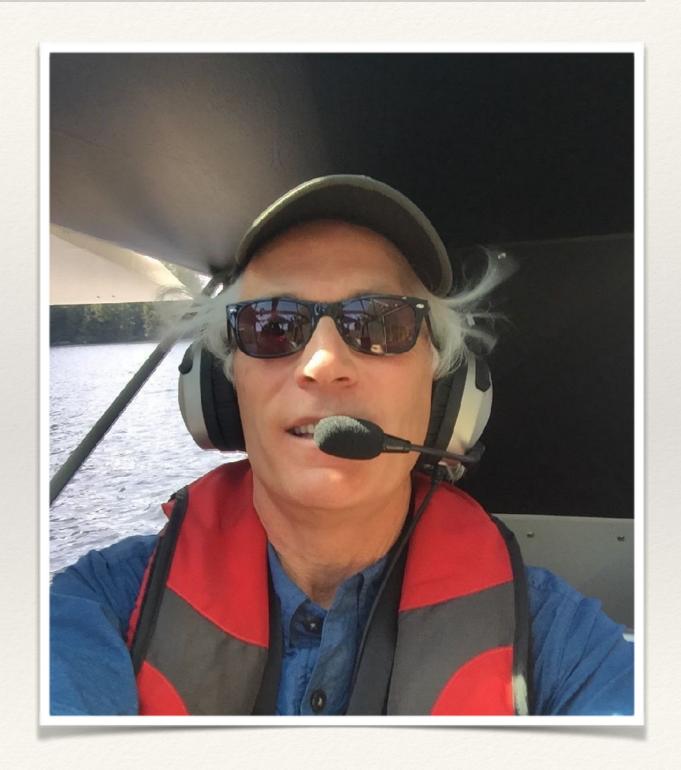






## A slide about life jackets (PFD's)

- \* This is yet another pilot never ending debate
  - \* "It may save your life"
  - \* "You'll never get out of the plane"
- \* Have them in the plane
- \* Do not wear auto-inflate PFD's



### Invasive Species

- Don't operate in Infested Waters
- Know if you are operating in ingested waters
- \* Inspect and clean your floats.
- \* Know who is concerned about invasive and be respectful and careful in their area.
  - \* Beware of Lake Whatcom
    - \* Local regulations "require" seaplane self reporting. See WSPA website for details.
- \* Obey local regulations.



#### Check the TFR's

#### Typical TFR's

- Stadium Events
- Air Shows
- Presidential
- Fire Fighting





### Wind Shear

Wind shear is a significant change in wind speed and/ or direction over a short distance

Terrain-induced wind shear is the leading cause of floatplane accidents in the Pacific Northwest/ Western Canada



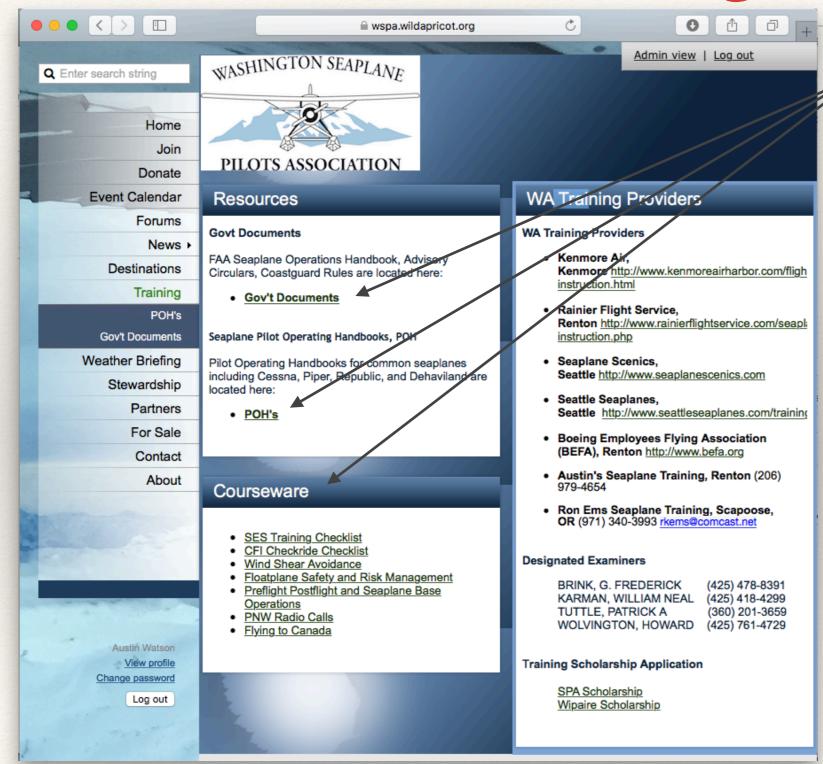


Wind Shear Avoidance Training

https://wspa.wildapricot.org/resources/Courseware/Wind%20Shear%20Avoidance.pdf

# Training

## WSPA Training Resources



You and your students should really go here. The is a lot of useful stuff here. More is coming.

### Training Checklist & Materials

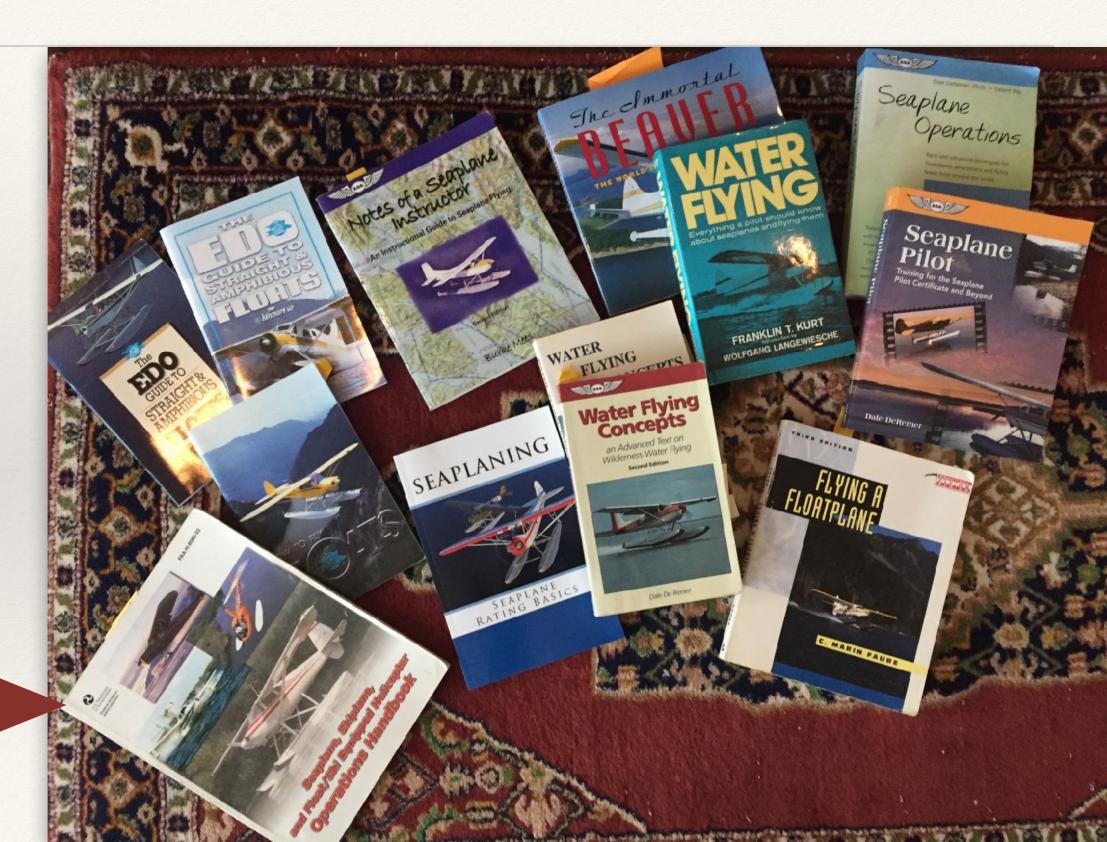
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	Date  Seemland Training Checklist		1		<u> </u>	<u> </u>	
-	Seaplane Training Checklist						
3	Normal Takeoff						
	Crosswind Takeoff						
	Glassy Water Takeoff						
5	Rough Water Takeoff						
7	Confined Area Takeoff						
3	Go Around						
)							
0	Normal Landing						
1	Crosswind Landing						
2	Glassy Water Landing						
3	Rough Water Landing						
4	Confined Area Landing						
5	Power Off Accuracy Landing						
6							
7	Normal Taxi						
8	Plow Taxi						
9	Step Taxi						
0	Momentum Turn						
1	Sailing						
2							
3	Docking						
4	Beaching						
5	Ramping						
6	Anchoring						
7	Mooring						
8							
9	Maneuvering During Slow Flight		T				
0	Mountain (Confined) Operations						
1	Emergency Procedures						
2							
3	Seaplane Base Operations		T				
4	Reading Wind and Water						
5	Seaplane Systems & Characteristics						
6	Regulations, 14 CFR 61, 91, AIM		1				
7	Performance & Limitations						
8	Preflight & Postflight		+				
9	FAA-H-8083-23 Familiarization		+	<del>                                     </del>			
0	POH Familiarization		+	<del>                                     </del>			
	r on r diffinition reactions						

This is the training task list from the Practical test Standards PTS.



FAA-H-8083-23

### More Books



get this one

## Recommendations & Regulations



### Advisory Circular

Subject: Scaplane Bases Date: 8/6/2013 AC No.: 150/5395-1A Initiated by: AAS-100 Change:

- Purpose. This advisory circular (AC) provides guidance to assist operators in planning, designing, and constructing seaplane bases and associated facilities.
- 2. Application. The FAA recommends the standards and recommendations in this AC for use in the design of civil seaplane bases. In general, use of this AC is not mandatory. Use of this AC is mandatory for all projects funded with federal grant monies through the Airport Improvement Program (AIP) and/or with revenue from the Passenger Facility Charges (PFC) Program. See Grant Assurance No. 34, Policies, Standards, and Specifications, and PFC Assurance No. 9, Standards and Specifications.

#### AIM 7-5-8 Seaplane Safety

- 1. Vigilance Boats, People, Power lines . . .
- 2. Right-of-Way USCG Rules covered by 91.115
- 3. Jurisdiction USDA, Forest Svc, Indians, State Park, Canadian Parks
- 4. Survival Gear reachable & floatable container
- 5. Floatation Gear See 91.205(b)12 / Recommended but not required
- 6. Advisory Circulars AC91-69 Seaplane Safety

#### FAR 91.115 Right-of-Way Rules: Water Operations.

- a. Keep clear of all others
- b. Crossing AC to right has right of way
- c. Approaching alter course to right
- d. Overtaking AC in front has right of way
- e. Risking Collision proceed with careful regard

#### FAR 91.119 Minimum Safe Altitudes.

- a. allow emergency landing
- b. congested area 1000 feet above obstacle within 2000 feet
- c. non-congested area 500 feet above obstacle within 500 feet

#### FAR 91.137 Temporary Flight Restrictions in the vicinity of disaster/hazard areas.

Check NOTAM system

#### FAR 91.155 Basic VFR Weather Minimums.



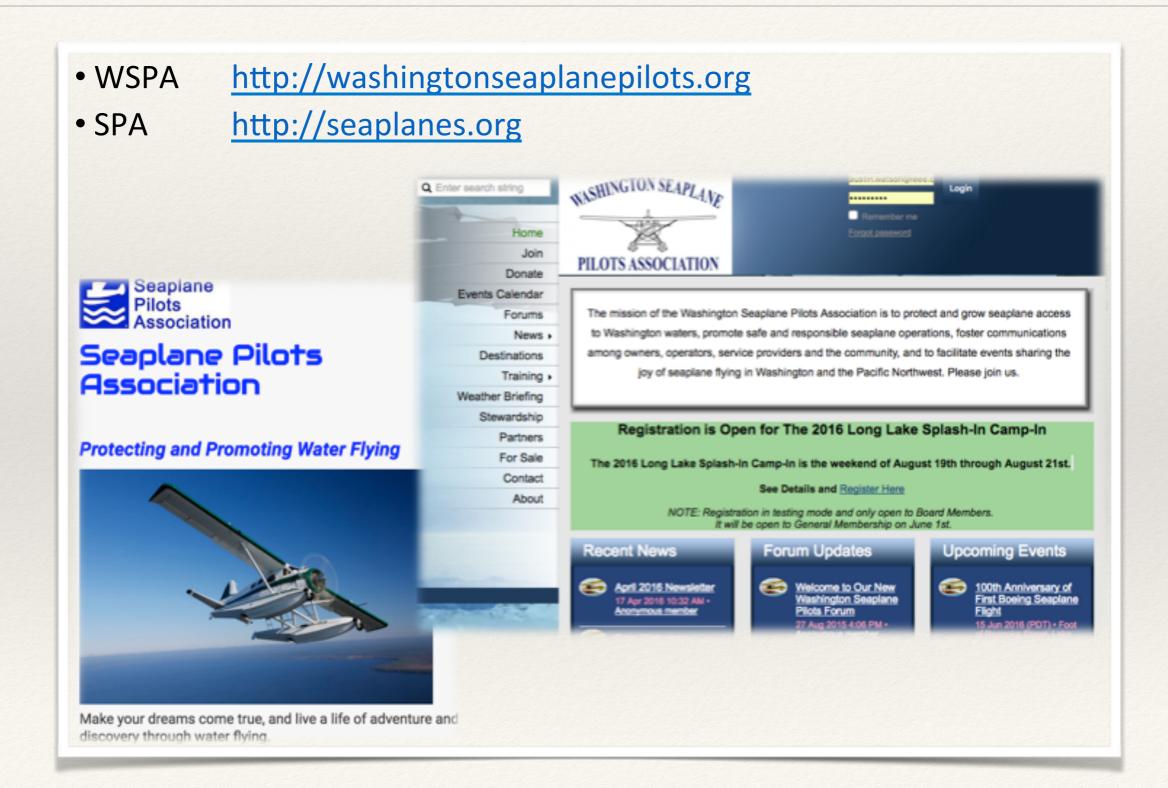
Class G – Day – Visibility One mile and Clear of Clouds

FAR 91.205 Powered civil aircraft with standard category U.S. airworthiness certificates: Instruments and Equipment requirements.

b. VFR, (12) PFD required if for hire and beyond safe gliding distance from shore

### WSPA / SPA Resources

#### Use All Available Resources



### WSPA initiatives

- Grants for Webcams
- Grants for proper docks
- Opening Seward Park beach to training
- Opening Magnuson Park ramp for off season splash in
- NWAC Seminars
- FAAST Seminars
- Fish Stocking at Isabel
- Isabel Cleanup 2.0
- Outhouse Installation at Isabel
- Lake Chelan SPB reopening
- Kirkland Scenics support
- Whatcom Invasives monitoring
- Lost Seaplane Base Initiative

- May 13-15 Poulsbo Splash in
- Aug 20 Oregon Eclipse Splash in
- Sep 8-10 Priest Lake Splash In

### END