HEFS workshop, 03/12/2015

Seminar F: update on ensemble products, and discussion

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1. Overview and status of HEFS products

Overview and status of products

HEFS Products Team

- Ernie Wells (HSD), Donna Page (OHD)
- Paul Miller (CBRFC), Mike Moneypenny (WFO, Raleigh), Wendy Pearson (Central Region), Greg Shelton (WGRFC), Dave Streubel (APRFC)

Team Charter Deliverables

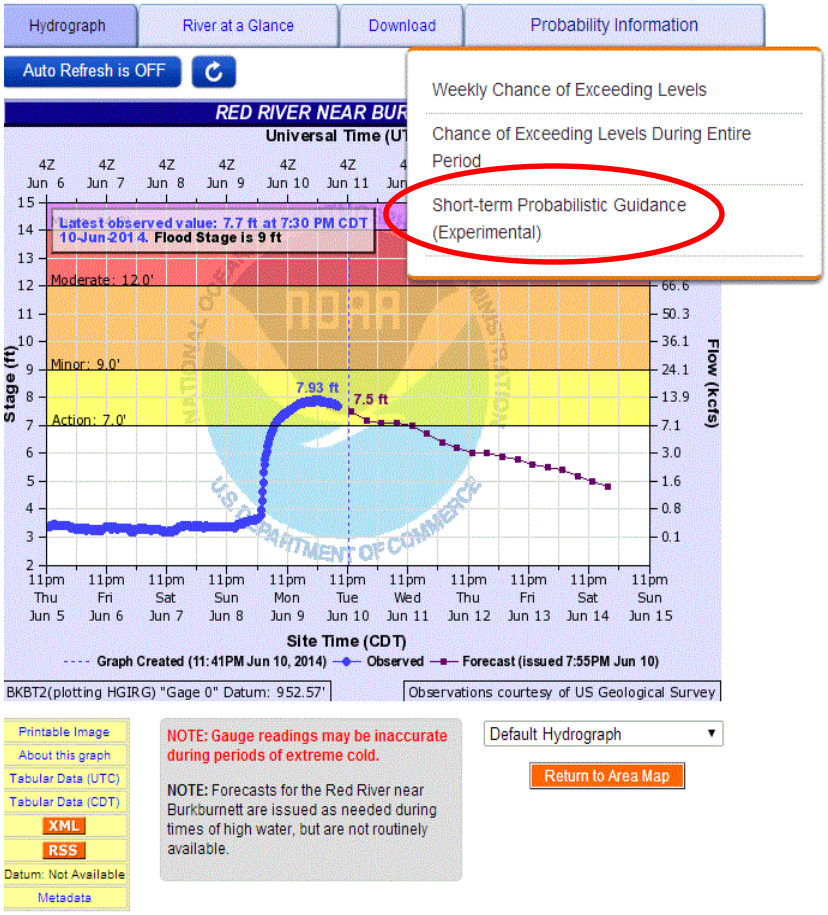
- Requirements and design for an initial experimental short-range probabilistic product for AHPS
- Requirements for a standard suite of short to long-range HEFS products and information

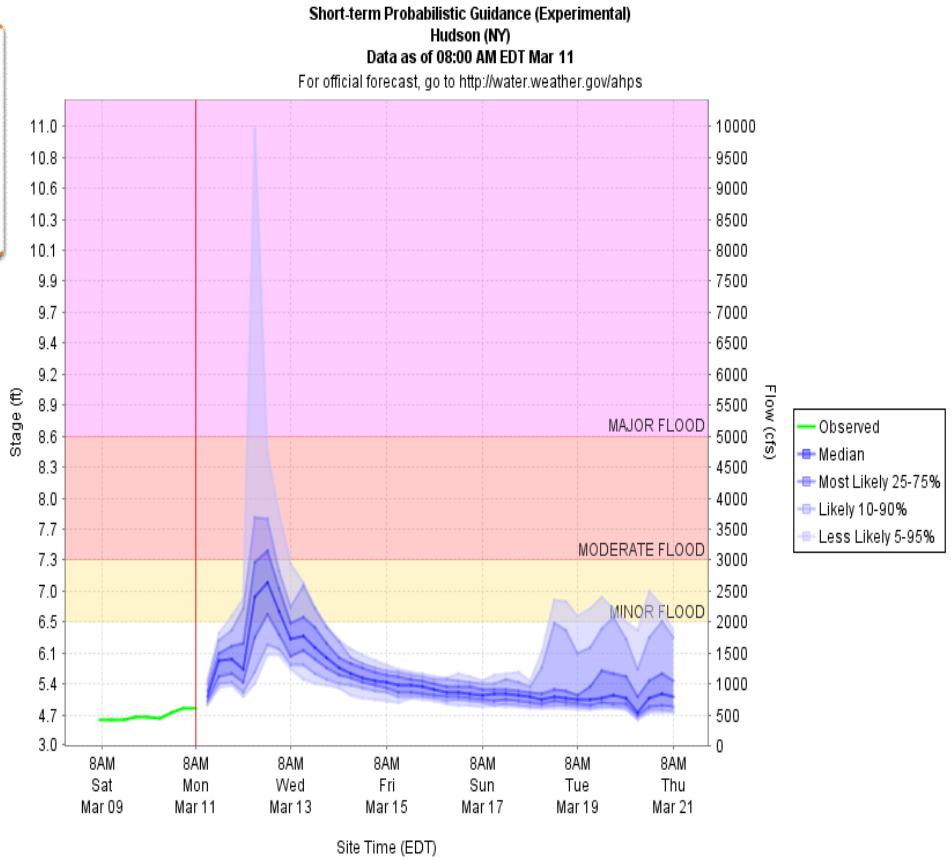
Completed actions

- Developed AHPS menus for probabilistic products
- Developed and tested controls for AHPS displays
- Finalized GraphGen templates for AHPS products, including the short-range probabilistic product
- Established standards for product filenames and implemented the rsync process (RFC to NIDS)
- Tested end-to-end process at ABRFC and CBRFC (i.e. generate product > rsyc > display on AHPS)
- Drafted a Product Description Document (PDD) for the new short-range probabilistic product

Short-range probabilistic product

AHPS menu and short-range product





Ongoing and future actions

- Streamline process for RFCs to set-up and generate new short-range probabilistic product with GraphGen
- Approve PDD and issue Public Information Statement (PNS) for new short-range probabilistic product
- Collect user/partner feedback on new short-range probabilistic product
- Define/refine validation products for screening HEFS forecasts prior to their public distribution (more later)
- Establish process to gather (from RFCs and others) the needs of stakeholders for new products/services

2. Products to screen forecast quality

Requirements

Verification has different purposes

- Support administration, monitoring, and reporting
- Support diagnostics and improvement by developers
- Querying archived quality information in real-time
- Screen forecast quality prior to “go live” at new sites

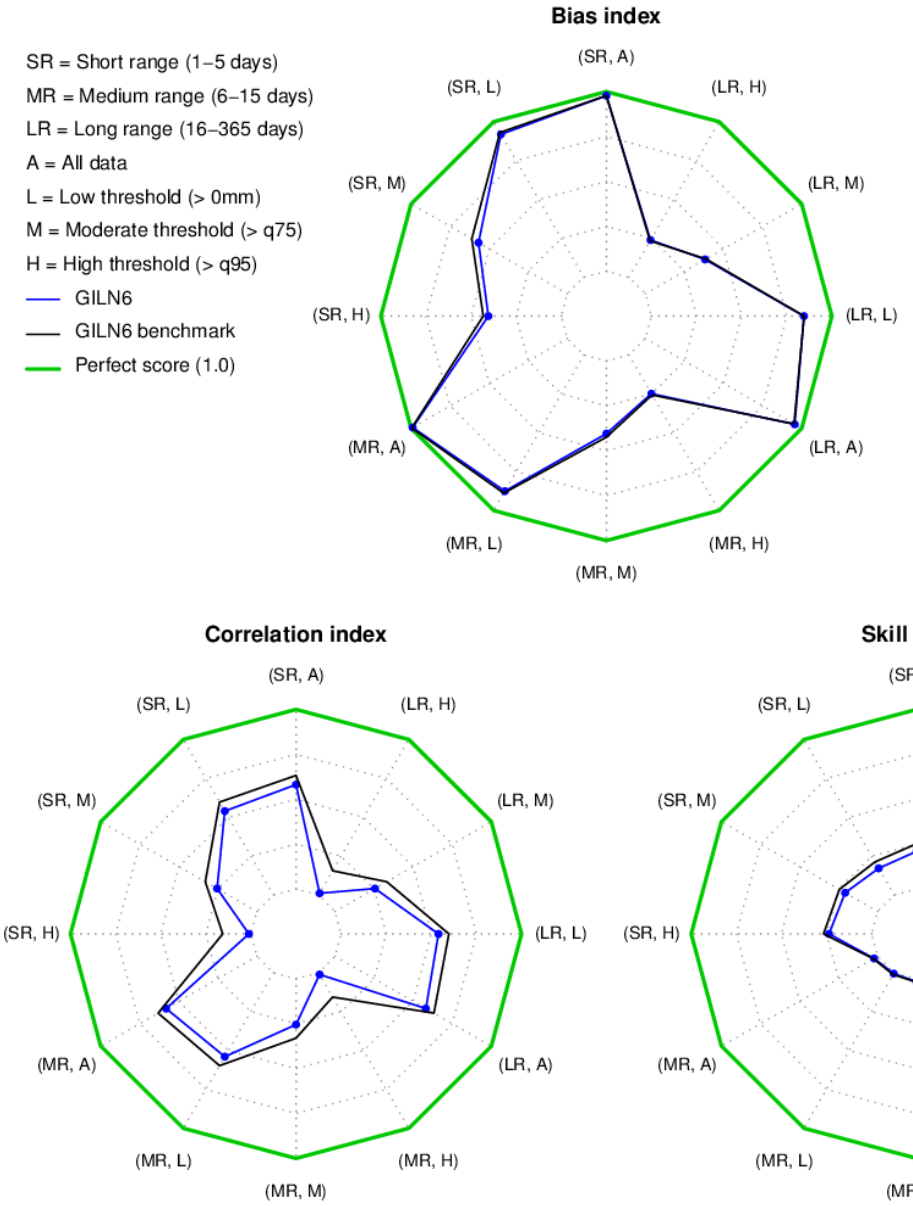
First step: screen quality at new sites

1. Ensure that quality is “reasonable” and comparable to similar (established) locations or benchmarks
2. Identify any extremes/outliers in individual forecasts that may point to issues (akin to quality control)

Verification dashboard

MEFP precip. at GILN6

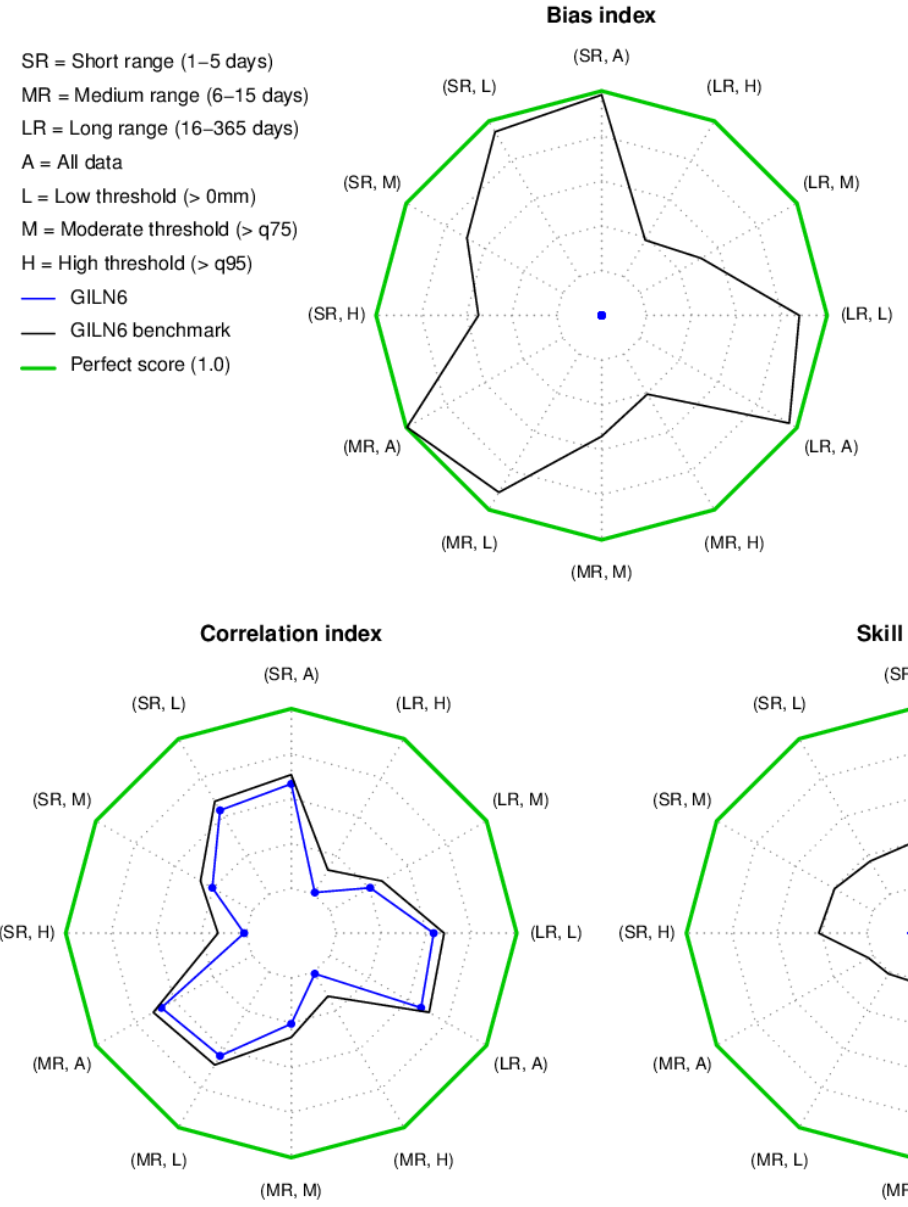
- Forecast quality for three dimensions (**bias**, **correlation** and **skill**)
- For each dimension, split into **time horizon** (short, medium, long) and **category** (all data, low, moderate, high)
- All configurable (e.g. SR = 1-3 or 1-5 days)
- Perfect score when polygon (blue) falls on outer margin (green)
- Benchmark (black line)



Example of problem via dashboard

MEFP precip. at GILN6

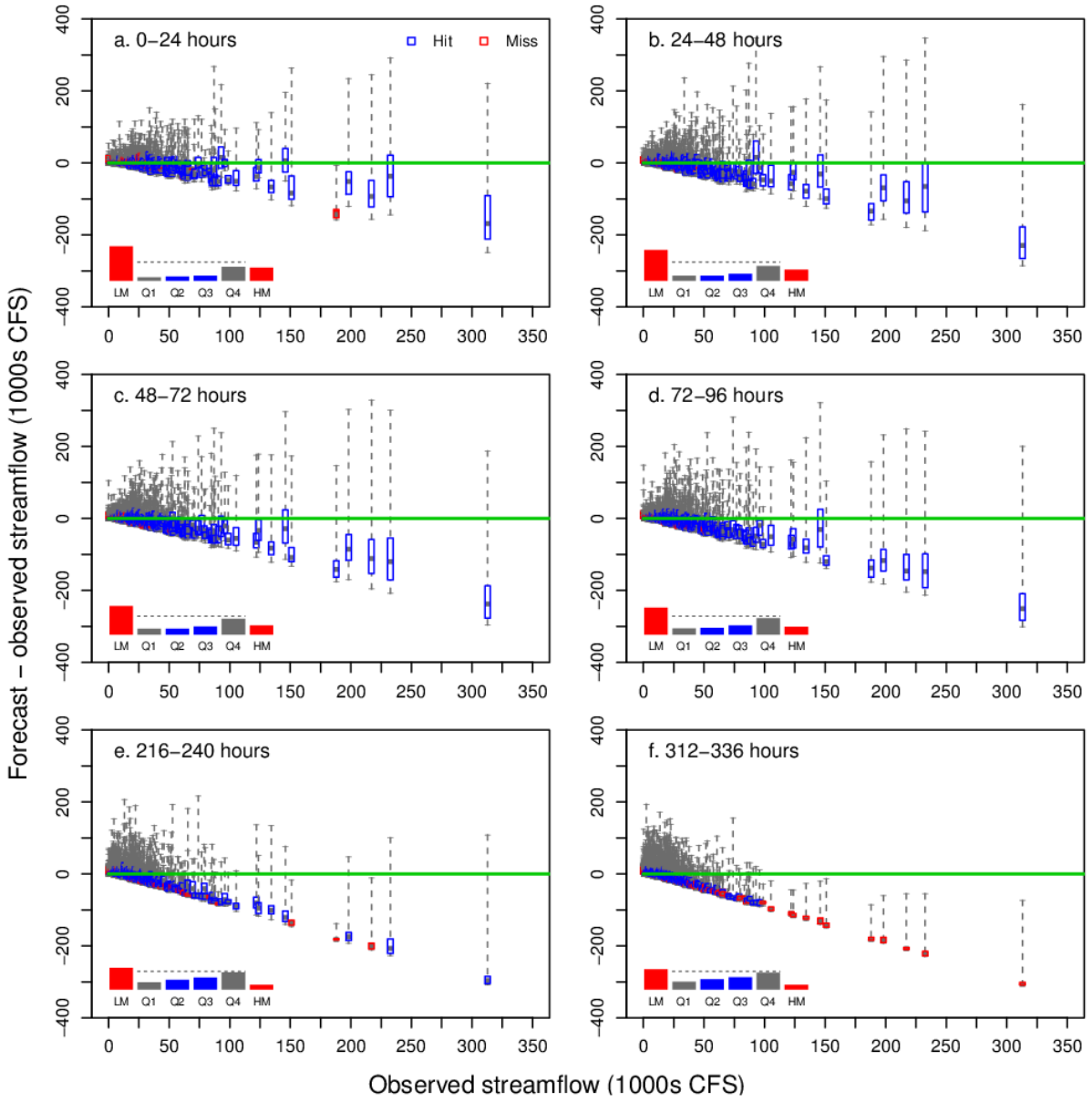
- Example of a problem highlighted through the dashboard
- Typically, a problem will appear as a discrepancy between current basin and benchmark for one or more measures
- Large bias and low skill (skill depends on bias), but good correlation
- Reflects a unit problem (MM vs. INCH)



Verification box plots

Biases and outliers

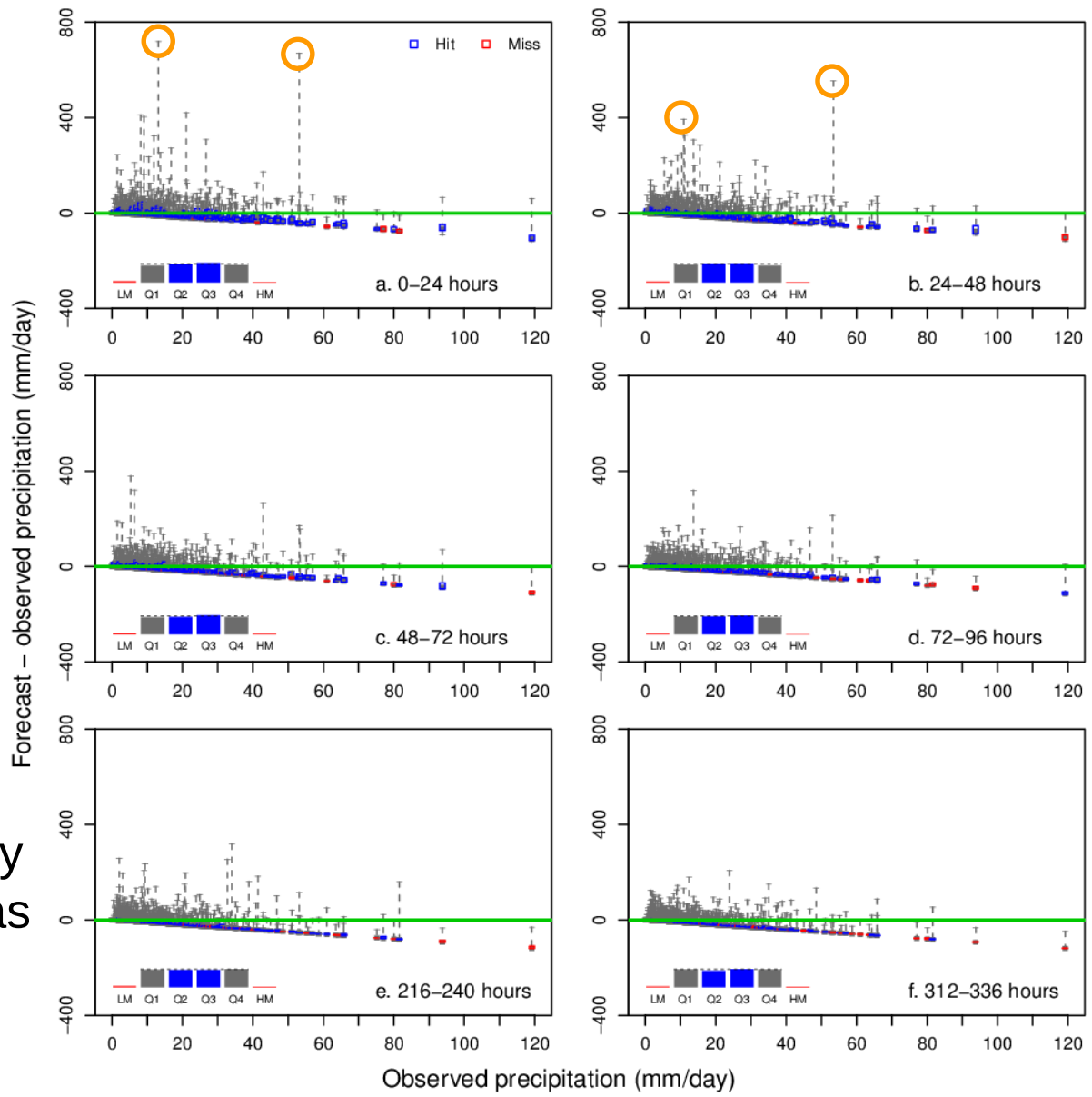
- Drills down to look at individual forecasts (flow @ ORDC1)
- Places emphasis on large events and identifying blown forecasts (“misses”)
- Inset shows fraction of obs. in each forecast quartile (**reliability**)
- Easily configurable and could be interactive (e.g. open in application to zoom etc.)



Example of problem via box plots

Unrealistic values

- MEFP precipitation forecasts at CBNK1 with WPC forcing inputs
- Forecasts are reliable (see inset). Thus, **would not necessarily see a problem in statistics**
- However, the largest ensemble member is frequently unrealistic (600+mm in one day)
- Missing obs. inadvertently filled with legacy export as “runIndependent=true”



Next steps for verification products

Small team on verification products

- Small team needed to pilot verification product ideas
- Identify/refine an initial suite of products
- Implement in EVS (initially), but eventually GraphGen
- Develop examples or “signatures” of common problems for each product (to assist with training)
- Scope centralized hindcasting and verification to generate these products nationwide, which could include a mechanism to flag “suspect” locations

3. Questions and discussion