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FAA
Flight Standards Assessment

Workshop for the Preliminary Staff Assessment Carlsbad Energy Center Project (07-AFC-6)

January 8, 2009

FAA Western-Pacific Region
Flight Standards Division
Los Angeles, CA

Aviation Safety Inspector

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Industrial Plumes

- Federal Aviation Regulation 14 CFR part 77 considers only the physical structure of a power plant for airspace case studies.

- No statutory authority to study exhaust plumes or declare as a hazard to navigation

Safety Risk Analysis

- FAA 2006 Safety Risk Analysis (SRA) of industrial plumes
- 30 year review: no accidents or incidents could be attributed to overflight of an industrial plume
- SRA assessed risk @ $1X10^{-9}$
- Target Level of Safety of $1X10^{-7}$

SRA Recommendation

- In spite of low level of risk, overflight of an industrial plume is not without risk.
- Pilots should avoid overflight of an industrial plume at altitudes <1000 feet above the plume source.

Encina Location

- Site elevation: 65 feet (rounded to 100 feet)
- Assumed stack height: 100 feet
- SRA recommendation: avoid <1000 feet above source
- Height to avoid:
  - 100 + 100 + 1000 = 1200 feet
- Arrivals/departures typically > 1200 feet over Encina

Business Park Locations

- Average site elevations: 472 feet (500)
- Assumed stack height: 100 feet
- SRA recommendation: avoid <1000 feet above source
- Height to avoid:
  - 500+100+1000 = 1600 feet
- Palomar traffic pattern altitude: 1500 feet

Plume Mitigations

- "See and avoid" is an acceptable mitigation
  - When there is sufficient time for pilots to locate the source on the ground, and
  - There is sufficient airspace to climb or maneuver to avoid overflight < 1000 feet.

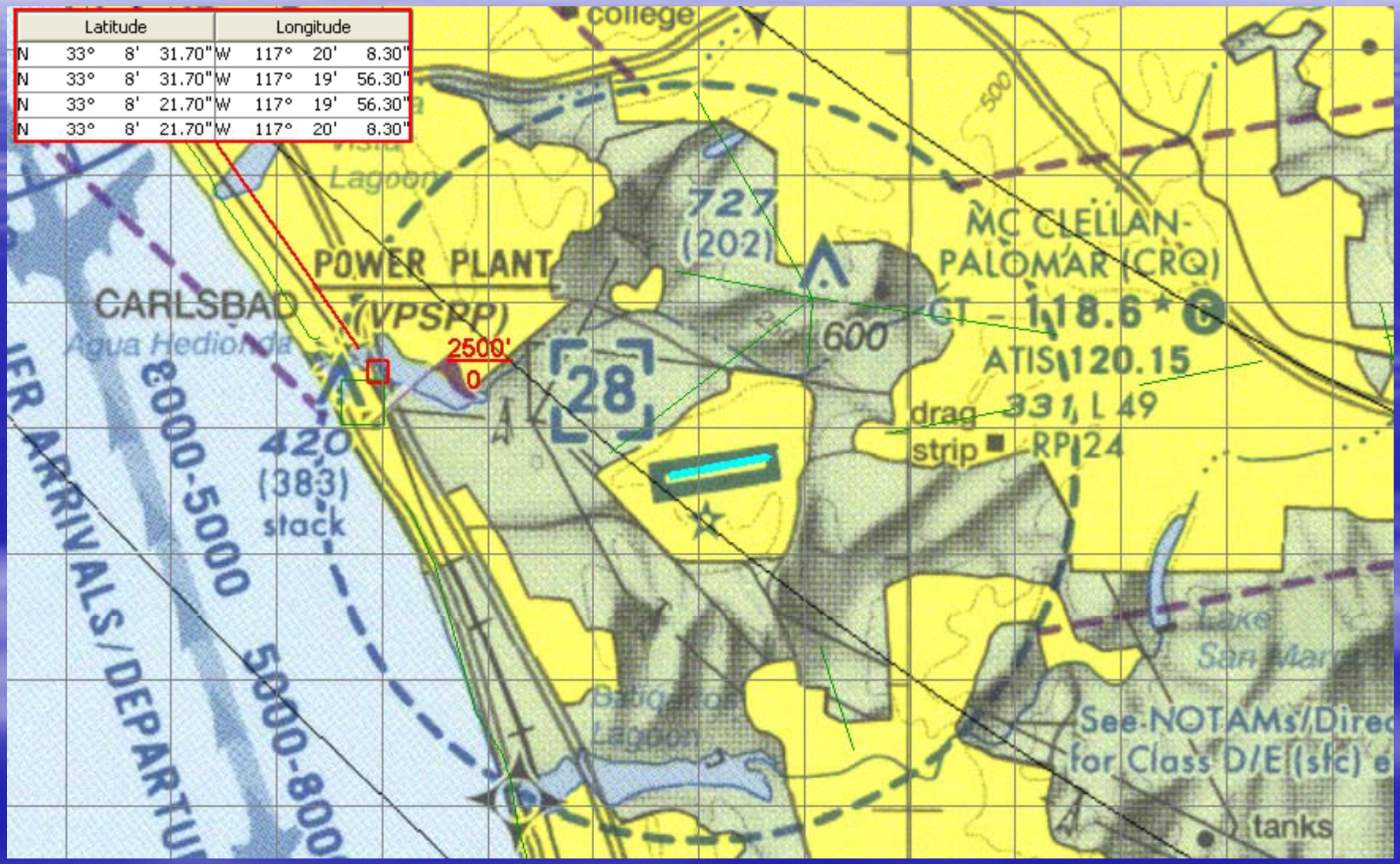
- "See and avoid" is not reasonable nor feasible for pilots in an airport traffic pattern.

Mitigation Requirements

- Proponent/airport publish pilot education materials
  - Location of plume
  - Recommended procedures to avoid
- Airport Facilities Directory note
- Notice to Airmen
- Automated Terminal Information Service

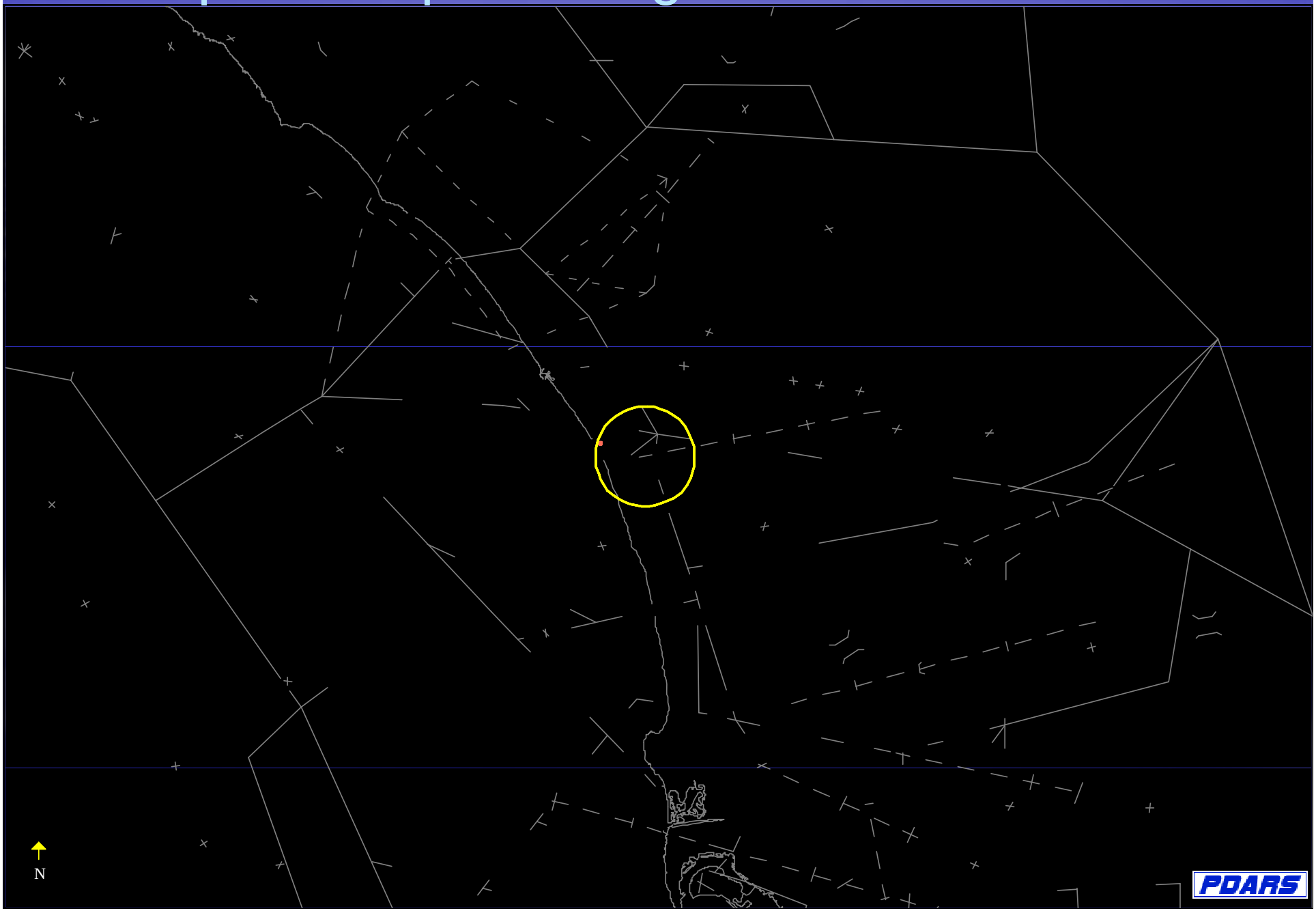
Proposed Plant Location (red box)

Latitude				Longitude			
N	33°	8'	31.70"	W	117°	20'	8.30"
N	33°	8'	31.70"	W	117°	19'	56.30"
N	33°	8'	21.70"	W	117°	19'	56.30"
N	33°	8'	21.70"	W	117°	20'	8.30"



Proposed Alternate Locations

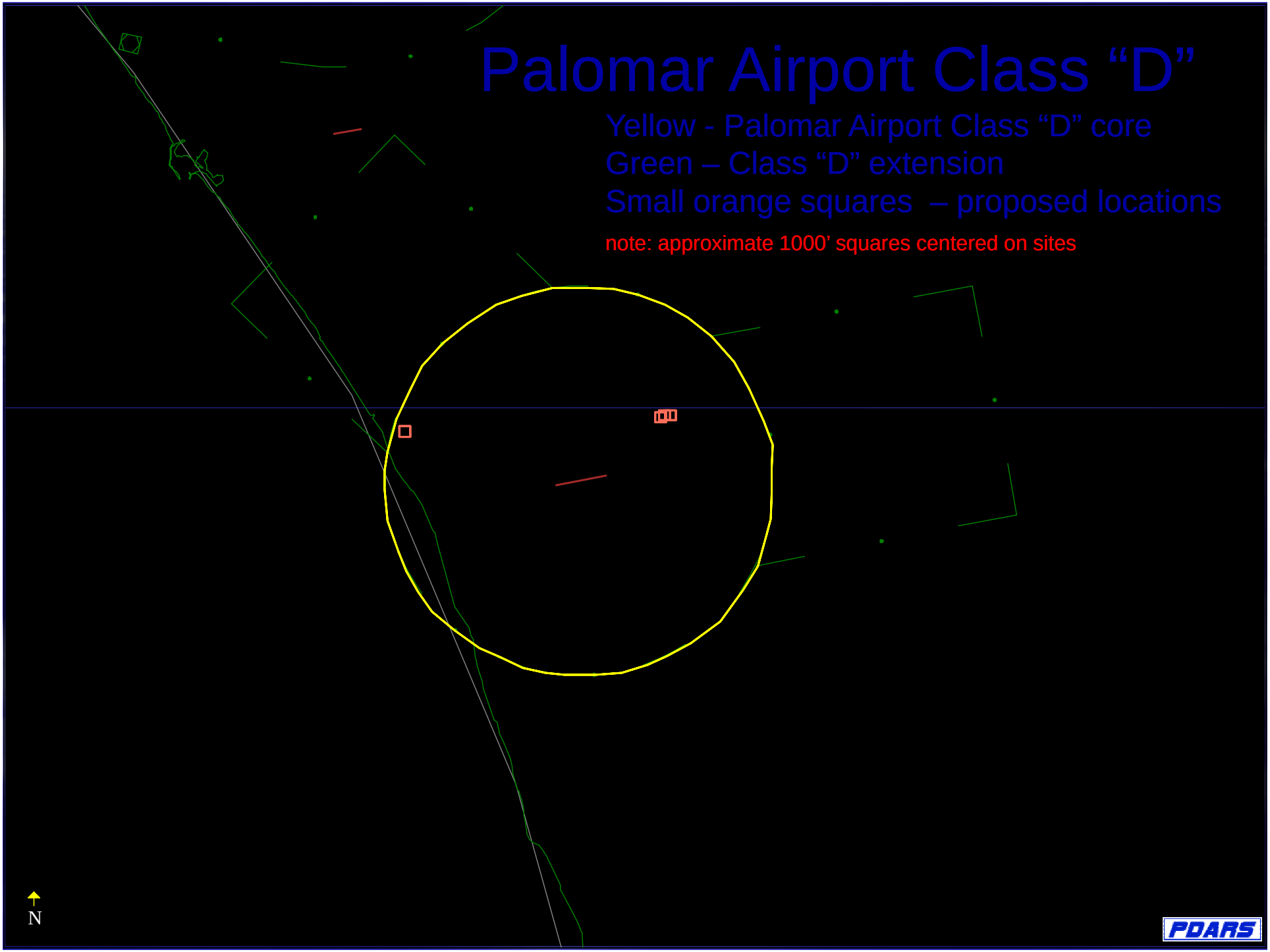
Airspace map showing extraction locations



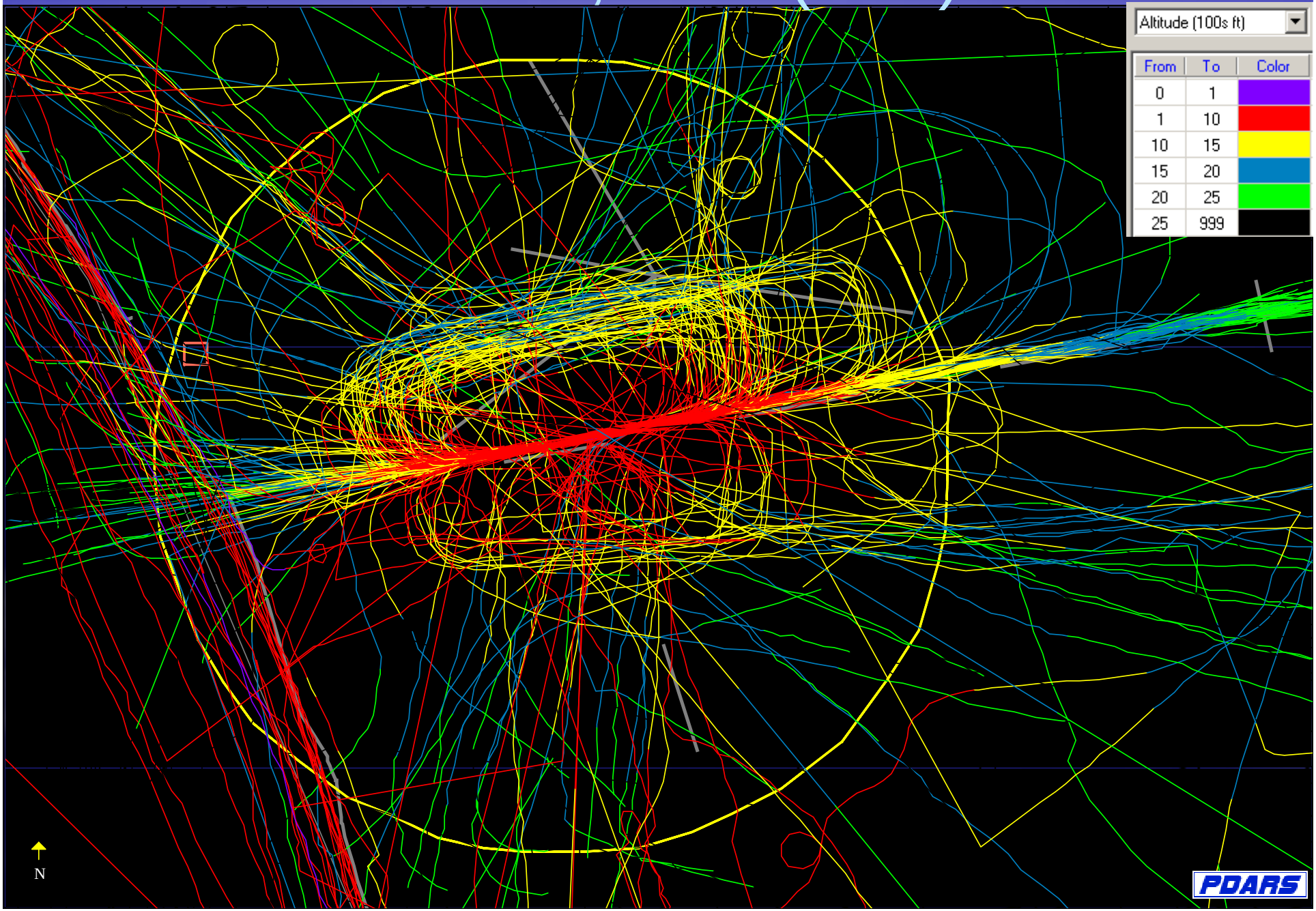
Palomar Airport Class “D”

Yellow - Palomar Airport Class “D” core
Green – Class “D” extension
Small orange squares – proposed locations

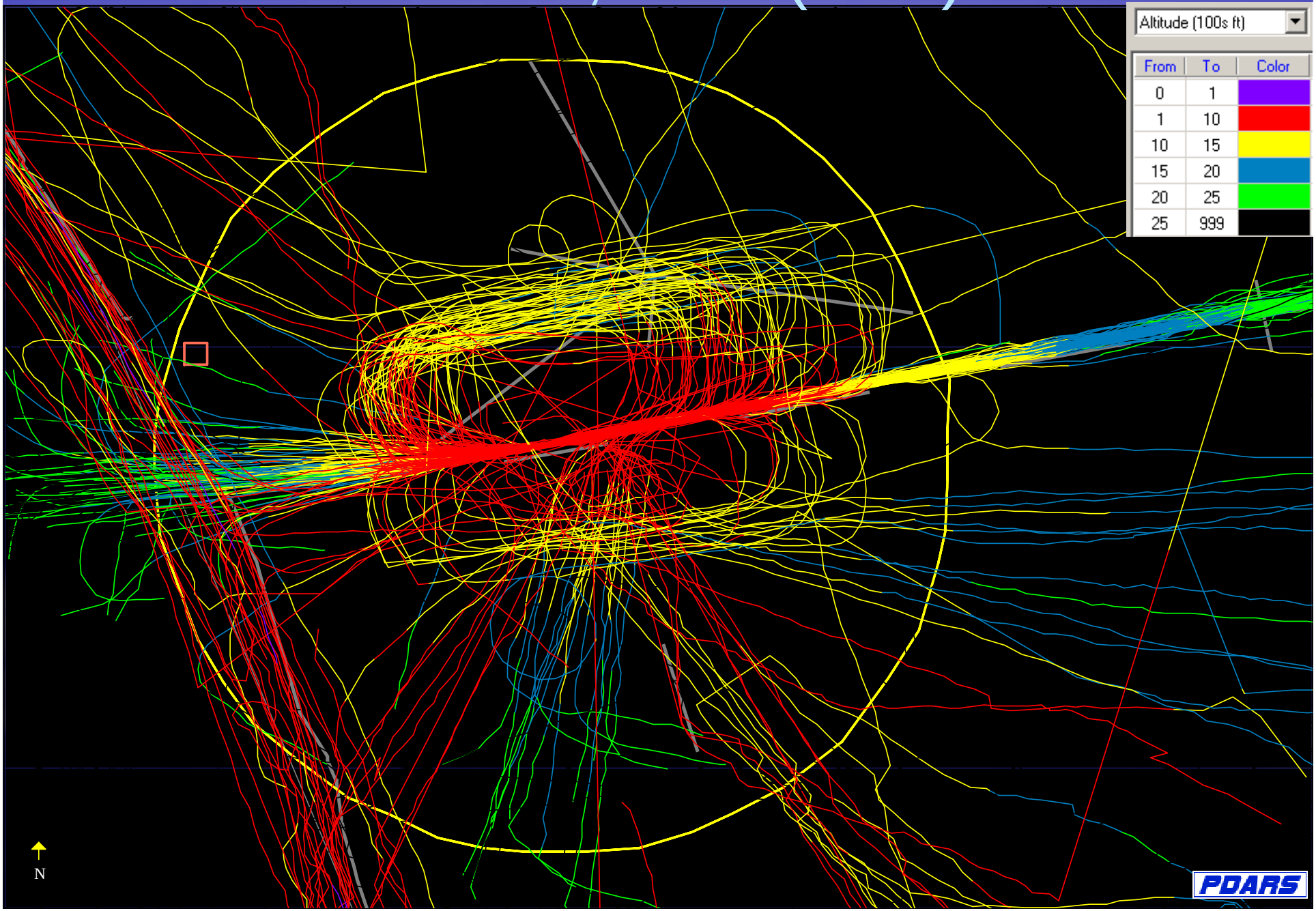
note: approximate 1000’ squares centered on sites



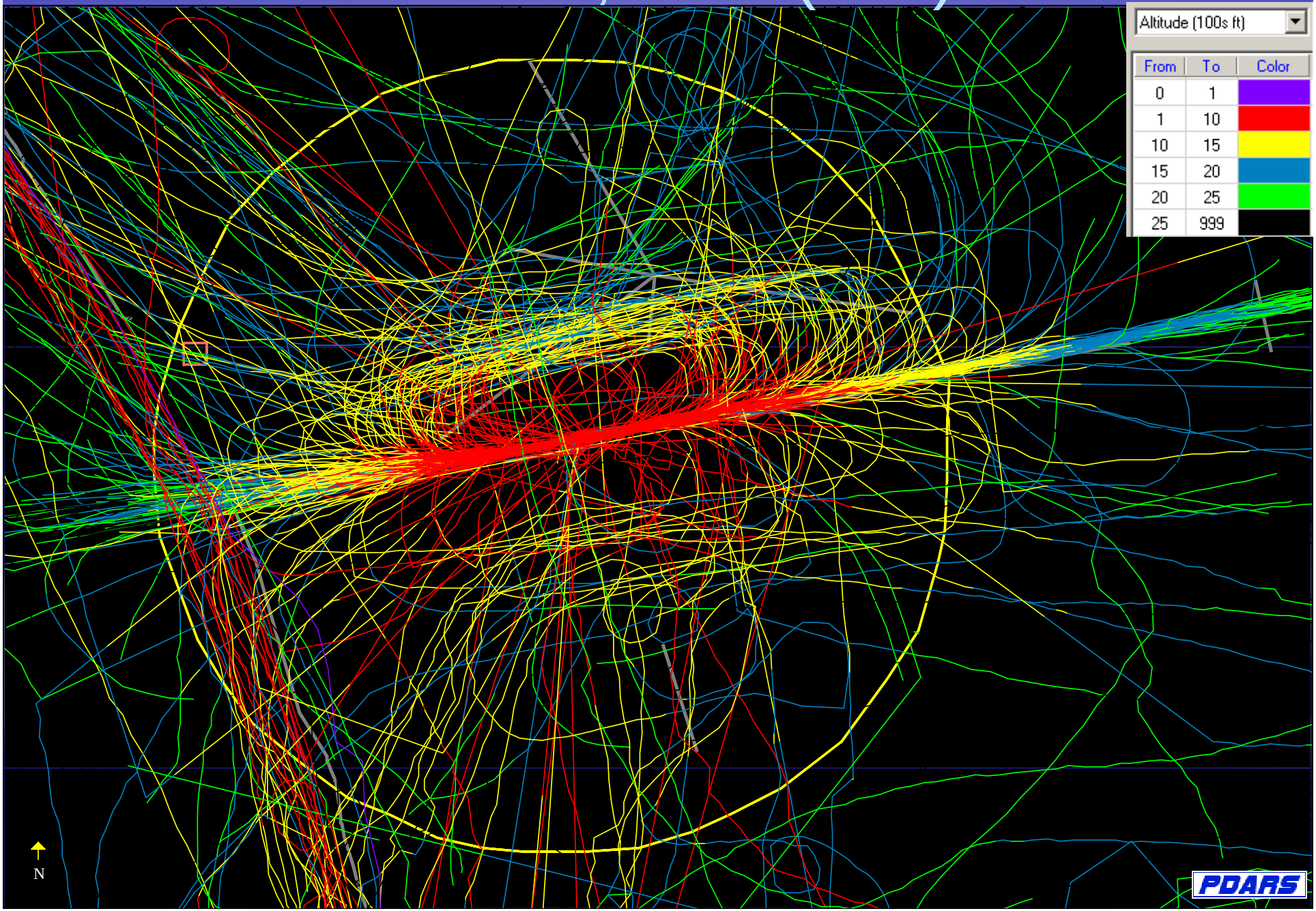
June 02, 2008 (Mon)

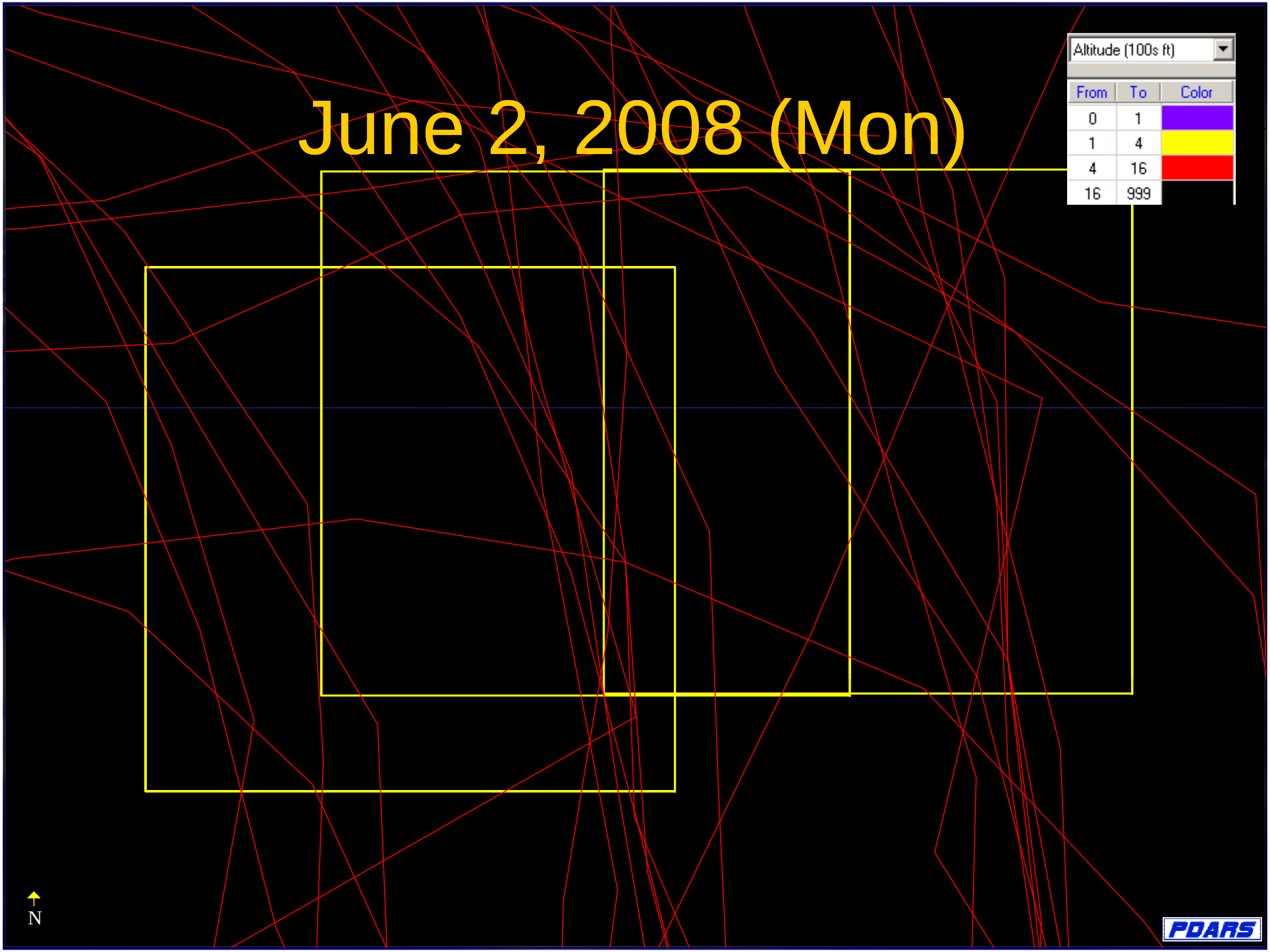


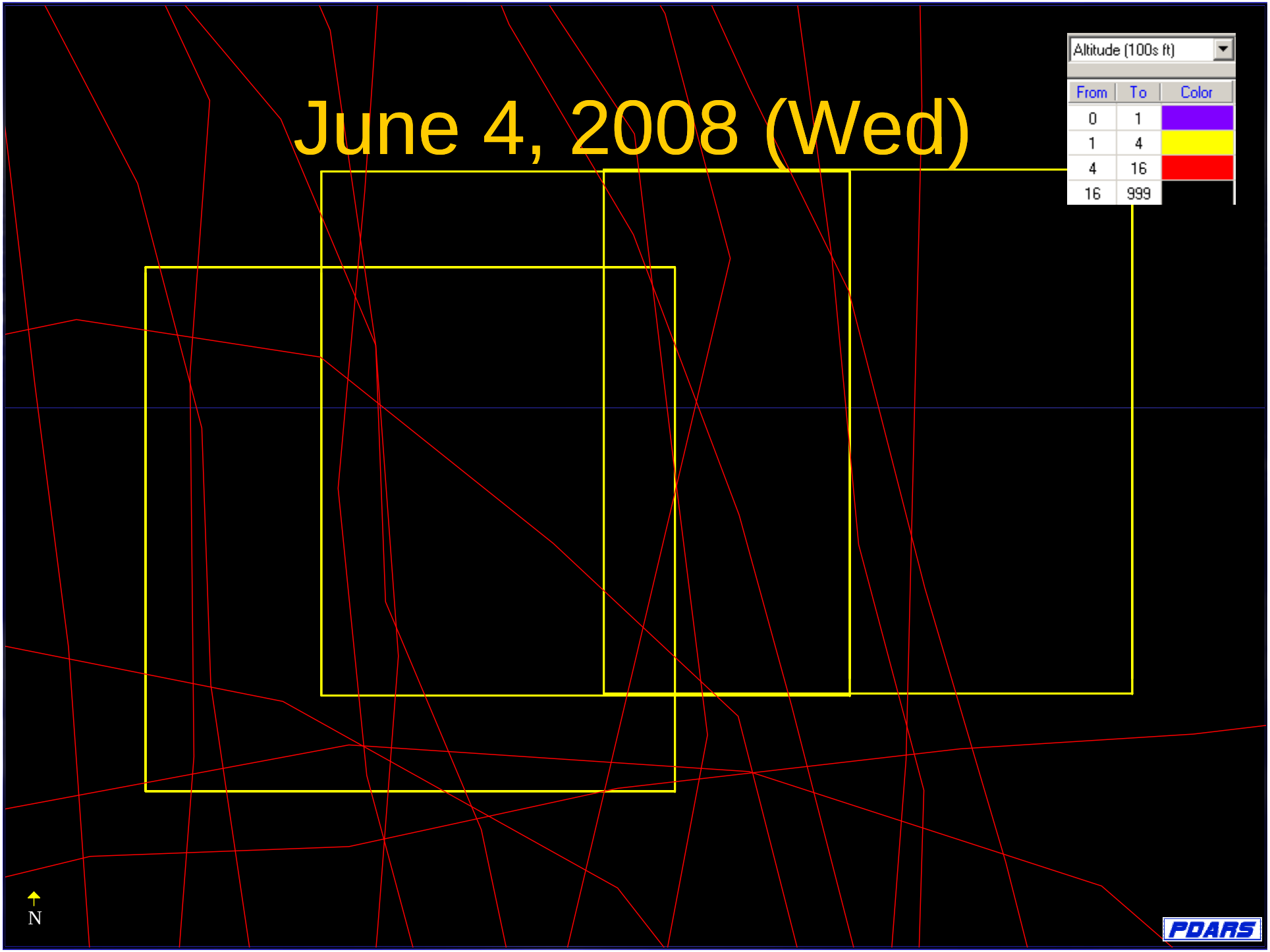
June 04, 2008 (Wed)

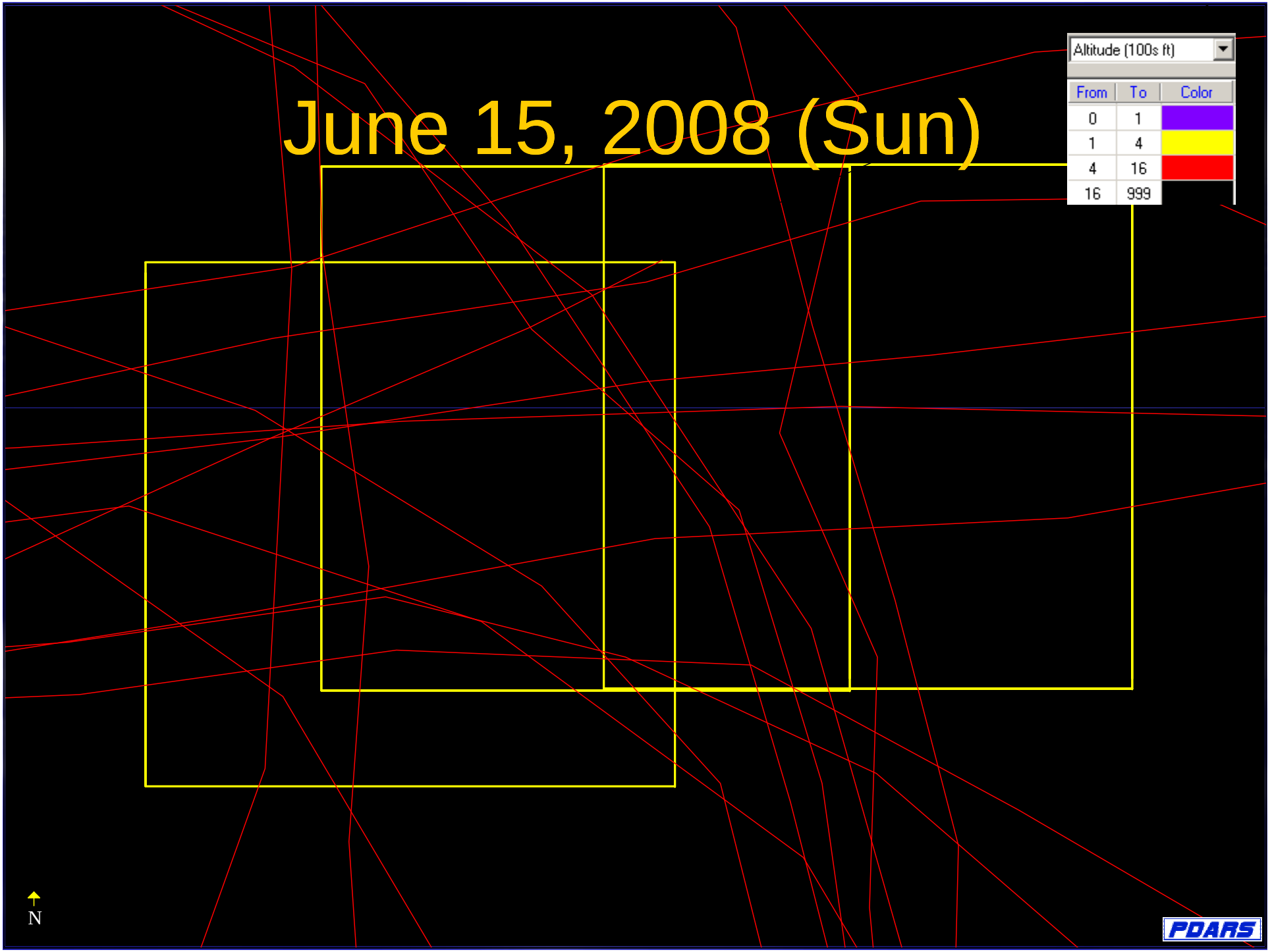


June 15, 2008 (Sun)




June 2, 2008 (Mon)
Altitude (100s ft)
From To Color
0 1
1 4
4 16
16 999
N
PDARS


June 4, 2008 (Wed)
Altitude (100s ft)
From To Color
0 1
1 4
4 16
16 999
N
PDARS


June 15, 2008 (Sun)
Altitude (100s ft)
From To Color
0 1
1 4
4 16
16 999
N
PDARS

Aircraft counts for June 2008

	Original	Red	Blue	Orange			Original	Red	Blue	Orange
Elevation	65'	472'	479'	466'		**Elevation**	65'	472'	479'	466'
Airspace	<= 1200'	<= 1600'	<= 1600'	<= 1600'		**Tested**	<= 1200'	<= 1600'	<= 1600'	<= 1600'
6/1/08	1	16	12	16		6/16/08	2	12	12	10
6/2/08	2	14	17	15		6/17/08	0	20	19	15
6/3/08	1	11	13	14		6/18/08	1	17	19	19
6/4/08	0	11	9	7		6/19/08	1	14	10	7
6/5/08	0	20	20	15		6/20/08	0	19	20	15
6/6/08	0	22	29	25		6/21/08	0	17	16	19
6/7/08	0	13	11	8		6/22/08	4	19	20	15
6/8/08	0	17	18	16		6/23/08	2	11	13	12
6/9/08	0	7	7	7		6/24/08	3	7	12	12
6/10/08	1	7	4	6		6/25/08	3	11	10	9
6/11/08	1	15	18	14		6/26/08	0	20	18	12
6/12/08	1	11	10	8		6/27/08	5	19	21	16
6/13/08	0	10	11	10		6/28/08	0	19	16	13
6/14/08	2	17	14	15		6/29/08	0	17	21	20
6/15/08	1	15	13	10		6/30/08	4	21	23	17
				Total Overflight Tracks:			35	449	456	397
				Note: Each track may represent multiple passes through the airspace						