



Pebble Prospect

Jane Whitsett, Manager Environmental Studies

March 2010

The Pebble Partnership

A Shared Commitment to Sustainable Development
and Social and Community Responsibility.

Northern Dynasty has delineated one of the world's great orebodies, assembling one of the most extensive environmental databases in the history of resource development.

Anglo American US brings a depth of corporate resources and a successful track record of global leadership in modern mining practices.

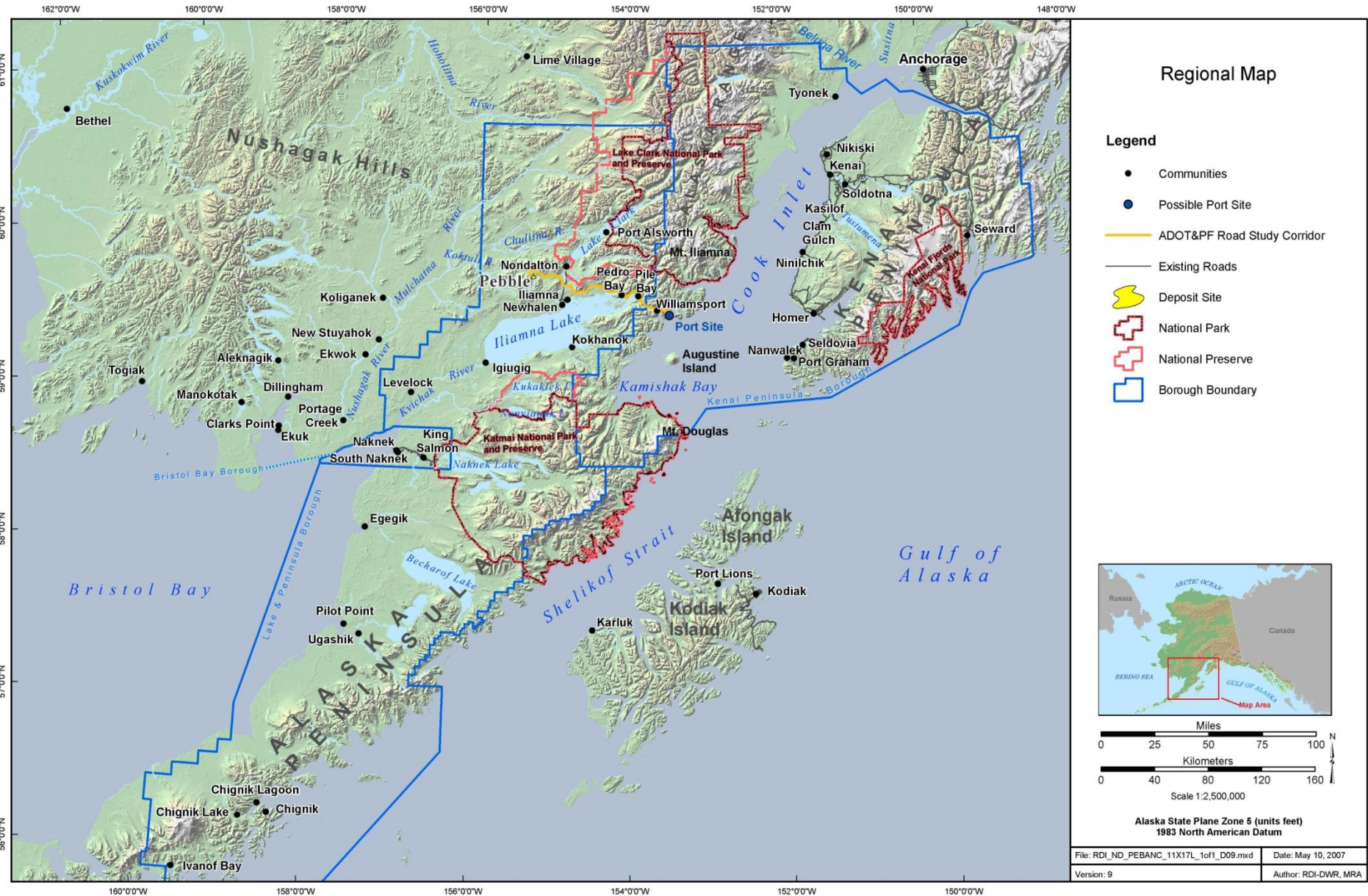
www.pebblepartnership.com

The Pebble Partnership

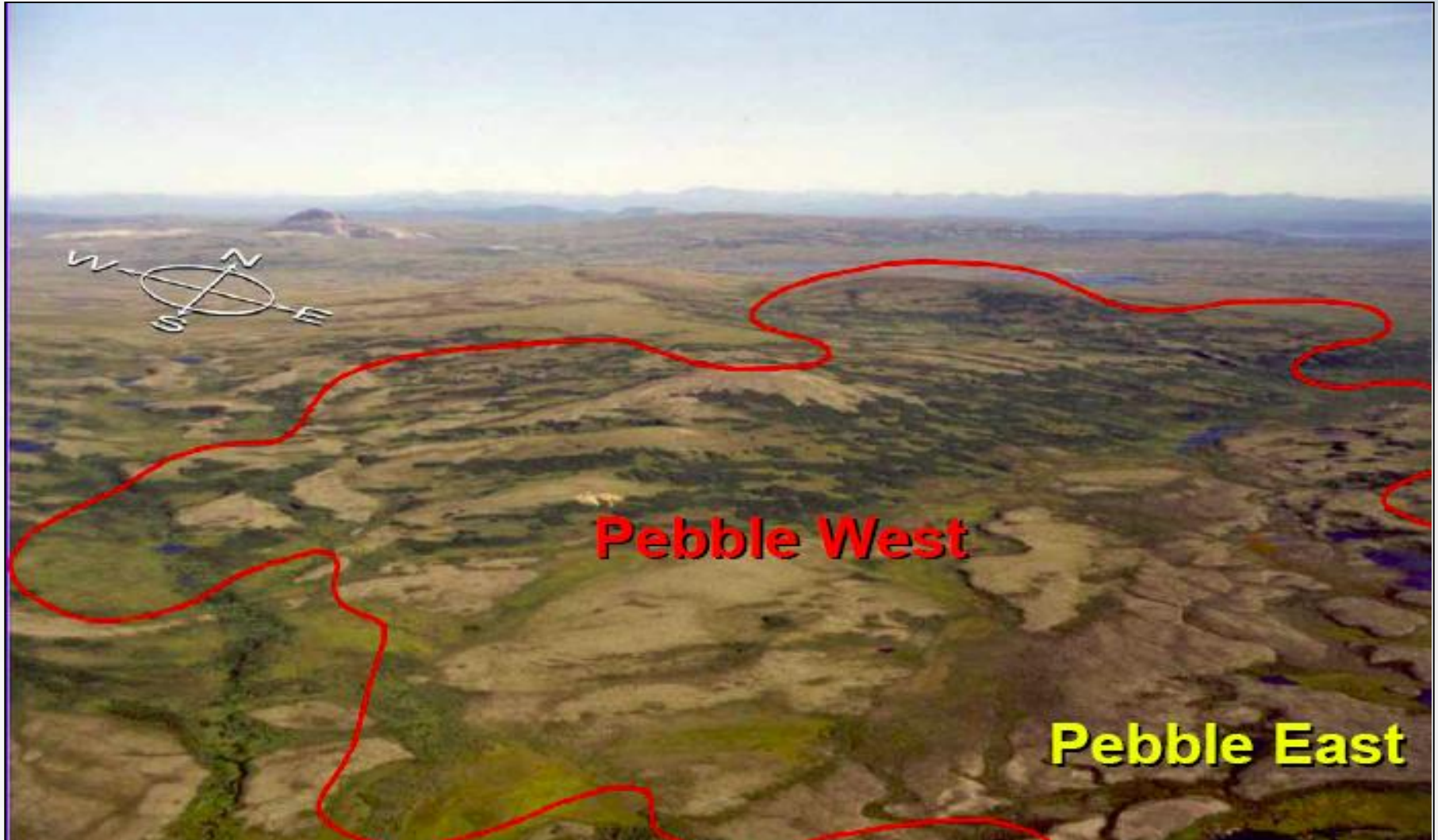
will be guided by **five core principles:**

- ☐ Pebble will benefit Alaskans
- ☐ Pebble will co-exist with healthy fish, wildlife and other valued natural resources
- ☐ Pebble will apply the world's best and most advanced science
- ☐ Pebble will help build sustainable communities
- ☐ At Pebble, we will listen before we act.

Prospect Location

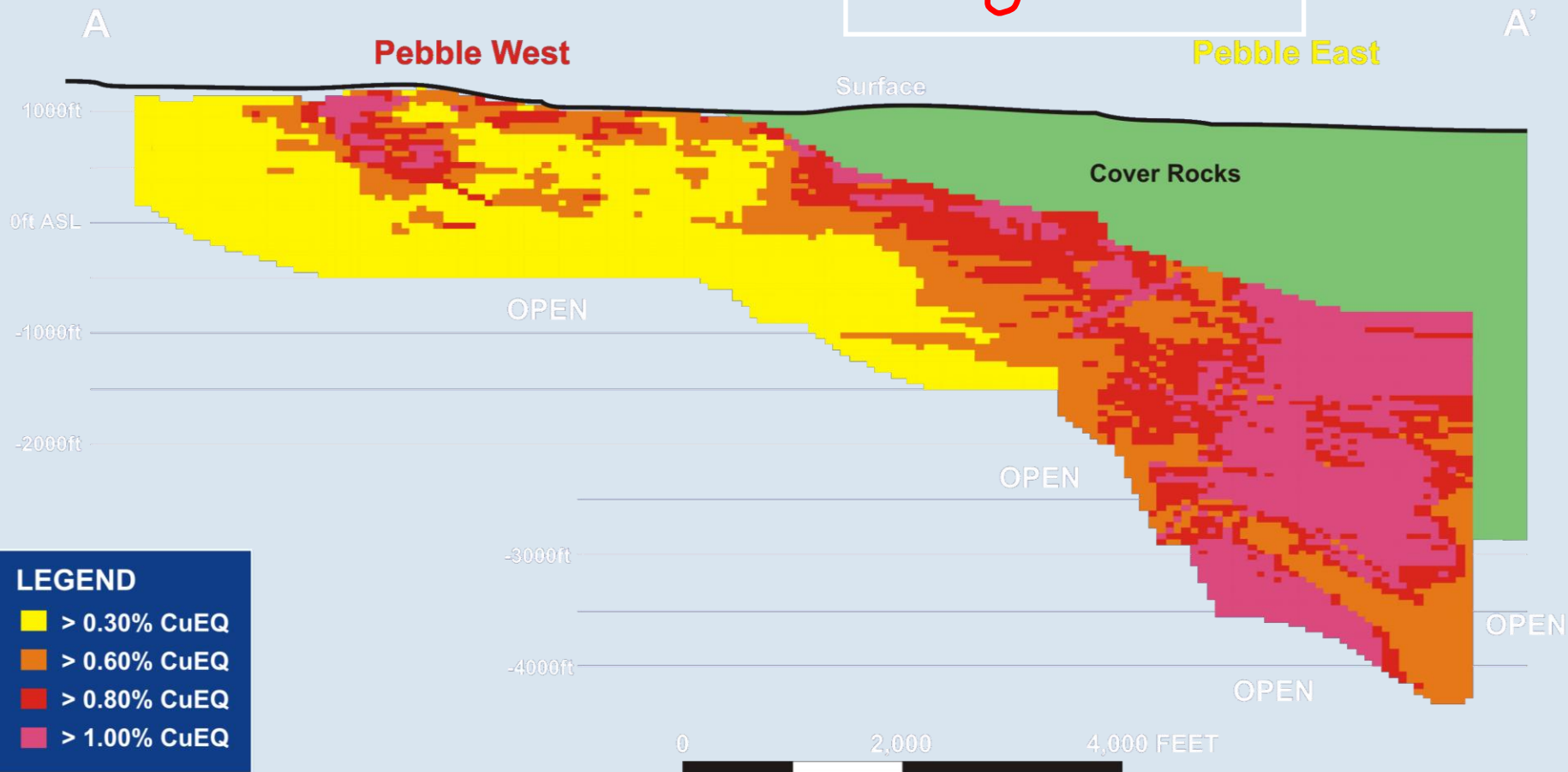
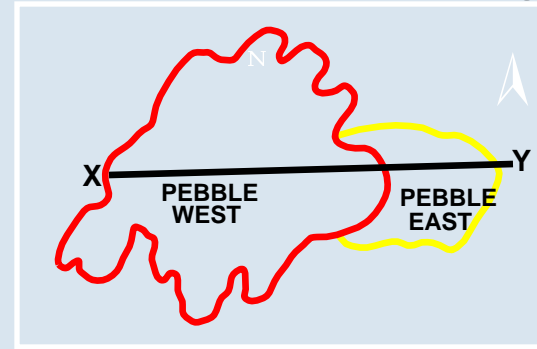


Pebble Prospect – Deposit Topography



Pebble Deposit

Total In-Situ Resource: 72B lbs Copper,
94M ounces Gold &
4.8B lbs Molybdenum.



Low Footprint Exploration



Environmental Baseline Study Objectives



- Characterization of baseline conditions before project initiation
- Input for project engineering and design
- A basis for impact assessment during the National Environmental Policy Act (NEPA) and permitting processes
- A basis for long term monitoring

Permitting

Agencies involved in permitting large hard rock mines in Alaska:

- AK Department of Natural Resources (lead agency)
- AK Department of Environmental Conservation
- AK Department of Fish and Game
- AK Department of Transportation & Public Facilities
- AK Department of Commerce, Community and Economic Development
- AK Department of Law
- US Environmental Protection Agency
- US Army Corps of Engineers
- US Fish and Wildlife Service
- US National Marine Fisheries Service
- US Bureau of Land Management
- US Forest Service

Environmental Baseline Studies

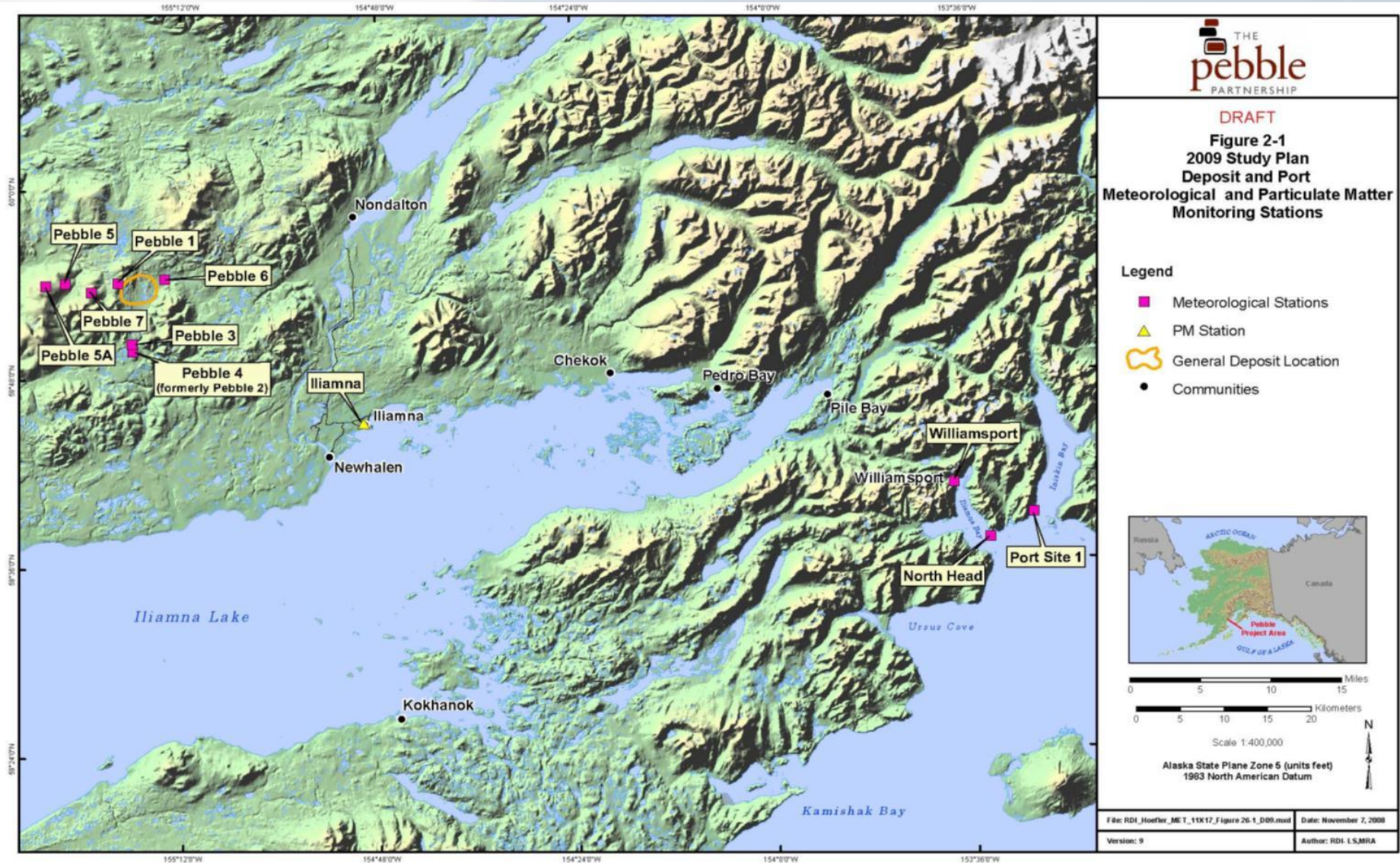
- ☐ Surface Water
- ☐ Water Quality
- ☐ Groundwater
- ☐ Geochemistry
- ☐ Snow Surveys
- ☐ Analytical QA/QC
- ☐ Fish & Aquatic Resources
- ☐ Macroinvertebrates
- ☐ Wetlands
- ☐ Trace Elements
- ☐ Flow Habitat Study
- ☐ Iliamna Lake Study
- ☐ Marine
- ☐ Wildlife
- ☐ Air Quality
- ☐ Noise
- ☐ Cultural Resources
- ☐ Subsistence
- ☐ Land Use
- ☐ Recreation
- ☐ Socioeconomics
- ☐ Visual Aesthetics
- ☐ Impact assessment & management
- ☐ Mine closure & reclamation



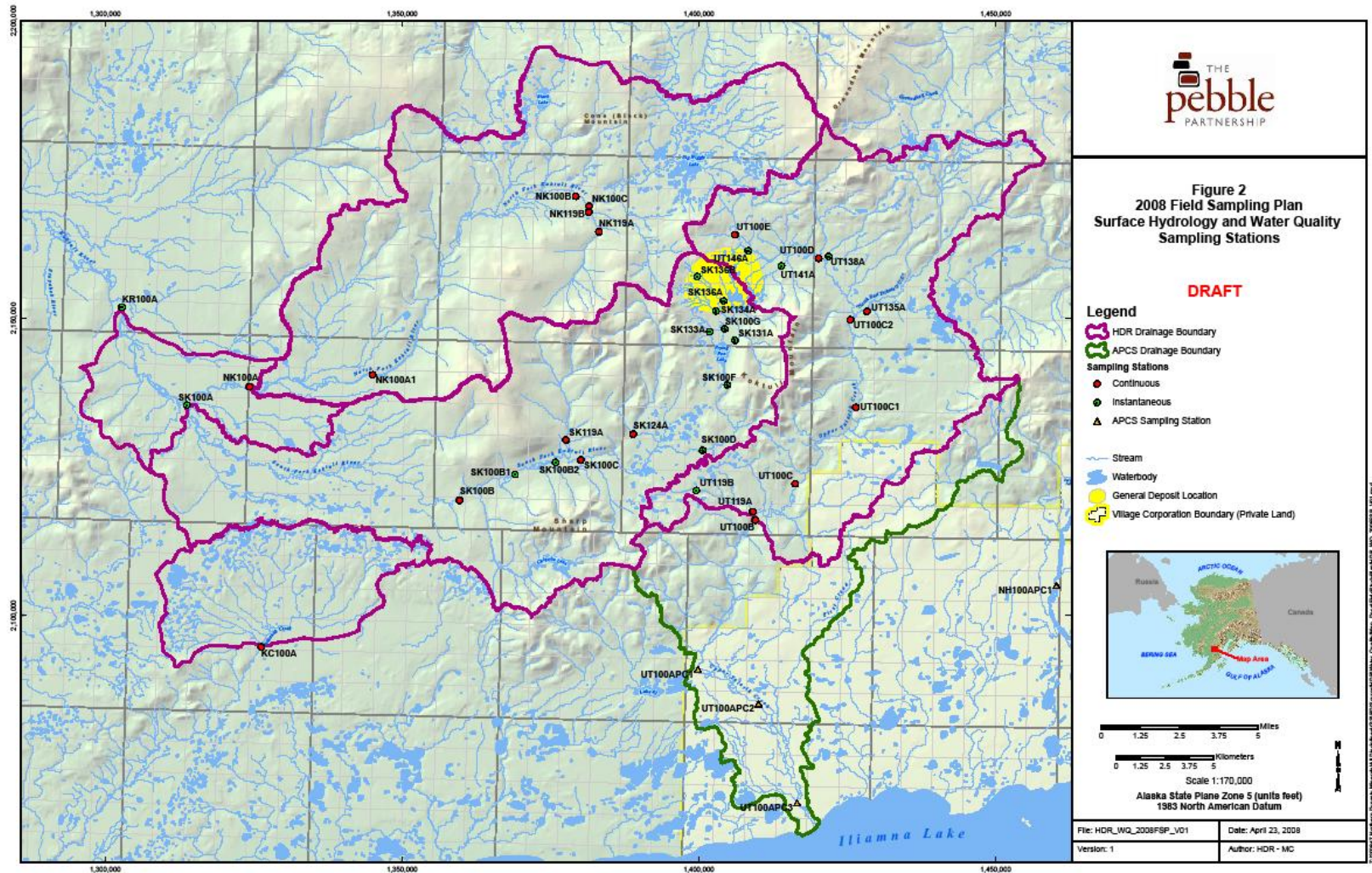
Environmental Baseline Studies Areas



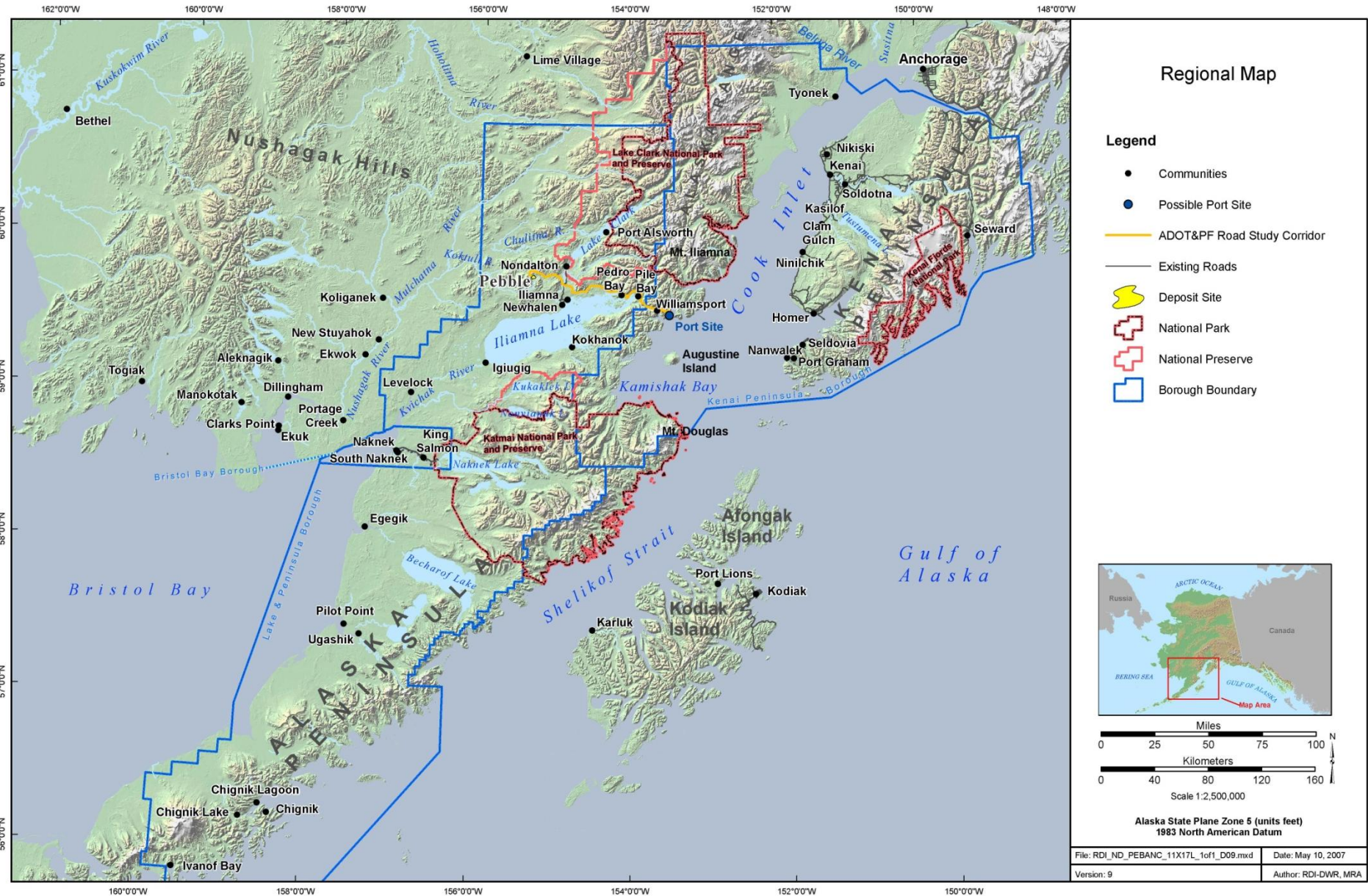
Meteorological/Air Quality Station Locations



Surface Water Quality Sampling



Prospect Location



Hydrologic Studies



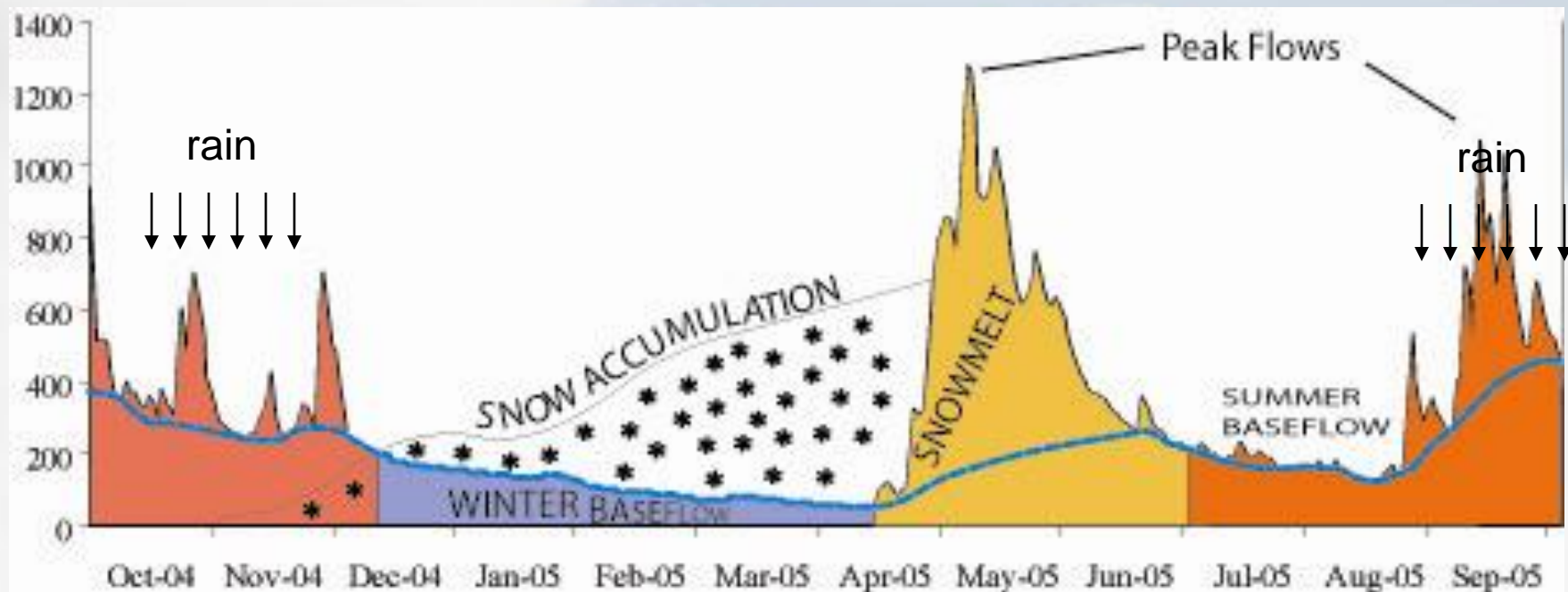
Snow Surveys 2004–2008

- Critical component for water balance modeling
- Snow cores up to 120 inches extracted and weighed, with snow-water equivalent as high as 46 inches.



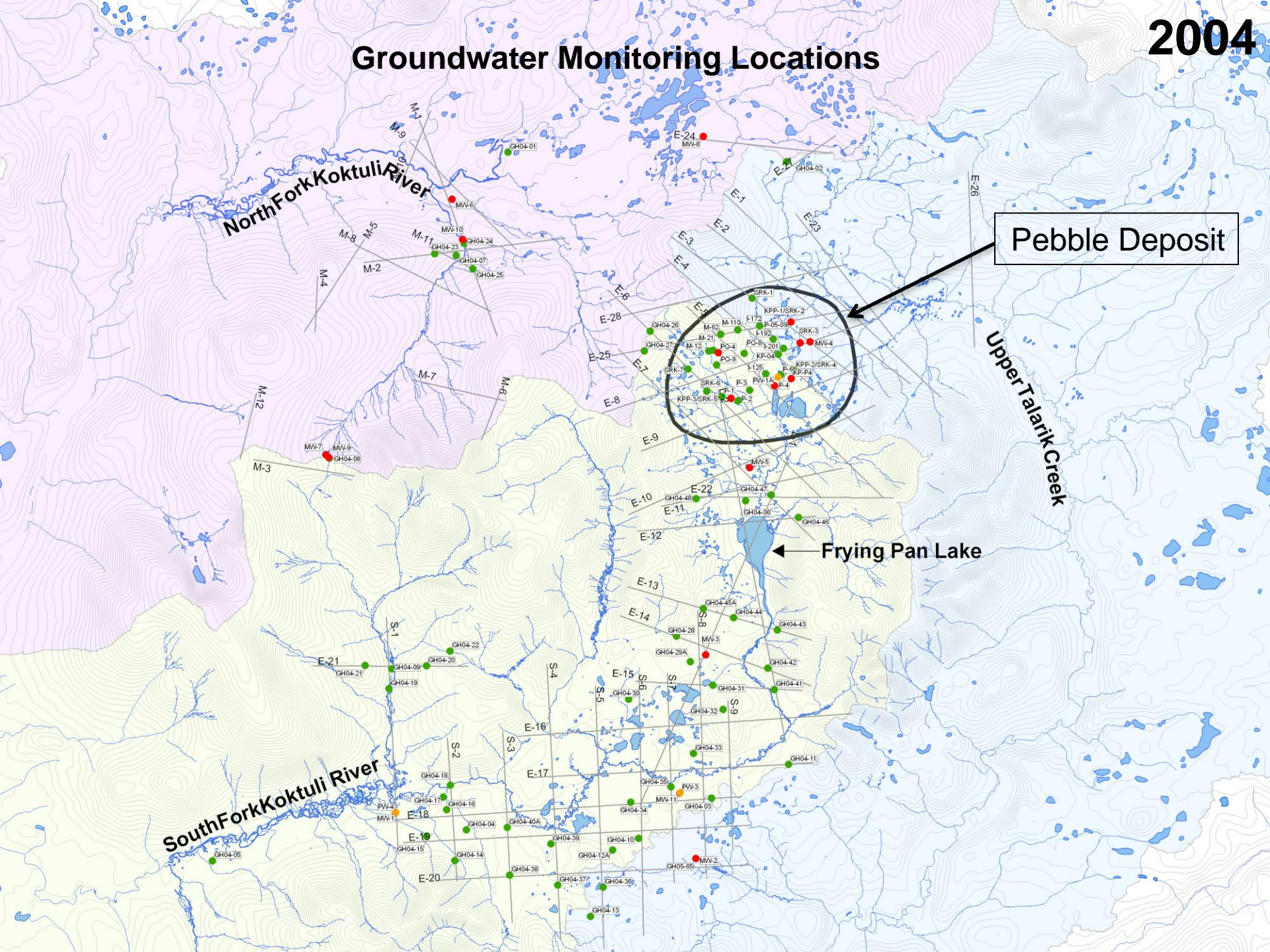
Baseflow Fieldwork

- 41 Stations
- Instantaneous Measurements



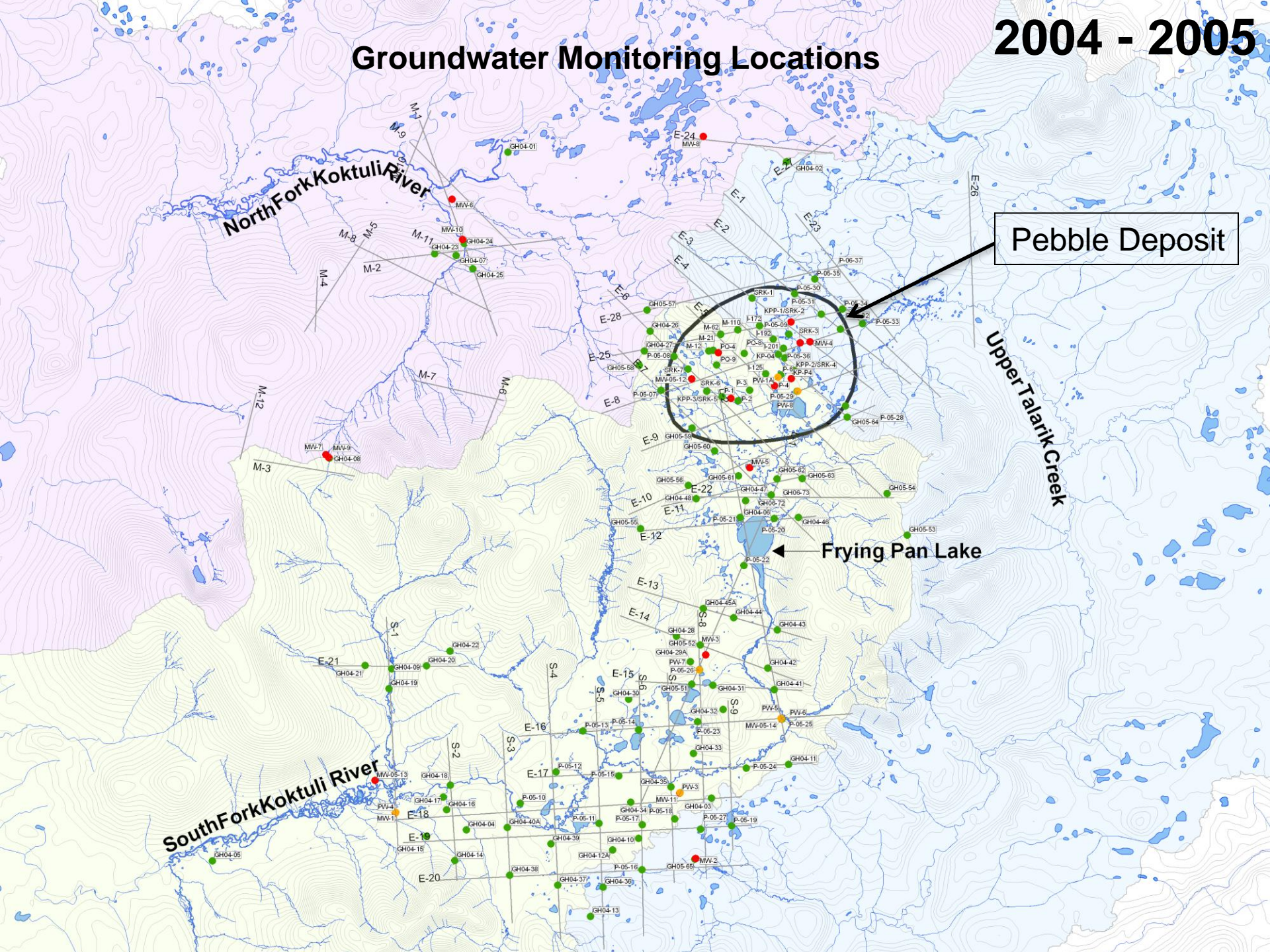
2004

Groundwater Monitoring Locations



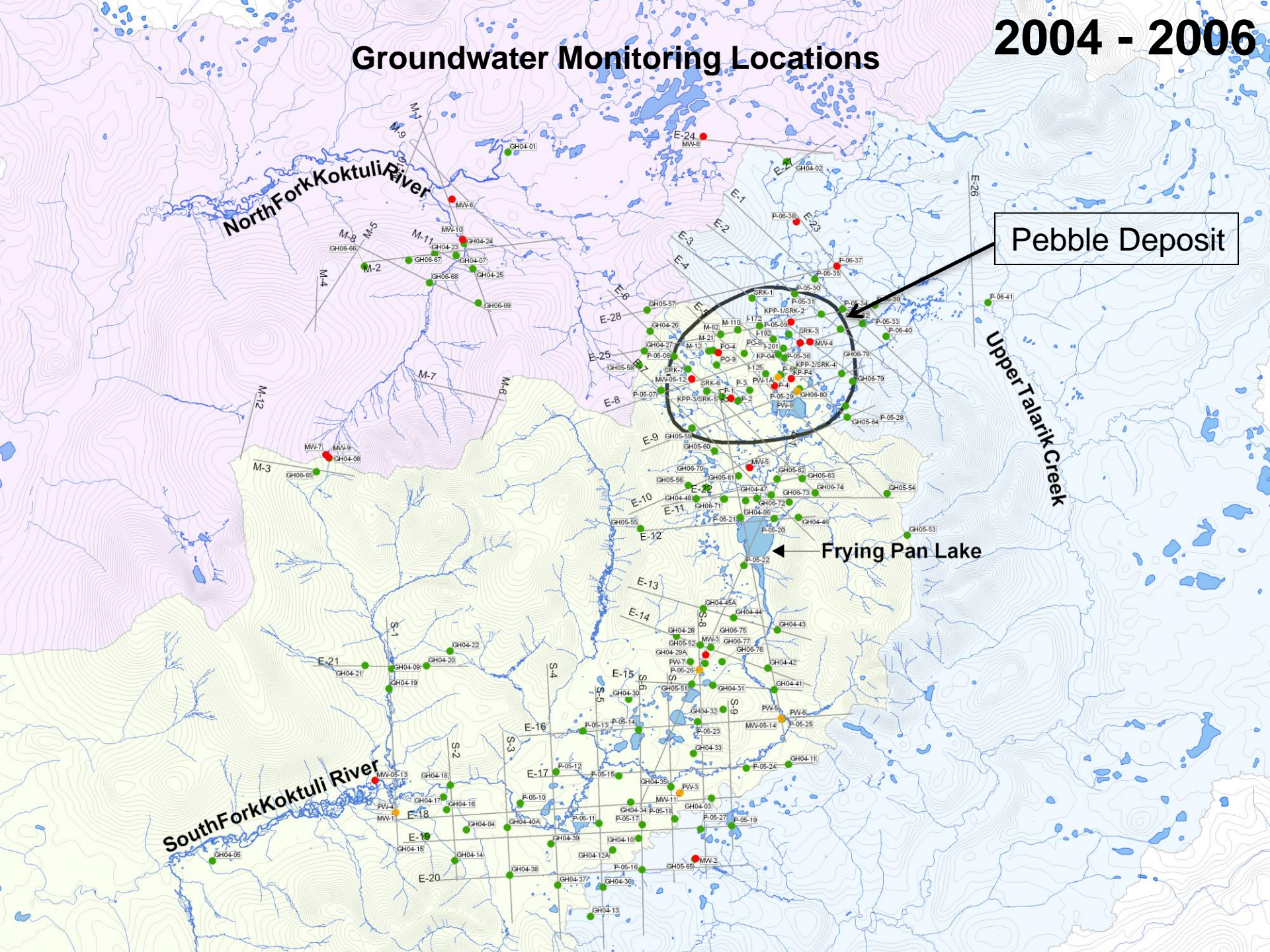
Groundwater Monitoring Locations

2004 - 2005



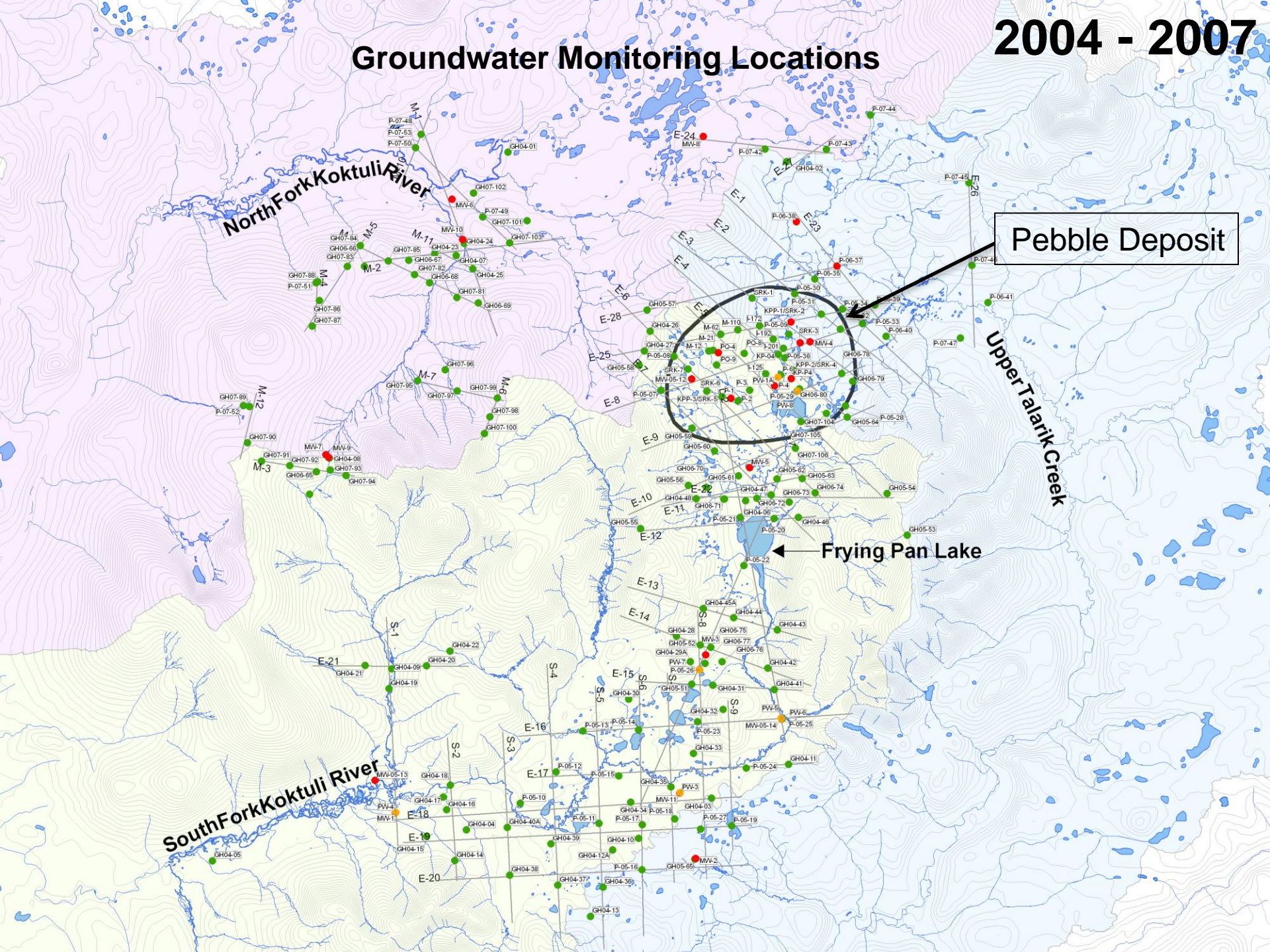
Groundwater Monitoring Locations

2004 - 2006



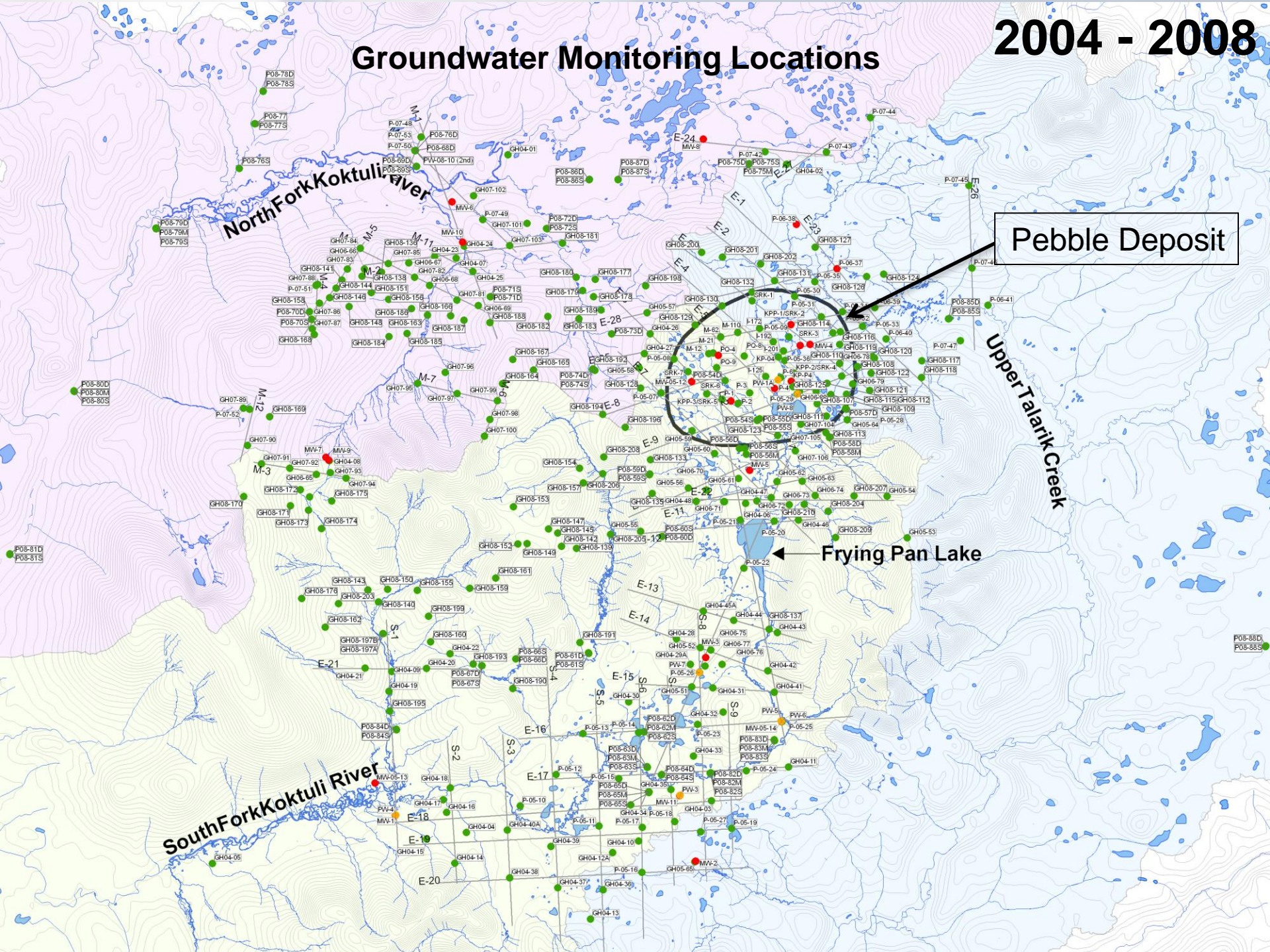
Groundwater Monitoring Locations

2004 - 2007



Groundwater Monitoring Locations

2004 - 2008





Fish Studies

A wide variety of fish studies are employed to assess:

- Species diversity
- Relative abundance
- Distribution
- Spawning
- Rearing
- Migration
- Escapement
- Habitat use



Relative Fish Abundance Surveys



Relative Abundance of Fish Videotaping



Aerial Spawning Surveys



Aquatic Habitat Surveys



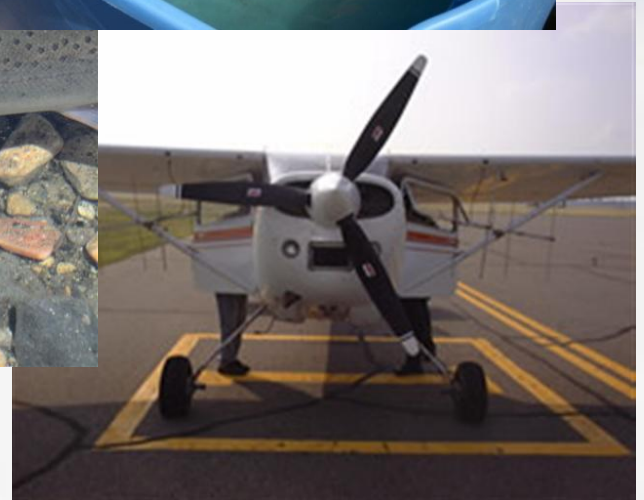
Instream Flow Habitat Modeling

Models include factors such as:

- Water surface elevations
- Water depth
- Discharge
- Velocity
- Substrate
- Channel geometry
- Cover
- Fish presence
- Habitat type:
 - Glide, run, riffle, pool, cascade, island complex

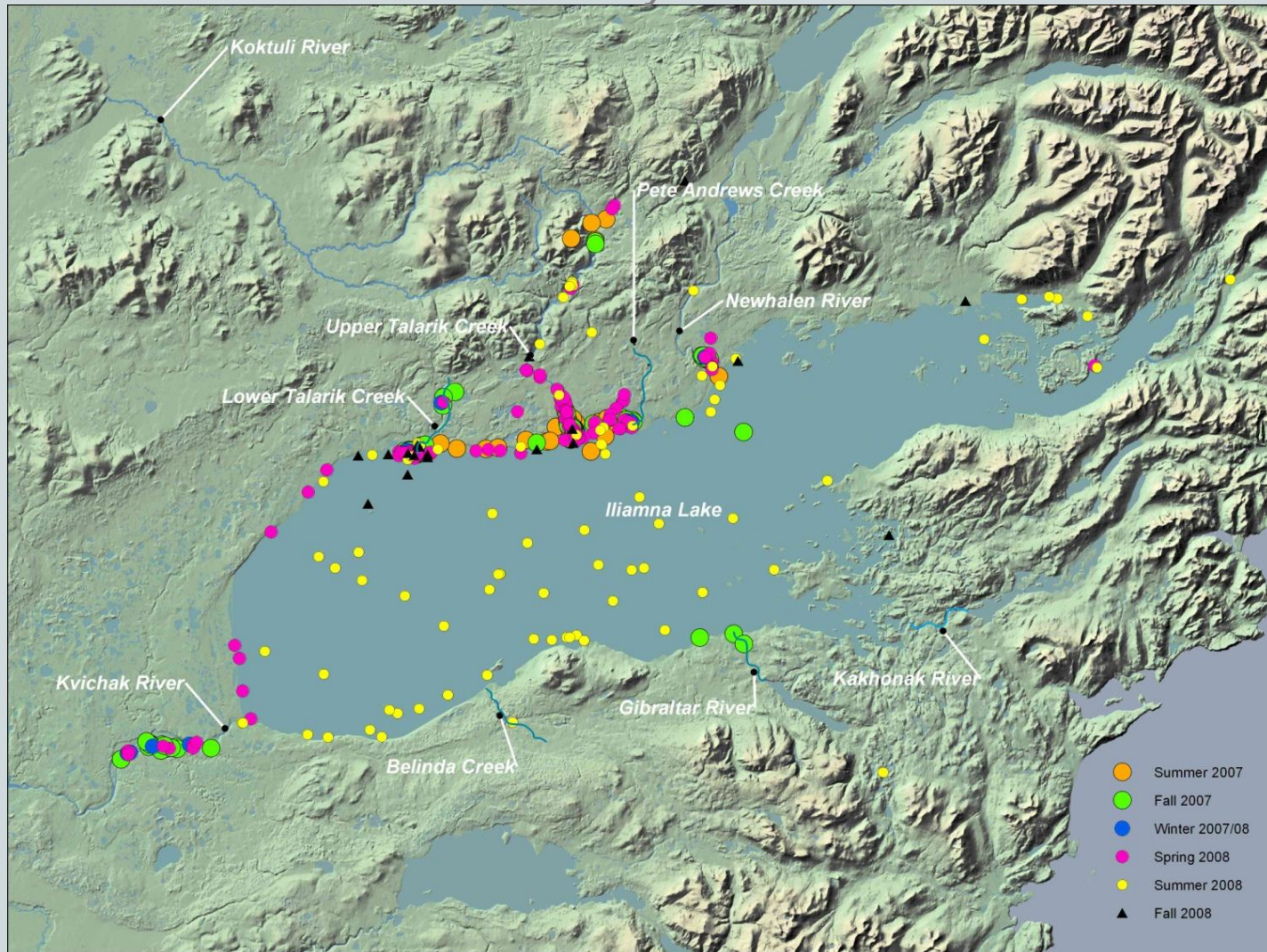


Telemetry Studies



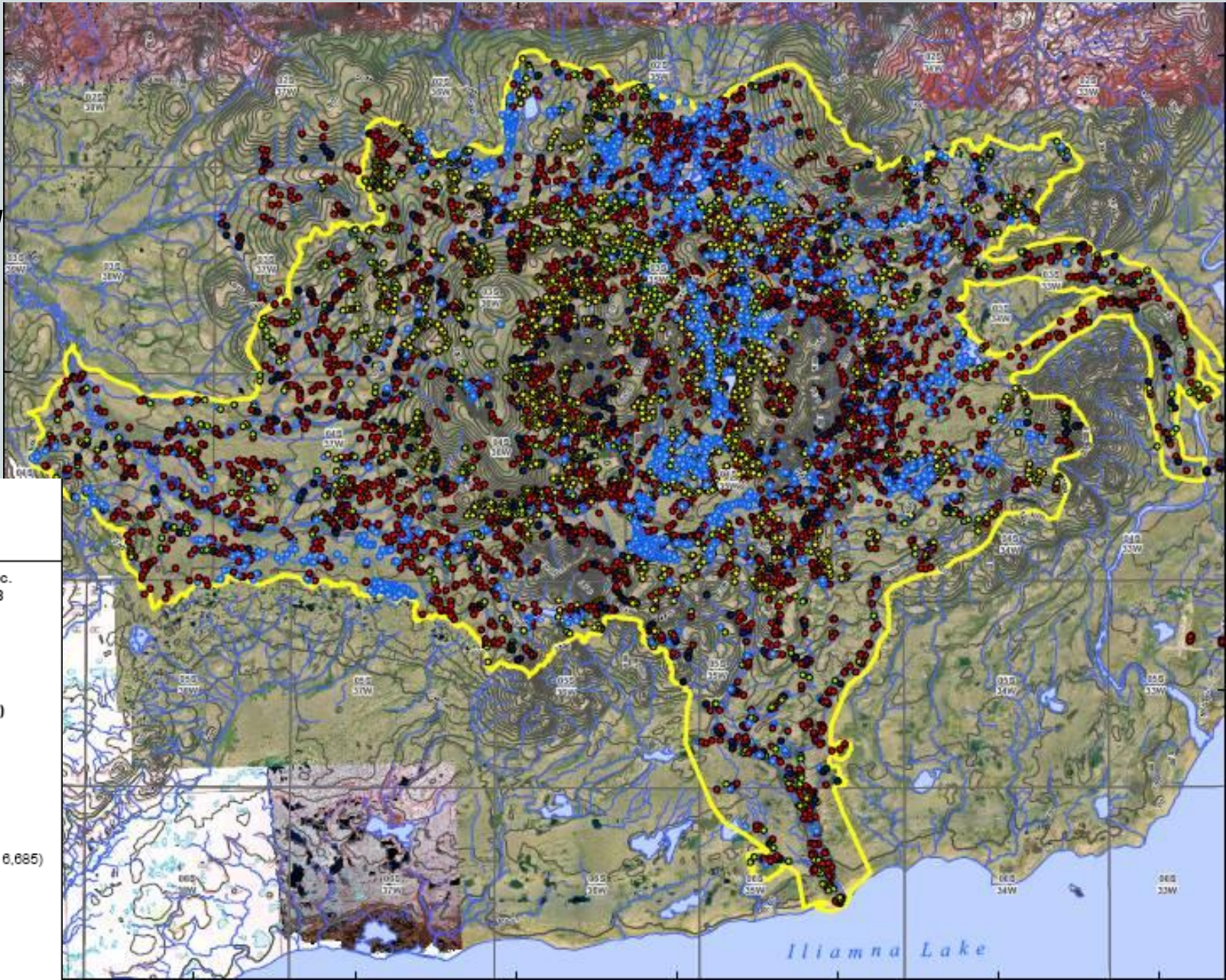
Late Summer 2007 Tag Group

Preliminary Data



WETLANDS FIELD SURVEYS

17,000
field plot
surveys
completed
in project
area



Three Parameters Plus, Inc.
3PPI and HDR 2004 - 2008
Field Plot Locations
DRAFT

Legend

3PPI and HDR 2004 - 2008
Field Plot Locations (10/28/2008)

- JD (Count 4,584)
- SH (Count 2,467)
- FA (Count 932)
- SC (Count 1,570)
- WB (Count 2,237)
- Other Photo Points (Count 6,685)
- 2008 3PPI Study Area
- General Deposit Location

Marine Fish Studies

Trawl Net Sampling
Beach Seine Sampling



Marine Studies

Monthly aerial surveys for Otters and Steller's Eiders in support of Section 7 Consultation for Threatened & Endangered Species



Wildlife Studies

Species dependent on wetlands and waterbodies are important components of wetland mitigation

Migration and other factors affect timing of the field survey



Wildlife Studies

- mapping habitats
- estimating population densities
- species diversity
- distribution
- seasonal use



Mammal Studies in Cooperation with ADFG

Aerial Brown Bear Surveys



Prospect Benefits

- Multi-billion capital investment
- 2,000 construction jobs
- 20 – ? year life
- Hundreds of millions dollars annual operating expenditures
- Local and state taxes
- 1,000 plus operating jobs
- Supply/service contracts & other project spinoffs



Pebble Prospect

www.pebblepartnership.com