Objectives

- Global Navigation Satellite Systems Today
  - What is GNSS?
  - How it works
  - Accuracy
- Differential Correction Options
- Trimble Forestry
- Common GPS Myths
Global Navigation Satellite System (GNSS)

- Allows you to calculate your location anywhere in the world using satellite signals
- GNSS encompasses all constellations i.e. GPS, GLONASS, Galileo, Compass etc
- Every GNSS is made up of three segments:
  - a control segment
  - a space segment
  - and a user segment

Control Segment

- Ground-based
- Master Control Station
- BUMCS – Backup Master Control Station
- Five Monitoring stations around the globe
- Ability to track and control satellites, and upload information
Space Segment (GPS Only)

30 Satellites, 6 orbital planes:
- Orbiting with a 55° rotation
- 20,200 km orbit, 12,000 miles
- 1 revolution per 12 hours
- Maintained by DoD

High Orbit: (SAC)
- Longer Satellite Survival
- Higher Accuracy/ Coverage

Benefits of GPS Modernization, GLONASS, GALILEO

- More satellites, less downtime
- Better Signals
- Additional frequencies
User Segment

Multiple Applications:

- GIS Data Capture
- Marine/Vehicle Navigation
- Surveying
- Forestry
- Emergency Services
- Aviation
- Photogrammetry
- Vehicle Tracking
- Recreation (hiking, etc.)
- Many more... and more to follow

So how does GPS work?

NASASciFiles - How Does GPS Work
How accurate is GPS?

- Three methods of positioning
  - Autonomous (Recreational)
    - 5 - 15 meters
  - Code Differential (Mapping and GIS)
    - 1 - 5 meters
    - Sub-meter
  - Carrier Phase Differential (Mapping & Survey)
    - Decimeter (H-Star)
    - Centimeter

Differential Correction
Differential Correction

- Differential correction removes most of the errors in the GPS information

How Accurate is GPS?
How Accurate is GPS?

Trimble Forestry
Trimble Forestry

• Trimble have a range of integrated solutions designed especially for the Forestry that covers every aspect of the industry.
  - SOLO Forest
  - BlueOx

Trimble SOLO Forest

• Specially design Mapping software for the forestry industry
  - easy to use functionality
  - split and merge polygons in the field
  - buffering points
  - generate custom grids either as squares, rectangles or hexagons
  - nest features
  - create traverse lines
  - displays & query customs background imagery
  - post-processing of data
Common GPS Myths

- GPS will work everywhere and at anytime
- You can get an accurate position with less than 4 SVs
- The more satellites I have the better my accuracy!!
- I can calibrate my GPS
- Don't believe everything you see