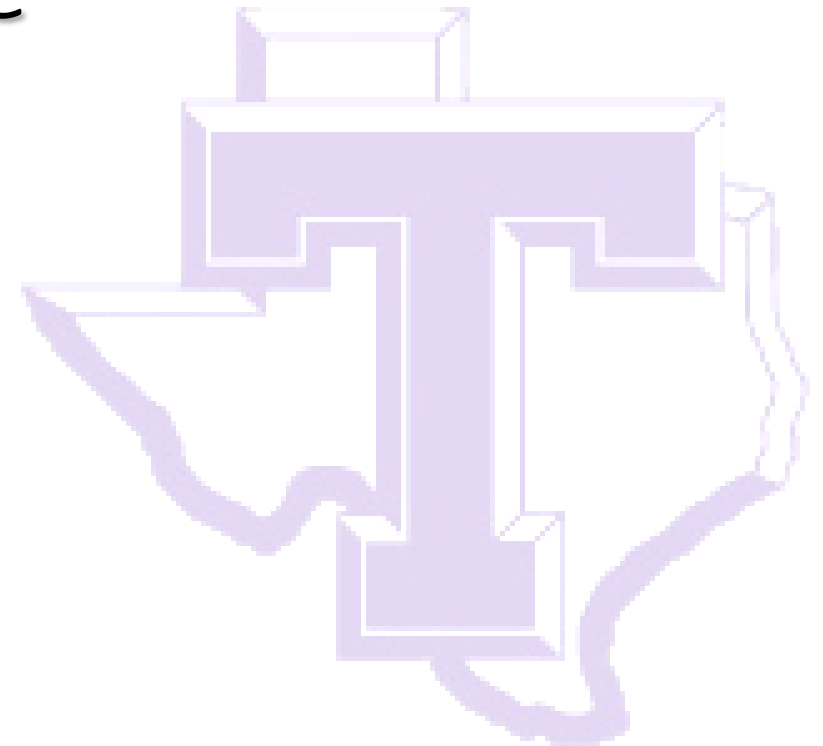# Using Aerial Drones to Increase Student Participation in an Agricultural Video Production Course

Dr. Wayne Atchley

Dr. David Frazier
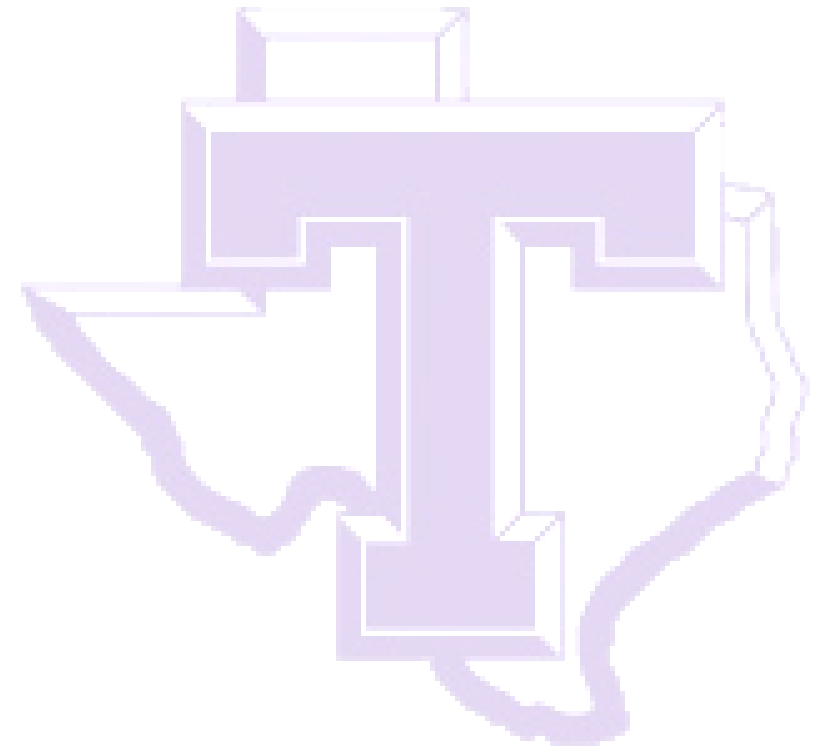
Dr. Sandra Graham

Dr. Whit Weems

Introduction

- Tarleton State University
  - Regional, Comprehensive University
  - Fall 2014 Enrollment – 11,681*
    - 10,217 – UG
    - 1,368 – GR
    - 96 – DR
  - College of Agricultural and Environmental Sciences
    - UG - 1,702
    - GR – 93
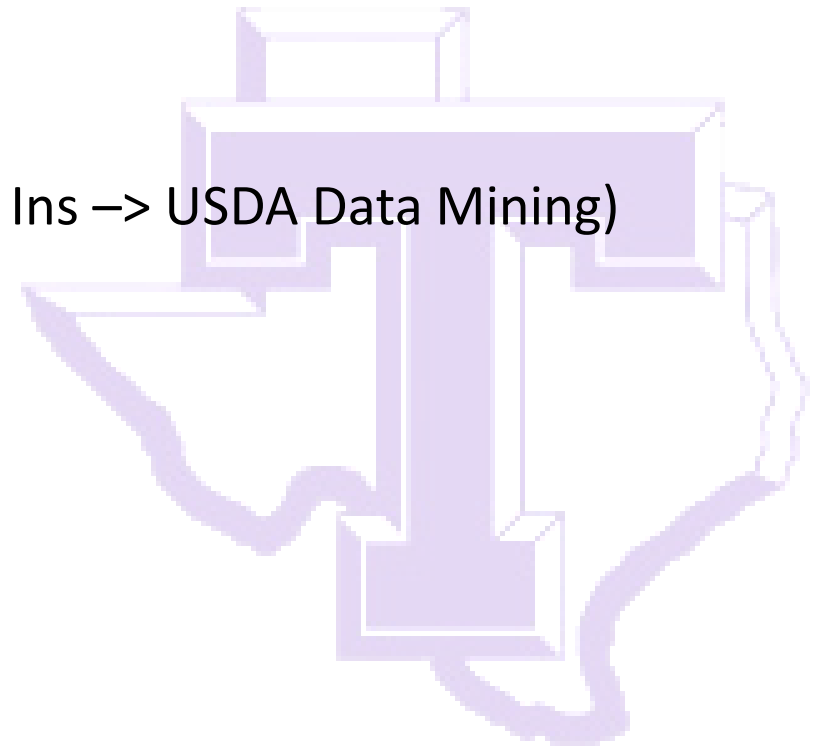 - Agricultural and Consumer Sciences
    - UG – 695
    - GR – 53

*THECB Certified Fall 2014 Enrollment Data

About Me

Education
- BS – Radio-TV-Film (Film/Video Production concentration)
  - Minor in Computer Science
- MBA – Management
- Ed.D. – Agricultural Education

Professional Experience
- Disc Jockey – KTCU, KCUB
- Video Editor – American Independent Network
- Software Development and Database Programmer (Auto Ins –> USDA Data Mining)
- Musician – Upright and Electric Bass

Personal
- Husband – 19 years
  - Married into Dairy family
  - Assist with cattle operation and coastal hay production
- Father – 2 Boys

Agricultural Communication*

- Joint program
  - Communication Studies
    - Core Communication Courses
  - Agricultural and Consumer Sciences
    - Core Agriculture Courses
    - Capstone Agricultural Communication Courses
- UG Enrollment
  - 43 Declared ACOM Majors

*BS – Agricultural Services and Development with Concentration in Communication Studies

ACOM Senior Courses

- ACOM 4305 – Publication Development
  - Layout & Design of Ag-Related publications
- ACOM 4320 – Advanced ACOM Computing
  - Baseline HTML, CSS, and Java-scripting plus After Effects 2.5D Animations
- ACOM 4390 – Wildlife & Agricultural Photography
  - Elements of Livestock, Production Agriculture, and Wildlife Photography
- ACOM 4350 – Electronic Field Production For ACOM
  - Using video production for Agricultural Advocacy and Awareness
  - Aerial videography principals and techniques
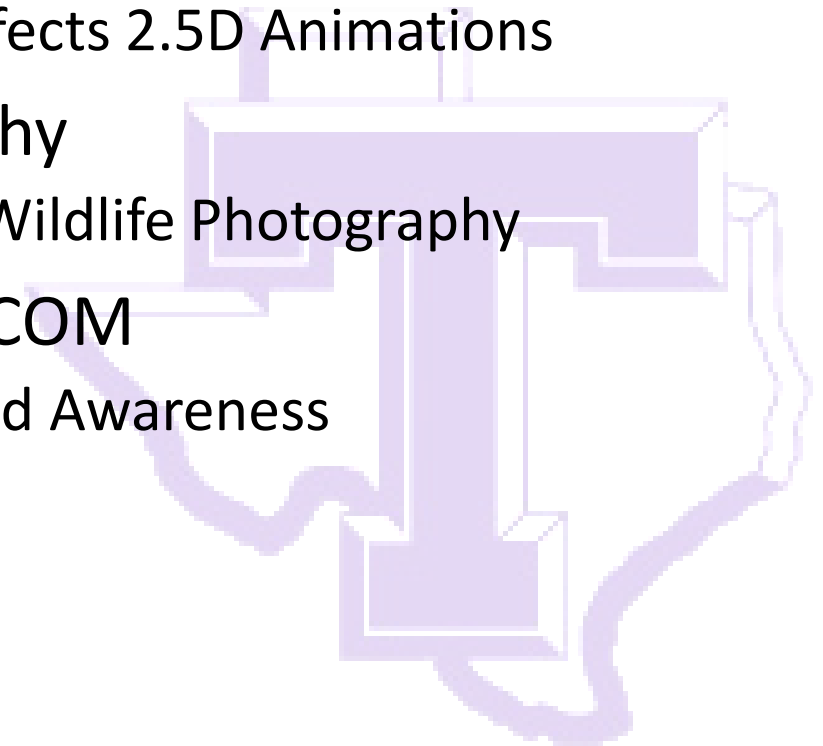
ACOM 4350 – Electronic Field Production (EFP)

- Catalog Description:

  This course provides directed experience in agricultural television field production and electronic news gathering. Students will master video production skills such as script writing, storyboarding, camera operation, and video editing in an agricultural setting.

- Course requirements
  - Three Major Video Assignments
    - "Guess the Problem" – Silent video to teach Visual Story Telling (PrEditor approach)
    - "Agricultural Issues/Topics" – Student groups select a topic of interest to produce a 2-4 minute informational video (Condensed roles/responsibilities)
    - "Capstone Video" – Whole class project with specific roles/responsibilities
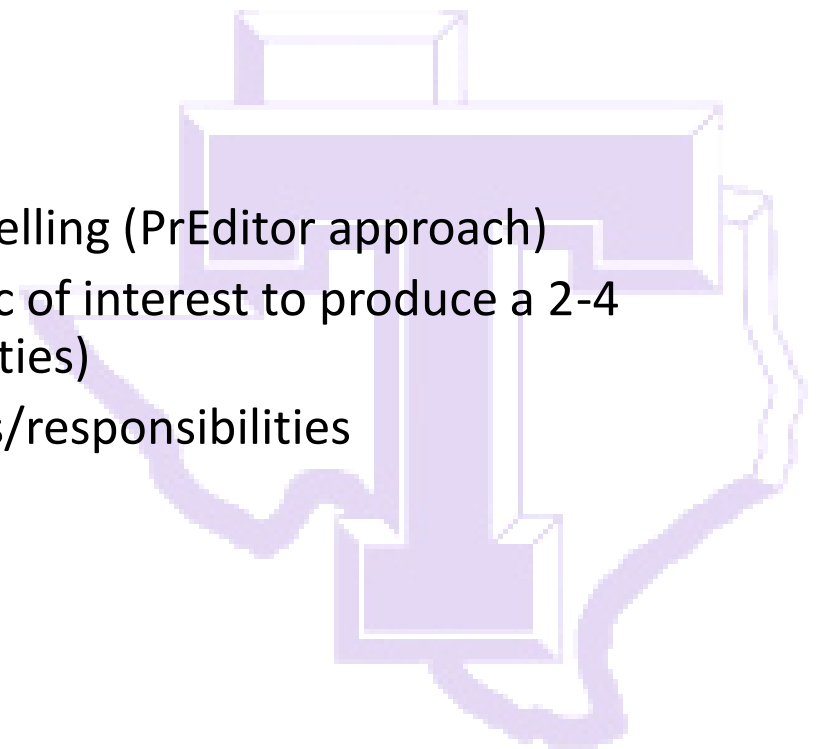
ACOM 4350 – EFP, cont.

- **Student Demographics**
  - Fall 2014 Sections (Graduate and Undergraduate)
    - Headcount – 8 (4-UG; 4-GR)
    - Female – 6
    - Male – 2
  - Spring 2015 Sections
    - Headcount – 10 (5-UG; 5-GR)
    - Female – 6
    - Male – 4
  - Fall 2015 Sections (Preliminary)
   - Headcount – 13 (12-UG; 1-GR)

Course Technology

- Sony NEX FS700R – HD Field Production Camera
- Canon XA10 – HD Video Camera
- Canon 60D – DSLR Camera with HD Video Capture
- Sony ECM-77B (int); Sony ECM-55B (ext)
- Shure FP1 Wireless System
- Azden FMX-42a – Portable Field Mixer
- Manfrotto 545BK Video Tripod
- Steadicam Pilot-AA
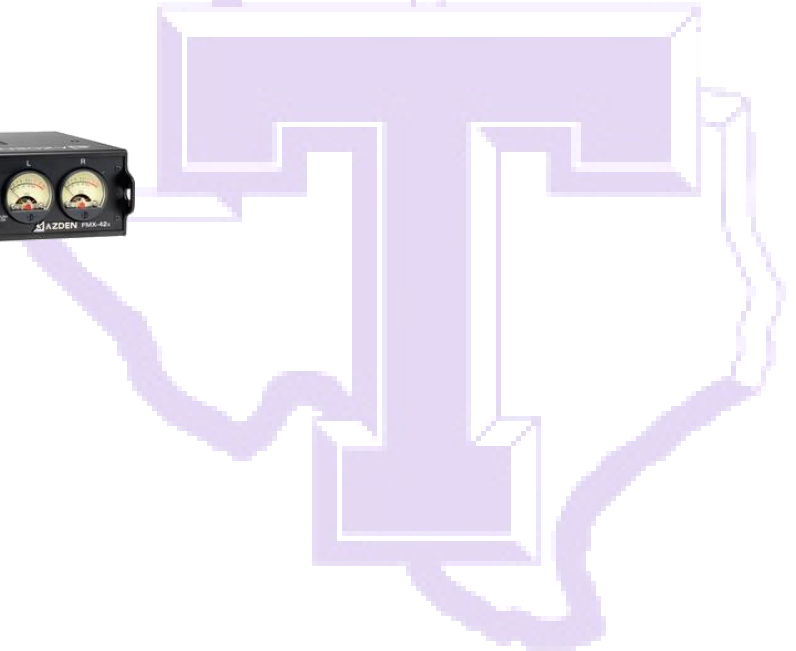
Class Requirements

- All students must serve in each of the major production roles
  - Producer/Director
  - Editor (using Adobe Premiere Pro CS6 or CC)
  - Camera Operator
  - Audio Engineer
  - Story/Script writer
- All students must train on the different camera platforms
  - SONY NEX FS700
 - Canon XA-10
  - Canon 60-D
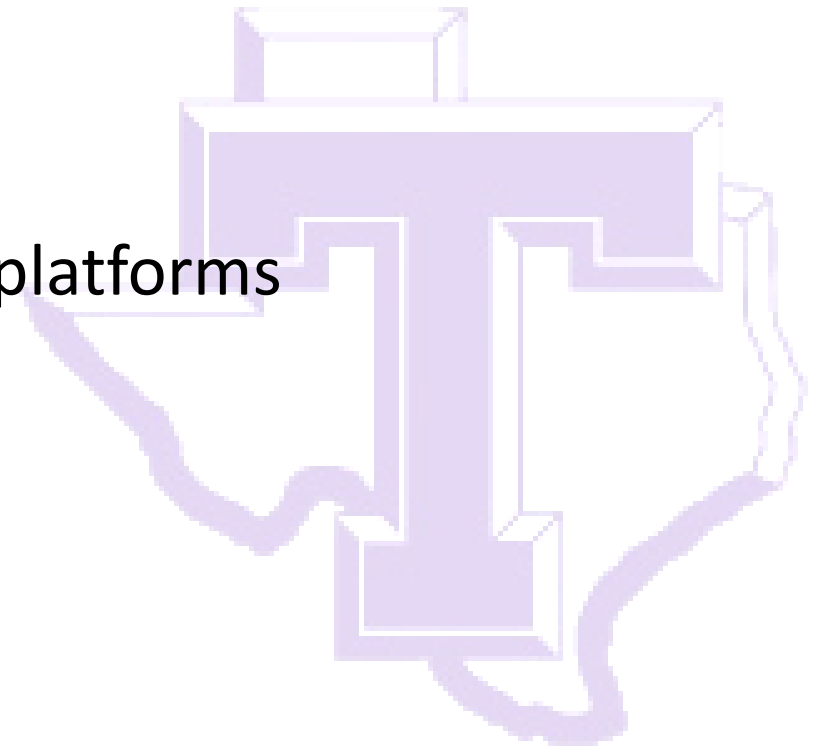
Initial Skepticism

- Fear of the equipment (Cost? Complexity?)
  - "Why can't we just use our Phones?"
- Uncertainty with Editing fundamentals (and Adobe software)
- Uncomfortable with written script/story requirements
- Tendency to "jump in" and "make it work"
- Fear of being creative and taking risks
- Gender differences in self-selected tasks
  - Male – Grip, gaffer, and the muscle
  - Female – story/script creation, producer/director, and some editing
- Something wasn't right…
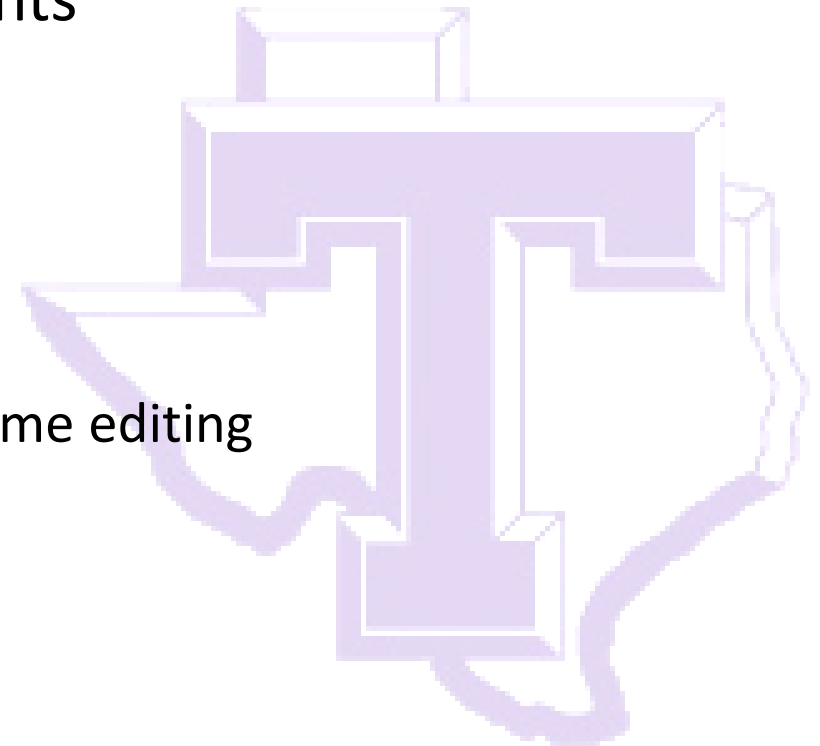
It's a VIDEO Production Course

- None of the students were eager to use the cameras!
  - Primary concern was the cost of the cameras
  - Also, Insufficient preparation prior to the class on visual story telling
    - The students are only required to have a Digital Video Editing course as part of the Communication Studies degree plan requirements.
  - Modifications to the course calendar to spend a week on visual story telling and how to frame a shot based for the biggest impact
  - After training, students were still reluctant to get behind the camera

  - What is the solution?? How do we motivate students to work on the Video portion of this Agricultural Video Production course??
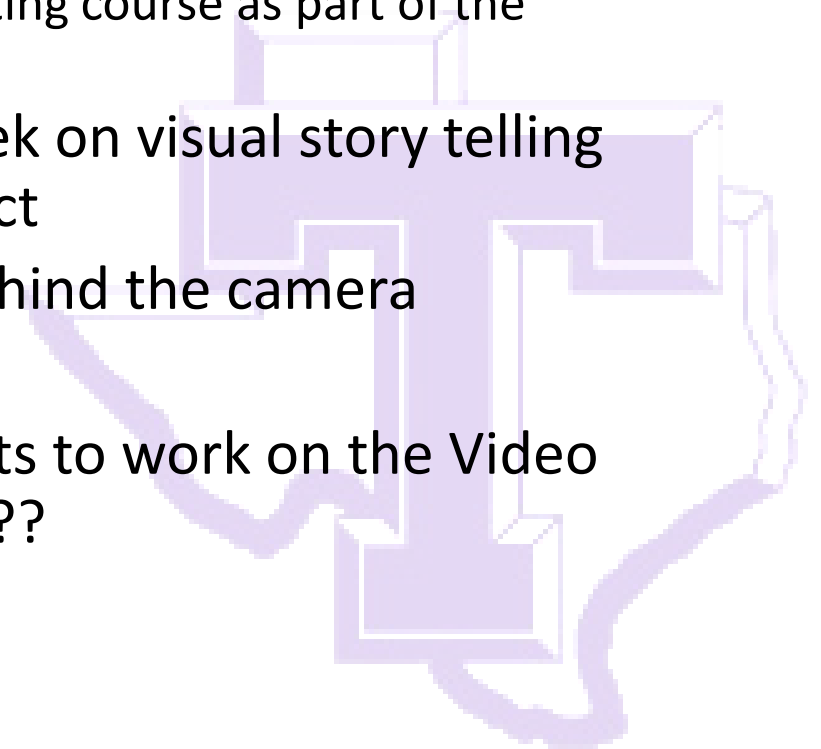
Make it Fun and Engaging!

- First aerial video platform was purchased in Fall 2012
  - Primary purpose was to familiarize ACOM program faculty with innovations in the field. (Plus it has a coolness factor that is off the charts!)
  - Secondary purpose was to research how the aerial drone could be used in more traditional agriculture operations…
- The first drone was used for internal departmental video production and as a recruiting tool for the ACOM Program
- The drone was not originally part of the EFP course design
  - Too expensive
  - High risk
  - Video was not suitable for use without extensive post-processing
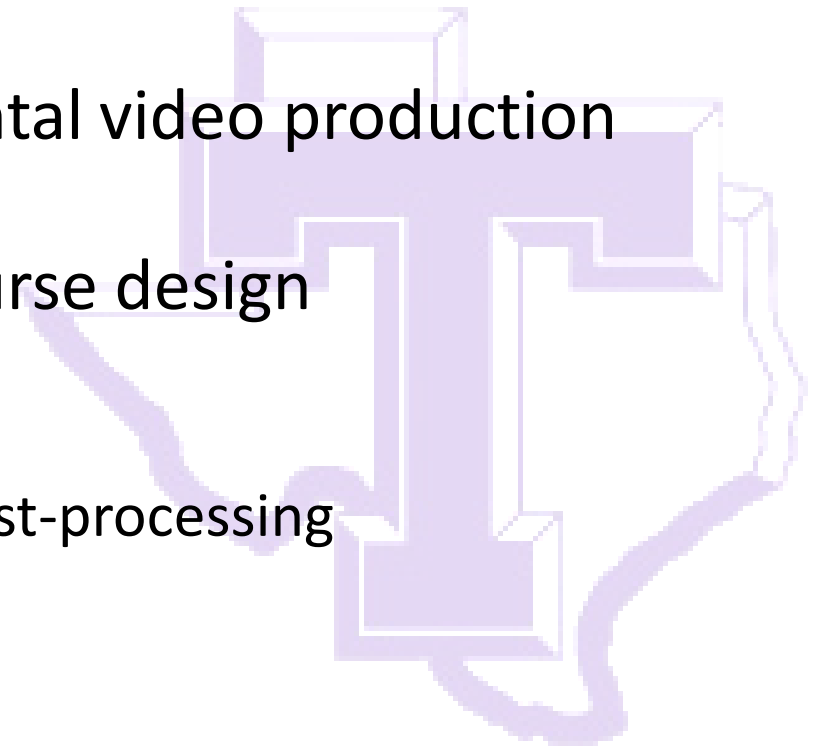
First Aerial Drone

- Phase 1
  - DJI Phantom 1 – Purchased Fall 2012
    - NAZA Guidance with GPS and flight stability
    - GoPro camera mount with no gimbal stabilization
    - Video Example: http://youtu.be/RHhte-SUYpQ
    - Upgraded to Stabilized 2D Gimbal
    - Kumba-Cam FPV kit
   - Video Example: https://youtu.be/RVLKGGTczr4

Student Reaction

- Before the first hands-on training, students were nervous and some refused to try

- But it was a mandatory training

- After training, students were highly motivated and had lost the "FEAR" of using the system

- Every major project had to incorporate aerial footage that someone in the group or team had captured using the system.
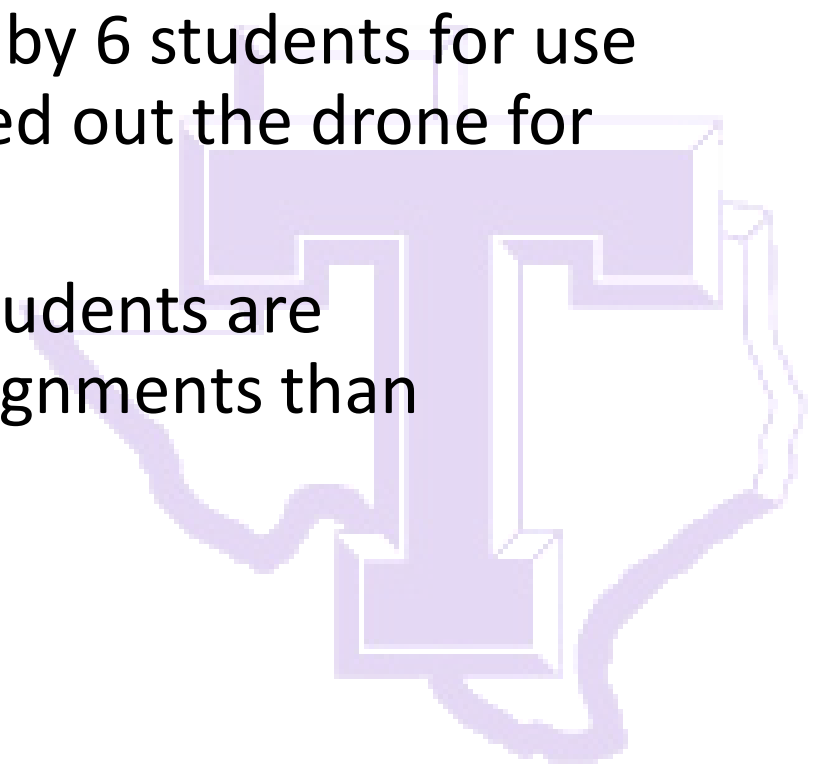
Aerial Drone v2

- Video Still somewhat shaky with noticeable "jello"
  - Possible to cleanup rolling shutter and shake in Premiere Pro

- Phase 2 – Current Solution
  - DJI Phantom Vision 2+ Purchased Summer 2014
    - NAZA Guidance with GPS and flight stability
    - Integrated 1080p HD Video Camera
    - Improved Vibration Reduction and Video Stabilization
    - FPV iOS DJI Vision App with camera tilt control and battery feedback
      - Still vs Video Mode; Start/Stop; Programmable Flight Path
    - Return to Home – Automatic landing (Haven't tried this)
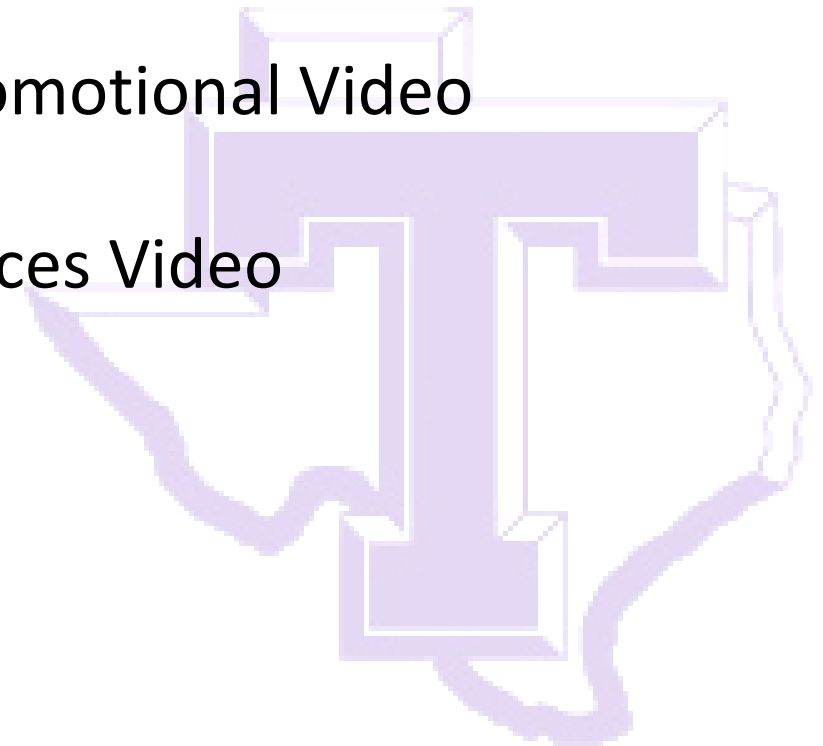   - Video Example: http://youtu.be/SKWz8_A1CKE
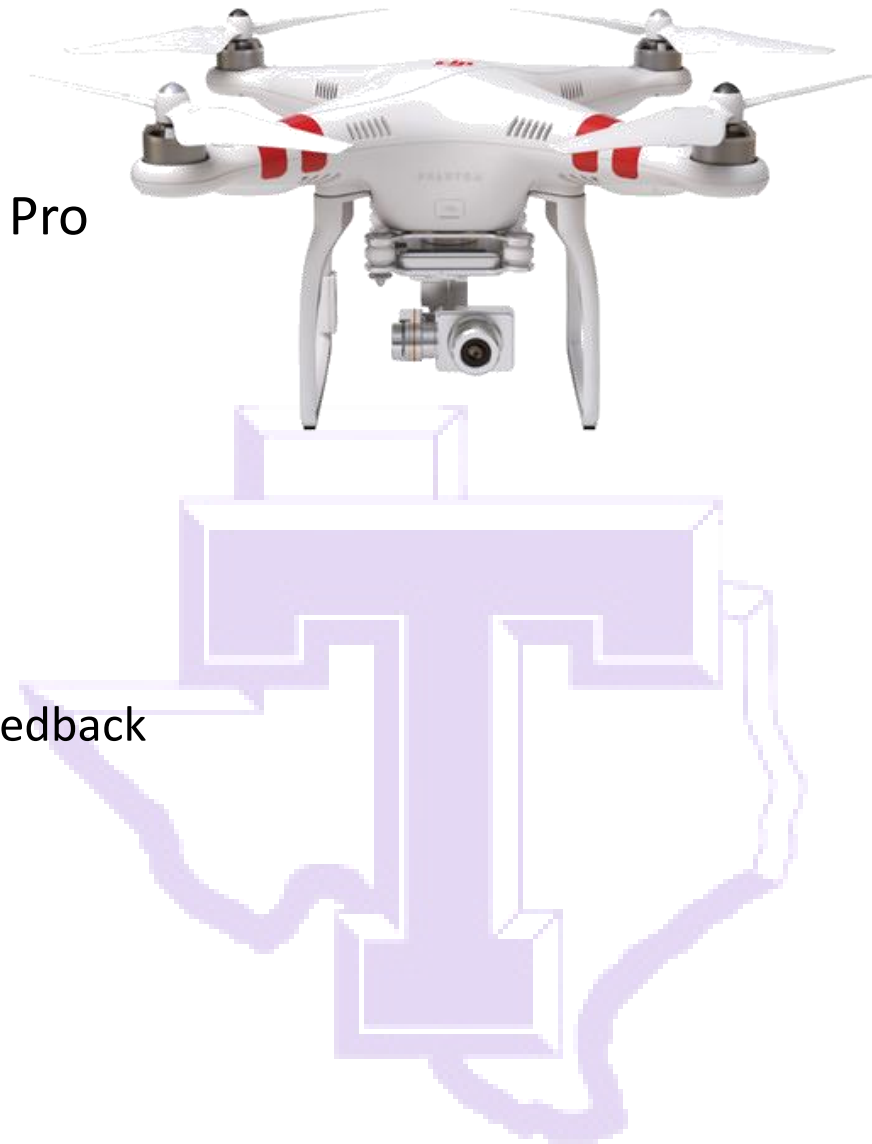
Student Usage

- During Fall 2014, the drone was checked out by 2 students for use in their class productions.
  - Other students used aerial video, but requested that I operate the drone
- During Spring 2015, the drone was checked out by 6 students for use in their class projects. Two students also checked out the drone for use in an independent production.
- With two drones available for the class, many students are incorporating more aerial footage into their assignments than traditional video.

Student Projects

- AGCS Departmental Video
  - https://www.youtube.com/watch?v=cbwD2uH7F6o
- Office of Applied Learning Experiences – Promotional Video
  - https://www.youtube.com/watch?v=JRoQ6SQpJ10
- Tarleton's Equine Assisted Theraputic Riding Promotional Video
  - https://www.youtube.com/watch?v=-LhaiYK1UqA
- College of Agricultural and Environmental Sciences Video
  - https://www.youtube.com/watch?v=bNyjsYzwciI
- National FFA Officer Workshop
 - https://www.youtube.com/watch?v=GzVglZIUIB0

Drone Regulations

- Federal Aviation Administration (FAA) Guidelines
  - [Section 336 of Public Law 112-95 (the *FAA Modernization and Reform Act of 2012*)](#)
  - Below 400'
  - Non-Commercial, Recreational, or Hobby Use
  - Maintain Visual Line of Sight
  - Remain clear of manned aircraft
  - Do not fly near people or stadiums
  - Do not be careless or reckless
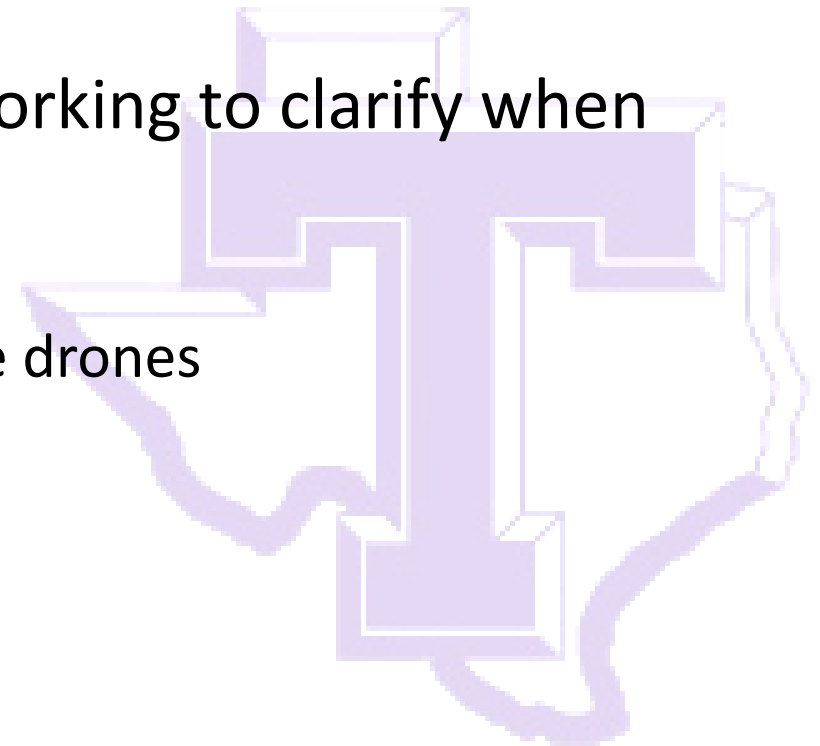 - Do not fly within 5 miles of airport without notification
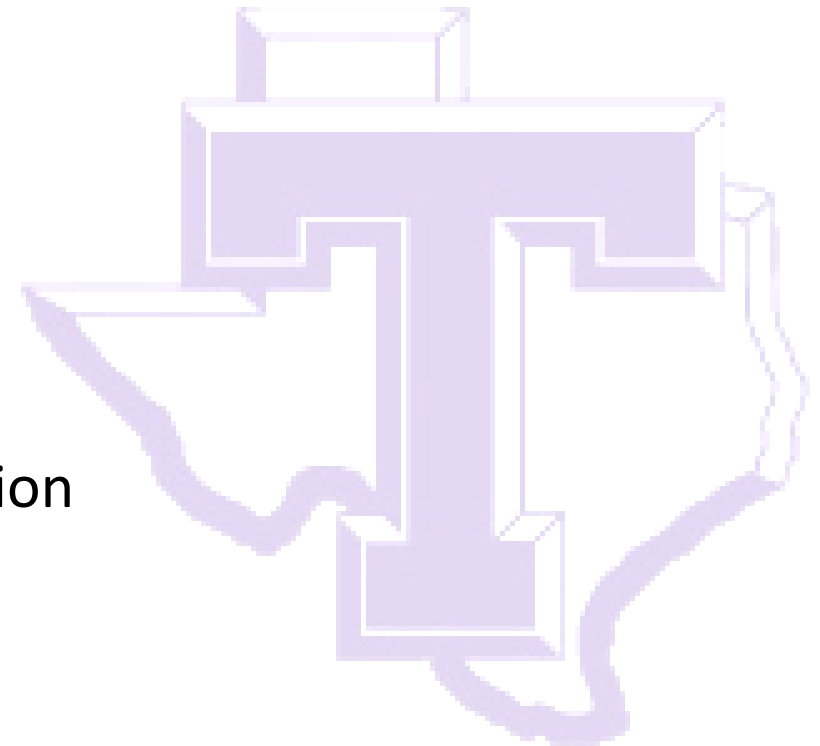
Drone Regulations

- Notice of Proposed Rulemaking for small, unmanned aircraft
  - February 15, 2015
  - Current regulations are unchanged
- Certificate of Waiver or Authorization (COA)
  - Issued by FAA to Public Operator
  - Public Aircraft
    - Title 49 U.S.C. § 40102(a)(41) provides the definition of "Public Aircraft" and § 40125 provides the qualifications for public aircraft status.
  - **Using an aircraft in the day-to-day activities of an agricultural extension service, if not related to development of an aircraft, would also not qualify as a governmental function (FAA memo 13 June 2014).**
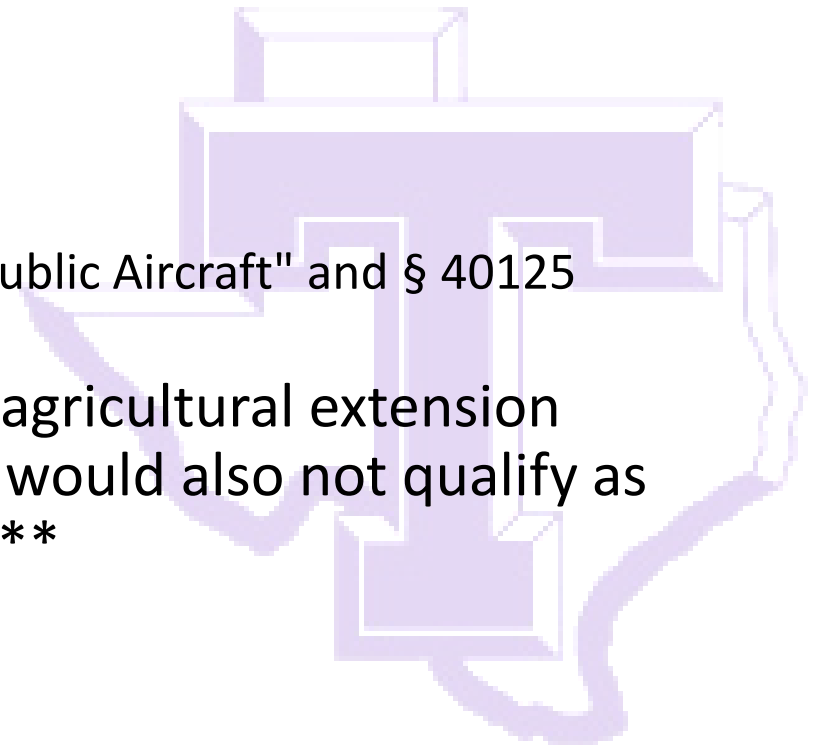
Risk Management Involvement

- Regulations are not totally clear about the use of COTS platforms for educational use.
  - TSU is not conducting Aeronautical Research
  - TSU is not developing a new platform or aircraft
- Out director of Risk Management is currently working to clarify when and where the drones may be used.
  - Other departments are not purchasing drones
  - Other organizations are requesting footage from the drones
- Basic Operational Guidelines
  - BE SMART. BE SAFE. DON'T BE STUPID

Questions??