

AAOF Legacy Collection

Status Report

Sean Curry, February 2012



[AAOF Collection Home Page](#)

Information

[About AAOF](#)
[About this Site](#)
[Contacts](#)
[Collection Statistics](#)
[Acknowledgements](#)

Browse Collections

Descriptions

[Overview of All](#)
[Bolton-Brush Growth](#)
[Burlington Growth](#)
[Denver Growth](#)
[Fels Longitudinal](#)
[Forsyth Twin](#)
[Iowa Growth](#)
[Mathews Growth](#)
[Michigan Growth](#)
[Oregon Growth](#)

Browse Images

[Bolton-Brush Growth](#)
[Burlington Growth](#)
[Denver Growth](#)
[Fels Longitudinal](#)
[Forsyth Twin](#)
[Iowa Growth](#)
[Mathews Growth](#)
[Michigan Growth](#)
[Oregon Growth](#)

Search Collections

AAOF Craniofacial Growth Legacy Collection

Welcome!

With support from the American Association of Orthodontists Foundation (AAOF), nine of the eleven known collections of longitudinal craniofacial growth records in the United States and Canada have joined together to create this web site and its underlying numerical database. Our purpose is to make representative materials from the participating collections available for viewing and further investigation by clinicians, craniofacial investigators, students of human growth, and interested members of the public.

These collections represent the work of hundreds of investigators. They have been gathered, cataloged, and studied over a period of more than seventy-five years. The materials they contain are literally irreplaceable. Each of the collections is independent from the others and has pursued its own sampling and data collection strategies. Taken together, these different and complementary strategies have produced a rich longitudinal record of craniofacial development among children who did not receive orthodontic treatment. Available documentation of the growth process in the several collections includes skull x-ray images of various sorts, hand-wrist films, dental radiographs, facial photographs, and study casts as well as written records on the physical and educational development of children of varied ethnicities and growth patterns.

The contributing collections, working individually, have produced most of the information that is available in the contemporary orthodontic literature on longitudinal craniofacial growth in untreated children. Now, by merging data from the several collections, we hope to make possible further collaborative studies that will enrich and refine our knowledge of craniofacial growth in untreated children and adolescents.

During the initial phase of this project which is now nearing completion, we have confined ourselves to the collection of lateral and frontal cephalograms. Presently available on the site are digital images of 2000 lateral cephalograms generated at different ages from over 200 cases gathered from 9 different Collections. Summary statistics on case distribution by sex/gender, age and Angle Class may be found by clicking on "Collection Statistics" in the Information section of the menu on the left side of this page.

This entire site is intended to be viewed as a work in progress, intended to function as a continually developing resource for orthodontic teaching and research. Its primary role is to serve as a repository for longitudinal records of all types with sufficient numerical documentation to facilitate useful search and querying.

Getting Started

You can mouse over the Collection Names in the Collection Highlights box at the right of the page, and see a brief description of each collection. Then just click on the Collection Name to get a more detailed description, plus a link to see the Collection's records. You can also click on a Collection Name in the left menu to jump to the description page.

Clicking on the "Overview of All" left menu item takes you to a page showing Overviews of all the Collections, with links to each Collection's description and records. Clicking on the Collection Name under the "Browse Images" left menu section takes you directly to the Collection's records.

Use of Materials from This Site

In creating and sustaining this site, AAOF and the participating collections seek to make possible the widest use of its unique materials in education and research. To that end, the entire content of the site is made available without cost for on-line use and downloading by all members of the orthodontic community. Other investigators and members of the public may also request permission to download site materials contingent upon agreement by the collection that was the original source of the materials in question. The pixel resolution of the images on the site is considered sufficient for most practical uses and equals or exceeds that at which clinical head film analyses are usually performed on digital images. However, higher resolution versions of selected images may be desired for specialized uses in research and publication. In such cases, interested parties should contact the collection(s) of origin directly, being aware that some the collections may find it necessary to charge for such higher resolution images.

When images obtained from this site are used in presentations or publications, the AAOF and the collection of origin should be cited appropriately.

Collection Highlights

Click A Collection Name for a Brief Overview

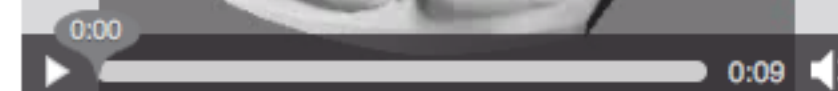
[Bolton-Brush Growth](#)
[Burlington Growth](#)
[Denver Growth](#)
[Fels Longitudinal](#)
[Forsyth Twin Sample](#)
[Iowa Growth](#)
[Mathews Growth](#)
[Michigan Growth](#)
[Oregon Growth](#)



[Michigan Growth Subject 02101](#)
Animation of 12 Timepoints Over 12 Years



[Landmark Overlays and Locations](#)



AAOF Legacy Collection Report

- Project Focus
- Current Status
- AAOF Legacy Website
- Handling Image Requests
- The Future

AAOF Legacy Collection Project Focus

1. Records Preservation

- The first task of the Legacy Collection Project is to acquire and collate a digital archive of representative images before the original analog versions are lost to progressive physical deterioration

2. Research and Teaching

- Make the images discoverable and available to a worldwide audience through the Legacy Collection Website

Records Preservation Status as of 2/2012

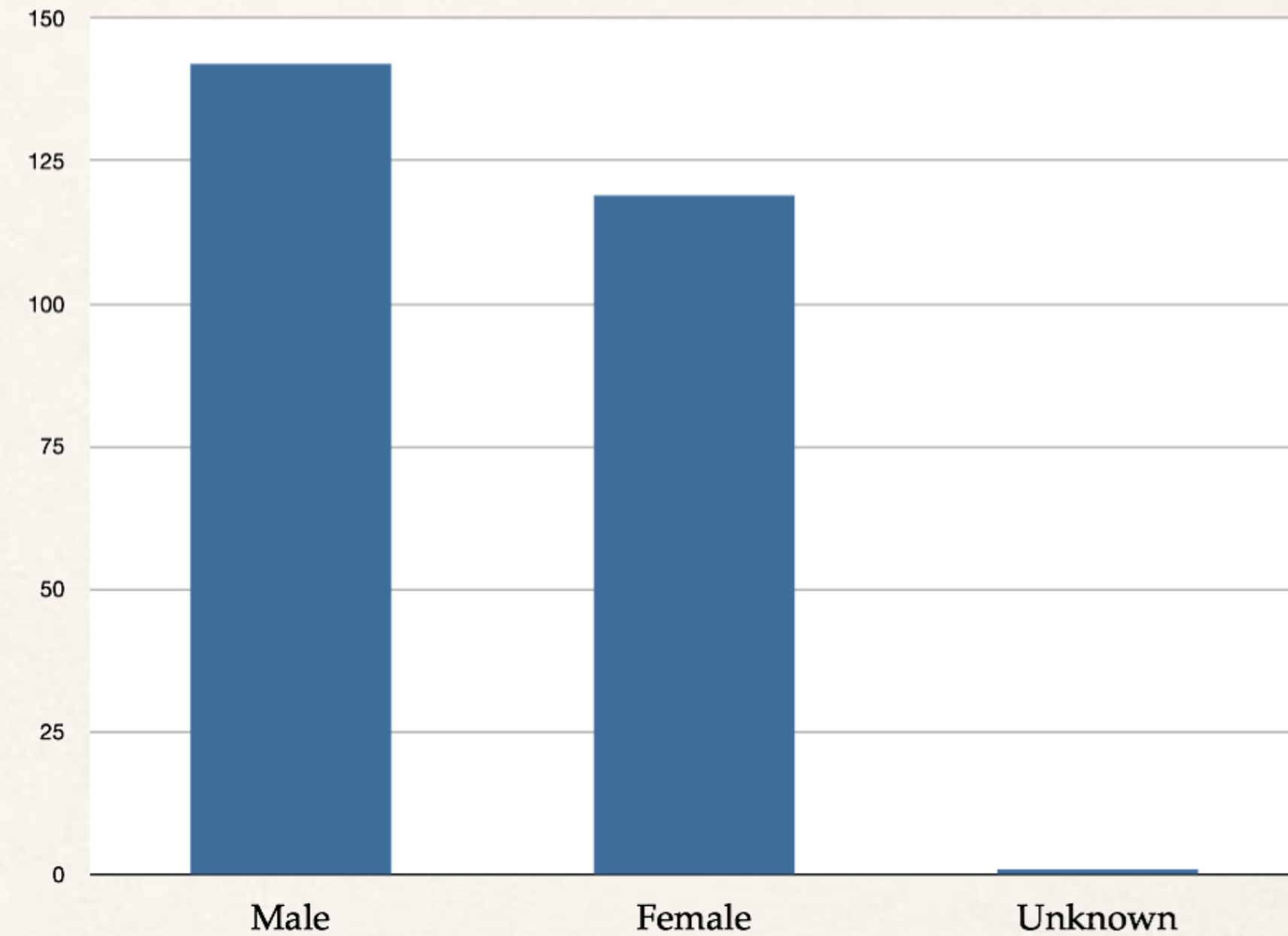
- 9 Collections
- 314 Subjects scanned and uploaded to the server
- Goal is 1000 Subjects over the full 2 years of the project
- 262 Subjects Loaded to the Website and database
- 2710+ Timepoints
- 3950+ Images (Lateral, Frontal, Hand Wrist, 3D Study Cast)
- 1250 Lateral Cephs with Landmarks Locations in the database

Subject Distribution

Subjects by Angle Class

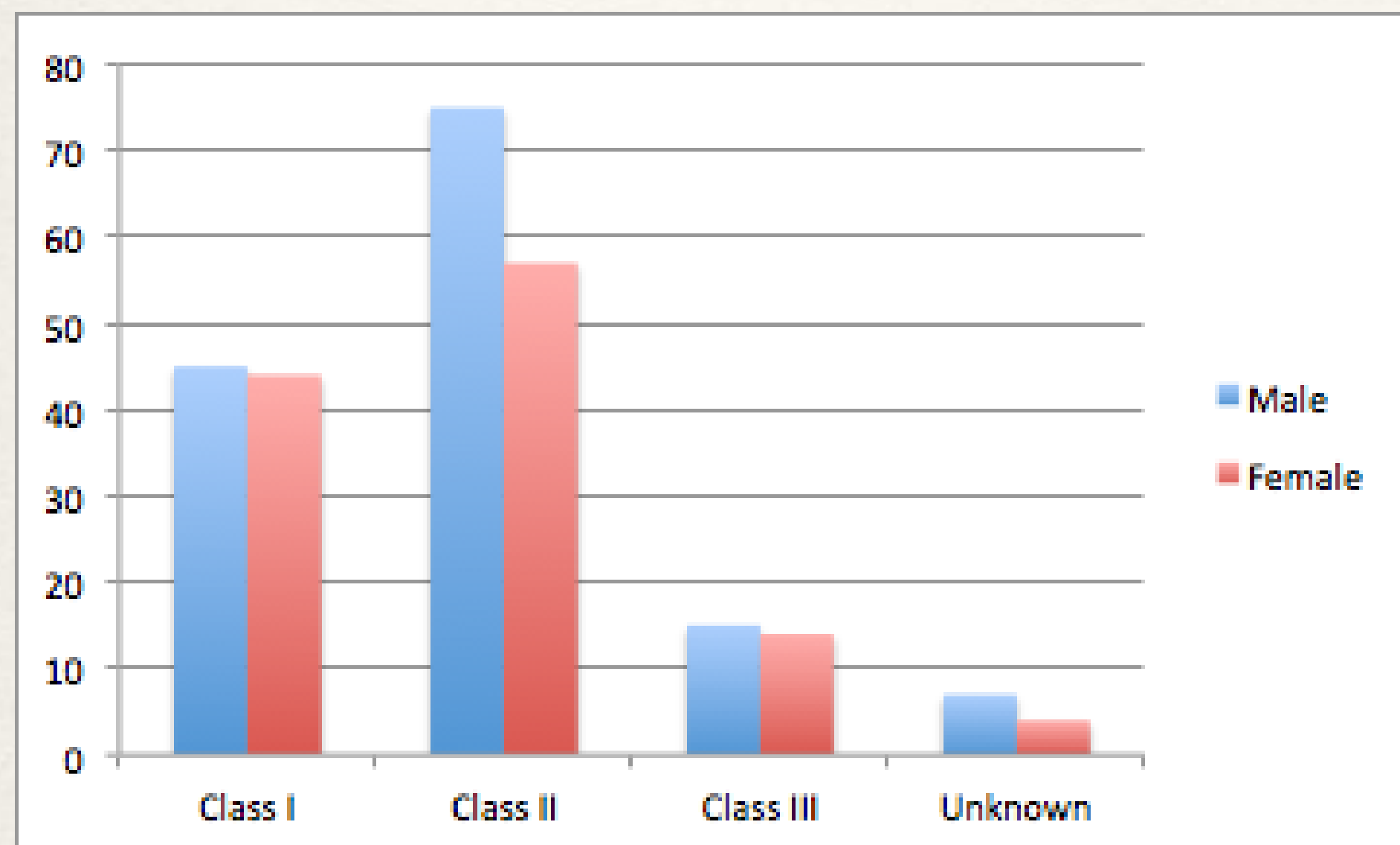


Subjects by Sex



Subject Distribution

Subjects by Sex and Angle Class



Average Age Ranges by Sex

	Female	Male	Combined
Avg Age at First Image	6.0	6.1	6.0
Avg Age at Last Image	16.6	18.1	17.4
Avg Range in Years	11.4	12.4	12.0
Count	119	142	261

Image Preservation

- Original film images are scanned at their respective institutions
- These raw Collection images are loaded to the AAOF server
- Organized and selected at CRIL
- Processed by a data assistant
 - Renaming, resizing, reformatting for the website
 - Demographic data loaded to the database
 - Organized and saved on the server for other users

AAOF Legacy Website

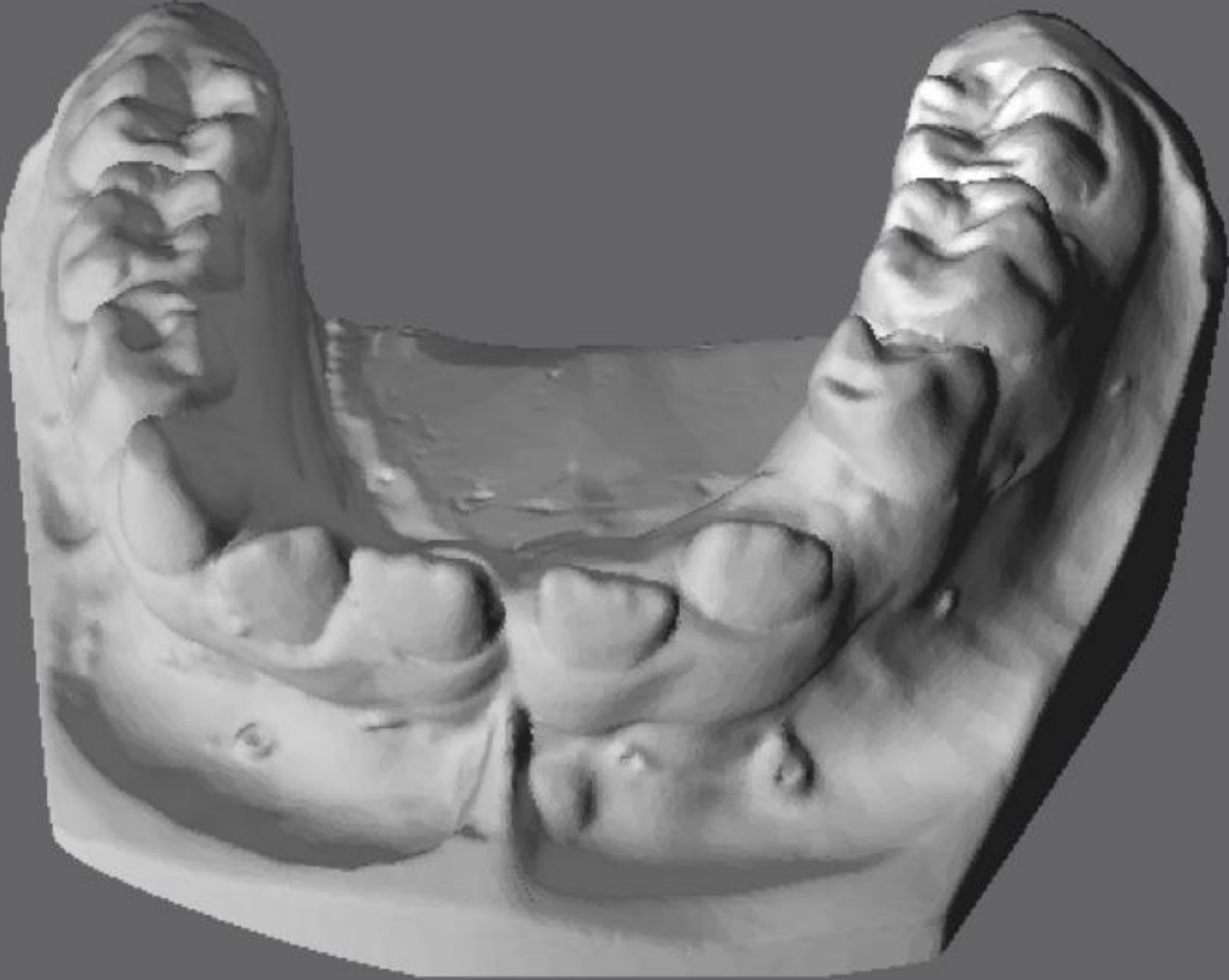
- www.aaoflegacycollection.org
- The Website is the interface to the Collections for researchers and educators around the world
- Tools to browse images by Collection
- Search tools to find Subjects by characteristics
- Users can select and request high-resolution images for later delivery

AAOF Legacy Website Usage

- Results from Google Analytics for 2011
- Over 6,000 visits from over 50 countries
- Approximately 32,000 pageviews
- Most visited Collections:
 - Michigan Growth
 - UOP Mathews
 - Case Western Bolton Brush

Website and Database Enhancements

- Current enhancement phase started 6/2011
- Focus on capacity, performance, functionality
- Ported entire database to PostgreSQL - industry standard, room for future growth
- New side-by-side image viewer
- 3D Study Cast viewing
- New search tables
- Addition of Hand Wrist images



UMICHGrowth : 02101
Timepoint: 04 of 12 Sex: M
Birthdate: 5/1949
Film Date: 5/3/1957
Age at Film: 8y 0m
Angle Class at First Film: Class II

Please allow 10-20 seconds for the model to download, depending on the speed of your Internet connection. Click and drag to rotate the model. Use the middle mouse wheel to zoom in and out. The Study Cast 3D display requires a modern browser (Firefox 5+, Safari 5+, and Chrome) with WebGL enabled, and an OpenGL compatible graphics card. Most recent laptop and desktop computers running Windows or Mac OSX should work fine without tweaking any settings. Due to Microsoft's continued refusal to follow web standards, Internet Explorer is iffy, although IE9 may work with the Google Chrome Frame installed.

Top Front Bottom Diagonal Zoom + Zoom - Mandibular Maxillary Occlusion

3D Study Cast Viewing

Requires Modern Browser

Collection Discovery

- As the Legacy Collection grows, tools are needed to locate and select Subjects
- Detailed Collection Inventory pages allow users to browse the Collection
- Search Tools allow users to search on demographic and anatomic characteristics
- We will continue to add more capability in this area

Sample Inventory View from the Burlington Growth Collection

Subject: 186
Sex: Male
Angle Class: Class II
Treatment: None

Click on grid cell for a Preview Image
[Click here to see all Preview Images](#)

Collapse/Expand This Image Grid

Number of Images: 14

Image	Age	Select
1	3y 0m	<input type="checkbox"/>
2	4y 0m	<input type="checkbox"/>
3	5y 0m	<input type="checkbox"/>
4	6y 0m	<input type="checkbox"/>
5	7y 0m	<input type="checkbox"/>
6	8y 0m	<input type="checkbox"/>
7	9y 0m	<input checked="" type="checkbox"/>
8	10y 0m	<input type="checkbox"/>
9	11y 0m	<input type="checkbox"/>
10	12y 0m	<input type="checkbox"/>
11	13y 0m	<input type="checkbox"/>
12	14y 0m	<input type="checkbox"/>
13	16y 0m	<input type="checkbox"/>
14	20y 0m	<input type="checkbox"/>

Preview Image (Click to See Full Size)

Lateral Ceph



Subject: 191
Sex: Male
Angle Class: Class II
Treatment: None

Click on grid cell for a Preview Image
[Click here to see all Preview Images](#)

Collapse/Expand This Image Grid

Number of Images: 8

Image	Age	Select
1	3y 0m	<input type="checkbox"/>
2	4y 0m	<input type="checkbox"/>
3	5y 0m	<input type="checkbox"/>
4	6y 0m	<input type="checkbox"/>
5	7y 0m	<input type="checkbox"/>
6	8y 0m	<input type="checkbox"/>
7	9y 0m	<input checked="" type="checkbox"/>
8	10y 0m	<input type="checkbox"/>

Preview Image (Click to See Full Size)

Lateral Ceph

Frontal Ceph

Hand Wrist



Subject 191 has Lateral Cephs, Frontal Cephs, and Hand Wrist Images



Collection Bolton-Brush Growth Subject B2603 Image 01 Type Lateral Ceph

Show Data Table Landmarks and Labels Light Labels

Collection Bolton-Brush Growth Subject B2603 Image 06 Type Lateral Ceph

Show Data Table Landmarks and Labels Light Labels

Side by Side Image Viewer

Compare Any 2 images from Any Collections and View Landmarks if Available

Collection Searching

- The Website is driven by a database
- Each Subject has Angle Class, Sex, Age at Films
- A selected subset of Subjects have anatomic landmark locations and computed measurements
- Search tools allow users to select on these various parameters
- Retrieved data can be downloaded for further analysis and as a guide to selecting images for further study

Search the AAOF Collections

Option 1. Search by Collection and Demographic Information

Select Cases from the Collection, where the
Age at First Film is years, and the
Age at Last Film is years, and
Angle Class is

Option 2: Search by Conventional Cephalometric Measurement and Age

List Timepoints for Subjects from Collection
where the value of at Age
is greater than and is less than

Option 3: Search by Conventional Cephalometric Measurement Changes

List the Subjects from Collection
where a value of between the ages of and is
and the change in between the ages of and is

Search the AAOF Legacy Collections

Search results at Any Age from the CASEBolton Collection, where Sella-Nasion-Point A Angle is greater than 80

Number of records matching search = 20 out of 41 Images with valid Sella-Nasion-Point A Angle

- Click on the Subject entry to display the image
- Click on a column heading to sort that column
- Shift-Click additional column headings to sort on multiple columns

Show 25 entries

Copy CSV PDF Pri

Collection	Subject	Image	Age	SNA	SNB	ANB	NP2PA	NP2PO	SNDST	SNFHA	CONVX	WITSA	AB2FH	OB_FH	OJ_OC	U6L6D	TFHNP	LFHNP	PLHNP	IIANG	I
CASEBolton	B1241	4	4.5	80.3	81.2	-0.9	-0.4	-2.3	60.1	10.2	173.8	N/A	-1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CASEBolton	B0343	5	17.8	80.6	80.6	0.0	-5.7	-12.7	79.1	14.7	172.5	N/A	-3.9	2.6	N/A	N/A	131.2	76.4	0.58	112.2	
CASEBolton	B2603	1	5.0	81.4	84.1	-2.8	N/A	N/A	70.7	N/A	176.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CASEBolton	B2603	3	9.0	82.0	84.1	-2.1	4.7	4.5	72.8	2.8	175.9	6.9	0.3	-1.2	-1.4	5.4	109.2	63.9	0.59	134.3	
CASEBolton	B1241	3	4.0	83.0	82.5	0.5	-0.9	-1.0	58.8	8.2	171.9	N/A	-0.0	N/A	N/A	N/A	87.5	50.0	0.57	N/A	
CASEBolton	B2603	4	11.0	83.5	84.4	-0.8	3.6	4.6	72.7	2.6	173.1	N/A	1.3	1.7	N/A	N/A	N/A	N/A	N/A	128.9	
CASEBolton	B2603	6	15.0	83.5	85.8	-2.3	8.0	7.5	78.5	-1.2	177.2	2.0	1.5	2.4	2.8	1.7	124.2	71.7	0.58	131.5	
CASEBolton	B2603	2	7.0	83.6	83.2	0.5	1.9	5.7	70.6	3.9	169.6	N/A	2.2	N/A	N/A	N/A	100.0	58.9	0.59	N/A	
CASEBolton	B0387	1	13.9	84.5	85.7	-1.2	0.6	N/A	68.0	4.8	N/A	5.3	-1.5	2.2	2.3	4.6	N/A	N/A	N/A	135.3	
CASEBolton	B0387	2	14.8	85.3	86.6	-1.3	-1.3	N/A	69.2	6.0	N/A	5.0	-3.4	3.3	3.3	4.7	N/A	N/A	N/A	N/A	
CASEBolton	B0387	4	16.9	85.4	88.2	-2.8	-0.8	-9.6	71.1	5.5	181.4	4.9	-5.6	3.6	3.7	6.3	116.2	64.7	0.56	146.5	
CASEBolton	B0387	3	15.8	85.8	88.3	-2.5	-2.1	-11.6	69.6	6.4	181.1	5.6	-5.7	2.8	2.7	5.3	114.6	64.3	0.56	140.6	
CASEBolton	B2603	5	13.0	86.1	86.7	-0.7	7.3	N/A	74.9	-3.8	N/A	2.3	4.0	2.4	3.0	1.9	N/A	N/A	N/A	N/A	
CASEBolton	B3341	7	18.5	87.2	84.3	2.9	-4.5	-2.4	74.6	6.7	167.9	3.2	2.7	-0.3	-0.2	1.2	140.6	81.5	0.58	122.6	
CASEBolton	B3341	5	16.1	87.6	84.9	2.7	-4.0	-2.8	75.0	6.0	168.8	3.5	2.3	1.1	1.0	4.6	136.8	79.8	0.58	118.2	
CASEBolton	B3341	6	17.2	88.0	85.0	3.0	-4.5	-2.7	75.2	6.0	167.8	4.4	2.6	0.0	-0.1	5.4	138.5	81.1	0.59	119.3	
CASEBolton	B3341	1	12.1	88.1	84.8	3.3	-5.9	-5.2	69.9	7.7	164.9	2.3	1.5	1.2	1.4	3.3	123.2	72.2	0.59	116.0	
CASEBolton	B3341	2	13.0	88.1	84.3	3.9	-5.1	-2.1	71.1	6.7	165.1	2.3	3.3	2.3	2.5	3.0	124.8	72.7	0.58	113.9	
CASEBolton	B3341	4	15.1	88.2	85.0	3.1	N/A	N/A	74.0	N/A	166.9	4.0	N/A	N/A	1.0	5.1	N/A	N/A	N/A	116.0	
CASEBolton	B3341	3	14.0	88.9	84.4	4.5	-6.7	-2.4	72.3	7.1	163.2	3.4	3.7	3.0	3.0	4.3	129.5	73.5	0.57	117.4	

Showing 1 to 20 of 20 entries

Search Table Results

Sortable Columns, Results can be Downloaded for Additional Analysis in Excel

AAOF Legacy Collection Image Requests

- Users can save the lower resolution images directly from the Website
- Full resolution images are selected on the Website and delivery is requested
- An email is automatically sent to the “aaofrequests” gmail account
- The details of the request are logged in a file on the AAOF server
- I manually review the request details and copy the images to an FTP folder
- The Requestor is notified that the images are available for download

Image Requests - Current Process

- Requesters are told that they must credit the AAOF and the Collection, and that images remain the property of the Collection
- Requests have arrived from Researchers and Residents in a number of countries
- Typical request: I am a orthodontic resident at the University of Washington and currently conducting a research project with Dr. Dave Turpin examining chronological changes at the antegonial notching in unique patient samples. We want to use the AAOF collection for our "normal" sample.
- This request encompassed 86 images from 8 Collections

Future Focus

- Continue loading scanned images
- Enhance website search capabilities
- Continue to enhance underlying website and database infrastructure for performance and future growth
- Further automate responses for image requests

Summary

- Data loading is proceeding smoothly
- Website and database enhancements are ongoing
- Image Requests are increasing
- The Curators of the AAOF Legacy Collections would like to thank the AAOF Board of Directors and the Legacy 300 Donors for making this project possible